

## AN ANALYSIS OF PRESENT AGRICULTURAL SCENARIO AND ITS PROBLEMS AND PROSPECTS - A CASE STUDY OF BAKSA DISTRICT OF ASSAM

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### ABSTRACT

Agriculture is the back bone of Baksa district, more than 70 percent of people in the district depends on agriculture for their livelihood. Most of the area in the district is located as plains adjacent to the foothills of Himalayas. The soil of the Baksa district is fertile and suitable for cultivation of different types of crops. Paddy is mostly cultivated by the farmers of the district. They grow mainly summer paddy and winter paddy. In addition to paddy, the farmers of the district grow some other major crops such as Mustard, Jute, Wheat, Potato, Lentil, Black gram and different types of vegetables like Cabbage, Knol-khol, Cauliflower, Brinjal, Radish, Tomato, Cucumber, Carrot, Onion, Garlic, Chilly, Zinger, Turmeric, Lady's finger etc. in different parts of the district. In spite of having some tremendous agricultural prospect in Baksa, agriculture sector is not well organized and developed. It has been seen that the economic condition of the rural people who are engaged in agricultural activities is not good. Therefore, this paper will try to analyze the present agricultural practices followed in the agricultural fields of the Baksa district and how well organized modern agricultural practices can help in changing the economic situation of the farmers and the district.

**Keywords:** Agriculture, Assam, Baksa District, Problems

### Introduction

Agriculture has been a way of life and continues to be the single most important livelihood of the masses in India. It is the most important sector of Indian economy from the perspective of livelihood of the people and employment generation. The share of agriculture (excluding allied activity) in Gross Domestic Product of the country was 48.6 percent in 1950-51 which, due to growth of industrial and tertiary sectors, declined to 29.5 percent in 1990-91 and to 12.3 percent in 2010-11 (Statistical Handbook of India, 2008-09, 2010-11, and Economic Survey of India, 2011-12). Notwithstanding the declining trend in Agriculture's share in GDP, the importance of the sector to the economy is best understood with reference to the share in employment and in terms of its criticality for macro-economic stability. Employment in agriculture sector as percentage of the total workforce has exhibited only a marginal decline from 75.9 percent in 1961 to 59.9 percent in 1999-2000 and then to 58.2 percent in 2009-10. (Economic survey of India, 2011-12).

Agriculture and its allied activities has a paramount importance in the state of Assam as this sector is the major contributor to the state

economy supporting more than 75 percent of the population of the state directly or indirectly providing employment to more than 53 percent of total work force. About 99 percent of total mass of the state is rural and almost 50 percent of the total area is utilized for cultivation. The net sown area is 28.10 lakh hectares (2009-10) and the per capita availability of net sown area comes to around 0.1 hectares. (Economic Survey Assam, 2011-12). On the top of it, 23 percent of the net sown area is either flood or draught prone. The average operational holding is 1.47 hectare in 1970-71, and it was 1.27 hectare in 1990-91, 1.11 hectare in 2005-06 and then 1.10 hectare in 2010-11, only and more than 85 percent of the farmer family is small or marginal farmers with average land holding of only 0.63 hectare. (State Report in Agricultural Census, 2005-06 and Economic Survey of Assam 2017-18). The contribution of agriculture sector to the state's income was about 50 percent in the early 1980's and it was 35 percent in the end of 1990's and then it was 19.89 in the year 2011-12, 16.39 percent in the year 2017-18 and 15.76 percent at the end of 2018-19, showing a decline trend as compare to the other sectors. (Statistical Handbook of Assam 2018-19).

Agriculture is the back bone of Baksa district, more than 70 percent of people in the district depends on agriculture for their livelihood. Most of the area in the district is located as adjacent of hill Himalayas, so the soil is most fertile and suitable for cultivation of different types of crops and average yield per hectares of land is also very high as compared to other district of the state. Paddy is mostly cultivated by the people, they grow mainly summer paddy and winter paddy. The farmers of the district grow some other major crops such as Mustard, Jute, Wheat, Potato, Lentil, Black gram and other different types of vegetables like Cabbage, Knol-khol, Cauliflower, Brinjal, Radish, Tomato, Cucumber, Carrot, Onion, Garlic, Chilly, Zinger, Turmeric, Lady's finger etc. in different parts of the district for self subsistence and commercial purpose. Likewise, some other minor crops are also grown in the district such as pea, sesame Niger, Cucurbits, Tapioca and plantation crops like banana, Coconut, areca nut, guava, mango, orange, lemon, bamboo etc. Kharif rice and Rabi rice are the major crops in the district, which covers about 62 percent in the kharif seasons and 38 percent in the Rabi seasons. The farmers in the district also produce a large variety of cereals, which are Maize, Wheat, Tur, Gram, Lentil pea, Rabi pulses, Linseed, Castor, Rape, Mustard etc. and some non food crops such as Jute, mesta etc. In the district there is a vast scope of crop intensification by way of increased cropping intensity and planned productivity, diversification and modernization of various subjects of agriculture to increase the cropping intensity. (. Statistical Handbook of Baksa 2017-18).

It has been seen that area under different crops has decreased and for some other crops increased during the last years, but the average yield of the major crops has been increasing except 2016-17, which was due to bad weather conditions in that year. Similarly, the total production of all major crops has a rising trend except 2016-17 as shown in table-2. The increasing trends of production of all crops was caused by intensive methods used by the farmers in the field of agriculture and use of modern inputs. It has also been notice that area under high yielding variety of Rice has increased in

the recent past, which has been shown in the following table .

**TABLE: 1: Area under high yielding variety of rice in Baksa District**

Sl.No	Item	Area in Hectare			
		2008-09	2011-12	2014-15	2017-18
1	Autum Paddy	8680	17970	18680	3897
2	Winter Paddy	38,202	70013	90390	90875
3	Summer Paddy	10,196	2875	540	4732

Source: District Statistical Hand Book, Baksa, Published Annually by Deputy Director Economic & Statistics, Baksa.

**TABLE: 2: Average yield of Major Crops in Baksa District (kg./Hect.)**

Sl. No	Item	Area in Hectare					
		2011-12	2013-14	2015-16	2016-17	2017-18	2018-19
1	Autum Paddy	2434	2864	2086	1608	1578	1690
2	Winter Paddy	2799	2942	2124	1948	2357	2232
3	Summer Paddy	3581	3423	2162	1964	2187	2446

Source: District Statistical Hand Book, Baksa, Published Annually by Deputy Director Economic & Statistics, Baksa.

**Table 3: Sub-division wise use of agricultural tools in the year 2017-18**

Sl. No	Item	Sub-Division			Total
		Tamulpur	Mushalpur	Salbari	
1	2	3	4	5	6
1	Tractor	102	97	71	270
2	Power Tiller	25	36	26	87
3	Sprayer Machine	500	600	500	1600
4	Other Machinery	20	25	10	55

Source: Statistical Handbook of Baksa 2018-19.

**Objectives:-** This study based on the following objectives-

1. To know the present status of agricultural practices in the district.
2. To access the problems associated in the agriculture sector in Baksa district.
3. To find out the prospect to developed the agriculture sector in Baksa district.

### Methodology of the study

This study is based on both primary and secondary data. Secondary data are collected for Government office, Books, handbooks etc. and Primary data are collected from field study

by preparing a questionnaire and covering three revenue circle out of the six revenue circle in the district. To collect primary data door to door field visit was conducted in the selected villages of the revenue circle. The villages and the households were selected through lottery method. Selected Revenue circle and Revenue villages are shown in tabular form in the following Table -4, in which 120 sample of farm families comprised of 36 from Goreswar, 56 from Baksa and 28 Jalah circle were taken.

**Table: 4**

Sl.No	Name of Revenue circle	Name of Revenue village	Total population (As per 2011 census)	Farm Family in the village	10% Selected farm family
1	Goreswar Revenue circle	Magurmari	591	100	10
		Nizjihargaon	1388	270	26
2	Baksa Revenue circle	Belguri Pathar	3270	315	30
		Sripur Dewar	2420	267	26
3	Jalah Revenue circle	Ghogapar	554	100	10
		Dongpar	910	160	18

Source: District Statistical Handbook, Baksa- 2017-18 and ADO report of respective Circle.

### Review of Related Literature

Bandhudas Sen (1974), makes a study entitled "The Green Revolution in India – a perspective", found that irrigation to be a far more important factor than farm size or tenancy in explaining the uneven diffusion of new varieties among farmers. He observed that a broad spectrum of farmers in which the small and medium size farms dominated, were using the new varieties. Widespread adoption of this nature was according to him, not so much due to the scale neutrality of new seeds as to the government initiated mass action programme under which all irrigation land and large, were sought to be covered

Pathak et al. (1978), on the basis of his study on five different categories of farms in Ludhiana District of Punjab found that the yield of paddy was reported to be higher on tractor farms than on bullock farms. The use of tractors enhanced paddy productivity due to better seed-bed preparation, timeliness of operations and precision in distribution and placement of seed and fertilizer owing to use of the seed-cum-fertilizer drills.

Rao, D.M. and R.S. Despande (1986) makes a study on "Agricultural growth in India, a review of experience and prospects" found that there is a positive contribution of irrigation towards increasing cropping intensity among the farmers. Irrigation is denoted as the main component of modernization of agriculture.

Sing Sukhdev and Kaur Maninder (2008) make a study in Rural Punjab entitled "Changing Agricultural Scenario and its impact" show that introduction of new technology such as chemical fertilizers, high yielding varieties and mechanization etc. will transform agricultural in Punjab from traditional to modern. Modernization of agriculture has also increasing materialism among the farmers and social nature of farmers.

Mazumder.R and Gupta.M (2013) make a study in Hailakandi district of Assam and found that the agricultural sector of the district is very backward due to small and marginal size of holdings, poor condition of farmers. Few farmers implying HYV cultivation got positive result.

Gautam.HR, kumar,E.R,(2013) in their studies found that growth of agricultural sector in India

is very slow as compared to other country due to the lack of technology transfer and the insufficient adoption of productive technology. They also found that if technology used in this sector then production will have to be increased considerably.

### Field Study Location

The study area of this study is Baksa District under Bodoland Territorial Area District (BTAD) now Bodoland territorial Region (BTR). The Baksa district is situated in between 25.50' N and 27.00'N Latitude and 90.15'E and 96'E Longitude. The district is surrounded by on the east Udalguri district and Darang district on the West Bongaigaon and Chirang district, on the north Bhutan and on the South Bongaigaon, Barpeta, Nalbari and Kamrup district. The district Baksa is created after 2001 census that is in 2003, along with other three districts of BTAD, Kokrajhar, Chirang and Udalguri after a long struggle of Bodos and different stages of movement of Bodos for their separate political, cultural and language entity as original tribe of the state. This newly formed BTAD cover existing seven district of the state such as Kokrajhar,

Bongaigaon, Barpeta, Nalbari, Kamrup, Darrang and Sonitpur and created under sixth schedule of the Indian Constitution. The district Baksa is located in the North-Western part of Assam with the District Headquarter at Mushalpur which is 105 away from State Capital Guwahati and 20 kms away from 31 no National Highway towards north. The main mode of connectivity to the district is through Road. The district Baksa is provided irrigation facilities. The irrigation facilities provided to the total land area of the district is 17644 hectares in 2015-16 (District Statistical Handbook, Baksa- 2017-18). There are total three numbers of irrigation projects i.e. Sukla, Boralia and Pahumara. Among them Sukla irrigation project is the second largest irrigation project of the state.

### Discussion

In the district Baksa there are six revenue circle (i.e. Goreswar, Tamulpur, Baganpara, Baksa, Barama and Jalah). Out of these six revenue circles three are selected for field study through lottery method. Following tables show the information collected through the field study.

**Table- 5: Distribution of Sample Farms According to Size of Operational Holdings**

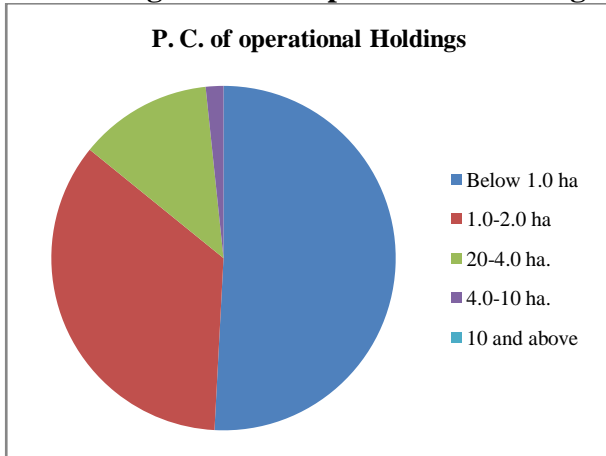
Size of Operational Holdings (in Ha)	Number of Sample Farms in			Total
	Baksa Revenue Circle	Jalah Revenue Circle	Goreswar Revenue Circle	
1	2	3	6	8
Below 1.0	27	15	19	61 (50.83%)
1.0 to 2.0	16	13	13	42 (35%)
2.0 to 4.0	11	-	4	15 (12.5%)
4.0 to 10.0	2	-	-	2 (1.66%)
10 and Above	Nil	Nil	Nil	Nil
Total	56 (46.66%)	28 (23.33%)	36 (30%)	120 (100%)

**Source: Field Survey Data, Note:** Figures in the parentheses represent percentage of the total sample.

The figures in the table shows that 61 out of 120, that is, 50.83 % of sample farm households had operational holdings below 1.0 ha. Similarly, 42, i.e. 35 % of farm households had operational holdings between 1.0-2.0 ha., 15 i.e. 12.5 % of farm households had operational holdings between 2.0-4.0 ha., 2, i.e. 1.66% of farm households had operational holdings between 4.0-10 ha., 10 and above ha. Thus, from the field survey it was found that

about 50% farm households fell in the category of operational holdings below 1.0 hectares.

**Figure:-1: Distribution of Sample Farms According to Size of Operational Holdings**



**Table-6: Distribution of Tenant Farm Households in the sample According to Leased Area in their Operational Holdings**

Size of Operational Holdings (in Ha)	Number of Sample Farms in			Total
	Baksa Revenue Circle	Jalah Revenue Circle	Goreswar Revenue Circle	
1	2	3	6	8
Below 1.0	17	8	12	37
1.0 to 2.0	-	10	8	18
2.0 to 4.0	-	-	-	-
4.0 to 10.0	-	-	-	-
10 and Above	-	-	-	-
Total	17	18	20	55

Source:-Field Survey Data

Table 6, exhibits that 55 out of 120, that is 45.83% of sample farm households had land on lease as part of their operational holdings. It indicated the presence of common practice of lease-in and lease-out in the villages.

**Table: 7 Average Fertilizers Used Pattern in Baksa District (kg/Bigha)**

Revenue circle	2015-16						2019-20					
	Traditional paddy			HYV Paddy			Traditional paddy			HYV Paddy		
	U	S	P	U	S	P	U	S	P	U	S	P
Goreswar Revenue circle	9	10	2	11	14	2	9	11	2	10	15	4
Baksa Revenue circle	8	12	2	10	15	2	10	12	2	10	18	2
Jalah revenue circle	8	10	2	10	14	4	8	10	2	12	14	4

Source:-Field Study Data

U= Urea, S= Super phosphate and P= Potassium.

Table 6, exhibited that the fertilizer used pattern of three revenue circle in the district. It has been observed that fertilizer use pattern in different revenue circle was slightly different, but no one circle can use fertilizer as per the

formula that is U-12kg, S-17kg, and P-4kg per bigha which is prescribed by the Govt. Agriculture Department. (Report of Agricultural Department).

**Table -8: Number of Sample Farmers using Modernized Ploughing and selected Agricultural Machineries and Implements in Paddy Cultivation**

Revenue Circles	Farms using Modernized Ploughing	Farms using Modernized Irrigation	Farms using Sprayer	Farmers using Harvester	Farmers using Rotovator	Paddy Thresher Machine	Total
1	2	3	4	5	6	7	8
Goreswar Revenue circle	34	36	36	-	-	2	108
Baksa Revenue circle	53	56	56	-	-	5	170
Jalah Revenue circle	26	18	28	Nil	2		74
Total	113	110	120	5	2	7	

Source:-Field Survey Data

Above Table-7, exhibits that 113 farmers used tractor or power tiller out of 120 sample farmers, 110 farmers out of 120 sample

farmers used modern irrigation, 120 farmers out of 120 sample farmers used sprayer, but only 5 farmers out of 120 sample farmers used

harvester, 2 farmers out of 120 sample farmers used rotovator, 7 farmers out of 120 sample farmers used paddy thresher machine.

**Table-9: Yield of Different Types of Crops Since 2015-16 to 2019-20 (Per ha. / in quint.)**

Revenue circle	2015-16		2019-20	
	Traditional paddy	HYV Paddy	Traditional paddy	HYV Paddy
Goeswar Revenue circle	0.68	1.13	0.75	1.42
Baksa Revenue circle	0.75	1.20	0.82	1.50
Jalah revenue circle	0.67	1.13	0.75	1.35

Source:-Field Study Data

From the table-8, it has been observed that production of traditional and HYV crops per hectare increased marginally during 2015-16 to 2019-20. But the increasing trend of HYV crops was higher than that of traditional crops during this period.

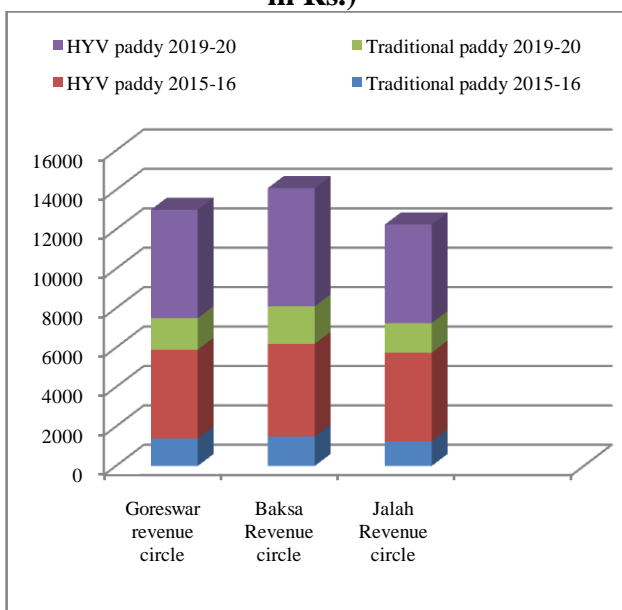
Similarly, it has also observed that from the table-9, that margin of profit during the period 2015-16 to 2019-20 was so nominal in case of traditional crops, but in case of HYV crops margin was slightly higher as compare to traditional crops.

**Table-10: Profits of Different Types of Crops Since 2015-16 to 2019-20 (Profit= Total Earnings- Total Cost ) (Per Bigha. / in Rs.)**

Revenue circle	2015-16		2019-20	
	Traditional paddy	HYV Paddy	Traditional paddy	HYV Paddy
Goeswar Revenue circle	4200-2800=1400	7500-3000 =4500	5000-3400=1600	9500-4000 =5500
Baksa Revenue circle	4500-3000=1500	8000-3300 =4700	5500-3600=1900	10000-4000 =6000
Jalah revenue circle	4050-2800=1250	7500-3000 =4500	5000-3500=1500	9000-4000 =5000

Source:-Field Study Data.

**Figure:-1 Profits of Different Types of Crops Since 2015-16 to 2019-20(Per Bigha. / in Rs.)**



**Problems associated with agriculture sector:-**

The major problems of agriculture sector in the district Baksa can be highlighted on the following heads as indicated by the farmers and the focus group in the district.

1. In Baksa District economic condition of most of the farmers are not good, so they are not able to purchase mechanized agro-machine, HYV seeds, chemical fertilizers, land development to increase the production and productivity. In this connection Government support to relief the farmers and financial help are not satisfactory as said by the farmers.
2. As per report of the farmers they have not got any government training and demonstration regarding the use of modern tools and implements and more than 50% farmers said that their AEA (Agriculture Extension Assistant) never visited the field.

3. In the district Baksa there are three irrigation projects, but these projects can not provide sufficient water supply as its intake capacity. Many of the canals are broken and needs to repair as said by the farmers at the time of field visited. Moreover, there are also a numbers of areas which are not yet covered by the irrigation projects nor have Shallow Tube Wells, Deep Tube Wells, Low Lift Pump and River Canal.

4. Marketing and communication facilities to purchase seeds, fertilizers, pesticides etc. are not well, distribution of these agricultural inputs are not adequate because of which the farmers are not able get these in actual price of the product.

5. There is vast communication gap between farmers and government officials. There exist bureaucratic complexities for which the farmers are unable to avail the advantages of government schemes - as reported by more than 80% of the farmers.

6. High rate of crop disease and attack of insect is another serious problem seen in the agriculture sector in the district.

7. Ignorance, lack of skill and low literacy level among the farmers are some other problem seen in the agriculture sector in the district.

8. Shortage of labour force and unwillingness to work due to easy earnings from different government schemes create problem in this sector.

9. Small size of land holding is another problem among the farmers, because in small size holdings use of modern agro-machinery becomes very costly as compare to big size holdings - argued by the farmers.

### Findings

From the study it has been found that the size of holdings in the study area are very small that is 50.83 percent below 1.0 ha., 35 percent between 1.0-2.0 ha., 12.5 percent in between 2.0-4.0 ha., 1.66 percent in between 4.0-10 ha. and above 10 ha. no holdings were found. Small size of holdings was the major drawbacks for the farmers to install and implements mechanized farm inputs, resulted low production. Yield difference of traditional crops during the period 2015-16 and 2019-20 was very negligible that is 0.68 quint. in 2015-16 and 0.75 quint. in 2019-20 i.e. difference is

only 0.7 quint. at Goreswar Revenue Circle, 0.75 quint. in 2015-16 and 0.82 quint. in 2019-20 i.e. difference is only 0.7 quint. at Baksa Revenue Circle and 0.67 quint. in 2015-16 and 0.75 quint. i.e. difference is only 0.8 quint. at Jalah Revenue Circle. Similarly, in case of HYV crops the product difference 0.29 quint. at Goreswar Revenue Circle, 0.30 quint. at Baksa Revenue Circle and 0.22 quint. at Jalah Revenue Circle during same period. As well as profit margin during this period is maximum @400 at Baksa Revenue Circle and minimum @ 200 at Goreswar Revenue Circle for traditional crops and for HYV crops profit margin was maximum that is @1300 at Baksa Revenue circle and minimum that is @500 at Jalah Revenue Circle. It has also been observed that farmers in the study area used only limited numbers of agro-machinery like tractor, power tiller and sprayer, but others machinery are not highly used. Moreover, that it has also been observed that fertilizer use pattern by the farmers of each revenue circle was not following the actual formula of agriculture department.

### Prospects and Suggestions

The soil in the district is most fertile and suitable for cultivation, due to foothills district of Himalayas and numbers of rivers flows from hill Himalayas to through the district, (they are-Puthimari, Nona, Pagaladia, Borolia, Pahumara, Baki, Kaldia etc.) so, the farmers can grows different types of crops in different sessions. In addition to that three important irrigation project Sukla, Borolia and Pahumara are located in the district, which create abundant scope to develop the sectors in the district. But to develop and to well organized the agriculture sector in the district some reforms and initiation should be needed, which are-

1. Agriculture department of the state shall take initiative to reconstruct the existing irrigation project and install new projects.
2. To help the marginal farmers, govt. and bank loan should be provided with less procedural and bureaucratic complexity.
3. District administration should conduct training and demonstration regarding the use of tools, fertilizers, pesticides etc. at least once in a year by covering two to four ADO circles. In

this connection, for training of farmers, AEA and ADO level training is required.

4. Facilities should be developed such that farmers get their agricultural inputs in actual price of the product.

5. To control attack of insects and high rate of crop diseases, govt. should make some remedial measures by creating a task force with persons with expertise in agricultural pest control.

6. The problems of small size of holding can be solved through modifying the hereditary law. Due to hereditary law a persons property will be subdivided among his sons after his death, as a result size of holdings became small and small generation after generation. Therefore, to solve this problem the only way is reintroduce join family system instead of single family. In addition to that the problems of fragmentation of holdings can also be solved by making co-operative society among the farmers at village or both level.

7. Communication gap between the farmers and the govt. officials should be reduced through frequent field visits by officials.

### Conclusion

It has been concluded from the above discussion that the present scenario of agriculture sector in the district Baksa was not very encouraging, because of having some problems of this sector the sector was not well organized and developed. Size of holdings, Shortage of capital, crop disease, attack of insect, irrigation problem, agri-tools, lack of govt. initiations, unskilled labour force, Sub-division and fragmentation of holdings were create the obstacles in the process of development and mechanization. As a result earning of profit by the farmers only marginal one. Though one section of farmers partially use the modern inputs in their fields and earn profit to some extent, which are not satisfactory.

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## REAL TIME DETECTION AND PREVENTION OF MULTITHREADED BRUTE FORCE AND DICTIONARY ATTACK ON SSH SERVERS

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### ABSTRACT

*The Brute Force and Dictionary attacks have been ever present and with the increase in computational power and dictionaries being bettered every year pose a serious threat to users especially those who do not use long, strong passwords. The brute force attack will eventually discover the password but sometimes it may take days or even months. Multithreading can be used to improve the performance of brute force and this greatly improves efficiency. A lot of platforms and protocols are vulnerable to brute force and dictionary attacks. In brute force the attacker tries every possible string combination to match usernames and passwords with the correct one whereas in a dictionary attack the attacker searches huge chunks of passwords or usernames which are most likely used by majority of the people today, to compromise credentials. The SSH protocol is way to access a remote server providing much greater safety than previous protocols such as TELNET due to encryption of messages sent to and from the remote server and host. The SSH protocol requires an authentication step before a connection is established and this simply requires authenticating via credentials. Since the SSH server is always up and listening attackers at any time may try authenticating via dictionary or brute force attacks. This may cost dearly as the attacker can gain total control of the remote server.*

**Keywords:** Brute Force Attack, Dictionary Attack, SSH attacks, multithreaded server attacks, Password Attack

### Introduction

#### A. Secure Shell Protocol

Preceding the SSH or Secure Shell Protocol, remotely accessing servers and computers was done using the TELNET protocol, however the TELNET protocol did not involve encrypting messages that were transferred to and from leading to message interceptions sometimes proving costly. To amend this SSH came into the picture and encrypted these messages. To transfer messages via SSH we need a SSH client and SSH server installed on our systems. The clients can then directly and remotely access the servers using credentials such as username and password. The SSH protocol usually communicates via port 22. However such a simple authentication process can be exploited using modern permutations and this is what is happening on a large scale.

#### B. Types Of Attacks On SSH Servers

Today predominantly Brute Force and Dictionary attacks are major threats to the SSH protocol. Brute Force semantically means trying out every possibility and is the simplest way to solve any problem, however compromising on resources such as time and

space. Brute Force attack in our case would mean trying out every single combination of desired groups of characters or digits of the desired length. Eventually one of these combinations is bound to break open the door. With advancing technology, core power, better heuristics such as using machine learning to find common password lengths the brute force is becoming better and better, a lot of tools provide fast brute forcing results.

The second type of attack which is also very common and widely used is the dictionary attack on SSH servers. As opposed to the traditional way of generating every possible combination we look for passwords and usernames in dictionaries. Dictionaries are usually text files which contain loads of passwords or usernames and the job of the attacker is scanning as fast as he can through these huge lists to find the correct pair for authentication. Again these files can be very large and improving scanning through them and making multiple connections at once will improve time. Unlike Brute Force attacks these require a little more craft. The formation of dictionaries is dependent on the most commonly used passwords and usernames. These keep changing every year making the

dictionaries ever increasing. Lately machine learning has been used to find commonly used passwords and this has help improved the quality of such dictionaries. So these are the most commonly used attacks on SSH servers and attackers keep running these attacks for days or months to get results.

### C. The use of Multithreading

Brute Force / Dictionary attacks by themselves can take a lot of time to give us the correct results. This is even truer now when there are huge dictionaries with very little probabilities for each password or username and the use of auto generated password makers which make strong, durable passwords. To counter this computational power has also increased and we now have multicore processors, access to GPUs which can perform manifold floating point operations per second compared to traditional CPUs. Hence we must exploit these features on strong machines. Even though most systems have advanced specifications, programs written are often such that they only exploit one CPU and leave out the others. Hence we use a multithreaded approach to give much better performance. Multithreading involves breaking the global process into threads all of which execute in parallel thus improving speed and computation. We can handle how every thread performs, what data it accesses and what operation or task it should perform. However common practice involves giving these threads the same task but carrying this task out on different data at the same time. Hence multithreading is almost essential to carry out such attacks and gives a lot more power and robustness to attackers. We will use these techniques to make our code stronger.

### D. Detection of SSH attacks and some tools which help with it

On enterprise levels SSH attacks happen all the time and hence one needs strong security to handle these attacks. Most popular UTM's or Unified Threat Managers handle this and log SSH attacks in particular providing custom incident response techniques. Alien Vault is one such example. Moreover we have advanced built in logging systems like syslog which log any activities and these can be tunnelled into remotely and the logs can be

monitored. We can also configure our server to shut down after a few failed tries and block some popular attacking usernames which have attacked many systems. A good UTM however is the best way to stay protected not only for SSH but other attacks which come along with it or after it too. All of them can be stopped from one place. The increasing use of SSH keys also helps.

## Related Work

### A. Hybrid multiprocessing

One way to go through the dictionary very fast is done using the hybrid multiprocessing technique [7]. In this the global list of passwords or usernames in the dictionary is divided into sub lists using efficient division or split up techniques like the ones offered by numpy. Then these sub lists are iterated over in parallel and each connection is made serially. This technique provides fast lookup from big dictionaries and is further optimized by splitting into the optimal number of sub lists [20]. This process is often processor dependant and also factors in the time taken by the CPU to be idle and involved in making the connection request. Then each thread or process works on the sub list making connections. The reason we can carry out this process is because our problem meets the multiprocessing criteria which is the code must not be reliant on previous outcomes, does not need to be executed in a particular order, does not return anything needed to be accessed later in the code.

Furthermore multiprocessing can be used for task scheduling for making connections in a dynamic way [19].

For the brute force approach one efficient method was discussed by S. Mount and R. Newman in [2] but one can use the recursive method to generate combinations and integrate it with multiprocessing.pool in python. However one downside to the brute force recursive method is the inability to perform it well on a general purpose GPU [6]. This method can also alternatively use the product method to calculate all possible combinations of the desired length. However calculating the product in advance needs a huge amount of space in the RAM and this may not be efficient

on smaller systems. For example the String object in python contains an attribute printable which is a string of 32 characters 94 characters and thus a length of n characters would require  $94^n$  combinations which can take up a lot of the RAM.

**B. Comparison of existing approaches**

The brute force attack can be computed using the recursive solution as we discussed above however the caveat here is that this would not work well on a general purpose Graphical Processing Unit due to the nature of construction of a GPU [6]. Another approach to reduce the space of the Brute Force attack is to use Machine Learning techniques such as classification to predict passwords that are most frequently used and vulnerable [4]. One such technique is to incorporate features such as length, starting letter, ending letter and other features to find most common passwords. This will not always guarantee a success hit but will reduce the search space by a huge factor. Even knowing the length in advance is very beneficial. This can then be used while computing Brute force combinations. This is much faster but the caveat here is the guarantee of success. The success rate is not always 100%.

In the dictionary attacks. One way is to split the list into sub lists and assign each of them to a thread especially for large lists. The caveat here is that making a connection via APIs such as paramiko in python would still require time if the connection is done serially. This however is the most logical approach. This too can be enhanced by choosing the best possible dictionary. The dictionary can be formed via clustering machine learning techniques to find popular passwords which will make the dictionary more prone to success as dictionary attacks do not guarantee 100% success like the traditional brute force method does.

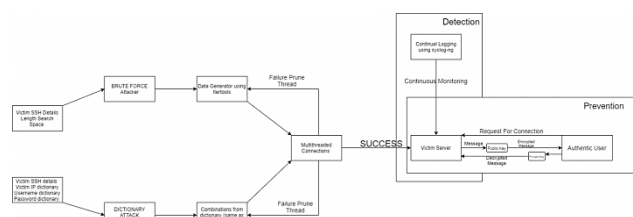
Another approach would be to pluck a few passwords from the dictionary serially, a number like 5 or 10 performs well, then these 5 can be provided to the api to make connections in parallel. This would perform fast as the connections are being made in parallel. If the connection is successful we prune the other threads running in parallel.

**Proposed Architecture Of Password Attack Detection**

Architecture that we will be using is to form a simple to use program directly from the terminal shell or command prompt with flags which will indicate possible modes of attack.

The brute force attack uses itertools to form a data generator which will dynamically generate passwords. This will work in tandem and will feed the connection module we have made. Here a few passwords at a time (can be decided by user, 5-20 is advisable) will be directly fed to the paramiko api and using multithreading connections with the victim will be established. On authentication success the other threads in the group are pruned, otherwise this process continues until all the existing combinations are exhausted.

The dictionary attack too consists of three possible dictionaries , one with usernames, one with passwords, one with IPs of victims, any combination of these can be used to perform the attack with known identities too if needed. The passwords picked up from the dictionary will then follow a similar pipeline to that of the Brute Force attack mentioned above and the multithreading will work exactly the same.



**Figure 1 - Architecture Diagram**

As shown in figure 1, the attack module has Dictionary attack and brute force attack, for detection constant monitoring is done on the server, and for prevention module SSH usage is advised.

**Modules Used**

The proposed system implementation has four modules the environment setup, attack algorithm, detection tools and prevention

**A. Environment Setup**

Operating system that have been chosen to perform the attack is Kali Linux in a Virtual Machine. The reason being Virtual Machines are always safer and recovering from faults is

always easier using them. Moreover Kali Linux has a shell with most of the dependencies installed especially the ones we will use. For testing purposes we have used an attacker on Kali Linux VM trying to attack an SSH server running the Kali Linux OS too. For this we must ensure that we have the SSH protocol service up and running.

Using package manager kali installed the Open SSH client on the attacker's side and the Open SSH server on the victim server VM. We then found an appropriate dictionary which was large enough for demonstration purposes. Then for utility purposes we provided our attacker with many options each of which can be configured manually by the attacker using the terminal and appropriate flags. The code we have written runs on and is tested on Python3 with systems having an SSD storage, 12GB of RAM and 6 main cores. The open SSH client and server were simply installed using `sudo apt get` in the terminal. The other dictionaries we have used is one for IP addresses of victims and also one for usernames.

### B. Attack Generation Phase

The attacker has a plethora of choices to choose from. If one wants to perform Brute Force, the code uses a fast data generator architecture which feeds multiple passwords to the connection API which multithreads connections to the victim in parallel. The attacker can choose a specific username to attack, If they have any sort of clues about the password they can include those characters in the search space and thus these will be used while generating all combinations thus reducing search space. The length can also be decided and given in advance.

The dictionary attack also comes with options. We provide a default dictionary but the user can choose any dictionary they please and also choose out of 8 combinations of choosing a dictionary for usernames, passwords and IP addresses. The dictionary attack is performed through traditional for loops but the connection is enhanced using multithreading, thus improving speed.

### C. Detection Algorithm

Continuous motoring on the server records all the connections that are being made by

different clients. If say there more connection than the usual it may give us some red flag about a possible attack.

- a) Check if Syslog is installed and working otherwise install `syslog-ng`
- b) If we want to check logs on the server itself (if we can access the server) open terminal on the server and type `cat /var/log/auth.log` and analyze
- c) If the server is remote SSH into it and then observe the logs
- d) Leave the log running in one terminal window using `tail /var/log/auth.log -f`
- e) Use our construe code in a new terminal and attack the server
- f) Switch over to the other terminal window and observe and analyze the Log

### D. Detection Tools

SSH attacks happen all the time in the background and especially on huge scale enterprise servers. These servers are vulnerable to such attacks all the time.

Such enterprises have advanced logging systems and Unified Threat Managers such as Alien Vault which provide comprehensive detection and logging for SSH attacks and moreover other attacks which would follow SSH attacks if the attacker gets access to the victims machine. We can create custom events and incident responses to such attacks, say mailing a particular staff member in case this happens, shutting down the server for a short period, shutting down the SSH service running on the server.

However these services are expensive and not easily available for everyone, hence we can also use services and logging systems such as `syslog-ng`. If we are already working on the server, open a new terminal tab and enter `tail /var/log/auth.log -f` and this will show all the attempts that are being made, by whom they are being made, on which port they are being made, which system they are being made from. If we do not have access to the server we can tunnel into it remotely using SSH and then run this on our device and see the results. We have used this method as it is very simple to use, concise and easy to set up. One only needs to install `syslog-ng`.

We can also configure syslog to send the logs directly to a desired system however we chose to tunnel into the server first hand.

### E. Prevention Algorithm

SSH keys are used for authentication but they are generated in pairs. We can simply generate one using `ssh-keygen -C username`. Using keys provides a new way of communication without using any type of password for authentication.

- a) client generates public key and privacy key [ `ssh-keygen` ]
- b) client copies public key to remote server [ `ssh-copy-id` ]
- c) server stores the public key
- d) when client wants to connect to remote server, it initiates a connection to server via SSH protocol [ `ssh <username>@<ipAddress>` ]
- e) remote server receives the connection from client
- f) remote server identifies which public key should be used based on protocol
- g) remote server uses public key to encrypt a random message
- h) remote server sends the encrypted message to client
- i) client uses private key to decrypt the message
- j) client sends the decrypted message and previous session ID to remote server
- k) remote server verifies the decrypted message from client, which is matched the sent message or not
- l) if match, client gains access to remote server.

### F. Prevention Methods

Mostly the SSH servers protocol relies only on a username password pair for authentication which today can be bypassed in one way or another. However the increasing use of SSH keys combats the attackers very well.

SSH keys are used for authentication but they are generated in pairs. We can simply generate one using `ssh-keygen -C username`. This then generates a public and private key. The process for using keys is, the user generates a key pair, the public key is then copied to the remote server which stores it. Now if the user wants to establish a connection it sends the server a request. The server in turn uses the public key

to encrypt a random message and sends it to the client. The client then uses its private key to decrypt the message. The decrypted message is then sent to the server which verifies it and matches it to the message it sent before encryption, on verification the client is granted access.

The trick here is that the SSH keys are very hard to decrypt using current computational techniques and thus Brute Force attackers have no chances of gaining access as that particular user. Although gaining popularity these keys are not as widely used today and a lot of people use the traditional way to gain access to their server as it is easier compared to this method, that is where security ends up being compromised.

### Implementation

#### A. ITERTOOLS

In brute force attack we used “itertools” for the Cartesian product of letter instead of the “map” function. The `map ()` function executes a specified function for each item in an iterable. The item is sent to the function as a parameter. Itertools is standard library of python. The functions of this library are used to make memory-efficient and precise code. Itertools is best viewed as a collection of building blocks that can be combined to form specialized “data pipelines”

Another advantage of itertools over `map` function is that it starts yielding the results of the Cartesian product during the Execution so that we don't have to wait for the Cartesian product to complete and can start trying to make connections using multiple threads whereas when we use `map ()` Function it first halts the further execution of program until the Cartesian product is calculated. This not only wastes CPU time and reduces efficiency but it also increases the time taken for the attack greatly. Code volume is kept small by linking the tools together in a functional style which helps eliminate temporary variables. High speed is retained by preferring “vectorized” building blocks over the use of for-loops and generators which incur interpreter overhead.

## B. Multithreading

Running multiple threads in program is a way of achieving multitasking. For increasing the speed of the program the multiple threads are created for connecting with SSH server with different credentials. Maximum number of threads that can be created can be provided by the user.

Once we reach our maximum thread then we wait for the result of each thread to see if we were able to make connection or not. Afterwards we clear the old threads and start the process all over again. Since these are light-weight processes and they do not require much memory overhead; they are cheaper than processes.

Using multithreading we are also able to use itertools in our advantage. Since itertools yield the Cartesian product in execution itself. The threads are created there itself afterwards we see whether the credentials were correct or not.

## C. Brute Force attack

Using "Itertools" we will be able to create all the possible combination of digits, alphabets, all printable characters as specified by the user. But as the number character increases the time for generating the Cartesian product also increases. If the length of the password is known it saves us a lot of time as we only need to try for strict length. Say we are using digits only and the password length of the victim is 6 then  $10*10*10*10*10*10$  or  $10^6=1$  Million combinations. But if the length of the password is not known then  $10+10^1+10^2+10^3+10^4+.....$  combinations. User can put the upper limit for the length so that the program gets terminated after some time.

The ability to test the different credentials same time increases the efficiency of the program significantly.

Brute force attack contains feature for password generation, username generation. Using multithreading we can also attack different host at same time.

## D. Dictionary attack

By using multiprocessing we are able to pull out different credentials from the file and check for the making the connection. Effectively decreasing the time inversely

proportional to the number of threads for creating the connection. If suppose there are 2 threads for creating the connection. Then the time it will take to go through all the items in the file is effectively halved. And so as the number of threads are increased the execution is decreased. But after a certain limit the processor starts doing task switching to service each threads as the number of threads it can handle concurrently are limited after that limit the execution time is not decreased instead it get increased as the context switching and thread management adds more overhead. Thus finding that balance is very important for optimal time.

Also, the better the system is for multithreading the less time it will take for executing the program.

Dictionary attack contains feature for feeding password file, username file, and target file to the program. Using multithreading we can also attack different host at same time.

## E. Brute / Dictionary Attack Prevention

There are many **methods to stop or prevent brute force / Dictionary attacks**. The most obvious is a strong password policy. Each web application or public server should enforce the use of strong passwords. If say the user has 10 letter password with mixture of numbers, alphabets and special characters. The total number of combination for 10 letter alone would be  $100^{10}$ . Practically impossible to crack within a human lifetime with current computation power.

Other methods include -Limit failed login attempts, Make the root user inaccessible via SSH by editing the *sshd\_config file*, Don't use a default port, edit the port line in your *sshd\_config file*, Use Captcha, Limit logins to a specified IP address or range, Two factor authentication, Unique login URLs, Monitor server log, Using SSH key for authentication.

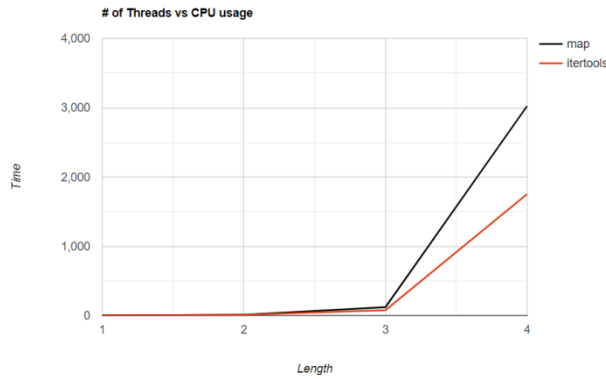
Are some effective measures to prevent a brute force / Dictionary attacks.

## Results And Comparison

Time taken when map() function and itertools we used for Cartesian product of alphabets with different length

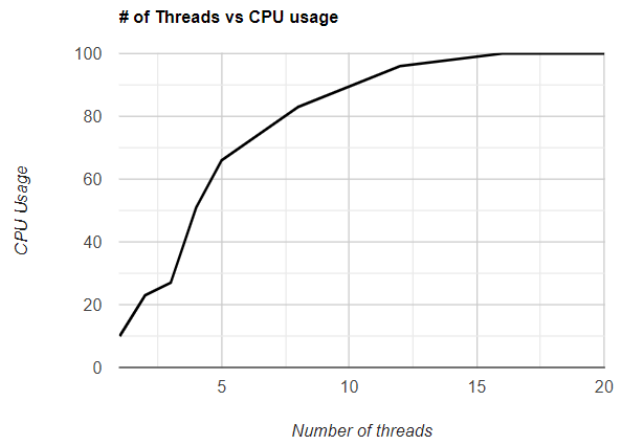
**Table 1- Time taken for generating Cartesian product**

Length	1	2	3	4
map()	0.012s	1.754s	120.510s	3023.793s
itertools.product()	0.127s	1.892s	76.593s	1752.234s



**Figure 2- Time taken for generating Cartesian product**

As shown in figure 2, the time it was took to generate all possible combination of the characters that can be generated. For a fixed length using itertools and map

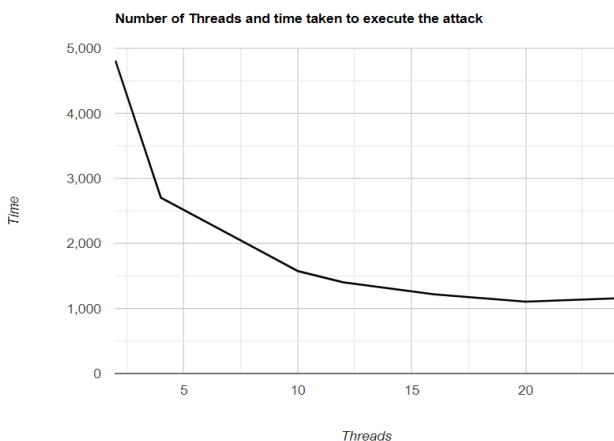


**Figure 3- CPU usage when using multithreading**

As shown in figure 3, CPU usage is increased the number of thread is increased after the certain limit the CPU usage hits 100 and further increasing the number of threads will just create more overheads for all threads and hence giving less time to threads to execute. Time taken for executing a Brute Force attack with different number of threads. As we increase the number of threads the total time taken to execute the same attack decreases as there are more threads available to make connection.

**Table 2- Number of Threads and time taken to execute the attack**

Threads	2	4	8	10	12	16	20	24
Time	4812.91s	2702.27s	1953.50s	1575.29s	1402.31s	1215.93s	1106.25s	1157.42s



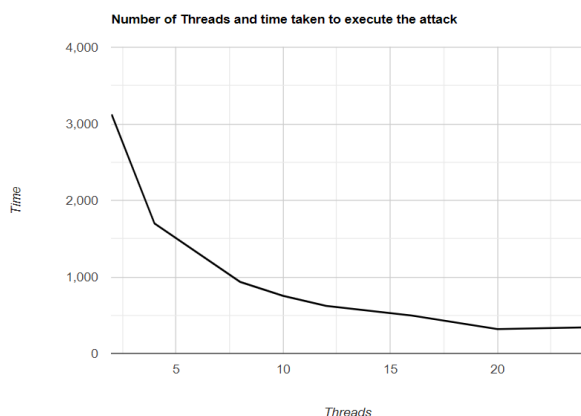
**Figure 4- Number of Threads and time taken to execute the attack**

As shown in Figure 4, as the increase in the total number of threads for attack after a limit the time taken is increasing as now the CPU is

also processing more overheads and doing context switching between different threads as there is not enough hardware to handle all the threads at once. Time taken for executing a Dictionary attack with different number of threads. As we increase the number of threads the total time taken to execute the same attack decreases as there are more threads to fetch the credentials from the file and make connections.

**Table 3- Number of Threads and time taken to execute the attack**

Threads	2	4	8	10	12	16	20	24
Time	3123.92s	1698.19s	934.79s	753.29s	621.72s	495.85s	318.95s	341.23s

**Figure 5- Number of Threads and time taken to execute the attack**

As shown in Figure 5, As the increase in total number of threads for attack after a limit the time taken is increasing as now the CPU is also processing more overheads and doing context switching between different threads as there is not enough hardware to handle all the threads at once.

### Conclusion and Future Work

The use of multithreading greatly improves brute force and dictionary attack efficiency also reducing the amount of time required to do these type of attacks and thus increases the already prevalent risks of using the SSH service. Hence, SSH server needs to employ more methods to secure the server from the attacker, older methods such as authenticating into a traditional SSH server is a very simple process and can be exploited easily. Using SSH keys should be adopted universally.

In the future searching through the dictionary can be made more efficient and code can be aligned to be compatible with general purpose GPUs which are becoming more and more common in the common user's system. Attacking using different IP address can also be done to make it harder for the victim to identify the attack and drop connections from an IP address. Furthermore instead of using a single System, Multiple system may be used for the attack in a multithreaded way. Increasing the efficiency and making it harder for the victim to response.

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## A STUDY TO ASSESS THE EFFECTIVENESS OF STRUCTURED TEACHING PROGRAMME ON ESSENTIAL NEWBORN CARE PRACTICE AMONG LSCS MOTHERS IN SRM GENERAL HOSPITAL, CHENGALPET DISTRICT

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### ABSTRACT

*This study was intended to assess the effectiveness of structured teaching programme on essential newborn care practice. Quantitative approach with Pre & Post test design was conducted among 30 mothers who are with LSCS in SRM General Hospital. Non probability convenience sampling technique was used. Structured questionnaire was used to assess the demographic variables and to assess the effectiveness of structured teaching programme on essential newborn care practice. The findings showcased that the effectiveness of structured teaching programme on essential newborn care practice was evidenced that the pretest, 23(76.67%) had inadequate knowledge and 7(23.33%) had moderately adequate knowledge regarding the essential newborn care practice. After the administration of structured teaching program on essential newborn care practice all the mothers 30(100) had a adequate knowledge.*

**AIM:** To improve the mothers knowledge about essential newborn care. The study sample comprise of 30 LSCS mothers with the age group of 18-36 years and above.

**STUDY DESIGN:** Descriptive study method was used in this study.

**PLACE AND DURATION OF THE STUDY:** All the LSCS mothers in postnatal ward at SRM general hospital.

Approximately 1 week spend for completing data collection.

**METHODOLOGY:** The research approach was Quantitative and the research design adopted was descriptive design. LSCS mothers were selected by non probability convenience sampling technique. The sample size for the study was 30. The researcher used structured Questionnaire for assessing the demographic variables and rating scale to assess the essential newborn care among LSCS mothers. The pilot study was conducted at SRM General Hospital and findings revealed that the tool was considered reliable and feasible for proceeding with the main study. Data collection was done for a period of 1 week.

**RESULTS:** The research was performed on postnatal ward at SRM General Hospital and result found that 23 responders (76.67%) had inadequate knowledge, and 7 responders (23.33%) had moderately adequate knowledge before intervention. After intervention of structured teaching programme on knowledge regarding essential newborn care all the mothers had adequate knowledge. The association of effectiveness of structured teaching programme on knowledge regarding essential newborn care practice among LSCS mothers with their demographic variables shown that there is no association between them.

**Keywords:** Assess, Effectiveness, Essential newborn care practice, LSCS mothers, Structured teaching programme

### Introduction

A newborn is not only valuable to his parents, family, community and nation, but also to the whole world. child is the foundation of the nation's health and wealth. Health maintenance is not only desired but positively valued by all societies, and thus an accepted goal of all communities is an improved level of health [1].

Newborn baby within one minute of birth is considered to be tiny helpless, dependent entirely on others for survival. The average newborn adapts from an autonomous complete dependent nature, capable of oxygenation and

carrying in the processes of life. Each newborn baby needs urgent treatment after delivery. Clearing the airways, drying, stimulating and returning the newborn period mothers out stretched arms are the some newborn cares [2].

### Background of the Study

#### GLOBEL SCENARIO

Globally, The mortality rate of the newborn is 4 million and 3.4 million in every year with in 7days of baby born. 66% of the death can occurs during the first 1day and 34% of the death occurs after 24 hours. If the mother is having the adequate knowledge about the

essential newborn care means can prevent the death of the newborn [3].

### SCENARIO OF NEWBORN CARE IN TAMILNADU

In India, 25 million babies are born each year, accounting for 20% of global births, and 1 million die before the first four weeks of life are completed. This accounts for almost 25 percent of the worldwide estimate of 3.9 million neonatal deaths. Prematurity, sepsis and pneumonia, birth asphyxia, burns, tetanus, congenital defects, and diarrhoea are the main causes of neonatal death [4].

LSCS mothers' inadequate awareness of primary neonatal care is a systematic approach made to develop the physical growth of a baby through pregnancy interventions. and before pregnancy, and after pregnancy all babies need basic treatment to help them live and start well. This critical treatment is called essential neonatal care and includes immediate care at birth, first-day care and up to 28 days [5].

#### Need For The Study

Due to many changes like warm, snug, dark atmosphere, chilly glaring, unbounded, gravity the neonates undergo many physiological changes at the moment of birth [6].

Tithes Asmelashberha, (2018) conducted a study on the learning and routine of critical newborn care practice among LSCS mothers. A cross-sectional survey focused on the population. It incorporates an aggregate of 456 baby moms, it is estimated that moms had great information & 81.1% had a decent implementation based on the neonatal safe keeping [7].

#### Material and Methods:

Quantitative approach with Pre & Post test design was conducted among 30 mothers who are with LSCS in SRM General Hospital. Non-probability convenience sampling technique was used. Structured questionnaire was used to assess the demographic variables and to assess the effectiveness of structured teaching programme on essential newborn care.

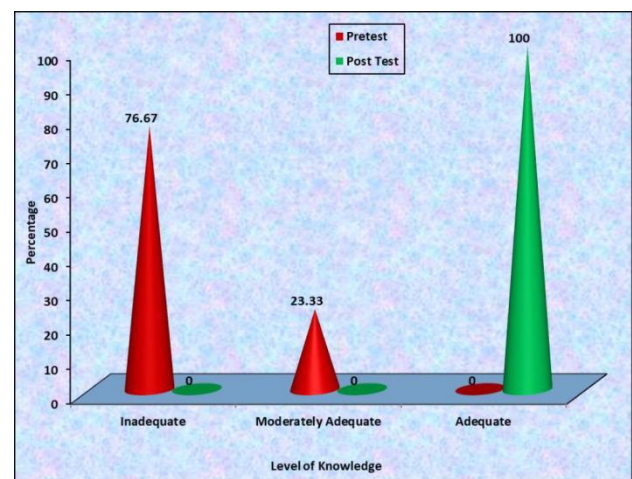
Section A-Consisting of demographic variables among the LSCS mothers.

Section B-consisting of total score 30 to assess the effectiveness of structured teaching

programme on knowledge regarding essential newborn care practice among mothers.

#### Results and Discussion:

Considering the age distribution at the maximum age 21-25 are 56.7% mothers with LSCS were in the age group of 26-30 were 36.6%, 31-35 were in 6.7%. Age of infant maximum of less than 6 months were in 100.0%. Number of children maximum of 2 were in 46.6%, 1 were in 30.0%, 3 were 16.7%, 4 were 6.7%. Type of maximum of nuclear family were 93.3%, joint family were 6.7%. The educational status of LSCS mother at the maximum of 33.3%, intermediate (or) diploma, 23.4% were in graduate, 23.4% were in High school certificate, and 13.3% were Middle class certificate, 3.3% were primary school certificate, 3.3% were illiterate. Considering the occupation of the mother to the maximum of 36.7% were in elementary occupation, 30.0% were professionals, 13.3% were Technicians and associate professionals, 13.3% were clerks, 6.7% were in skilled agricultural and fishery workers. Religion status at the maximum of 83.3% LSCS Mothers were in Hindu, 10.0% were Muslim, 6.7% were Christian. Considering the income of the family maximum of 53.4% were 6,327-18,949, 23.3% were 18,953-31,589, 23.3% were <6,323.



It indicates that the mean before giving knowledge information score was  $13.53 \pm 1.52$  and the mean after administering knowledge score was  $28.77 \pm 1.13$  and the mean improvement score was 15.23 (50.77%). at  $p < 0.001$  level the measured paired 't' test value

of t=46.010 was found to be statistically highly important. This clearly suggests that there is a formal training curriculum on information about critical neonatal care practice.

**Association of post test level of knowledge regarding essential newborn care practice among mothers with LSCS with their selected demographic variables.**

N=30

Demographic Variables	≤Mean (28.77)		>Mean (28.77)		Chi-Square and p value
	No.	%	No.	%	
<b>Age of mothers in years</b>					$\chi^2 = 1.179$ d.f=2 p=0.555 N.S
21 – 25	8	26.7	9	30.0	
26 – 30	3	10.0	8	26.7	
31 – 35	1	3.3	1	3.3	
<b>Age of the infant</b>					-
Less than 6 months	12	40.0	18	60.0	
More than 6 months	-	-	-	-	
<b>Number of children</b>					$\chi^2 = 2.083$ d.f=3 p=0.555 N.S
1	3	10.0	6	20.0	
2	7	23.3	7	23.3	
3	2	6.7	3	10.0	
4	0	0	2	6.7	
<b>Type of family</b>					$\chi^2 = 0.089$ d.f=1 p=0.765 N.S
Nuclear	11	36.7	17	56.7	
Joint	one	3.3	1	33.	
Extended	-	-	-	-	
<b>Educational status of mother</b>					$\chi^2 = 2.589$ d.f=5 p=0.763 N.S
Profession or honors	-	-	-	-	
Graduate	3	10.0	4	13.3	
Intermediate (or) Diploma	4	13.3	6	20.0	
High school certificate	4	13.3	3	10.0	
Middle school certificate	1	3.3	3	10.0	
Primary school certificate	0	0	1	3.3	
Illiterate	0	0	1	3.3	
<b>Occupation of the mother</b>					$\chi^2 = 9.787$ d.f=4 p=0.044 S*
Legislator, Senior officials and Managers	-	-	-	-	
Professionals	2	6.7	7	23.3	
Technicians and Associate professionals.	0	0	4	13.3	
Clerks	1	3.3	3	10.0	
Skilled agricultural and fishery workers	2	6.7	0	0	
Craft & related trade workers	-	-	-	-	
Plant & machine operators and assemblers	-	-	-	-	
Elementary occupation	7	23.3	4	13.3	
Skilled workers & shop makers	-	-	-	-	
Unemployed	-	-	-	-	
<b>Religion</b>					$\chi^2 = 0.139$ d.f=2 p=0.933 N.S
Hindu	10	33.4	15	50.0	
Christian	1	3.3	1	3.3	
Muslim	1	3.3	2	6.7	
Others	-	-	-	-	
<b>Family monthly income</b>					$\chi^2 = 1.280$ d.f=2
Rs.1,26, 360	-	-	-	-	

N=30

Demographic Variables	≤Mean (28.77)		>Mean (28.77)		Chi-Square and p value p=0.527 N.S
	No.	%	No.	%	
Rs.63,182 – 1,26,356	-	-	-	-	
Rs.47,266 – 63,178	-	-	-	-	
Rs.18,953 – 31,589	2	6.7	5	16.7	
Rs.6,327 – 18,949	6	20.0	10	33.3	
<Rs..6,323	4	13.3	3	10.0	

\*p<0.05, S – Significant, N.S – Not Significant

This table deliver that the demographic variable occupation of the mother showed a statistically significant level of knowledge associated with important neonatal protection among LSCS mothers at p<0.05 with a chi-square value of (corresponding to 9.787, p=0.044) and the remaining demographic variables showed no statistically notable level of understanding associated with essential newborn care practice.

#### Conclusion:

The research results discuss the effectiveness of structured teaching programme on knowledge regarding essential newborn care practice among LSCS mothers. We express our sincere thanks to all those who have inspired, helped, motivate, guided and corrected us in completed this research project.

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#### COMPETING INTERESTS:

Declaration of competing interests should be placed here. All authors must disclose any financial and personal relationship with other people or organisations that would inappropriately influence [bias] their work.

#### AUTHORS CONTRIBUTION:

Authors may use the following wordings for this section: “ Anushiya.J designed the study, performed the statistical analysis, wrote the protocol, and wrote the first draft of the manuscript. Janani.S and Kiruthiban.P managed the analyses of the study. Kiruthiban.P managed the literature searches…… All authors read and approved the final manuscript.”

#### CONSENT:

#### ETHICAL APPROVAL:

This study was approved by research committee of SRM college of nursing, SRM institute of science and technology, kattankulathur, chengalpet district. permission was obtained from Dean, SRM college of nursing and informed consent was obtained from each participant for study before starting data collection. Assurance was given to the subjects that anonymity of each individual would be maintained and they are to withdraw from study at any time.

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## CORRELATION BETWEEN ANTHROPOMETRIC VARIABLES AND AGILITY IN GATKA PLAYERS

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### ABSTRACT

**Aim:** The purpose of this study was correlation between anthropometric variables and agility in gatka players. **Materials and Methods:** Thirty (N=30) trained male gatka players who belonged to Shaheed Baba hanuman Singh GatkaAkshara, Patiala, District Patiala (Punjab). Two Groups- I, 15 subjects age of (10-15) and group- II, 15 subjects age of (15-20). Anthropometric measurements were recorded according to the standard procedure. The Illinois Agility Test (Getchell, 1979). **Results:** Table 1 shows mean age, height, weight, BMI and agility time of Gatka group-I Age (10-15) years was 11.73±1.624year, 137.73±3.634cm, 34.53±3.482kg, 17.73±1.624kg/m<sup>2</sup> and 13.47±.640 seconds respectively. It was founded that age was positively significantly with height (r= .568<sup>\*</sup>). It was founded that height was positively significantly with weight (r= .548<sup>\*</sup>) and It was founded that weight was highly and positively significant with BMI (r= .835<sup>\*\*</sup>) (Table 2). Table 3 shows mean age, height, weight, BMI and agility time of Gatka group-II Age (15-20) years was 17.87±1.552year, 166.27±5.133cm, 55.47±7.791kg, 19.53±2.167kg/m<sup>2</sup> and 14.40±.910 seconds respectively. It was founded that age was highly and positively significantly with height (r= .659<sup>\*\*</sup>). It was founded that age was positively significantly with weight (r= .602<sup>\*</sup>). It was founded that height was highly and positively significantly with weight (r= .681<sup>\*\*</sup>). It was founded that weight was highly and positively significantly with BMI (r= .924<sup>\*\*</sup>) and agility time (r= .707<sup>\*\*</sup>). And It was founded that BMI was highly and positively significant with agility time (r= .681<sup>\*\*</sup>) (Table 4). **Conclusion:** This study concluded that there is a significant correlation between anthropometric variables and agility in gatka players but there is no significant effect of age on agility. This study will help in prediction of performance in gatka players and its association with anthropometric variables. Data and results derived from this research will prove beneficial for future studies and there is a scope for finding the relationship between other sports performance variables with anthropometric variables in gatka players.

**Keywords:** Age, Agility, Anthropometric, BMI

### Introduction

Gatka is a form of martial art from the North of India practiced by the Sikhs. It is intended to harmonize mind, body and spirit. Originally, most Sikhs were farmers and they had to be able to defend themselves with simple tools, used in everyday life. Gatka is based on the Indian martial art ShastarVidyaa (Shastar = weapon, Vidyaa = essence/art). The origins can be traced back as far as 7000 years. ShastarVidyaa stems from old Indian traditions like ayurveda or yoga. Gatka is one of the 64 arts of the old Vedic philosophical tradition. As reported by Singh and Kumar(2016) this technique has originated in later 19th century, out of sword enactment in the British Indian Army, splitted in two sub-style, called rasmi (ritualistic) and khel (sport) from the 1880s. From the standpoint of physical moulding, the objective of gatka training is to put together competitors to constructively direct both the

physical activity and the physiological requirements of combat. In tournament, contenders execute long duration of fight insinuate with cursory periods of non-fighting task (pause, 30 second).

In Gatka balance, rhythm, breathing and meditation are trained. Right-handers are trained left-handedly and vice-versa, which means the halves of the brain are adjusted. If you practice Gatka regularly your body will be tempered and flexible, your spirit will be focused in the present. Auditory and visual reaction time is considered as an ideal tool for measuring sensory motor association (Giard and Peronnet 1999 and Shenvi & Balasubramanian 1994). Reaction time (RT), is the elapsed time between the presentation of a stimulus which can be of any modalities of sensory input like visual, auditory, pain, touch or temperature and the subsequent behavioural response to occur. It is considered to be an index of speed of processing. The behavioural

response is typically a button press but can also be an eye movement, a vocal response, or some other observable behavior (Lohot, Gite, Kelkar and Dongre2017). Anthropometric measurements are the finest pertinent means for inspecting body size, shape and composition. It assists considerably in sports flair selection, sports steering and assessment of fatness for health related physical fitness as mentioned by (nthropometric measurements are the best applicable means for studying body size, shape and composition. It helps greatly in sports talent selection, sports counseling and measurement of obesity for health related physical fitness. One of the most important tasks for physical education is to measure different part and components of human body.Singh and Singh, 2017)

**Materials and Methods**

Thirty (N=30) trained male gatkaplayers who belonged to Shaheed Baba hanuman Singh GatkaAkhara, Patiala, District Patiala (Punjab).Two Groups- I, 15 subjects age of (10-15) and group- II, 15 subjects age of (15-20).Anthropometric measurements were recorded according to the standard procedure. The Illinois Agility Test (Getchell, 1979).

**Results**

Table 1 shows mean age, height, weight, BMI and agility time of Gatka group-I Age (10-15) years was 11.73±1.624year,137.73±3.634cm, 34.53±3.482kg, 17.73±1.624kg/m<sup>2</sup> and 13.47±.640 seconds respectively.

**Table 1: Mean ±SD of Gatka Players (Group-I)**

Variable(s)	N	Mean ± S D
Age (years)	15	11.73±1.624
Height (cm)	15	137.73±3.634
Weight (KG)	15	34.53±3.482
BMI	15	17.73±1.624
Time (sec.)	15	13.47±.640

It was founded that age was positively significantly with height (r= .568<sup>\*</sup>). It was founded that height was positively significantly with weight (r= .548<sup>\*</sup>) and It was founded that weight was highly and positively significant with BMI (r= .835<sup>\*\*</sup>) (Table 2).

**Table 2: Correlation among Age, Height, Weight, BMI and Agility time of Gatka Players (Group-I, Age 10-15 years)**

Variable(s)	Height (cm)	Weight (KG)	BMI	Time (sec.)
Age (years)	.568 <sup>*</sup>	.330	-.002	-.147
Height (cm)	-	.548 <sup>*</sup>	.023	-.188
Weight (KG)		-	.835 <sup>**</sup>	.137
BMI			-	.266

\*significant at the 0.05 level; \*\* significant at the 0.01 level

Table 3 shows mean age, height, weight, BMI and agility time of Gatka group-II Age (15-20) years was 17.87±1.552year,166.27±5.133cm, 55.47±7.791kg, 19.53±2.167kg/m<sup>2</sup> and 14.40±.910 seconds respectively.

**Table 3: Mean ±SD of Gatka Players (Group-II, Age 15-20 years)**

Variable(s)	Mean ± S D
Age (years)	17.87±1.552
Height (cm)	166.27±3.634
Weight (KG)	55.47±7.791
BMI	19.53±2.167
Time (sec.)	14.40±.910

It was founded that age was highly and positively significantly with height (r= .659<sup>\*\*</sup>). It was founded that age was positively significantly with weight (r= .602<sup>\*</sup>). It was founded that height was highly and positively significantly with weight (r= .681<sup>\*\*</sup>). It was founded that weight was highly and positively significantly with BMI (r= .924<sup>\*\*</sup>) and agility time (r= .707<sup>\*\*</sup>). And It was founded that BMI was highly and positively significant with agility time (r= .681<sup>\*\*</sup>) (Table 4).

**Table 4: Correlation among Age, Height, Weight, BMI and Agility time of Gatka Players (Group-II, Age 15-20 years)**

Variable(s)	Height	Weight	BMI	Time (sec.)
Age (years)	.659 <sup>**</sup>	.602 <sup>*</sup>	.447	.040
Height (cm)	-	.681 <sup>**</sup>	.359	.419
Weight (KG)		-	.924 <sup>**</sup>	.707 <sup>**</sup>
BMI			-	.681 <sup>**</sup>

\*significant at the 0.05 level; \*\* significant at the 0.01 level



Table 5 shows absolute mean difference & absolute % of age, height, weight, BMI and agility time between Group-I and Group-II Gatka players was 6.14 & 20.74%, 28.54 & 9.38, 20.94 & 23.26, 1.80 & 4.83 and 0.93 & 3.33 respectively.

**Table 5: Absolute & Percent Difference of Anthropometric Variables and Agility between Group -I and Group-II Gatka players**

Variable(s)	Group I vs. Group II	Absolute difference	Absolute %
Age (years)	11.73±1.624 vs. 17.87±1.552	6.14	20.74
Height (cm)	137.73±3.634 vs. 166.27±3.634	28.54	9.38
Weight (KG)	34.53±3.482 vs. 55.47±7.791	20.94	23.26
BMI	17.73±1.624 vs. 19.53±2.167	1.80	4.83
Time (sec.)	13.47±.640 vs. 14.40±.910	0.93	3.33

Table 6 shows that statically significant of Anthropometric Variables and Agility between Group 1 and Group 2 Gatka players.

**Table 6: Independent T-Test of Anthropometric Variables and Agility between Group-I and Group-II Gatka players**

Variable(s)	T	df	Sig. (2-tailed)	Mean Difference
Age (years)	-10.573	28	.000	-6.133
Height (cm)	-17.570	28	.000	-28.533
Weight (KG)	-9.501	28	.000	-20.933
BMI	-2.574	28	.016	-1.800
Time (sec.)	-3.249	28	.003	-.933

\*significant at the 0.05 level

### Discussion

This study compared the anthropometric variables with agility in trained male gatka players (n=30). Total subjects were divided in two groups with 15 subjects in each group on the basis of their age. This study found that the anthropometric variables which include BMI, height and weight are highly significant with agility. Shafizadeh (2020) stated in a study that

there is an inverse relationship between weight and speed. Shivalingaiah (2016) found negative correlation between BMI and agility. This study concluded that absolute mean and percentage difference of age, height, weight, and BMI and agility time between Group-I and Group-II Gatka players was 6.14 & 20.74%, 28.54 & 9.38, 20.94 & 23.26, 1.80 & 4.83 and 0.93 & 3.33 respectively. Further the data was analysed to find out the significant difference among the players. On differentiating two athletes with same total body mass, the heavier athlete will have less lean mass to come up with the speed requirements of agility execution. Along with it the heavy athlete will have more fatty tissue and because of this he will need more force production per unit of lean mass to generate speed with direction (Enoka, 2002). This study showed no significant relationship between age and agility. Thakur (2014) showed that there is no significant relationship between agility among children and adolescents.

Mathisen (2015) showed in a study that body mass and height are significantly correlated with sprint performance in the children above the age of 13 whereas there is no significant relationship between sprint performance and anthropometric variables in the subjects below the age of 13 and accredited these relationships to ageing and divergent pattern in growth surge. Garcia-Gil et al (2018) stated that performance can be predicted by the results of certain anthropometric measures and showed that agility is better in the taller subjects.

### Conclusion

This study concluded that there is a significant correlation between anthropometric variables and agility in gatka players but there is no significant effect of age on agility. This study will help in prediction of performance in gatka players and its association with anthropometric variables. Data and results derived from this research will prove beneficial for future studies and there is a scope for finding the relationship between other sports performance variables with anthropometric variables in gatka players.

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## INFLUENCE OF SOCIAL MEDIA AFFINITY ON PSYCHOLOGICAL WELL BEING: GENDER AS A MODERATOR

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### ABSTRACT

*The mission statement of Facebook – the largest social networking media states it empowers the people to share and stay connected. But in the process of staying connected with friends, many are guilty of their strained relationship with family. They tend to live more in the virtual world than in the real one. This study is aimed at bringing out the empirical evidence of this corrosion. Speaking in detail, we bring to light the impact of Social Media on the psychological wellbeing of the people who are active in social networking. In the bargain, we also test to know which gender is vulnerable to this snowballing disaster.*

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**Keywords:** Gender, moderator, networking, psychological wellbeing, Social media

### Introduction

As on January 2021, there were 624 million web clients and 1.10 billion portable associations in India. The quantity of portable communication connections expanded by 23 million (+2.1%) between January 2020 and January 2021. The quantity of portable communication connections was identical to 79.0% of the complete populace. Likewise, there were 448 million online media clients in India. The quantity of Social media clients in India expanded by 78 million (+21%) somewhere in the range of 2020 and 2021. The quantity of Social media clients in India was comparable to 32.3% of the absolute populace. From the insights it is apparent that Social media has filled quickly in the new past (Leong et al, 2019; Kemp 2020). Particularly for the more youthful populace, Social media assumes a significant part as it is demonstrated from broad utilization of online stages (Ofcam 2018).

### Review of Literature

#### Social Media Usage or Affinity

The Social media are characterized as any online applications that permit individuals to make, offer or trade data, thoughts and pictures or recordings in virtual correspondence and organizations. In India, among the most famous online media are Facebook, Twitter, YouTube and Instagram. As characterized by

(Verduyn et al. 2017) Social media use alludes to online practices that work with "direct trades" among clients. Such practices incorporate loving, remarking, sending messages, and in any case drawing in with different clients. Online media proclivity can be seen as one type of Internet fixation, where people show an impulse to utilize Social media in overabundance (Griffiths, 2000; Starcevic, 2013). People with online media proclivity are regularly excessively worried about Social media and are driven by a wild desire to sign on to and utilize Social media (Andreassen and Pallesen, 2014).

#### Psychological Wellbeing

Psychological Well-being is a somewhat intricate thought with an assortment of parts that might add to it. In basic words, Psychological Well-being might be characterized as the positive Psychological working of people. According to a hierarchical perspective, Psychological Well-being might be characterized as the general viability of a representative's Psychological working. Keyes et al., (2002) characterized Psychological Well-being as the impression of commitment with the existential difficulties of life. Psychological Well-being can be said to survey the degree to which a singular feels better and satisfied with himself / herself, in a way which might be subject to his/her work circumstance. Meanings of Psychological Well-being

projected by different researchers have shown that this hypothesis has something like three qualities (Wright and Cropanzano, 2004). Right off the bat, it is a singular encounter. It implies that individuals will encounter Well-being to the extent that they trust themselves to be content. Also, Psychological Well-being is estimated to be a stage of positive feelings and negative feelings, where more noteworthy degree of good feelings over bad feelings indicates prevalent Psychological Well-being.

### **Social Media Affinity and Psychological Well-being**

However Social media adds to working of confidence and a being of associated with important gatherings (Twenge and Campbell, 2019) there are additionally developing worries of negative concerns like Social media compulsion (Swar and Hameed, 2017; Kircaburun et al., 2020), cell phone habit (Swar and Hameed, 2017; Leong et al., 2019), tension, forlornness, and misery (Dhir et al., 2018; Reer et al., 2019), social seclusion (Van Den Eijnden et al., 2016; Whaite et al., 2018) and especially on Psychological Well-being (Chotpitayasunondh and Douglas, 2016; Jiao et al., 2017; Choi and Noh, 2019; Chatterjee, 2020).

Many investigations via online media use and emotional wellness have shown that the drawn out utilization of Social media, for example, Facebook is decidedly connected with psychological well-being issues like pressure, uneasiness, and sadness and contrarily connected with long haul Well-being (Eraslan-Capan, 2015; Hong, Huang, Lin and Chiu, 2014; Malik and Khan, 2015; Marino et al., 2017; Pantic, 2014; Shakya and Christakis, 2017; Toker and Baturay, 2016). For instance, the time spent via Social media was emphatically identified with burdensome manifestations among secondary school understudies in Central Serbia (Pantic et al., 2012) and among youthful grown-ups in the United States (Lin et al., 2016).

In any case, we can't stop the unending discussion concerning the impact and pertinence of Social media on the Psychological Well-being of people For instance, Twenge and Campbell (2019) express that utilization of online stages and the Social

media have unfriendly impact on Psychological Well-being, while Orben and Przybylski (2019) banter that the relationship between Social media use and Psychological Well-being is so minor and that it is pretty much immaterial.

Research on the utilization of Social media or its liking is the new focus. Get the question of subject depicted and explored with the connection to the Psychological Well-being of individuals with their significant Social media utilization or fondness. Additionally, an examination gap in this contemporary field is essential as it might prompt future research in new and praiseworthy ways.

### **Objectives**

1. To assess the impact of Social media liking on Psychological Well-being.
2. To inspect if gender moderates the connection between Social media liking and Psychological Well-being.

### **Research Methodology**

Questionnaire for the survey were distributed and collected for the review. About 83% of the members participated in the survey and reciprocated with a filled in questionnaire. Based on the review it was tracked down that the average age of respondents was between 21 to 30 years.

The proportion of Social Media Affinity was estimated utilizing a Likert Scale created by Gerlich (2010). It is a 13 item instrument which was created to quantify the convictions of respondents about Social media destinations. The scale comprises of nine positive and four negative items. This action utilizes a six point scale with number 1 = unequivocally differ and number 6 = Strongly Agree.

The proportion of Psychological Well-being was estimated by utilizing the twelve items Likert scale initially created via Carol Ryff (1995). The scale comprises of nineteen positive and three negative items. This action utilizes a six point Likert scale with number 1 = Strongly disagree and number 6 = Strongly Agree.

Other than the scales the poll comprises of 10 closed ended inquiries to catch the demographic profile of the respondents.

**Analysis**

The analysis was performed using IBM SPSS software. The moderation model (Model 1) was tested using the PROCESS macro (Hayes, 2013). Gender was included as the moderator. The effects were tested with bias-corrected bootstrapping ( $n = 5,000$ ) and 95% confidence intervals (CI) for the indices. When a 95% bootstrapped CI does not include zero, it indicates the parameter is statistically significant.

**Results**

**Social Media Affinity On Psychological Well-Being**

A regression analysis was done to assess if the Social media affinity is associated with Psychological well-being the result of which is presented in table 1. The positive beta value ( $\beta = 0.997$ ) supports the expectation that the Social media affinity influences the psychological well-being of individuals.

Table 1: Coefficients<sup>a</sup>

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	-.441	.026		-16.909	.000
SMA	1.093	.006	.997	172.971	.000

a. Dependent Variable: PWB

**Moderation**

The direct effect of social media affinity on psychological well-being is statistically significant as in table 1. Testing for moderation, using model 1 of process macro, it was found that the relationship between social media affinity and psychological well-being is moderated by Gender. Table 2 gives the results of moderation. Where the R-Square of 0.994 indicates that the moderation is well explained and the p value of the moderation is statistically significant.

being in which social media affinity positively influences the psychological well-being of individuals. The purpose of this study was to investigate whether gender moderated their relationship which was also found to be positive. The arguments of Orben and Przybylski (2019) is supported by our study. The social media affinity seems to have not much adverse effect on the psychological well-being. Gender playing a vital role is also evident.

Table: 2

Model Summary						
R	R-sq	MSE	F	df1	df2	p
.9970	.9941	.0127	10261.2811	3.0000	183.0000	.0000
Model						
	Co-eff	se	t	p	LLCI	ULCI
Constant	-.3928	.0372	-10.5553	.0000	-.4662	-.3194
SMA	1.0760	.0121	89.1320	.0000	1.0522	1.0999
Gender	-.3162	.1220	-2.5914	.0103	-.5570	-.0755
Int_1	.0693	.0257	2.6984	.0076	.0186	.1200

**Discussion**

Empirical support exists for a link between social media affinity and psychological well-

**Conclusion**

This study tested a moderation model to examine the moderating effect of gender underlying the relationship between social media affinity and psychological well-being. In brief, the results found that the positive relationship between social media affinity and psychological well-being is positively moderated by gender. Knowing these results allows advances on how to define future research proposals and on how to collect data.

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**COMPARATIVE HYDROLOGICAL ANALYSIS OF INSTREAM FLOW IN ABAYA CHAMO SUB BASIN (IN A CASE OF KULFO RIVER), ETHIOPIA****Debebe Yegelilaw Eyesus<sup>1</sup>, Koshuma Abera Ermias<sup>2\*</sup>, Dasho Defaru Katise<sup>3</sup>,  
Vasudeva Rao Pampana<sup>4</sup>**

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**ABSTRACT**

*The Water demand of life do not go to human being only, but for the whole ecology. Sometimes in certain site water is absolutely consumed or diverted to front customers and downstream bionetwork remains in scarceness. In stream flows is flow that are leftward or continue in, system to maintain healthy of bionetwork. Quantifying the in-stream flow level and allocating the obligatory expanse flow is key portion in ecological sustainability. This study focused on approaches and setting works used in different countries to allocate in stream flow for downstream ecosystem under different management practices and ecological viewpoints., Fair or degrading habitat status for a methods Tennant, Tesman and Smakhtin and largely modified Environmental management classes for Global flow calculator package were taken in account for in stream flow computation. By applying four hydrological methods for 19 years gauged flow and identified habitat status, Tessman and Global flow calculator (GCF) technique is taken as favorite to fix conservational river flow necessity and verified by checking the correlation of monthly calculated in stream flow and the average locally calculated in stream flow. On the basis of estimated Environmental flow data, monthly-wise water demand in the river is ranges 1.08 to 3.96 m<sup>3</sup>/s.*

**Keywords:** *Kulfo River, in stream flow, Hydrological method, EMC, Comparative Inspection*

**Introduction**

This study focused to protect an ecology along the river which becoming in risk when stream flow is totally consumed. The alteration in natural state across the watershed continued date to date by human intervention and the desire of water across the river is also increasing. However, there is eco system below the Kulfo bridge site, the water is totally diverted to Amibara project for irrigation purpose during dry season. Based on existing Management classes in the watershed and possible approach could be conducted across the world were assessed and suitable method is selected to allocate flow regime in the river. The environmental management classes (EMCs) are considered as a level of existing environmental status and corresponding environmental water requirement is considerable water demand. There were numerous environmental flow requirement analysis methodologies, encompass significantly or insignificantly the environmental management classes. The methods based on available time, technical capacity, data, and finances can be broadly

categorized as detailed assessment methods and desktop assessment method (Dyson M., et al., 2003). Substantial amounts of field work, time and resources under Holistic and Habitat models are expected in detailed assessment whereas rapid assessment primarily using ecological relevant information hydrological behavior of watershed, like Desktop Reserve Model (DRM), Tenant method, and GEFC packages (Gabriel L., et al., 2015).

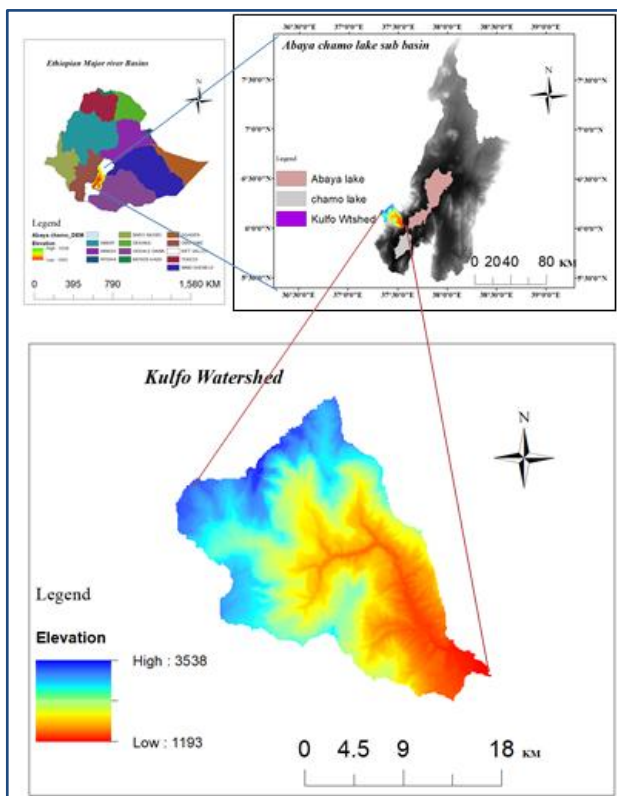
The method conducted in this study is not answering all questions related environment requirement issue. In the case, the absence of habitat and clear ecological information, desktop environmental flow assessment method clearly provides an average confidence to estimate environmental river flow. The estimation is realized when the study reinforced with a concept of ecological operational system of the river. The correlation of gauged river data and watershed conservation status quo taken in an account to ensure the quantities required in stream flow throughout the year Kulfo River.



## 2. Materials and Methodologies

### 2.1 Description of Study area

The Watershed is part of Abaya-Chamo Lake sub-basin specifically and a found in great east Ethiopian Rift Valley and it drains to Chamo Lake. The study area is geographically positioned between 5°55'N and 6°16'N latitudinal and 37°18'E and 37°38'E longitudinally as shown in Figure 3.1. According to the site visit during the study the Kulfo River is formed from different tributaries. The tributaries Baba, Gulando and Yeremo drain the Upper part of the basin, whereas the tributaries Wombale and Majale drain the middle part of the watershed. The tributaries Korzha, Ambule, and Titika join Kulfo at the lower part of the catchment area and flow measurement was conducted near Sikela from 1991 to 2013 by national Ministry of Water, Irrigation and Energy (MoWIE).



**Figure 1: Location map of the study area**

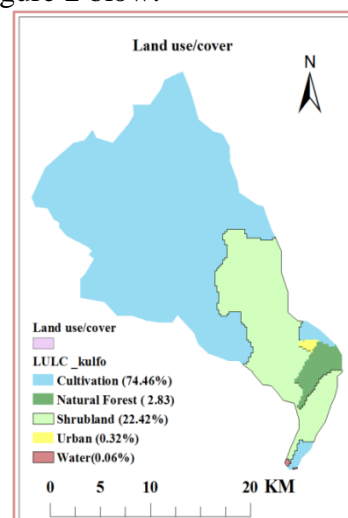
Kulfo watershed contains five zones classified traditionally which mainly relies on altitude and temperature, as Wurch (cold weather at above 3000 m. altitude), Dega (weather state found at elevation range 2500-3000m. altitude), Woina Dega (ranges altitude from 1500-2500m.), Kola (, elevation less than

1500m in altitude), and Bereha very hot climate ( (NMSA ,Initial National Communication of Ethiopia to the United Nationsl, 2001)NMSA , 2001).

As the part of rift valley, the geology of watershed was created by volcanic actions (Ababu T., 2005). As the result of this the catchment is, mainly categorized under volcanic rocks and quaternary period alluvium deposits. Some parts of the upper reach, all of the middle reach and half of the lower land part are characterized by tertiary period trap series alkali basalt and trachyte generally known as Oligocene basalt flows (Ababu T., 2005).

Identification of soil type distribution over the catchment was made by a data collected from Ethiopian Ministry of Water, Irrigation and Electricity (MoWR). Based this soil type in the watershed categorized as chromicvertisols, dystric nitisols, eutricnitisols orthicacrisols, eutricfluvisols, leptosols, dystricfluvisols.

According to 2008 land use land cover data of prepared by ministry of water irrigation and electricity of Ethiopia, the land use of Kulfo watershed has been changing progressively due to different agricultural activities and weak watershed management practice. As the result these and increase in population, natural condition has been replaced by cultivated land and bare land. Legally protected little forest in the lower part of the Kulfo River near Abaya and Chamo lake (Nech sar national park) about 2.8% is remain dense natural dense forest as shown Figure 2 blow.



**Figure 2. Land Use land Cover of the study area**

### 2.2. Hydrological analysis of in stream flow allocation

Due to the lack of deep habitat investigation and ecological data, this study followed hydrological based environmental flow requirement analysis. There are several methods which estimating environmental flows based on hydrological analysis of time series data (Tharme, 2003). However, it is considered that the factors (e.g., temperature, water quality and turbidity) which can influence the of aquatic ecosystems, the approach more emphasis the stream flow as primary agent (Richter B. D. et al. , 2006)

The in-stream flow requirement is related to quantifying the required amount of water to keep sustainable level of aquatic biota at various phases of development. It should be legally protected when the flow level in the river is below the quantified amount.

In this study hydrological based in stream or minimum required environmental flow assessment methods; like Tennant Method, Revised Tennant (Tessman), Smakhtin, and Global flow calculator (GFC) Method were applied and their relative comparative analysis was verified by correlation coefficient ( $r^2$ ).

#### ***Tennant method***

This method developed by studying change in percentage of width, depth and the velocities variations in terms of MAF for 58 rivers in Montana, Wyoming and Nebrask (Tennant, 1976).

In this method determining in stream flow requirements was obtained simply by computing the mean annual flow (MAF) based on flow historical data. As study conducted in Mortana different percent of MAF is prepared for corresponding ecological condition (Tennant, 1976). For Fair or degrading habitat in the watershed 30% and 50% of MAF was allocated during low and high flow seasons respectively.

#### ***Tessman method (revised Tennant) method***

Tessman developed Tennant flow variation concept to compensate the percentage of Mean Annual flow (MAF) to hydrologic and ecosystem monthly variation. Under this modified method the seasonal variability taken in account as Lowest monthly flow equivalent to the monthly mean flow (MMF).

#### ***Smakhtin Method***

Smakhtin hydrological based environmental flow computation and allocation techniques slightly similar in terms flow quantity accounting and hydrological seasons with The Q90\_Q50 method. The Q90\_Q50 method (A.V. Paster et al., 2014) is based on the annual flow quantities to allocate the minimum in stream flow during the extreme flow season and minimum flow seasons. As Smakhtin et al. (2004) four potential ecological statuses for application within global hydrological model were introduced and following this, respective Q50, Q75 and Q90, flow requirement for good ecological status, moderate ecological status and for fair condition recommended.

#### ***Global flow calculator (GEFC)***

This above historical stream flow methods are simple and easy assessment technique and can be used to regional studies by means of regression approaches (Daniel Caissiel and Nassir El-Jabi, 1995). Historical stream flow approaches remain effective where the above methods become too cost. On other hand methods can be applied on larger projects to provide an initial assessment of in river flow requirements (Daniel Caissiel and Nassir El-Jabi, 2003).

Recently, there are numerous environmental flow applications which incorporates the ecological and management perspectives. Desktop reserve model (DRM) a hydrology-based, in stream flow assessment tool adopted (Hughes D., Hannart P., 2003) and Global flow calculator (GEFC) free software package developed by (IWMI) are utilizing lately. Under this method FDC shifting techniques were coded in visual basic 2005 to estimate in stream flow requirement. GEFC was used to examine the data and guesstimate in stream flow as the result of it estimates the percentage of MAF as well as flow in continuous monthly series.

According to (DWAf, 1997) Six EMCs and their corresponding environmental explanation, managing perception and nominal flow duration curve (FDC) shift limits was executed in this method and shown in Table:.1 below.

Table 1: Ecological Managing Classes (EMC) and equivalent nominal limits for FDC alteration as (DWAf, 1997).

EMC	Ecological descriptions	Management perspectives	Default FDC shift limits
A.Natural	Pristine condition or minor modification of in-stream and riparian habitat.	Protected rivers and basins. No new water projects (dams, diversions, etc.) allowed. Reserved and national parks.	Lateral shift of a reference FDC is one percentage point to the left along the time axis from the original FDC.
B.Slightly modified	Largely intact biodiversity and habitats despite water resources development and/or basin modifications.	Water supply schemes or irrigation development present and/or allowed	Lateral shift of a reference FDC one percentage point to the left along the time axis from the position of the FDC for A class.
C: Moderately modified	The habitats and dynamics of the biota have been disturbed, but basic ecosystem functions are still intact. Some sensitive species	Multiple disturbances associated with the need for development e.g., dams, diversions habitat modification and reduced water quality.	Lateral shift of a reference FDC one more percentage point to the left along the time axis from the position of the FDC for B class.
D: Largely modified	Large changes in natural habitat, biota and basic ecosystem functions have occurred. A clearly lower	Significant and clearly visible disturbances associated with basin and water resources development including dams, diversions, etc.	Lateral shift of a reference FDC one more percentage point to the left along the time axis from the position of the FDC for C
E: Seriously modified	Habitat diversity and availability have declined. A strikingly lower than expected species richness. Only tolerant species remain.	High human population density and extensive water resources exploitation.	Lateral shift of a reference FDC one more percentage point to the left along the time axis from the position of the FDC for D class.
F: Critically modified	Modifications have reached a critical level and ecosystem has been completely modified with almost total loss of	This status is not acceptable from the management perspective. Management interventions are necessary to restore flow pattern.	Lateral shift of a reference FDC one more percentage point to the left along the time axis from the position of the FDC for E.

According to recent land use land cover data and overall management practice of Kulfo watershed has been changed progressively due to deforestation as a result of increase in population and land for cultivation, which results in replacement of vegetation cover by cultivated land and etc. According EMC categories viewed in the previous page the watershed is related to D Largely modified (High human population density, habitat diversity change etc.).

As per land use land cover data analysis the watershed is mainly agricultural land (above 74.46%) were totally disturbed from natural condition and the others were slightly. A default Adjacent move of a reference FDC is more than single ratio point to the left along the time axis from the original FDC was used.

The summary of FDC result is indicates the in-stream flow regime for each EMC. The curves obtained by the lateral shift of the reference FDC to the left, along the probability axis. The indicated seventeen percentage values on the axis of probability: 0.01, 0.01, 0.1, 1, 5, 10, 20, 30, 40, 50, 60, 70, 80, 90, 95, 99, 99.9, 99.99 percent were applied as steps in this shifting technique. The shift of a flow duration curve to the left has defined meanings.

General characteristic feature to estimate EF calculation is that more variability of flow in the river (i.e., the steep the FDC), and the reverse is applied. After the flow regime was defined in terms of MAF then simulation of monthly or daily based in stream river flow across the river was computed.

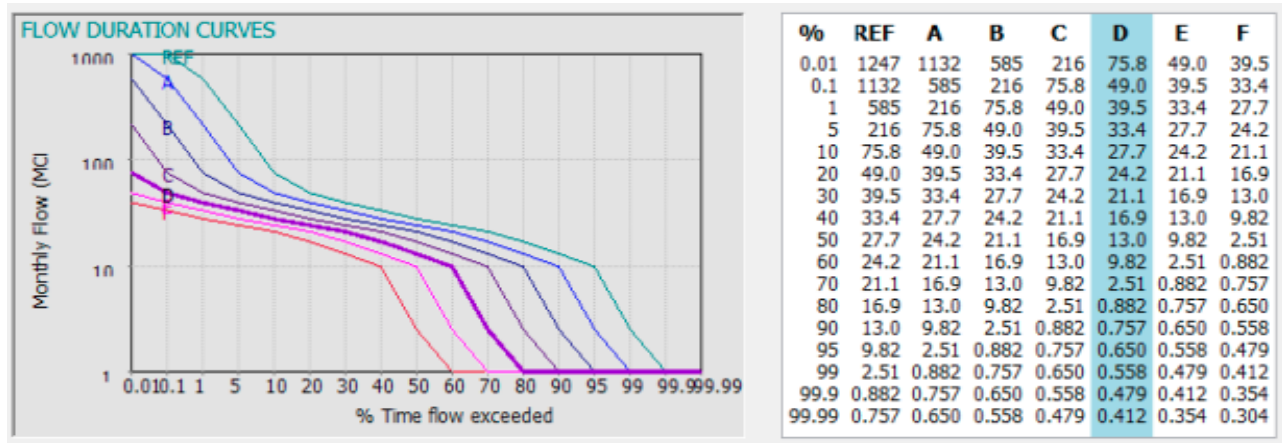


Figure 3: FDC for different EMC classes (GCF output)

This summary of FDC may be directly applied for reservoir yield analysis, but this summary should be converting into the actual environmental daily or monthly flow series. The interpolation techniques defined (Hunghe D. and Smakhtin., 1996) was applied in the simulation procedure monthly time series EF. The basic approach is that, flows going on simultaneously at sites in reasonably close proximity to each other correspond to similar percentage points on their corresponding FDCs. In the context of Global Environmental Flow Calculator, the destination FDC is the one representing the EF sequence to be generated, while the source FDC and time series are those representing the reference natural flow regime. Daily gauged flow at Sikela near Arbaminch was converted to monthly based and used in GEFC.

**Observations and Discussions**

On the basis of analysis of 19 years (1995-2013) flow statistics of Kulfo River in observation site and the watershed condition taken as largely modified (Class D) condition. Among the varieties rapid analysis methods four were applied for identified habitat condition and monthly environmental flow was allocated as shown figure 5 below.

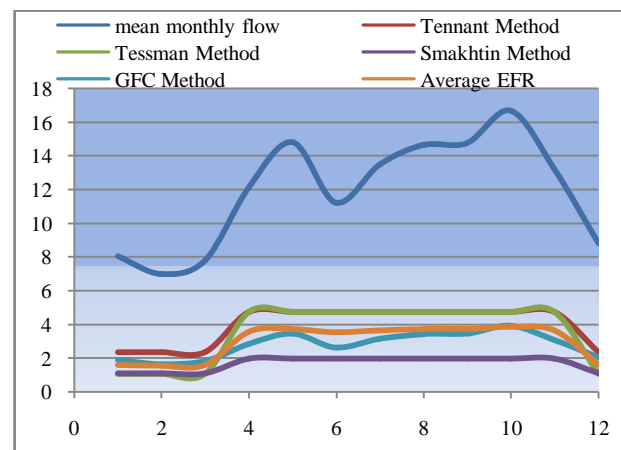
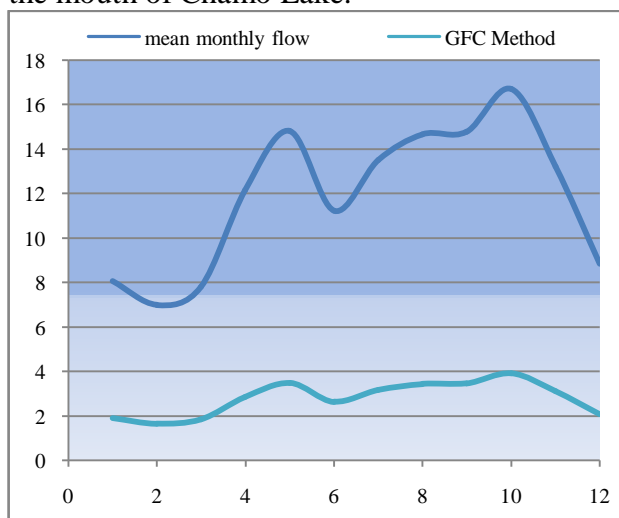


Figure 4: Comparison of EF methods with mean monthly flow

As it was indicated in the figure 5 either the percentage of MAF or flow varies from method to method in both high and low flow seasons. The environmental flow ranges from 1.7m<sup>3</sup>/s to 3.96m<sup>3</sup>/s in method to method over all months. As the result of this correlation made among the methods was identified the method with the best correlation coefficient was applied for environmental flow allocation in the Kulfo River. The correlation between the locally calculated EF with the four selected methods was computed. From the figure all the simulated EF was highly correlated with calculated EFRs. The Global Flow) revised Tenant (Tessman) and Calculator (GCF method recorded the highest correlation coefficient (R<sup>2</sup> =0.878 and 0.967), while the Smakhtin, and Tennant methods showed a correlation R<sup>2</sup> =0.77 and 0.67 respectively. Revised Tennant technique is found to be chosen to estimate the conservational flow rations, which as the result it computes on monthly basis. This method categorizes the

river discharge into Six Environment Management Classes (EMC) spreading from natural condition (A) to critically modified (F) condition. The Mean Annual Flow (MAR) of the river during January 1995 to December, 2012 was estimated 381.8 MCM. On the basis of estimated discharge data, month-wise water requirement in the river was calculated for all months. Having considerable seasonal variation of flow in the river, the allocation again varies. The absolute minimum EF monthly allocated amount by this method found 1.69 m<sup>3</sup>/s and flow should not be less than in the river particularly in lower part up to the mouth of Chamo Lake.



**Figure 5: Monthly environmental river flow requirement**

## Conclusions

In the study instream flow necessity at observation sites located in lower part of the river has been investigated by using, Tennant and Modified Tennant method (Tessman method), Smakhtin and GCF model. Tessman method and GCF method showed good correlation with calculated EFRs from case study. The key element of the study was to ensure flow that should be left in the river or to a river system begin Arba Minch town to the mouth of Chamo lake to maintain healthy of eco system. Based on GFC the minimum EF allocated in the river was found 1.69 m<sup>3</sup>/s/ and it should be legally protected when the flow level in the river is below the quantified level. The methods conducted were average confidence and further, intensive investigations would be necessary to obtain data on ecological needs of the river in order to recommend the realistic values of EF for this river.

## Acknowledgements

We acknowledge Ministry of Water, Irrigation and Energy of Ethiopia for their necessary data and information provision, in this study. Again, we would like to express our sincere appreciation to international water management Institute (IWMI) for free provision of GFC software package. Finally, I would like to thank Arba Minch University for logistic support to conduct this research.

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## EFFECTIVENESS OF MODULAR LEARNING APPROACH (MLA) AND THE STUDENTS ACADEMIC PERFORMANCE IN SULTAN KUDARAT STATE UNIVERSITY- KALAMANSIG CAMPUS

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### ABSTRACT

The purpose of this study was to assess the effectiveness of the modular learning approach (MLA) at Sultan Kudarat-State University-Kalamansig Campus and its relationship to students' academic performance. The study used a quantitative approach. Two (2) groups of respondents were polled in this study. The first group included faculty members, whereas the second group included students. Twenty-three (23) faculty members and thirty-three (33) students acted as study's respondents; a total of fifty-six (56) respondents participated in this study.

The data gathered were analyzed using the SPSS software V21x64. The statistical methods used were mean, standard deviation, grand mean, frequency and percentage, t-test, and Pearson product-moment correlation coefficient.

The teachers assessed the effectiveness of the modular learning approach in terms of instructional quality, technical quality, and usability to be fairly effective, while the students assessed the module's effectiveness as fairly effective. In this case, there was no significant difference between the teachers' and students' assessments on the effectiveness of the modular learning approach.

The student's performance, as measured by their general point average (GPA), was 91, which is considered above average according to the SKSU-Kalamansig campus grading system. There was a significant correlation between the effectiveness of the modular learning approach (MLA) and students' academic performance. It means that the effectiveness of the modular learning approach has something to do with the student's performance. The effectiveness of modular approaches such as instructional, technical, and usability of modular approach significantly impact the student's performance or grades.

The recommendation to use modular instruction in another discipline is applicable because it has been beneficial. Additionally, it suggests that modular instruction be maintained and strengthened throughout educational institutions to boost student performance.

Finally, studies examining the viability of employing the modular learning strategy to increase student performance in other disciplines should be undertaken.

**Keywords:** Module, Modular Learning Approach, Students Academic Performance, Effectiveness

### Introduction

The COVID-19 pandemic has changed the lives of everyone from old normal to new normal. It has brought a huge change between and among the lives of everyone. Due to its impact, most sectors worldwide have adopted a new scheme to survive this pandemic. In particular, learning institutions such as schools, colleges, and universities have adopted the new scheme of academic operations to manage learning loss, while millions of schools have closed due to this pandemic. As reported, many countries have decided to close schools to prevent the spread of the virus, which interrupts the continuity of student learning.

This challenge calls all learning institutions to have an aggressive education policy to cope with the crisis to reduce learning loss while schools are closed. Such policies manage continual learning to support learning recovery and make the crisis an opportunity to improve

learning and accelerate, making learning education stronger and more equitable than before.

It should be emphasized that the purpose of Higher Education Institutions (HEIs) is to assist the educational system in making decisions about how to execute and enhance the educational process in response to the pandemic's issues. These HEIs implement appropriate safeguards to protect students from disturbance and learning loss. They develop and organize plans for the sustainability and continuity of instruction through alternative learning modalities and online-based professional development. (Reimers & Schleicher, 2020).

Alternative learning modalities such as the modular learning approach (MLA) optimize learning resources while paying attention to learners to manage their learning. Educators' roles shift from information providers to

learning facilitators by providing various learning resources, fostering learning enthusiasm, providing opportunities to practice learning outcomes, providing feedback on learning progress, and ensuring that what they learn is aligned with the objectives to be met.

The usage of modules is vital because education is no longer confined to the classroom. One of the benefits of incorporating modules into education is that students learned or enhanced their ability to do self-study or self-learning. Students take an active role in developing a working knowledge of the module's concept. As they complete the module's activities, learners develop a sense of responsibility and progress independently with little or no assistance from others.

It is vital to emphasize that this strategy is often regarded as effective. However, its effectiveness would be harmed by behaviors that violate the modular learning approach's concept. Additionally, kids may have lost opportunities to practice certain concepts, abilities, and understandings necessary for their holistic development, resulting in poor academic performance.

For the HEIs to continue providing quality education, using a modular learning approach is highly pivotal. The effectiveness of the modular learning approach may provide knowledge and skills to help students perform better in the teaching-learning process during the time of the pandemic.

This study addresses the need for more efficient and more effective use of the modular learning approach of the teachers in Higher Education Institutions (HEIs). These issues and whether or not such an approach relates to the student's academic performance. The purpose of research and discussion is to demonstrate an educational institution's commitment or address an educational issue.

It is in this context that the researchers believe this study is pertinent and warrants further investigation.

### **The Research Problem**

This study aimed to assess the effectiveness of the Modular Learning Approach (MLA) and the students' Academic Performance in Sultan Kudarat State University- Kalamansig Campus.

Specifically, this study sought to answer the following questions:

1. How effective is the use of modular learning approach as assessed by the teachers and the students in terms of;
  - a. Instructional Quality;
  - b. Technical Quality; and
  - c. Usability?
2. How effective is the use of modular learning approach as assessed by the students in terms of;
  - a. Instructional Quality;
  - b. Technical Quality; and
  - c. Usability?
3. What is the student's academic performance?
4. Is there a significant difference between the effectiveness of the Modular Learning Approach as assessed by the teachers and the students?
5. Is there a significant relationship between the effectiveness of the Modular Learning Approach and the student's academic performance?

### **Hypotheses of the study**

Based on the problems mentioned earlier, the following hypotheses were formulated:

**H<sub>01</sub>:** There is no significant difference between the effectiveness of the Modular Learning Approach as assessed by the teachers and the students.

**H<sub>02</sub>:** There is no significant relationship between the effectiveness of the Modular Learning Approach and the student's academic performance.

### **Literature Review**

#### **Definition of Module**

The module is a learning media commonly used in learning activities and comes in a script or print media form. The module is designed as a stand-alone unit, with a sequence of learning activities intended to help learners achieve learning objectives that have been set clearly and operationally. Modules are packed comprehensively and systematically, containing a series of planned learning experiences and meant to assist students in mastering specified learning objectives. A minimum of learning objectives, learning material/substance, and evaluation are included



in each module. The module works as an autonomous learning tool, allowing students to learn at their own pace. According to the Ministry of National Education (2020), modules are a collection of educational materials provided systematically so that their application can be mastered with or without the teacher's assistance.

Modules optimize learning resources while paying attention to learners so that they can manage their learning. Educators' roles shift from information providers to learning facilitators by providing various learning resources, fostering learning enthusiasm, providing opportunities to practice learning outcomes, providing feedback on learning progress, and ensuring that what they learn is aligned with the objectives to be met.

Reading ten percent, hearing twenty percent, seeing thirty percent, seeing and hearing fifty percent, discussing seventy percent, experiencing eighty percent, and teaching others ninety percent is the learning process that involves the activeness of learners, according to Robert Heinich et al. (2014). As a result, the teacher must develop a good teaching tool to engage the learner's actual senses in learning, mainly supporting teaching material. The desired learning process creates teaching materials in learning modules, including emotive, cognitive, and psychomotor learning components.

Nasution (2010) lists the following advantages of learning to use modules: 1) Learners can learn anywhere, in groups or alone, which increases the effectiveness of their learning. 2). Determine and establish a study period more in line with students' requirements and growth, 3). Continually monitor the achievement of student competencies using the criteria outlined in the module, 4). Knowing the deficiencies or competencies that students have not accomplished based on the module's requirements allows them to decide and assist participants in improving their learning and remedial work. On the other hand, learning to utilize modules is intended to diminish students' learning capacity through independent learning activities.

Modules are defined by Sejpal (2013) as a self-contained working unit in an instructional course and a teaching technique based on

developing knowledge and abilities in discrete units.

### **The Quality of Module**

According to Nasution (2010: 217), the quality of educational products is determined by developing learning materials, but evaluation of three quality characteristics, namely validity, practicability, and efficacy, can be applied to a broader product range.

According to Nasution (2010), the validity relates to the level of intervention design based on content and construct validity knowledge. Validity is a metric that demonstrates how reliable an instrument or set of data is. In gathering data, the principle of validity is measurement or observation.

Module development must consider the characteristics that contribute to a module's effectiveness. The characteristics of an outstanding module area). Self Instruction, Self Contained, Stand Alone (Stand Alone), Adaptive, and Friendly / Familiar (User Friendly).

Ibyatova et al. (2018) investigated the modular method's utility in the teaching-learning process by looking at students' motivation, achievement, and performance to see if it is more effective than traditional education. An experiment was conducted with two groups of students studying English at a technical institution. Engineering students' modular learning, teaching, and evaluation processes were examined using quantitative and qualitative study methods. According to the study, learners of modular courses found it motivating and effective, which motivated them to improve their performance on succeeding modules. On the other hand, modular assessment and learning did not reduce the workload and stress associated with more traditional techniques. Teachers appreciate the modular approach's emphasis on instructional needs and well-designed examination possibilities. The framework of the experiment, as well as the approach to modules, might be improved.

Ali et al. (2010) investigated the effects of modular instruction on student achievement. They used an experimental approach. The study used an analogous group design. The

acquired data were analyzed and interpreted using the mean, standard deviation, and t-test. Research findings validated the modular strategy. Overall, modular training was far more effective than traditional teaching methods in the teaching and learning of biology. Learners in modular training can study at their own pace, ability level, and needs. Instant reinforcement is provided as feedback for the learner's motivation to perform a task in this self-study mode. According to the study, this strategy should be widely adopted in traditional classrooms at all levels of education.

### **The Concept of Modularization**

There is a current trend toward integrating education through the use of modules. The notion has gained significant attention in the educational systems of the majority of countries, particularly in technical and vocational education and higher education. Ethiopia's MoE [Ministry of Education] (2013) reports that higher education institutions increasingly emphasize a modular approach to education. Modular education is a paradigm change away from traditional instructional methods and toward an outcome-based learning paradigm.

Modularization is a notion that involves the division of a curriculum into self-contained, non-sequential modules or units that are typically brief. Credits are earned when students finish courses that lead to a specified number of credit points required for qualification. According to Hornby, a module is a nearly self-contained unit of instruction and a teaching technique that focuses on discrete skill and knowledge development, as Yoseph & Mekuwanint (2015) mentioned. As a result, a module is a course that can expand into a specific area of skill when paired with other related courses. Each unit or module is a quantifiable component of a larger learning experience that leads to a specified qualification(s) for which a specific number of units or modules, generally in a specific order, are required.

Moreover, unlike a linear degree program consisting of a set of subjects, modularized degrees are made up of self-contained, self-contained modules that can be finished in any order and at any speed allowed by French law

(2015). It is linked to the idea of delivering information in "bite-sized" portions and hence lends itself to time-sensitive and intense distribution strategies (French, 2015). Students can take greater ownership and accountability for their education with the modular approach to education. It requires a higher level of maturity from the learner, and the courses are better suited to mature students. In a modular approach, all needed competencies are tightly bound together. The task groups are formed. Money generation, allocation, accounting, and monitoring, for example, are all financial management functions that can be bundled and packaged as a financial management module.

According to Ali et al., a modular higher education curriculum is mainly a response to the rapidly growing corporate, industrial, and consumer choice sectors in general (2010). Rather than a broader definition of "course," it focuses on more specific outcomes for each part of the degree. In comparison to most traditional curriculum designs, modular design provides students with more program options and a broader range of entry and exit points. These authors went on to say that modularity allows curriculum design to be tailored to the needs of individual students, thus changing the curriculum from the supply side (what institutions want to offer) to the demand side (what students want) (what students and their employers identify as what they want). For today's learners, modular training is preferable to traditional instruction in terms of both learning quality and content.

Additionally, the teaching-learning process is centered on the learners, which is the fundamental tenet of modularization. It encourages a learning environment in which students are actively participating in knowledge creation and a shift in the instructor's role from knowledge transmitter to facilitator of learning. Additionally, modularization entails constant assessment and monitoring of students' progress throughout the module/course. When instructors employ continuous practical assessment, they can adapt their teaching and learn to the evidence gathered during the assessment. Additionally, it enables students to obtain feedback on their progress and suggestions for improvement. In other words, by implementing a modularized

curriculum in Ethiopian higher education institutions, active learning and ongoing assessment will be facilitated.

Ethiopia's Ministry of Education (MoE) has proposed modularization as the optimum strategy for implementing curriculum and creating globally competent graduates as part of its drive to reengineer the teaching-learning core process (Ministry of Education 2013). As a result, Ethiopian higher education institutions began implementing modular curricula in 2013 (Mekuwant and Joseph, 2015). It was created to emphasize the capabilities that graduates must possess by integrating knowledge and abilities to successfully train professionals for a variety of employment opportunities in areas where skilled workers are in high demand.

Modular teaching focuses on each student as an individual with distinct abilities and interests, assisting each student in thinking independently and allowing each learner to be distinctive. The instructor's focus must be on a single student with unique abilities, aspirations, and life experiences, and the instructor's educational method must be personalized and customized to deliver quality education. When teachers are dedicated to individual learning, they schedule one-on-one talks with students and give tailored support. The individual study may contribute to the development of many notable and self-sufficient persons, and students can spend time following their interests and satiating their curiosities in more modern methods.

Success in the real world requires creativity, adaptability, and lifelong learning. Struyven et al. (2010) propose that for pupils to develop these skills, schools should be designed around the learner rather than the teacher. Student-centeredness has been a tenet of educational reform. Student-centered learning emphasizes what students need to know rather than what the teacher wishes to teach. Classrooms are increasingly being considered "centers of intellectual inquiry," where students can generate ideas, take risks, make mistakes, think critically, correct errors, and learn how to deal with issues that come from their blunders. The interaction between professor and student is no longer sufficient; it must now be bidirectional. Students will communicate with teachers,

peers, parents, and even outside professionals to seek out and comprehend their learning (Ali et al., 2010).

### **Basic Concept, Importance, and Module Development**

Nepomuceno classified the following modules as having a separate, identifiable set of talents or outcomes other than skills, according to Balderas (2016). It is concise in order to encourage students to maximize their study time. While it encourages collaboration, it is fully self-teaching. It is interdisciplinary, incorporating theory and practice and active learning, reading, and thinking. Additionally, it includes a list of recommended readings or resources for the skill being pushed. It suggests ways in which students might contribute to the creation of their projects and explanations and evaluation criteria. It is grounded in reality because it makes every effort to immerse students in real-world circumstances. It gives information about the product that may be utilized to improve and redesign it. Based on these characteristics, he advanced the following reasons for the necessity of modules in education. The first is to foster self-directed learning, guarantee minimum criteria are met, provide remedial units, give fundamental education, and upgrade content.

Likewise, it should strengthen teacher competencies, connect theory and practice, accommodate individual learning differences, accommodate diverse groups within a single course, consolidate crucial areas, promote industrial certification, and provide resources. Additionally, he describes a module as enabling the construction of multiple sequences of experiences to reflect the teacher's or student's specific interests. Self-instructional units allow the teacher to focus exclusively on the student's shortcomings in the subject at hand, obviating the need to cover material the student already understands. It enables the assessment of kids' educational development. It alleviates the monotony associated with lesson learning. The teacher is free to interact personally with the pupil. Because self-instructional units were self-contained, it was possible to update study materials without making significant changes. It can be a starting

point for teachers who wish to construct their resources and customize them.

The European Learning Path Organization describes the difference between a "module" and a "unit" as follows: "A module aims to establish a discrete and certifiable portion of the curriculum, as determined by competency objectives," according to Mercedes (2016).

These goals should be fulfilled in a fair amount of time (language modules usually range between 20 and 30 hours). This time limit is critical for the modular organization since the entire curriculum is based on the premise that time, human, and material resources should be employed to achieve foreseeable goals. Naturally, this can lead to rigidity, which is why, in order to accomplish real continuous learning, a modular organization requires regular monitoring and feedback. Typically, units are organized around well-defined goals (often described in grammar, vocabulary, functions, skills, and others). On the other hand, modules appear to have a higher goal: to enable students to achieve a level of proficiency that goes beyond grammar, vocabulary, and functions. Modules should have a distinct focus — a discrete organizing concept — although units are commonly referred to as sub-divisions of modules (they may also be referred to as stages, steps, or other names). According to Mercedes, a statement of purpose, required prerequisite skills, instructional objectives, module implementers, the modular program, relevant experience, and evaluative Pretest, and module evaluation are also included in modules.

According to UNICEF (2017), "business as usual" strategies such as increasing the number of teachers, classrooms, and textbooks will not be enough to reach the most marginalized children and youth who are currently out of schools, such as those with disabilities, children from ethnic, religious, or linguistic minorities, and children displaced by armed conflict.

In India, for example, financial resources are being provided to assist students with impairments in attending regular schools and adapting school facilities. In addition, instructors receive training in inclusive education, and resource centers have been built to assist school clusters. New policies on the

language of instruction have been developed in Vietnam to provide more relevant education for distinct ethnic groups.

According to Morrila (2017), one of the instructional tactics used by ALS Implementers is modular instruction. Modules encompassing a variety of learning strands enable ALS Implementers to efficiently and effectively teach the content. Module-based training is the most effective teaching method in ALS programs for speeding students' growth and development. Modular teaching is synonymous with the concept of a malleable instructional technique, and the ALS curricular objectives are all specified. Additionally, it enables pupils to monitor and measure their development. Numerous teaching approaches have varying advantages depending on the situation; nevertheless, a modular approach is strongly suggested while using the Alternative Learning System.

The construction of a method of assessment other than marks or grades is one of the advantages of employing a modular approach to training. The courses are studied by the students in their actual working environment. Learners can concentrate on their studies without interrupting their daily activities and duties. Individually, in a small group, or a big group, modules can be delivered. It gives the learner authority over his or her learning. ALS Facilitators can benefit from learning about these advantages.

It is possible to enhance learners' learning and understanding by utilizing proper teaching approaches in certain cases. Morrill stated that modular instruction accommodates students' individual learning preferences by determining what they need to learn actively. Their learning should be guided by their ability, motivation, and interest, not by their peers. Individualized instruction, he explained, is a multi-media strategy for designing coherent educational programs that prepare students to take complete responsibility for their education.

Lardizabal (2004) defines a module as "a series of learning assignments that students must complete." It can be used to supplement a course, a stand-alone course, or a curriculum design. Modules are condensed segments of training that are combined with other types of instruction to target specific, condensed

components rather than a whole course. Modules are self-paced training approaches that may include programmed instruction, self-study kits, mail courses, and a mastery learning approach. By allowing students to study at their own pace, she adds that modules have effectively concretized the concept of individual uniqueness. Additionally, intellectually bright children may enroll in more modules, whereas less gifted students may enroll in a limited number of modules. Additionally, she mentions the following module advantages. It enables children to work independently, assumes responsibility for their learning, sees that textbooks are not the sole source of information, understands what they need to study, be driven to master the module and faceless competition for marks. According to teachers, adopting modules enables them to dedicate more time to specific learning challenges. They are skilled at spotting problems early on. They are free to act as resource persons, answering inquiries and supporting others who require assistance. She proceeds by detailing the module's many components. It should include a mission statement, a list of required prerequisite abilities, instructional objectives, module implementers, the modular program, relevant experience, and evaluative Pretest, and module evaluation.

### **Effectiveness of Modular Teaching Approach**

In his article "The Main Goal of the Study on the Effectiveness of Modular Teaching in Biology at the Secondary Level at Asian Social Science," Ali (2010) examined the impact of modular education on student achievement. The findings supported the modular teaching method by indicating a large gender gap in general comprehension between male and female students, with male students outperforming female students on general comprehension tests. As a result, it is recommended that this approach be widely used in general education classrooms at all levels of education. Although most learning packages are completely tailored, he claims that group experiences can be included. The fact that modules can aid in the resolution of key educational issues is the primary motivator

for their inclusion in the teaching-learning process. They are popular because they fit the fundamental prerequisites for effective learning and can be implemented in various ways. When using such goods, individual differences are considered, and students can work at their own pace.

It is critical in the context of this study since it demonstrates the effectiveness of modular instruction. Highland (2015) observes in her study on Self-Paced Individualized Learning that children do not acquire knowledge at the same rate or in the same manner as their peers. She proposes building a self-paced, personalized classroom as a solution. Students can learn at their own pace and take control of their education in a classroom setting. She analyzed data collected in the classroom from seventh and eighth-grade mathematics students. She examined how students' attitudes about arithmetic and their comprehension of the subject altered once they took charge of their education. As a result of the study, students' capacities to learn independently increased. There has been a rise in the number of students studying mathematics. According to the report, children earned 11 to 55 percent higher arithmetic targets during the school year. In addition to their math skills, her children learned how to use instructional books to understand and clarify a topic.

They learned how to take charge and ask for help when they needed it. Students learned to put their trust in one another and to seek help and guidance from their peers. The study is relevant to this one since it covers the benefits of a modular learning strategy and its application to the curriculum.

Haddad (2009) defines functional literacy as achieving self-reliance in literacy and numeracy, becoming aware of the causes of their deprivation and ways to overcome them through organization and participation in the development process, and acquiring skills to improve economic status in his study of the state and development of adult learning and education in Asia and the Pacific. The implementation of this functional and instrumental concept of literacy differed greatly. It frequently veered toward a more traditional approach, emphasizing the mechanics of basic alphabet recognition over

self-sufficiency in acquiring the skills needed for subsequent learning and critical consciousness development.

In her study on the impacts of modular and traditional teaching methods on students' general comprehension, Malik (2012) compares the effects of modular and traditional teaching approaches on students' general comprehension at the secondary school level. The study was placed in two secondary schools, one for males and the other for females. The experiment participants were recruited at random from a group of grade 9 pupils. The data was collected using social science statistical software and an independent sample t-test, and the results were analyzed using a teacher-created general understanding evaluation. According to the statistics, students' general comprehension varied greatly between modular and traditional procedures. The researchers discovered that students taught using a modular approach earned a better mean score on a teacher-created general understanding test than students taught using a traditional approach. Male and female students revealed a large gender disparity in general comprehension, with male students outperforming female students on general comprehension examinations.

It is significant in the current study because it demonstrates the benefits of modular education to pupils.

### **Modular Learning Approach in Philippine Context**

The most frequent type of distance education is modular learning. Distance learning via printed and digital modules is the most popular mode of distance learning among parents of students enrolled this academic year, according to a poll done by the Department of Education (DepEd), and it is now employed by all public schools in the Philippines (Bernardo, 2020). It also considers learners in remote locations who do not have access to the internet for online learning.

The teacher is in charge of the students' development. The teacher can be reached via e-mail, phone, text message, and instant messaging, among other methods. If possible, the instructor will visit students who need remediation or support at their homes (Llego,

n.d.). Instructors or local government organizations will send printed Modules to children, parents, and guardians.

Parents have become educators' collaborators because education is no longer confined to the classroom. In the family, parents play an important role as facilitators. In modular learning, their major role is to connect with and guide the child. (FlipScience,2020)

According to the Department of Education, parents and guardians have a range of roles in modular learning, including Module-ator, Bundy-clock, and Home Innovator (DepEd). At the start and conclusion of each week, Module-actors are responsible for collecting and delivering printed Self-Learning Modules (SLMs) to and from schools or barangay halls, as agreed upon by parents and the school. They must use a Bundy-clock to evaluate their child's routine or weekly schedule. They must make certain that all protocols are followed to minimize cramming or submission delays, which could harm the learner's results. Finally, as Home Innovator, they must create a positive learning atmosphere for their child to concentrate more effectively on academics. The environment must be well-lit, well-ventilated, and distraction-free.

Modules allow students to learn at their own pace. Students' self-study and learning skills improve as a result of employing modules for instruction. Students take an active role in learning about the subjects covered in the curriculum. As they complete the module's tasks, they get a sense of responsibility. Children develop on their own, with little or no assistance from others. They are honing their learning skills and gaining confidence in their abilities (Nardo, M.T.B, 2017). Improved teaching resources, increased student choice, self-pacing, and enhanced diversity and flexibility for instructors and staff are just a few of the benefits of modular instruction.

Students will need more self-discipline and motivation, more time to prepare, a lack of clear incentives for teachers and staff, and administrative resources to handle several courses and students.

### **Theoretical Framework**

This study is based on Bruner's theory of constructivism. According to Fosnot (2005),

constructivism places a premium on the learner's active involvement in the process of knowledge construction and meaning building. Instead of being passive learners, constructivist teaching involves learners actively participating in the building of knowledge.

Bruner's theoretical framework defines learning as an active process in which students gain new ideas or concepts based on prior and present knowledge. The learner selects and adjusts data, formulates hypotheses, makes judgments, and places his or her faith in comprehension. The cognitive framework (schema) provides meaning and organization for their experiences, transcending the facts provided. Meanwhile, the teacher's objective should be to urge students to uncover principles independently. By utilizing the module, students will be able to process new concepts they read in the module. As a result, they will be able to rely on their knowledge and develop their problem-solving abilities.

### Methods

The quantitative research design was used in this study. The descriptive correlation method was utilized to describe the effectiveness of the Modular Learning Approach (MLA) and its relationship to the academic performance of students enrolled at Sultan Kudarat State University-Kalamansig Campus during the Academic Year 2020-2021.

The descriptive survey method was used to assess the Modular Learning Approach's effectiveness and student's academic performance. The survey approach is often employed in the following circumstances: when some degree of generalization is sought when time and money are crucial and when the target population is vast. As a result, this study meets the criteria for conducting a survey research approach.

As the researchers select the respondents of this study, simple random sampling was utilized. It involves the process of handpicking individuals from the population based on the researchers' knowledge and judgment. Additionally, this sampling technique may be successful when just a small number of persons are available to act as data sources due to the nature of the research design and study objectives. Twenty-three (23) faculty members

and thirty-three (33) students from Sultan Kudarat State University- Kalamansig Campus taking the Bachelor of Elementary Education (BEED) program participated in this study. This study surveyed a total of fifty-six (56) respondents.

The data gathered were analyzed using the SPSS software V21x64. The statistical methods used were mean, standard deviation, grand mean, frequency and percentage, t-test, and Pearson product-moment correlation coefficient.

The survey questionnaire was developed following a review of relevant studies, journal papers, and news articles. The survey questionnaire had closed questions that required respondents to select from a limited number of possibilities. The possible disadvantage of this form of inquiry is that respondents cannot respond differently than those advised (Crawford, I.M 1990).

To counter this problem, the survey questionnaire was reviewed and validated by the different subject experts. A kappa alpha of 0.56, interpreted as "fair," indicates that the self-created questionnaire was valid. Correlation coefficients that did not reach the required standards were either removed or enhanced, while items that exceeded the required standards were maintained. Additionally, after the instrument's items were finalized, a reliability test was conducted to test the instrument's reliability. This test yielded a reliability index of 0.97, suggesting that the questionnaire was highly reliable.

### Results and Discussion

This part shows the assessment of teachers and students as to the effectiveness of the modular learning approach. The assessment covers the instructional quality, technical quality, and usability of modular learning approach.

**Table 1**  
**Effectiveness of Modular Learning Approach (MLA) as Assessed by the Teachers**

**n=23**

Items	Mean	SD	Description
Instructional Quality	2.83	0.418	Fairly Effective
Technical Quality	2.89	0.286	Fairly Effective
Usability	2.86	0.476	Fairly Effective
Grand Mean	2.86	0.39	Fairly Effective

Legend:  
 3.50 – 4.00 - Very Effective  
 2.50 – 3.49 - Fairly Effective  
 1.50 – 2.49 - Less Effective  
 1.00 – 1.49 - Ineffective

Table 1 reflects the teachers' assessment of the effectiveness of the modular learning approach. This table shows that instructional quality has a mean score of 2.83, described as "Fairly Effective." It means that the modular learning approach, in terms of its instructional quality, provides authentic learning activities to develop their higher-order thinking skills while self-independent learning. Also, the module clearly states what the students need to achieve and guide these students with the different task for flexible learning in the "new normal" educational set-upset-up.

Meanwhile, teachers assessed the module's technical quality as "Fairly Effective," with a mean score of 2.89. This figure confirms that the module caters to the learners' digital capacity, uses colorful and clear drawings, and supports the teaching-learning process with graphs and charts. The module's usability garnered a mean score of 2.86, described as "Fairly Effective" by the teachers. It means that the module is very useful in the new normal educational set-upset-up. Strategies and modern pedagogies suit students' needs, allowing them to work at their own pace.

In general, a grand mean score of 2.86 suggests that the module has effectively developed the students' knowledge, skills, and understanding and can transfer them flexibly and productively through authentic assessment. The figure further suggests that the module as assessed by the teachers can improve the students' learning while learning at their own pace.

It affirms the idea of Nasution (2010), who said that one of the advantages of modular instruction is, learners can learn anywhere, in groups or alone, which increases the effectiveness of their learning.

Lardizabal (2004) also asserted that modules have successfully concretized the concept of individual uniqueness by allowing students to work at their speed.

**Table 2**  
**Effectiveness of Modular Learning Approach (MLA) as Assessed by the Students**

**n=33**

Items	Mean	SD	Description
Instructional Quality	2.81	0.432	Fairly Effective
Technical Quality	2.83	0.495	Fairly Effective
Usability	2.86	0.500	Fairly Effective
Grand Mean	2.83	0.475	Fairly Effective

Legend:  
 3.50 – 4.00 - Very Effective  
 2.50 – 3.49 - Fairly Effective  
 1.50 – 2.49 - Less Effective  
 1.00 – 1.49 - Ineffective

Table 2 displays the effectiveness of the modular learning approach as assessed by the students. As displayed, the module's instructional quality provides the students with meaningful activities that can be used in real-life contexts. Also, modular instruction allows students to think critically, meaningfully, and do self-learning even in times of pandemic. It is manifested with a mean score of 2.81, described as "Fairly Effective."

The technical quality module provides colorful and meaningful instructional materials to aid the learning of the students. The module gives that students the opportunity to demonstrate their digital capabilities in the teaching-learning process. This is manifested with a mean score of 2.83, described as "Fairly Effective."

Lastly, the usability received a mean score of 2.86, described as "Fairly Effective." It means that the various strategies and activities performed by the students are all based on real-life situations. These activities, puzzles, written expression, illustrations, and captions are useful to aid the students' learning process.

In conclusion, the modular learning approach assessed by the students effectively developed the student's fundamental knowledge, skills, and understanding. Through the module, these knowledge, skills, and understanding can be transferred flexibly and be productive. It is manifested with a grand mean score of 2.83, described as "Fairly Effective?". This figure also suggests that the module allows students what needs to be achieved in a given period. It



allows them to perform and demonstrate their authentic knowledge and skills independently. Ali et al. (2010) concurred, stating that modular instruction better matches the needs of today's students than traditional instruction in terms of both learning quality and content.

**The Student's Performance**

The students' performances are shown in table 3. These performances are measured according to their General Point Average (GPA) for the second semester, A.Y. 2020-2021.

**Table 3: The Distribution of Student's Grade**

Grades	Frequency	Percentage
93-95	3	9.00
90-92	27	82.00
87-89	3	9.00
<b>Total</b>	<b>33</b>	<b>100.00</b>
<b>Mean Grade</b> =	<b>91</b>	

Highest Grade: 95      Lowest Grade: 87

As shown in Table 3, three students (9.0%) had average grades ranging from 93 to 95. Twenty-seven students, or 82.00 percent, earned an average grade of 90-92, while the remaining 9.00 percent, or three (3) individuals, earned an average grade of 87-89. Ninety-five (95) was the highest grade earned, while eighty-seven (87) was the lowest. The mean grade calculated was 91.

**Difference of Teachers' and Students' Assessment on effectiveness of MLA**

This portion presents the difference between the teachers' assessment and the student's assessment on the effectiveness of the modular learning approach (MLA)

**Table 4: T-test of the Assessment of the Teachers and the Students on the Effectiveness of Modular Learning Approach**

	Teachers	Students
Mean	2.86	2.83
SD	0.363	0.434
Observation	23	33
df	48	48
T-stat	0.263	
P-value	0.794	

Legend:  $p < 0.05$  – **Significant**;  $p > 0.05$  – **Not Significant**

Table 4 shows the t-test of the teachers' and students' assessments on the effectiveness of

the modular learning approach. This table shows the mean difference between the teachers' (2.86) and the students' (2.83) assessments. The paired variables obtained a calculated t-value of 0.263 and a p-value of 0.0794, with a 0.05 level of significance. It means that there is no significant difference between the teachers' and students' assessments on the effectiveness of the modular learning approach. It entails that the null hypothesis stating that there is no significant difference between the teachers' and the students' assessment on the effectiveness of the modular learning approach is accepted.

**Relationship between Effectiveness of MLA and the Student's Academic Performance**

This part reflects the correlation between the effectiveness of the modular learning approach (MLA) and the student's academic performance, such as their General Point Average (GPA) grade.

**Table 5: The Correlation Coefficient between the Effectiveness of Modular Learning Approach (MLA) and the Student's Academic Performance**

Paired Variables	Correlation Coefficient r	Description
Effectiveness of MLA and Student's Performance	.45	Moderate (Significant)

r to be significant at 0.05 level of significance should be at least 0.19

Legend: Ranges of Values of r	Description
0.00 -±0.19	Very Weak
± 0.20 -± 0.39	Weak
± 0.40 -± 0.59	Moderate
± 0.60 -± 0.79	Strong
± 0.80 -± 0.99	Very Strong
± 1.00	Perfect

As gleaned in this table, there is a moderate significant relationship between the effectiveness of the modular learning approach (MLA) and the student's academic performance. It is shown by the computed r-value of 0.45 at a 0.05 level of significance. It entails that the null hypothesis stating that there is no significant relationship between the effectiveness of the modular learning approach and the student's academic performance is rejected. It means that the effectiveness of the modular learning approach has something to do with the student's performance. The data presented in table 5 further suggests that the effectiveness of the modular approach predicts

the improvement of student's academic performance. The effectiveness of modular approaches such as instructional, technical, and usability of modular approach significantly impact the student's performance or grades.

This result affirms Morilla's (2017) idea that modular instruction is the most effective teaching technique to accelerate students' growth and development. The usefulness of the modular approach in the teaching-learning process is to motivate students to perform better in the classroom.

### Conclusion and Recommendations

Based on the findings of this study, the effectiveness of the modular learning approach assessed by the teachers and the students was revealed as "Fairly Effective," which means that the module used in the new normal educational set-up allows teachers to enhance their modern pedagogies and assists them to deliver flexibly and productively the lesson among their students. It also provides the students with the knowledge, skills, and authentic assessment that can be used in real-life context while doing independent learning.

Meanwhile, three students, or 9.00 percent, had an average grade of 93-95. Twenty-seven students, or 82.00 percent, earned an average grade between 90-92, while three students, or 9.00 percent, earned an average grade between 87-89. Ninety-five (95) was the highest grade earned, while eighty-seven (87) was the lowest. The mean grade calculated was 91.

The estimated p-value of 0.794 at the 0.05 level of significance indicates that there is no significant difference in teachers' and students' assessments of the modular learning approach's effectiveness. It implies that the null hypothesis is accepted, saying that there is no significant difference in teacher and student assessments

of the modular learning approach's effectiveness.

The effectiveness of the modular learning approach (MLA) and students' academic performance has a moderately significant relationship. The estimated r-value of 0.45 at the 0.05 level of significance confirms this. It means that the null hypothesis that there is no significant relationship between the modular learning approach's effectiveness and the students' academic performance is rejected. It means that the effectiveness of the modular learning approach has something to do with the student's performance. It further suggests that the effectiveness of the modular approach predicts the improvement of student's academic performance. The effectiveness of modular approaches such as instructional, technical, and usability of modular approach significantly impact the student's performance or grades.

It is recommended that the Higher Education Institutions (HEIs) such as the Sultan Kudarat State University- Kalamansig campus maintain or improve their performance towards making and developing instruction using the modular learning approach. The use of this approach is found fairly effective in developing the student's academic performance. Thus, the proposal to apply the same approach to different fields of study is relevant.

Moreover, the Instructional Materials Division must design monitoring and implementing strategy relative to the development of module for the sustainability of effectiveness in developing the student's performance.

Finally, studies examining the viability of employing the modular learning strategy to increase student performance in other disciplines should be conducted.

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## IMPROVING THE STORAGE CAPACITY OF EXISTING CONTENT MANAGEMENT SYSTEMS

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### ABSTRACT

*Content Management (CM) is the method involved with overseeing computerized and unstructured substance for the duration of its life cycle (beginning from the formation to extremely durable ability or elimination). The substance can be images, audiovisual, encyclopedic and mixed mass media, or typescript. Organizations generate 100 terabytes of unstructured content every day, such as document imageries that are critical for their corporate and operations. A decent CM device can guarantee the classification, respectability, accessibility and security of advanced substance. There is an assortment of CM apparatuses available accessible from sellers like Documentum, FileNet, share point, and Open Text, which permit the support of organized and unstructured information of the association. But these tools are expensive in terms of paying customers for licensing and installing software and maintenance in the data center. For this reason, most open groups and academes like in India is still do not purchase and use CM software releases, but rely on Paper trail or computer drives, CDs, Google Drives, etc. to save their organization content. However, traditional storage systems do not guarantee the confidentiality, truthfulness, accessibility, and safety of content. The central goal of this paper is to improve the existing storage mechanisms used by content management systems by using public cloud services such as Amazon Web Services (AWS), MeghRaj (NIC National Cloud), or Microsoft Azure. The content management system will use the noSQL storage system, use mongoDB and other databases, and use elastic search, Lambda services to build, and the materials are deposited using cloud storage services such as S3/Glacier. The storage materials will be encrypted to ensure data reliability and safekeeping.*

**Keywords:** CM, DCM, AWS, NIC, CRM

### Introduction

**A Digital Content management systems (DCM)** is a laptop utility which helps the formation and change of virtual file material. it's far frequently used to guide a couple of customers running in a collaborative surroundings [2] [3] [13]. The software Digital Content Management Systems (DCM) grants distributing, upgrading, also adjusting content just as its safety through utilizing joining strategies, procedures or potentially work processes, from a significant interface, in a community oriented environmental factors [2][3][4] [13]. DCM fill in as a critical vault for content material, which will be, literary records, documents, films, pix, cell phone numbers, and additionally clinical records. This may then be used by clients of the office/association across novel bundles. The net posted substance likewise can be dispensed to customers and undertaking accomplices open air the association. The center programming of the DCM is to control content throughout its whole lifecycle for example from presentation through distributing. The substance material of the DCM can likewise be

shared via e-exchange and buyer relationship control structures (CRM). net distributing gadget empowers you to set up a steady appearance and experience all through your website page, but gives your non-specialized substance creators the ability to submit and refresh their own personal substance utilizing simple, yet successful, program based absolutely instruments. A portion of the DCM structures incorporate with content vehicle bundles to supply the substance through a web website [2] [3] [4] [13].

### Foundation of the Work

In a growing country namely, in India, colleges, public compositions offices and different companies cannot invest the cash for to search for expensive market essentially based DCM frameworks, therefore restricting their usefulness in expressions of record control which not straightforwardly affect their effectiveness and development their functional expenses. We embrace to extend a web DCM contraption that is accessible to public/business undertaking at exceptionally low cost. In addition, this present reality appropriateness of

this machine is really in spaces of preparing, public works, emergency clinics and each and every further area that records (paper, fax, electronic mail email, investigation, and photograph) information have to be kept up with and controlled.

Indeed, even specialists of India is zeroing in on computerized India and has dispatched various drives nearer to the equivalent. One among the model could be Digilocker drive (<https://digilocker.gov.in/>) [11] that has been utilized by numerous offices like CBSE, Ministry of Petroleum, and Ministry of street delivering, etc. Digi locker is catered nearer to character clients while DCM machine will cater the association/organizations [9] [13].

In addition, administration of India has dispatched a public cloud administration named Megh Raj a drive through Ministry of Electronics and records period. What's more, has delivered strategy papers "GI Cloud Strategic Way Paper" and "GI Cloud adaption and execution guide" that feature the desire of administration of India toward advanced India. The arrangement papers are accessible for down load at <http://meity.gov.in/contentmaterial/gi-cloud-meghraj> [10] [13]. Via constructing and demonstrating low value DCM, the undertaking advocate to assist corporations/organizations to put into effect and adapt digital philosophy and as a consequence transferring India toward virtual India.

### Outlining the Problem Statement

➤ An extraordinary palatable CM device ensures the computerized content's trustworthiness, privacy, accessibility and security. There is different CM gear accessible like Sharepoint [10], FileNet, Documentum, OpenText [9], Alfresco, and Liferay that allows the control of a venture's formless information, anyplace where insights exist. That hardware can be sent in customary realities center notwithstanding on cloud. Yet, limit of those items are steeply-valued as far as:

- 1) Licensing expenses (basically put together limit of the time with respect to shopper depend)
- 2) Set up cost

3) Operational or assurance charges.

4) Humans exertion/esteem.

➤ Because of the above listed reasons, a large portion of the overall population organizations, colleges in India, Hospitals are still done shopping such CM stock and rather rely on completely their associations content through Paper trail or on PC drives, Cd's, Google power, etc. This sort of carport component does not guarantee documents uprightness, accessibility and security. In addition, looking of record real time is exceptionally hard and frequently one needs to depend on shopper memory (in which have they saved the record) [7] [13].

➤ The venture attempts to determine this issue through developing a virtual substance material control (DCM) machine that is minimal expense and smooth to use out of the holder.

➤ **The goal of this task involves the subsequent sports-**

- 1) Extend a powerful system form that can be utilized by partnerships to shop their archives.
- 2) Design a wellbeing system model to make certain record honesty and security.
- 3) Layout and widen DCM gadget in Cloud-MeghRaj (country wide Cloud with the guide of NIC), Amazon AWS or AZURE.
- 4) Layout and increment an interface that is appropriate to content material administration interoperability standard (CMIS) for document ingestion and recovery.
- 5) Constructed a distributing structure which could deliver and set up content to net.
- 6) Demonstrate a reproduction variant via considering the understudy marks as measurements set to save inside the public cloud through DCM. The purpose of proposed DCM version is to help the educational institutions, public paintings departments and hospitals [2] [3] [4] [13].

### Review of Similar Work Completed

Many of the corporations and authorities corporations are moving towards the services the use of virtual content control.

1. GI Cloud [12] which has been named as 'MeghRaj'. This creativity is to put into

- effect diverse additives together with supremacy device to confirm propagation of Cloud inside the authorities [10].
2. ECM (Enterprise Content Management) system ambitions to mix the responsibilities of the internet, content material control and to methodically comprise now not most effective conventional reproducing events however, economic facts, human aid, files, and many others., for an entire agency [9] [7].
  3. IBM content material foundation on Cloud: IBM content basis on Cloud permits groups to leverage the energy and scalability of IBM content material foundation in a nimble, less costly, and consumable way [5].
  4. Alfresco technique services (powered through Activiti) is an organization business method control (BPM) solution targeted at business people and builders. At its center is an excessive performance open-supply enterprise method engine primarily based on Activiti with the ability and scalability to address a huge style of vital processes. Alfresco technique offerings offer a powerful suite of give up user equipment and integrates with a number organization system, which include Alfresco content services, field and Google power [6] [13].
  5. Gartner: enclose as one of the leader in content material partnership structures for 2017: Gartner valued 14 unique sellers inside the substance cooperation frameworks commercial center portion fundamentally dependent upon the fulfillment of innovative and judicious and ability to perform on such vision [6][7] [13].
  6. SharePoint is a web fundamentally based, collective stage that incorporates with Microsoft work environment. Delivered in 2001, SharePoint is all in all purchased as a report control and capacity gadget, yet the item is enormously configurable and utilization differs impressively between bunches [9] [13].
  7. DigiLocker is a "virtual storage" supplier worked by the public authority of India that permits Indian residents to store sure solid documents on the cloud [10] [13].
  8. GI Cloud [12] which has been named as 'MeghRaj'. This drive is to place in power various added substances, for example, administration instrument to make certain expansion of Cloud inside the specialists [10] [13].

### AIMS

- 1) Built a low powerful DCM- low onboarding and coffee operational price.
- 2) Can be used by any employer/agency out of the container.
- 3) Hosted in public cloud like MeghRaj, Amazon net services (AWS) or Microsoft Azure.
- 4) Constructed the usage of state-of-the-art technology like Lambda services, elastic search.
- 5) Encryption of document to make sure integrity and safety of statistics.
- 6) Cost effective garage gadget as public cloud carrier is used and item storage makes use of least quantity of garage space [2] [3] [4] [13].

### Present Methods And Draw Backs

There is numerous CM instrument programming program are accessible in commercial center with the guide of unique merchants like Share point, FileNet, Documentum, Open Text, Alfresco, Life ray that allows in the administration of an association's unstructured measurements, wherever that realities exists. Anyway limit of those items are extremely expensive as far as permitting costs (based absolutely limit of the time on client depend), establishment value, Operational or upkeep costs, individual's exertion/cost. In addition, those items can't be utilized effectively out of the case. They must be arranged and modified to sound a business/organization wishes. These results in enormous time delay [4] [5] [6] [7] [8] [9] [10] [13].

### Proposed System

The Proposed machine could be a worth incredible web supplier as far as charge and carport, facilitated on cloud DCM very much like what has been anticipated in specialists of India computerized India strategy. The Proposed contraction could be facilitated in broad daylight cloud like AWS or Azure of

Megh Raj (GOI drive). The device can be constructed the utilization of Lambda contributions, versatile hunt and diverse new innovations accessible in commercial center. The genuine report can be put away the utilization of cloud carport gadgets like S3/Glacier. Focus Product ability will comprise of-

- 1) Taxonomy or document model dressmaker to layout metadata (realities about the substance material).
- 2) Search dressmaker all together that clients can characterize their own look for rules for looking through the record.
- 3) An out of the field individual interface on versatile and web to permit clients to push records to the DCM instrument and to recover it with precision anytime of time.
- 4) API Interface to perform report activity distantly.
- 5) Interfaces on versatile and web to permit clients to push records to the DCM gadget and to recover it with exactness anytime of time.
- 6) Safety model for validation and approval could be intended to guarantee record security.
- 7) Report encryption to make certain respectability of information.
- 8) A watcher will likewise be ensured to permit record seeing capacity.
- 9) Publishing capacity to present record on sites.
- 10) Management UI for control [1] [13].

### Importance of Proposed Method

It is certain that a low worth simple to apply virtual substance material control might be a shelter for Indian colleges, public work offices and various organizations that can't figure out how to pay for to look for expensive commercial center based DCM frameworks. The genuine worldwide materialness of this device is unbelievable in practically all areas like preparing, public works, medical clinics and some other region that records (paper, fax, email, test, and photograph) realities to be kept up with and oversaw. This could help the organizations acquire effectiveness and straightforwardness. Also, the dynamic abilities could be progressed with the

assistance of quick get admission to records in genuine time on need premise.

### The proposed device incorporates the subsequent benefits:

- 1) Value of protection will lessen substantially in phrases of installation, operational price, licensing, safety, garage and standard maintenance of statistics all through its life cycle.
- 2) Stepped forward garage machine.
- 3) Progressed security for public region.
- 4) Carrier is provided within the form of web service so separate group isn't required for the information protection [1] [13].

### Worldwide Reputation

Part of organizations are pushing toward virtual substance the board. Organizations like IBM, Microsoft, Open Text, Alfresco, and box are moving nearer to DCM region. Those associations however have essentially business diversion for moving towards virtual substance the board. Numerous tech monsters use CMS for various regions and purposes. Some are recorded beneath:

1. IBM substance material establishment on Cloud empowers organizations to use the strength and versatility of IBM content material premise in a deft, lower estimated, and consumable way [5] [13].
2. Gartner: holder a pacesetter in content material Alliance frameworks for 2017: Gartner valued 14 explicit transporters in the substance material Collaboration structures market portion basically dependent on their fulfillment of visualization and capacity to accomplish on that inventive and judicious [7] [13].
3. The Association for Information and Image Management (AIIM) worldwide, the overall relationship for association content material control, depicted the term in 2000. AIIM has refined the truncation ECM various occasions to mirror the growing extension and meaning of insights control [8] [13].
4. SharePoint is a web-principally based, synergistic stage that incorporates with Microsoft office. Delivered in 2001, SharePoint is in the fundamental sold as an archive the board and carport gadget, but the item is astoundingly configurable and

use shifts altogether between associations [9] [13].

### Countrywide Fame

Indeed, even the Indian associations and specialist's administrations are moving toward the computerized content control methods to keep the secrecy of tremendous amount of records due to huge people in the country.

1. DigiLocker is a "computerized storage" supplier worked with the guide of the specialists of India that licenses Indian residents to keep sure authentic records on the cloud. The supplier is pointed toward diminishing the need to hold real records, and is a piece of the Narendra Modi-drove government's virtual India drive [10] [13].
2. GI Cloud [12] is popularly known as 'MeghRaj'. This drive is to utilize different parts along with administration instrument to guarantee expansion of cloud on the specialized areas. Focal point of this drive is to speed up provision of e-contributions inside the country, simultaneously enhancing ICT expenditure of the public authority. MeghRaj will make certain most gainful use of the foundation and speed up

the turn of events and arrangement of eGov programs [10] [13].

### Conclusion

The proposed method describes the usage of cloud usage for increasing the storage capacity of the content management tools. This can be utilized for various classes of content administration frameworks, for example, record the board framework, web content administration framework, venture content administration framework, part content administration framework and computerized resource the executive's framework. Using cloud storage method replaces the traditional storage devices such as CDs, hard disks and hard copy for maintaining the documents of an organization. As the quantity of data generated ranges from terabytes to petabytes per day, employing public cloud storage can remove the storage limitations over google drive or any online storage medium. The service for storage can be taken from any public cloud vendors like Amazon, Google and Microsoft. From using cloud based storage system, it improves the searching time, storing capacity and no sequel storage.

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**EMOTIONAL INTELLIGENCE: MEASUREMENT AND CLASSROOM IMPLICATION****M. Chakraborty<sup>1\*</sup> and V. Ambedkar<sup>2</sup>**<sup>1,2</sup>Department of Education, Annamalai University, Chidambaram, Tamil Nadu, India<sup>1</sup>chakrabortymadhurima2@gmail.com**ABSTRACT**

After the 21<sup>st</sup> century life skills were listed down by the Organization of Economic Co-operation and Development, the need for Emotional Intelligence has outgrown Intelligence Quotient. Emotional intelligence is said to be not just being aware of self, managing own emotions but also respecting and acknowledging others. No matter how efficient a person is in his/her job, until and unless he/she has workable emotional intelligence it will never be possible for him/her to perform to their best. Therefore measuring emotional intelligence of employees has also become a current task of the employer. Viewing this issue from the perspective of a teacher the investigator here attempted to construct and standardize an emotional intelligence dichotomous scale to measure the EQ of the secondary school students, who are in the verge of choosing their career. From the population of secondary school students, the sample taken were 8<sup>th</sup> standard students studying under Central Board of Secondary Education, Tamil Nadu, India. The seeds of life skills needs to be planted in an early stage, in the classroom itself, to view the implication of EQ, in order to let it nourish and grow by the time those students reach the age of employability.

**Keywords:** Emotional intelligence, measurement, construction and standardization, classroom implication

**Introduction**

The concept of intelligence was first described by David Weschler in 1940s. Since then, prioritizing cognitive intelligence and ignoring the emotional aspect of a human has been the trend. It was later in 1990s that Peter Salovey and John Mayer came up with the concept of emotional intelligence, which is considered to circle our mundane activities and life, and also a very important aspect to lead oneself towards success. It has been observed that the general intelligence of a student only plays 10-20% role for him or her to become successful in life (Mayer & Salovey, 1997). The rest of the success lies in the level of emotional intelligence that the student possesses, or is going to possess through proper training, provided by teachers or the fellow mates or parents who would interact with them, being in their surrounding environment.

Researches has also concluded that both cognitive intelligence and emotional intelligence are entwined where emotions pave ways for reasoning and logic to function.

Emotions are seen as the guiding force which helps individuals to process information and understand those for making and taking decision. It also helps in identifying key factors for decision making process. It drives individual to choose between problems to be solved based on the priority of the issue.

Emotions are even considered to be the ones which set goals, while reason work towards achieving that goal.

As it can be seen that emotions and reason are interconnected, but only one side of the coin i.e; reason has been emphasized on for years, emotions, and therefore emotional intelligence has become a burning issue in the present world, were even the 21<sup>st</sup> century skills list down items which pertains to emotional intelligence primarily.

Emotional Intelligence is defined by Salovey and Mayer as, "a type of social intelligence that involves the ability to monitor one's own emotions and others', to discriminate among them, and to use this information to guide one's thinking and actions." The term first was found in a chain of academic articles authored by them in 1990, 1993 and 1995. In the modern world which is full of chaos and discrimination, it has become the key to social inclusion as well as solving problems. The fast changing society requires people who are emotionally intelligent in order to face challenges.

Salovey and Mayer gave a four step explanation of how emotional intelligence can be measured. Those steps are as follows,

- **Perceiving emotions:** Here the people are expected to rate the extent of emotions by

seeing any picture, whether face, figure or landscape.

- **Emotional facilitation:** It is measured by asking people to describe their emotional sensation towards other sensory modalities and incorporating their moods into their thought process concerning any fictional character.
- **Understanding emotions:** It is measured by asking people to understand, how the simple emotions whisked to form complex emotions and also the way emotional reaction changes towards the same subject or incident or event over the passage of time.
- **Emotional management:** It is measured through given hypothetical situations, where the test takers has to manage their emotions as well as the emotion of others to deal with any particular problem.

On the other hand, Daniel Goleman who popularized the concept of emotional intelligence divided it into five domains: self-awareness, self-management, social skills, motivation and empathy. Extensive review of literature on the meaning and definition of these five domains made to arrive at conclusive briefing of the above mentioned domains as:

- a. **Self-awareness:** Knowing thyself i.e being aware of your own emotions.
- b. **Self-management:** This domain focuses on managing one's emotions.
- c. **Social Skills:** Social skills as the name suggests talk about people's skills and therefore it focuses on not own but other's emotions and stepping into their shoes.
- d. **Motivation:** Motivation here refers to intrinsic motivation than extrinsic.
- e. **Empathy:** It is the ability to step into others' shoe and identify oneself with them mentally and to understand accurately, how others feel, their perspectives, the diversity, the mood and also the political and social realities.

Exhaustive study of the theories of emotional intelligence propounded by various educationists which focused on the ones which relate it to the classroom level learning were done. It was found that most of the academicians dissects emotional intelligence into two parts: *Intrapersonal intelligence and Inter-personal intelligence*. Intra-personal

intelligence focus on self-awareness and self regulation, whereas Inter-personal intelligence focus on Social Competence.

Here, Emotional regulation or self-regulation which comes under self-management was looked at from perspective of Mayer and Salovey, are based on specific actions. Those actions are,

- a. **Cognitive response:** Consisting of thoughts and awareness of emotional status
- b. **Behavioral response:** It refers to speech, body movement, gesture, facial expression
- c. **Physiological response:** Refers to activities of brain, reaction to skin or other physical aspects.

Again, Social competence which comes under social skills, is discussed under different light where the emotional intelligence and social relations are shown to be intertwined. For example, a child or an individual who has dealt with complex relations is bound to have high emotional intelligence. It was also perceived that emotional responses are contextually anchored in social meaning, whether cultural messages or social transaction, relationships or self-definitions, emotional competence seems inseparable from cultural context. Therefore, emotions and relationships has reciprocal effects on each other.

Mayer and Salovey noted that motivation to be taken as a component is not satisfactory as it is immeasurable. The rest of the domains were on par with their theory of emotional intelligence.

Acute reflection on the relevance of motivation in case of classroom learning and its significance for learners to excel in learning (as it has to be intrinsic), led towards chalking out way, to measure motivation by including it as one of the dimension of the emotional intelligence dichotomous scale developed.

It can be said that the impact of something can only be understood when, measured. Measuring the effect lies at the heart of any novel idea, invention or implementation. Therefore, the investigator cajoled to the construction of an emotional intelligence dichotomous scale and also standardizing it for usage by the future researchers and teachers. All the five domains of emotional intelligence were considered, also keeping in mind the alternative terms used for those and questions

were framed based on them. The following pattern of weightage was given:

**Table 1: Distribution of Weightage**

Emotional Intelligence Components	Total Number of Questions	Weightage (%)
Self-Regulation	14	17
Social Skills	22	28
Social Awareness	16	20
Motivation	15	19
Empathy	13	16

### Methodology

Every unit of research demands a well chalked out plan to carry out the research, so the investigator too approached the standardization of the emotional intelligence dichotomous scale through well knit procedure. The steps that were taken under consideration are described below in detail.

### Item Analysis

**Table 2: First Draft of the Emotional Intelligence Dichotomous Scale**

Emotional Intelligence Components	Items	Total Number of Questions	Weightage(%)
Self-Regulation	10, 13, 15, 18, 22, 23, 29,30, 45,64,67,68,78,79	14	17
Social Skills	1, 11, 14, 19, 21, 25, 28, 38, 41, 44, 46, 50, 51, 57, 58, 59, 60, 72, 73, 74, 76, 9	22	28
Self Awareness	3,2,4,5,6,17,20,26,32,37,49,69,70,75,77, 80	16	20
Motivation	16,24,27,33,34,40,39,47,48,61,62,63,65, 66,71	15	19
Empathy	7,8,12,31,35,36,42,43,52,53,54,55,56	13	16

**Table 3: Second Draft of the Emotional Intelligence Dichotomous Scale**

Emotional Intelligence Components	Items	Total Number of Questions	Weightage (%)
Self-Regulation	13,15, 18, 22, 23, 30, 45,64,68,79	10	17
Social Skills	1, 11, 14, 19,25, 28, 41, 44,50, 51, 57, 58, 60, 72, 73, 74, 76, 9	18	28
Social Awareness	3,2,4,5,6,17,20,26,32,69,70,75,77,80	14	21
Motivation	16,24,27,40,39,48,61,62,65,66	10	17
Empathy	7,12,31,35,36,42,43,52,53,55,56	11	17

Originally eighty items were framed based on the five domains following the weightage pattern as mentioned above. The items were handed over to language and psychology experts of the department for verification and approval of the items. Eighteen items were found to be inappropriate and hence were omitted. The items as per common consensus was sixty four. Now these items were in the form of 'yes/no' questions and for 'yes' scoring was positive (+1) and for 'no' it was void(0). The scale was then administered to forty, class eight students from a Central Board of Secondary Education School, Tamil Nadu, India and under the supervision of the investigator the responses were collected. After the scores were tallied, using the acceptable range of Cronbach Alpha value, items were selected and rejected. Out of sixty two items only fifty three items were finally selected as appropriate for the tool.

### Instructions

In order to make the administration of the tool smooth and understandable, a set of instructions regarding the way to fill in the response box, the purpose behind collecting the responses and assurance to keep the data confidential were laid down on the cover page of the tool. The investigator was present in the situation when the tool was administered and raising hands were encouraged in case of any doubt. No particular time limit was set for filling up the tool. However, it took around 25 minutes by the students to put the right tick on the right box according to them.

### Scoring pattern

The responses collected in the form of yes or no were then marked as '1' for 'yes' and '0' for

'no'. The items were tallied likewise and then the Cronbach Alpha value was calculated.

### Reliability of the Emotional Intelligence Dichotomous Scale

The test-retest reliability was calculated after a gap of two weeks and the alpha value was found to be .831 at .05 level.

### Validity of the Emotional Intelligence Dichotomous Scale

The present scale was co-related against the emotional intelligence scale set up by Narain & Singh and the concurrent validity was found to be .631 which was significant at .05 level. For this purpose of establishing concurrent validity, both the tools were administered on the same sample.

**Table 4: Final Draft of the Emotional Intelligence Dichotomous Scale**

Emotional Intelligence Components	Items	Total Number of Questions	Weightage (%)
Self-Regulation	18, 22, 23, 30, 45,64,68,79	8	15
Social Skills	1, 11, 14, 19,25, 28, 41, 44,58, 60,74, 76, 9	13	24
Social Awareness	4,5,6,17,20,26,32,69,70,75,77	11	21
Motivation	16,24,27,40,39,48,61,62,65,66	10	19
Empathy	7,12,31,35,36,42,43,52,53,55,56	11	21

### Observation: Classroom Implication

As implication is the assumed output of any particular treatment, instruction or process, the assumed output of measuring the emotional intelligence of the secondary school students is considered here as the classroom implication. The emotional intelligence of the students, to be measured at the pre-treatment and post treatment level, the assumed behavioral and emotional change that the students would undergo, is considered as the output or the implication of the treatment.

When the 'Banking concept of education' was challenged because children are not empty vessels to be filled in with knowledge, only a part of the total development of personality of children were emphasized on. Lest was considered that children too have their own world where they are pro-active and pro-social in their own way. It is the job of the teacher to look at children through the lens of multiple

childhood and therefore help them work on their emotional intelligence, so that their pro-active and pro-social nature gets nurtured properly, and channelized to fit the conventional world later.

The relevance of the students undergoing certain changes in behavior or thought patterns is that they are preparing themselves for the world outside, the world with cut throat competition, aggression, self-centered and deceit. The classroom environment serves as a miniature of the world outside but without violence and aggression. Dealing with classmates, perceiving emotional cues both interpersonal and intrapersonal, managing own emotion and also the emotion of friends and peers, and also understanding ones own emotion in response to certain activities, things going in the classroom, or with the classmates, will certainly make them at least sense how to handle people, develop social skills, and also enhance one's own behavior.

The New Education Policy, 2020, India also suggested to focus on greater life experience while framing the curriculum of a school. Life experience doesn't come without dealing with people and therefore directly or indirectly the importance of emotional intelligence is emphasized on even by the policy makers.

### Discussion

In the present scenario it has been seen that emotional intelligence holds equal or even more significance empirically, than cognitive intelligence which is the Intelligent Quotient (IQ). A highly intelligent person without no capability of emotional regulation, and social competence will be considered cramped and

therefore, incapable to suit him or herself to the dynamism of the ever changing society.

Emotional intelligence has become a key factor in the modern era and measuring emotional intelligence is therefore another task that has to be adopted by the teachers in schools for making the students ready for the world. For measuring emotional intelligence of the secondary school students, this dichotomous scale has therefore been constructed and validated so that the students can be measured, guided and counselled properly. It is emotional intelligence; the non-violent weapon, which can help the students buckle up before running in the race of life and career, equipping them with life skills.

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## ASSESS THE LEVEL OF KNOWLEDGE ON LIFE STYLE MODIFICATION AMONG CARDIAC PATIENTS AT SRM GENERAL HOSPITAL, KATTANKULATHUR, CHENGALPATTU DISTRICT

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### ABSTRACT

**Aims:** To assess the level of knowledge regarding lifestyle modification among cardiac patients and to associate the level of knowledge on lifestyle modification of cardiac patient with their selected demographic variable.

**Sample:** In this study the sample consisted of cardiac patients who fulfilled the inclusion Criteria. 50 cardiac patients. Purposive sampling method was used.

**Study design:** Quantitative approach with non-experimental descriptive design was conducted

**Place and Duration of Study:** The survey was carried at SRM General Hospital, Kattankulathur, Chengalpattu district in the cardiac medical ward and cardiac OPD.

**Methodology:** Structured questionnaire was used to assess the demographic variables and to assess the knowledge on lifestyle modification among cardiac patients.

**Results:** The findings showcased that the knowledge regarding lifestyle modification among cardiac patients was moderate. The P-values corresponding to the demographic variables are not significant at a level of 95 percent as they are not less than 0.05 thus it is assumed that there is no meaningful relationship between the demographic variables and the level of knowledge on life style modification.

**Conclusion:** The study results conclude that majority 37(74%) of cardiac patients have moderate knowledge on lifestyle modification. Implementing cardiac educational programmes help enhance knowledge and adherence to healthy lifestyle among patient with cardiovascular disease.

**Keywords:** cardiac patients, Lifestyle modification

### Introduction

According to WHO 31% of all deaths occurs due to cardiovascular disease world wide, 17.9 million people die each year from CVD's. The leading cause of death globally is cardiac disease. The general cause for cardiovascular diseases is the build-up of fatty deposits on the inner walls of the blood vessels supplying the heart to brain.[1]

Other factors include uncontrolled diabetes mellitus, high blood pressure, obesity, family history, smoking, alcoholism, excessive fatty food consumption, stress and hyperlipidemia. [2]

In 2016 it was reported that the prevalence of CVDs in India was 54.5 million. [4]

CVD related risk factors in adult in india are 15% of population were smoking and use of tobacco, 4.3 liters of alcohol consumed by a person, 21.1% of people have hypertension it can increase related to risk factors like heart failure and heart attack.[3]

The most common symptoms of cardiovascular disease are chest pain or discomfort, shortness of breath, peripheral edema, weight gain, palpitations, unusual fatigue, dizziness, changes in level of consciousness, confusion, sweating and restlessness. Cardiac diseases can be prevented and controlled by life style modifications like avoidance of tobacco use, reducing dietary salt, stress reduction, maintenance of normal body weight, eating fruits and vegetables, daily physical activity and avoiding the consumption of alcohol have been useful to reducing the risk of cardiovascular disease.[1]

### Material and Methods / Experimental Details / Methodology

Quantitative approach and non experimental descriptive research design was adopted for this study. The study was conducted at SRM general hospital Kattankulathur. 50 samples of cardiac patient those who were available during the period of data collection were selected by purposive sampling method. Structured

questionnaire were used to assess the demographic variables and also to assess the level of knowledge related to life style modification.

**2.1ASSESSMENT OF CARDIAC PATIENT DEMOGRAPHIC FACTORS**  
**2.2 ASSESSEMENT OF THEDEGREE OF AWARENESS ABOUT CARDIAC PATIENT LIFESTYLE ADJUSTMENT.**  
**2.3 ASSOCIATE CARDIAC PATIENT LEVEL OF INFORMATION ON LIFESTYLE CHANGE WITH THEIR CHOOSEN DEMOGRAPHIC VARIABLES**

**Results and Discussion**

The purpose and variable of the research analysis are the deliberation of the sample. The patient claimed that at SRM General Hospital, Kattankulathur, Chengalpattu district, Tamilnadu, to assess the level of awareness on lifestyle modification of cardiac patients.

The research design is non experimental descriptive design. It was decided to collect data from 50 samples. The study was done among cardiac patient at Cardiac ward and cardiac OPD at SRM General hospital, Kattankulathur, Chengalpattu district, Tamilnadu.

Median age maximum 27 (54%) belongs to the age group of above 55 years.

Majority of the gender distribution were male 32 (64%)as compared with females 18(36%).

With respect to the religion, most of them were Hindu 35 (70%) as compared with other religion

With regard to the residency, most of them were from urban 26 (52%).

Regarding the family monthly income 15 (30%) were earning Rs 7878 – 11816 as monthly income.

With respect to education 15 (30%) were in middle school education as compared with other education.

Based on the occupation most of them 24(48%) were professional.

With respect to the type of diet most of them 23 (46%) had mixed diet.

Regarding the duration of cardiac disease 29( 38%) were in duration of 1 – 2 years.

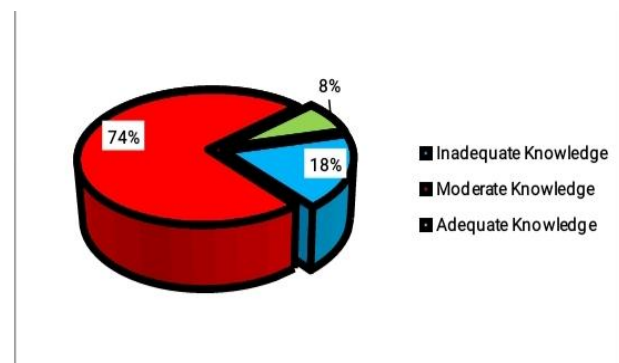
With respect to the frequency of visit to doctor, most of them were 16(32%) visited the doctor monthly once.

With regard to attended programme on life style modification no one had attended any programme on lifestyle modification.

**N=50**

LEVEL OF KNOWLEDGE	NO.OF. RESPONDENTS	PERCENTAGE (%)
Adequate knowledge	4	8%
Moderate knowledge	37	74%
Inadequate knowledge	9	18%
Total	50	100%

The analysis reveals that maximum 37 (74%) of cardiac patients had moderate knowledge; 9 (18%) had inadequate knowledge and few 4 (8%) had adequate knowledge.



The P-values corresponding to the demographic variables are not significant at a level of 95 percent as they are not less than 0.05 thus it is assumed that there is no meaningful relationship between the demographic variables and the level of knowledge on life style modification.

**Ethical Consideration**

Formal approval obtained from research committee in SRM college of Nursing. Assurance was given to the individual that reports are kept safe.

**Conclusion**

An analysis reveals that 37 (74%) of cardiac patients had moderate knowledge on lifestyle modification. An analysis shows that the P-value referring to demographic variables is not significant, so there is no meaningful association between demographic variables and

cardiac patient awareness level. The nurse administer should continue to enhance the knowledge about cardiac life style modification to the cardiac patients, and educate about lifestyle modifications and its importance.

### Limitations

The study was limited only in assess the knowledge on lifestyle modification and not the practices due to time constraints.

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## A STUDY TO COMPARE THE QUALITY OF LIFE AMONG ELDERLY PEOPLE RESIDING IN JOINT FAMILY AND NUCLEAR FAMILY AT EAST POTHERI, KANCHEEPURAM (DT)

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### ABSTRACT

To assess the QOL among elderly population. **Materials and Methods:** The descriptive survey research method was used for this study. The samples for the study were chosen using a non-probability convenience sampling technique. The elderly people who met the sampling criteria were chosen until the sample size for the current study was determined. The sample size is made up of 100 elderly people from nuclear families and 100 elderly people from mixed families. For data collection, a structured interview Questionnaire with 35 items was used. **Result:** In the joint family the quality of 23 (31.9 %) samples was good, but it was 15 (53.6 %) in the nuclear family. There was a significant relationship between the level of quality of life and the number of male children in a joint family. **Conclusion:** This study clearly demonstrated the importance of giving to and caring for the elderly in their family. Family members who work in psychiatric settings should actively participate in caring for and assisting the elderly to recover from their problems

**Keywords:** Quality of life, elderly people, joint family, nuclear family

### Introduction

Ageing is an unavoidable developmental phenomenon that causes a variety of changes in physical, psychological, hormonal, and social conditions<sup>1</sup>. Aging is a universal process that affects everyone, including individuals, families, communities, and societies. It is a natural, progressive, and unstoppable process. Ageing is generally defined as a process of deterioration in an individual's functional capacity caused by structural changes as they get older<sup>2</sup>.

The elderly is a valuable asset to any country. They contribute their strength for the nation's sustenance and advancement, owing to their wealth of experience and wisdom<sup>3</sup>. formalized the terms quality of life (QOL) and health-related quality of life (HRQOL) are frequently used interchangeably. Because QOL is a broader construct that includes HRQOL, global experts created the WHO Quality of Life (WHOQOL) instrument, which assesses both QOL and HRQOL<sup>4</sup> at the same time. The division of the WHOQOL into domains (Physical, Psychological, Social Relations, and Environmental) can help identify which aspects

of a person's life are more concerning and require intervention<sup>5</sup>.

### Methodology

The descriptive survey method was used for this study's research. The samples for the study were chosen using a non-probability convenience sampling technique. The elderly people who met the sampling criteria were chosen until the sample size for the current study was reached. The sample size is made up of 100 elderly people from nuclear families and 100 elderly people from joint families. structured interview A 35-item questionnaire was used to collect data. The physical domain was represented by ten items, the psychological domain by fourteen, the environmental domain by six, and the social domain by five. The tool's reliability was evaluated using the test – retest method. Descriptive statistics were used to examine the frequency, percentage, mean, and standard deviation. Inferential statistics were used to examine the relationship between elderly people's quality of life and various demographic variables.

**Table 1: Association between level of QOL and elders demographic variables (nuclear family)**  
N=100

		Level of QOL				Total	Chi square test
		Good		Moderate			
		n	%	n	%		
Age	60 -70 years	9	47.4%	10	52.6%	19	$\chi^2=3.12$ p=0.07 Df=1 not significant
	71 -80 years	6	66.7%	3	33.3%	9	
Sex	Male	3	50.0%	3	50.0%	6	$\chi^2=0.04$ p=0.84 Df=1 not significant
	Female	12	54.5%	10	45.5%	22	
Marital status	Single	1	100%			1	$\chi^2=6.87$ p=0.08 Df=3 not significant
	Married	7	36.8%	12	63.2%	19	
	Divorced	2	100%			2	
	Widow / widower	5	83.3%	1	16.7%	6	
Educational Qualification	Illiterate	9	52.9%	8	47.1%	17	$\chi^2=4.94$ p=0.42 Df=5 not significant
	Literate	3	75.0%	1	25.0%	4	
	Primary	1	25.0%	3	75.0%	4	
	Secondary	1	100%			1	
	Higher Secondary	1	100%			1	
	Graduate			1	100%	1	
Occupation	Private	5	33.3%	10	66.7%	15	$\chi^2=7.89$ p=0.05 Df=3 not significant
	Government employed	2	66.7%	1	33.3%	3	
	Self employed	2	50.0%	2	50.0%	4	
	Retired	6	100.0%	0	0.0%	6	
No of family member	Two	5	41.7%	7	58.3%	12	$\chi^2=1.22$ p=0.54 Df=2 not significant
	Three	8	61.5%	5	38.5%	13	
	Four	2	66.7%	1	33.3%	3	
Housing	Owned	6	100.0%	0	0.0%	6	$\chi^2=9.40$ p=0.01 Df=1 not significant
	Rented	9	40.9%	13	59.1%	22	
Financial Status	RS.1000 to 2000	2	100%			2	$\chi^2=1.86$ p=0.39 Df=2 not significant
	Rs.2001 to 3000	1	50.0%	1	50.0%	2	
	Rs. 3001 & Above	12	50.0%	12	50.0%	24	
Source of Income	Pension	10	76.9%	3	23.1%	13	$\chi^2=5.32$ p=0.02 Df=1 significant
	Aid from Government	5	33.3%	10	66.7%	15	
Associated Medical Illness	Hypertension	12	70.6%	5	29.4%	17	$\chi^2=6.43$ p=0.09 Df=3 not significant
	Diabetes Mellitus	1	16.7%	5	83.3%	6	
	Asthma	2	50.0%	2	50.0%	4	
	Others			1	100%	1	

Table 1 demonstrates the relationship between demographic variables and level of QOL in the elderly Retired/Government employee elders,

own house elders, and pensioners have higher QOL than others. The chi square test was used to calculate statistical significance.

**Table 2: Association between level of QOL and elders’ demographic variables (Joint family) N=100**

Demographic variables		Level of QOL				Total	Chi square test
		Good		Moderate			
		n	%	n	%		
Age	60 -70 years	12	30.8%	27	69.2%	39	$\chi^2=0.99$ p=0.60 Df=2 not significant
	71 -80 years	8	29.6%	19	70.4%	27	
	> 80 years	3	50.0%	3	50.0%	6	
Sex	Male	10	34.5%	19	65.5%	29	$\chi^2=0.14$ p=0.70 Df=1 not significant
	Female	13	30.2%	30	69.8%	43	
Marital status	Single	3	50.0%	3	50.0%	6	$\chi^2=1.95$ p=0.58 Df=3 not significant
	Married	12	28.6%	30	71.4%	42	
	Divorced	6	40.0%	9	60.0%	15	
	Widow / widower	2	22.2%	7	77.8%	9	
Educational Qualification	Illiterate	14	41.2%	20	58.8%	34	$\chi^2=4.11$ p=0.53 Df=5 not significant
	Literate	2	22.2%	7	77.8%	9	
	Primary	4	33.3%	8	66.7%	12	
	Secondary	1	20.0%	4	80.0%	5	
	Higher Secondary	2	25.0%	6	75.0%	8	
	Graduate	0	0.0%	4	100%	4	
Occupation	Private	8	21.1%	30	78.9%	38	$\chi^2=4.44$ p=0.21 Df=3 not significant
	Government employed	5	45.5%	6	54.5%	11	
	Self employed	5	45.5%	6	54.5%	11	
	Retired	5	41.7%	7	58.3%	12	
No of family member	Two	1	100%	0	0.0%	1	$\chi^2=16.77$ p=0.01 Df=4 significant
	Three	5	83.3%	1	16.7%	6	
	Four	8	22.2%	28	77.8%	36	
	Five	9	45.0%	11	55.0%	20	
	>Five	0	0.0%	9	100%	9	
Housing	Owned	8	57.1%	6	42.9%	14	$\chi^2=5.07$ p=0.02 Df=1 significant
	Rented	15	25.9%	43	74.1%	58	
Financial Status	RS.1000 to 2000	3	100%	0	0.0%	3	$\chi^2=15.91$ p=0.07 Df=2 not significant
	Rs.2001 to 3000	10	58.8%	7	41.2%	17	
	Rs. 3001 & above	10	19.2%	42	80.8%	52	
Source of Income	Pension	19	63.3%	11	36.7%	30	$\chi^2=23.30$ p=0.01 Df=1 significant
	Aid from Government	4	9.5%	38	90.5%	42	
Associated Medical Illness	Hypertension	16	35.6%	29	64.4%	45	$\chi^2=1.74$ p=0.63 Df=3 not significant
	Diabetes Mellitus	6	31.6%	13	68.4%	19	
	Asthma	1	14.3%	6	85.7%	7	
	Others	0	0.0%	1	100.0%	1	

**Table 3 Comparison of quality of life****N=100**

	Type of Family				Mean difference	Student independent t-test
	Nuclear Family		Joint Family			
	Mean	SD	Mean	SD		
Physical	16.21	2.71	17.24	2.48	1.03	t=1.80 p=0.07 DF=98 Not significant
psychological and spiritual	24.96	3.28	26.31	2.95	1.27	t=1.88 p=0.07 DF=98 not significant
Environment	8.64	1.62	9.58	2.23	0.94	t=2.03 p=0.05 DF=98 significant
Social	9.93	.26	10.00	.00	0.07	t=2.33 p=0.03 DF=98 significant
<b>TOTAL</b>	<b>59.82</b>	<b>7.11</b>	<b>63.13</b>	<b>7.34</b>	<b>3.31</b>	<b>t=2.04 p=0.04 DF=98 significant</b>

Table 3 shows that In physical domain, nuclear family elders are having 16.21 score whereas in joint family they are having 17.24 score, so the difference is 1.03. This difference is not statistically significant. In psychological and spiritual domain, nuclear family elders are having 1.27 score whereas in joint family they are having 17.24 score, so the difference is 1.03. This difference is not statistically significant.

In Environment domain, nuclear family elders are having 16.21 score whereas in joint family they are having 17.24 score, so the difference is 0.94 This difference is statistically significant. In Social domain, nuclear family elders are having 16.21 score whereas in joint family they are having 17.24 score, so the difference is 0.07. This difference is statistically significant. Overall, nuclear family elders are having 59.82 score whereas in joint family they are having 63.13 score, so the difference is 3.31. This difference is statistically significant.

### Discussion

The study's first goal was to assess the quality of life of elderly people living in joint and nuclear families. Among nuclear family samples, 6 ( 10% ) had a good quality of life, 13 (46.4 % ) had an average quality of life, and 15 (53.6 % ) had a poor quality of life. In contrast, in a joint family, 23 (31.9 % ) of the samples had a good quality of life, 49 (68.1 % ) had an average quality of life, and 0 (0.0 % ) had a poor quality of life. According to Robinson and Shaver (2003) and Holmes (1999), the main predictor of high subjective

quality of life appears to be positive and closer to stable social relationships <sup>6</sup>.

The study's second goal was to compare the quality of life of elderly people living in joint and nuclear families. Among subjects from nuclear families, 6 (10%) had good quality of life around three-fourths of the time, 13 (46.4%) had average quality of life, and 15 (53.6%) had poor quality of life. In contrast, in a joint family, 23 (31.9%) had a good quality of life, 49 (68.1%) had an average quality of life, and 0 (0.0%) had a poor quality of life. The mean score for quality of life in a nuclear family is 59.82, with a standard deviation of 7.11. In contrast, the mean score of quality of life in a joint family is and the standard deviation is 7.34. As a result, it is possible to conclude that the joint quality of life is high. The Hindu (Nov 2008) reported that the quality of life is better in a joint family than in a nuclear family, which supports my findings.

The third goal of the study was to determine the relationship between the quality of life of elderly people living in joint and nuclear families and various demographic variables. Based on the findings, it is concluded that there is a link between the level of life satisfaction and the level of life satisfaction. However, it does not demonstrate that there was no significant association between quality of life and other demographic variables in nuclear and joint families. According to Cornell (2002), thousands of studies have found that social isolation and a lack of social support are linked to poor health and well-being in the elderly. However, current measures of social

integration and isolation used among the elderly do not capture critical details about levels of social integration and social support that could be useful in designing interventions to reduce social isolation and increase social support.

### Conclusion

This study clearly demonstrated the importance of giving to and caring for the elderly in their family. Family members who work in psychiatric settings should actively participate in caring for and assisting the elderly to recover from their problems.

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## ASSESS THE LEVEL OF KNOWLEDGE REGARDING PATIENT'S SAFETY AMONG STAFF NURSES WORKING AT SRM GENERAL HOSPITAL, KATTANKULKATHUR, CHENGALPATTU DISTRICT

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### ABSTRACT

*Patient safety (PS) and quality improvement of health care delivery to the patients are among the highest priorities of health care system. Patient Safety education and its training for all health care providers including both doctors and nurses is an important required learning at all levels of training Patient Safety refers to the reduction of unnecessary harmful risks associated with the healthcare to an acceptable minimum. Patient safety is important in hospital and home set up to prevent geriatric problems.*

**Keywords:** Patient, Staff Nurses, Hospital, SRM

### Introduction

Patient safety (PS) and quality improvement of health care delivery to the patients are among the highest priorities of health care system. Patient Safety education and its training for all health care providers including both doctors and nurses is an important required learning at all levels of training Patient Safety refers to the reduction of unnecessary harmful risks associated with the healthcare to an acceptable minimum. Patient safety is important in hospital and home set up to prevent geriatric problems.

### Aim

A study to assess the level of knowledge regarding patient's safety among staff nurses working at SRM General hospital, kattankulathur, chengalpet district.

### Methodology

The Research approach was Quantitative and the Research design adopted was Non Experimental Descriptive Research Design. Staff nurses were selected by non probability convenient sampling technique. The sample size for the study was 110. The Researcher used structured Questionnaire for assessing the demographic variables and to assess the level of knowledge regarding Patients Safety.

### Results and Conclusion

The study concluded that 95(86.4%) had Moderately adequate knowledge and none of them had inadequate knowledge. Through Continuing nursing education the nurses must be updated regarding patient's safety. The findings of our study was consistent with the literature and it was concluded that the knowledge regarding patient's safety was adequate among staff nurses.

Patient safety (PS) and quality improvement of health care delivery to the patients are among the highest priorities of health care system. Building a safe health care system means designing processes of care to ensure that patients are safe from accidental injury. Patient Safety education and its training for all health care providers including both doctors and nurses is an important required learning at all levels of training 1

Patient Safety refers to the reduction of unnecessary harmful risks associated with the healthcare to an acceptable minimum. An acceptable minimum means the collective notions of given knowledge and resources available and context in which care was delivered weighed against the risk of all other treatment. The security of the patient is a severe world wide problem of human health. Patient safety is important in hospital and home set up to prevent geriatric problems 2



The security of the patient is a severe world wide problem of human health. patient safety is important in hospital and home set up to prevent geriatric problems 3

World Health Organization refer that the patient safety is the absence of preventable harm to the patient during the process of treatment and reduction of unnecessary harm. Patient safety is a global imperative. it has extensive applications for all WHO (World Health Organization) state members 4. Patient safety is the responsibility of all medical professionals to teach about health care professionals, patients, neighbours and family members. 5

Patient safety climate is an essential domain of the health care infrastructure today. But however, it differed by hospital and among and within work areas and disciplines. Emergency department personnel perceived the worse safety climate and personnel in nonclinical areas perceived better safety climate than workers in other areas 6. Nurses were more negative than physicians regarding their work unit's support and recognition of safety efforts, and physicians showed marginally more fear of shame than nurses. For other dimensions of safety climate, physician-nurses differences depended on their work area. 7

### Methodology

The Research approach was Quantitative and the Research design adopted was Non Experimental Descriptive Research Design. Staff nurses were selected by non probability convenient sampling technique. The Sample size for the study was 110. The Researcher used structured Questionnaire for assessing the demographic variables and to assess the level of knowledge regarding patient's safety among the staff nurses . The pilot study was conducted at SRM General hospital and findings revealed that the tool was considered reliable and feasible for proceeding with the main study. Data collection was done for a period of 1 week.

### Tools for data collection

The tool consists of 2 parts. Part A consist of a structured questionnaire to assess the Demographic variables such as Age, Sex, Religion, Family monthly income, Residency,

Number of years of experience, Area of working, Currently working as, Educational qualification. Part B contains a structured questionnaire consists of 40 questions to assess the level of knowledge regarding patient's safety among staff nurses.

### SCORING INTERPRETATION

- Adequate knowledge=27 to 40(66% to 100%)
- Moderate knowledge=14 to 26(33% to 65%)
- Inadequate knowledge=1 to 13(1% to 32%)

**ETHICAL CONSIDERATION:** The proposed study was conducted after the approval of Institutional Review board of SRM College of nursing, SRM IST, Kattankulathur, Chengalpattu district. Setting permission were obtained from the Medical superintendent of SRM General hospital, kattankulathur, chengalpattu district and the oral and written consent were obtained from the participants before the collection of data. Assurance was given to the individuals and the confidentiality of each individual was maintained and was free to withdraw from the study at any time. Participants made aware of the benefits of being the study samples.

**STATISTICAL ANALYSIS:** Descriptive and inferential statistics were used to assess and associate the level of knowledge regarding patient's safety among staff nurses working at SRM General hospital.

### Results

**Table 1:** Frequency and percentage distribution of level of knowledge regarding patient's safety among Staff Nurses at SRM General Hospital

**N=110**

S. No.	Level of Knowledge	No. of respondents	Percentage
1	Inadequate Knowledge	0	0.0%
2	Moderately Adequate Knowledge	95	86.4%
3	Adequate Knowledge	15	13.6%

## Discussion

### THE FIRST OBJECTIVE IS TO ASSESS THE LEVEL OF KNOWLEDGE REGARDING PATIENT'S SAFETY AMONG STAFF NURSES AT SRM GENERAL HOSPITAL

The findings reveals that the level of knowledge regarding patients safety among staff nurses that Majority 95(86.4%) of them had Moderately adequate knowledge, 15(13.6%) of them had adequate knowledge, none of them had Inadequate knowledge. This study finding is consistent with study done by NieY, Maox, et al research on Hospital survey on patient safety culture in China. Patient safety culture is an important measure in assessing the quality of health care. There is a growing recognition of the need to establish a culture of hospital focused on patient safety. Methods used are they used the modified HSPSC questionnaire to measure 10 dimensions of patient safety culture from 32 hospitals in 15 cities all across China. The questionnaire included 1160 Chinese health-care workers who consisted of predominately internal physicians and nurses. Hence the result is A total of 1500 questionnaires were distributed of which 1160 were responded validly (response rate 77%). The positive response rate for each item ranged from 36% to 89%. Therefore the conclusion is the results show that amongst the health care workers surveyed in China there was a positive attitude towards the patient safety culture within their organizations.<sup>8</sup>

### THE SECOND OBJECTIVE WAS TO THE ASSOCIATE THE LEVEL OF KNOWLEDGE REGARDING THE PATIENT'S SAFETY AMONG STAFF NURSES WITH THEIR DEMOGRAPHIC VARIABLES.

The demographic variables —Religion and Place of Residence are significant at 5% level since they are less than 0.05 hence we can conclude that there was a significant association between —Religion and Place of Residence of nurses and knowledge regarding patient's safety among staff nurses working at SRM general hospital. Hence the Null hypothesis stated that there is no significant association between the level of Knowledge regarding Patient Safety among staff Nurses with their demographic variables was not accepted. The p values corresponding to all other demographic variables —Age, Gender, Family Monthly Income, Educational Qualification, Working Experience and Area of Working are not significant since they are not less than 0.05 hence the hypothesis stated that there is no significant association between the demographic variables —Age, Gender, Family Monthly Income, Educational Qualification, Working Experience and Area of Working and knowledge regarding patient's safety among staff nurses working at SRM General hospital was accepted.

## Conclusion

The study concluded that majority 95(86.4%) of the nurses had moderately adequate knowledge and no one has inadequate knowledge. 15(13.6%) of them had adequate knowledge regarding patient's safety. The p values corresponding to the demographic variables —Religion and Place of Residence were significant at 0.05 level. With knowledge regarding patient's safety among staff nurses working at SRM General hospital. Hence, the findings of our study was consistent with the literature and it was concluded that the knowledge regarding patient's safety was effective among staff nurses.

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**Conflict of Interest:**

No conflict of interest. In addition, this study was not funded

**Statement of Human and Animal Rights:**

All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2008

**Statement of Informed Consent:**

Informed consent was obtained from all the study participants for being included in the study.

**A STUDY TO ASSESS THE QUALITY OF LIFE AMONG THE PATIENTS WITH HYPERTENSION AT SRM GENERAL HOSPITAL, KANCHEEPURAM DISTRICT****Mr.Sandeep.P<sup>1</sup>, Mr Venkatesh .G<sup>2</sup>, Ms Ranjitha.M<sup>3</sup>, Mrs. V. Priya<sup>4\*</sup>, Dr.C.Kanniammal<sup>5</sup>**<sup>1,2,3</sup> B.Sc (N), SRM College of Nursing, Kattankulathur, Tamil Nadu, India<sup>4</sup> Assistant Professor, Department of Paediatric Nursing, SRM College of Nursing, Kattankulathur, Tamil Nadu, India<sup>5</sup> Dean, SRM College of Nursing, Kattankulathur, Tamil Nadu, India  
Email: <sup>2</sup>priyakeerthi82@gmail.com**ABSTRACT**

To analyse the the standard of living among hypertensive patients at SRM general hospital in Kancheepuram district, Tamil Nadu. To link with hypertension with their specified demographic factors. The study was conducted using a WHO-standardized instrument. The quality of life of hypertensive patients was found to be linked to demographic factors such as age, gender, and family history of hypertension. However, no link was discovered between hypertension patients' quality of life and other demographic factors such as education, employment, family, or income.

**Keywords:** Quality of Life, Hyper Tension

**Introduction**

One of the most important risk factors for cardiovascular illnesses, such as cerebrovascular stroke, is hypertension, or high blood pressure. (1).

Hypertension is often undiagnosed, and many For years, people with excessive blood pressure went unnoticed. According to the World Health Organization's World Health Report 2002, ischemic heart disease and cerebrovascular stroke are the leading causes of mortality globally (2). The third most important driver of disability-adjusted life years is blood pressure regulation that isn't optimal.. (3).In the year 2000, 972 million individuals worldwide were projected to have hypertension.

Although the knowledge needed to prevent and manage hypertension, a major public health concern, is theoretically accessible, control rates in every region of the world remain appalling. (8-11). Many nations lack baseline data, and most countries lack national statistics, making it impossible to generate any credible predictions. (4).

**Methodology**

The examination of literature allowed the investigator to create a structured questionnaire that allowed him to define the study's methodology and prepare for data analysis in the most efficient way possible. The study was

conducted using a quantitative methodology and a non-experimental research design. At SRM general hospital in Kattankulathur, Kancheepuram district, the study was done among hypertension patients. The primary study involved 60 hypertension patients who were treated at SRM general hospital in Kattankulathur, Kancheepuram district. The samples were chosen using a non-probability sampling approach. Descriptive and inferential approaches were used to analyze the information based on the objectives. The data was collected over the course of a week. Part-A is a structured questionnaire used to measure demographic characteristics, and part-b is the WHO quality of life scale used to evaluate hypertension sufferers' quality of life

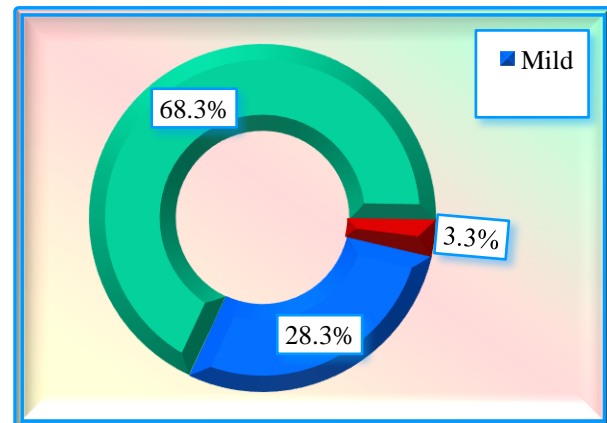
**Ethical Approval**

Before beginning data collecting, the research committee of The project was approved by SRM college of nursing, SRM institute of science and technology, kattankulathur, chengalpet district. The Dean of the SRM College of Nursing granted permission, and each participant gave informed consent. The subjects were assured that their identity would be preserved and that they may withdraw from the research at any moment.

**Result And Discussion:**

The study was conducted among hypertension patients in SRM general hospital, Kancheepuram district, using a non-experimental descriptive research method. It was chosen to perform the study with 60 participants. In this study, the demographic characteristics were as follows: Regarding hypertensive patient age, 23 (38.3%) patients were in the 19-30 age range; Regarding gender, 40 (66.7%) patients were male; Regarding profession, 18 (30.0%) patients were in the private sector; In terms of family income, 11 (18.3%) had less than \$5,000; in terms of religion, 49 (81.7%) were Hindu In terms of past sickness, 41 people (68.3%) have been sick before. In terms of family history, 25 (41.7 percent) of people did not have any. The study's findings were addressed in light of the goals. The initial goal was to assess individuals with hypertension's quality of life. Of the 60 patients, 41 (68.3%) had moderate quality of life, 17 (28.3%) had mild quality of life, and 2 (3.3%) had high quality of life.

The quality of life of hypertensive patients was found to be linked to demographic factors such as age, gender, and family history of hypertension. However, no link was discovered between hypertension patients' quality of life and other demographic factors such as education, employment, family, or income. It was shown that 41 (63.3%) of patients had a moderate quality of life, 17 (28.3%) had a mild quality of life, and 2 (3.3%) of patients had a high quality of life.



**Conclusion**

**SECTION A**

**ASSESSMENT OF DEMOGRAPHIC VARIABLES OF PATIENTS WITH HYPERTENSION**

Table 4.1 shows frequency and percentage distribution of demographic variables of patients with hypertension

N=60

S. No.	Demographic Variables	Class	No. of respondents	Percentage %
1	Age	19-30 Years	23	38.3
		30-40 Years	5	8.3
		40-50 Years	7	11.7
		50-60 Years	25	41.7
2	Gender	Male	40	66.7
		Female	20	33.3
3	Occupation	Government	9	15.0
		Private	18	30.0
		Coolie	16	26.7
		Other	17	28.3
4	Family income	< 5000	11	18.3
		5000-10000	2	3.3
		10000-15000	6	10.0
		15000-20000	10	16.7
		>20000	31	51.7

5	Religion	Hindu	49	81.7
		Muslim	7	11.7
		Christian	4	6.7
		Others	0	0.0
6	Previous illness	Yes	41	68.3
		No	19	31.7
7	Family history of hypertension	Yes	25	41.7
		No	35	58.3

**ACKNOWLEDGMENT:**

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**CONFLICT OF INTEREST:**

There are no conflicts of interest. Furthermore, this research was not sponsored.

**STATEMENT OF HUMAN AND ANIMAL RIGHTS:**

All procedures were carried out in line with the competent committee on human experimentation's (institutional and national) ethical norms, as well as the Helsinki Declaration of 1975, as amended in 2008.

**STATEMENT OF INFORMED CONSENT:**

All study participants gave their informed permission before being included in the study.

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## IMPACT OF COVID-19 IN SOUTH ASIAN POLITICAL RELATIONS

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### ABSTRACT

*Maintaining diplomatic political relations among the South Asian countries such as Nepal, India, Pakistan, Bangladesh, Afghanistan, Vietnam, Myanmar, Vietnam, Thailand and so on can be regarded as an important political necessity. These countries are generally regarded as economically developing and the COVID-19 pandemic has created significant economic downfall for these countries. Furthermore, the COVID-19 response from the governments of these countries had required resourceful support from neighbouring countries. The paper analyses the impact of COVID-19 in South Asian political relations by employing a qualitative methodology through thematic analysis on the topic.*

*Analysis of various areas of impact of COVID-19 such as economic, political, social and migration related issues has indicated that political turmoil in these regions had been evident. However, the absence of resourceful neighbouring countries in the South Asian region had hindered the process of attaining benefits for the countries. It has also been indicated that the participation in SAARC had not been adequate, leading to a contradictory condition of coordination and competition. Historical political turmoil between India and Pakistan has also created a gap in the process of formulating political relations. The COVID-19 government response in these densely populated countries had been inadequate and the health system infrastructure had been largely inadequate to accommodate the COVID-19 crisis, especially in poor countries such as Vietnam and Nepal. Thus, the findings indicate that the impact of COVID-19 on South Asian political relations had mostly been negative and inadequate. On the other hand, it has simultaneously inflated towards the necessity of formulating diplomatic and mutually beneficial political relations to mitigate such large-scale crises.*

**Keywords:** Political relations, impact of COVID-19 on economy, South Asian politics, political dissonance, COVID crisis, government response

### Introduction

The implications of COVID-19 have been significant in the political realm of the South Asian countries. The South Asian countries such as India, Nepal, Pakistan, Afghanistan, and Bangladesh along with Philippines, Thailand, Indonesia, Vietnam, Myanmar and Singapore are generally recognised as economically developing countries. This entails the inability to face such a large-scale health crisis due to lack of proper economic support and adequate equipment. The long-term impact of COVID-19 had been economic fall and rise of social and economic inequality among the citizens of the South Asian states. The political relationships between the South Asian countries have also faced critical issues due to the inability of the countries to uphold the political commitments, restrictions on resource import-export and migration restrictions.

The restrictions imposed on the citizens of these countries have borne major political implications, resulting in questions of

restricting individual freedom. As per the words of Ide (2021), the definite result of COVID-19 had also affected the national security measures. Political tension created between the South Asian countries such as India and Pakistan has borne critical implications between the political relations between these countries which had been critical since time immemorial and which had further deteriorated due to the national crisis faced by these countries.

The prospect of protecting the national borders align with providing proper health and safety for the citizens had required the countries to distribute its resources properly. Mismanagement in this regard had created strain on the political condition of the South Asian countries. As mentioned by Lee *et al.* (2021), due to the COVID-19 crisis, migrated citizens of various countries have faced issues in returning to their home countries. Especially with the restrictions imposed upon international transportations, the working migrants dispersed across the South Asian countries had faced issues. Hence, the problem

statement that the paper seeks to address is the varied negative implications on the political relations between the South Asian countries during the COVID-19 crisis.

The aim of the paper can thus be defined as investigation of the impact of COVID-19 on the political relations of South Asia. The objectives of the paper are to analyse the political relations between South Asian countries. Further, the paper aims at investigating the impact of COVID-19 on economic and political conditions of the South Asian countries. An analysis of the impact of COVID-19 on the current political relations of South Asia and a critical assessment of the long-term implications of the political dissonance caused by COVID-19 on South Asian political relations will also be included in the paper. Thus, the paper seeks to present a comprehensive analysis of various factors that had impacted the South Asian countries during the COVID-19 crisis.

#### **Evaluation of political relations among South Asian countries:**

Maintaining diplomatic political relations with the neighbouring countries is one of the important aspects of political strategies. Such diplomatic relations enhance the scope of attaining support and resources from the neighbouring countries in times of distress. In addition, as part of the South Asian countries, nations such as India, Pakistan, Nepal, Vietnam, Thailand, Myanmar and so on are required to foster beneficial political relations with each other. As per the words of Chung (2018), the development of politically beneficial international relationships with other countries enhanced the political capacity of a country. Establishment of beneficial relations with the resourceful nations helps in building the economic foundation of a nation.

However, these political relations are required to be built based on mutual scope of beneficial interchange of support and resources. As stated by Schiff (2018), India, in terms of population, is one of the biggest nations in South Asia. The sheer enormity of the nation has attributed it with various benefits pertaining to resources. However, the political relations between India and other South Asian countries have faced

turmoil in the past due to matters of regional security.

Political relations of India with its neighbouring countries such as Pakistan had been in turmoil due to the border conflict. According to Chhachhi (2019), the dynamics of political relations among the countries of South Asia in the past had been based upon arbitrary aspects of coordination and competition. Political relations between various South Asian nations vary in accordance with the economic, political, demographic, religious, cultural and territorial conditions of each nation. Thus, it can be stated that the relationship between India and Pakistan has suffered from greater political turmoil in comparison to political relations between India and Nepal or India and Thailand.

#### **Economic and political crisis faced by South Asian countries during COVID-19:**

COVID-19 has been recognised as one of the biggest health crises on a global scale of the century and various countries have been faced with critical economic and political challenges. As per the view of Sharma *et al.* (2020), health infrastructure of various South Asian countries had been underprepared to face the COVID-19 crisis. The result of such a crisis had been to adopt drastic measures such as nationwide lockdown with the nation and restricting all types of international transportation. India, as a part of the South Asian region, had adopted the *Neighbourhood First* policy by reactivating SAARC along with providing bilateral medical supplies to the neighbouring countries (Pattanaik, 2021). In essence, the regional policies adopted by the South Asian countries are aimed at managing the current situation and providing proper medical resources to manage and prevent further spread. On the contrary, the policies adopted by various South Asian countries had also been averse to maintain proper diplomacy for preserving the interest of the nation. The economic state of these countries had been low prior to COVID-19 pandemic that had further worsened with the advent of the pandemic.

The fall of economic stability due to COVID-19 has also led to the conflict in interest among the nations as each nation had been more inclined to maintain its internal economic



stability. As mentioned by Stone (2020), despite the economic fall of Pakistan and India, other nations such as Sri Lanka and Bangladesh had also faced the threat of recession. The World Bank, along with the International Money Fund had also made revisions on economic growth in the region due to the shutdown of the textile Bangladesh industry and the tourism industry in Maldives and Sri Lanka (Shahid and Ahmad, 2021). Further economic downfall has also been attributed to the inability to acquire regional and international industrial and agricultural resources across various South Asian countries. Therefore, the impact of COVID-19 on the regional and international political relations had been negative and had been further deteriorating due to the economic crisis faced by these nations.

#### **Implications of political dissonance of South Asian political relations :**

Political dissonance among the South Asian nations creates long-term negative implications on these countries. Establishment of beneficial and diplomatic regional and international political relations in times of crisis is essential for attaining resourceful aid from neighbouring countries. As per the words of Khan *et al.* (2019) SAARC provides the opportunity to establish collaborative relationships among the South Asian regions for adding social, logistical, environmental and economic aspects. In essence, the lack of proper collaborative political relations may hinder the process of gaining economic benefits, especially for South Asian countries that are recognised as economically developing. In comparison to India, the economic infrastructure of various other South Asian countries such as Vietnam and Pakistan has indicated instability. Moreover, the lack of proper political relations creates a sustainable position of a country by aiding the process of transport-aided logistical or resource interchanges.

Majority of the countries included in the South Asian region are economically developing and require the support of neighbouring countries to maintain a profitable supply chain. According to Fraune and Knodt (2018), sustainable economic position is attained by

the development of both agricultural and industrial domains within a country. In essence, the long-term implications of political dissonance may lead to the restriction of attaining proper resources for obtaining agricultural and industrial development, leading to further economic downfall. In addition, it may also threaten territorial safety measures, leading to further political tension among the neighbouring nations.

#### **Methods and Techniques:**

Adoption of an organised research methodology helps in developing a research that is credible, valid and authentic. The research methodology for a research paper thus includes a research philosophy that is to be followed in order to find a concrete direction in the discovery of truth. Among the various philosophies for researchers, this particular paper has adopted a *positivism philosophy* that has helped the paper to investigate the worldly phenomenon in a logical manner. As per the words of Alharahsheh and Pius (2020), the adoption of positivism principles enables the researcher to define the truth in a verifiable manner, based on logical data. The political relations among the South Asians can be regarded as worldly or social phenomena that have been investigated in this regard by analysing various social factors such as COVID-19 pandemic.

The research design adopted for this paper has been a *descriptive research design* for attaining results that are based on systematic and accurate analysis. As mentioned by Atmowardoyo (2018), investigation of various variables can be conducted accurately and logically with a descriptive design for research. The adoption of this design for the scratch has helped in analysing various data sources and demonstrating a particular pattern of South Asian political patterns. The paper also utilises a *deductive research approach* for investigating the validity of the political theories pertaining to beneficial political relations. According to Pearse (2019), a deductive approach enables the researcher to generate new hypotheses based upon existing theories and information relevant to the research topic. Hence, this approach has enabled the paper to make logical hypothetical

deductions based on existing resources, leading to a comprehensive and critical analysis of the subject.

Furthermore, the overall research method has followed a *qualitative methodology* for enhancing the scope of in-depth analysis. In the realm of political science, the topic relating to political relations among various nations are subject to change with changing times. These modifiable external factors had been analysed through the incorporation of a qualitative research method, leading to the attainment of logical findings, based on concrete, valid and relevant evidence. The data collection method has also been selected carefully, following a systematic data collection method.

The data collection method for various secondary resources had included a sampling method consisting of inclusion-exclusion sampling criteria. These criteria included peer-reviewed journal articles, published newspaper articles, academic works published in the last 5 years, articles published in English language and articles searched with certain relevant keywords such as *political relations, South Asian political relations, regional policies, diplomatic policies, COVID-19 impact and economic fall*. Based on the gathered secondary resources from selected electronic databases such as Google Scholar and ProQuest, a *thematic analysis* has been conducted. Ethical considerations have also been maintained by constructing a detailed bibliography of all the resources used on the work to maintain credibility and validity of the research work.

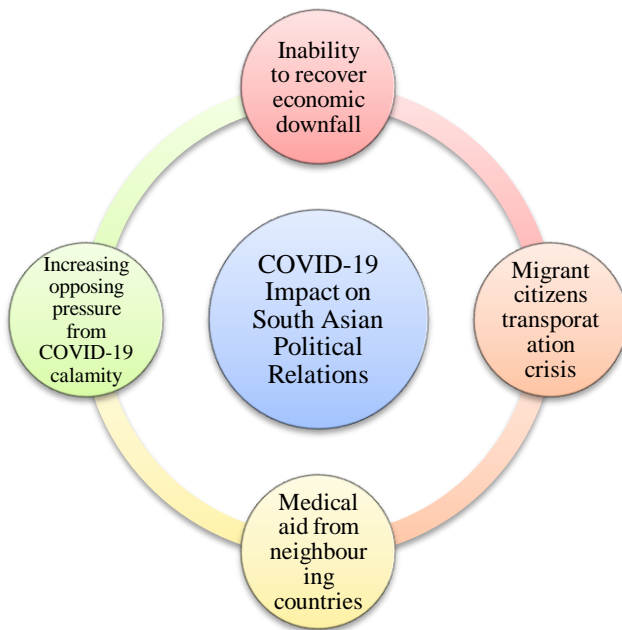
### **Findings and Discussion:**

#### ***Theme 1: impact of COVID-19 on the political relations of South Asian nations***

The impact of COVID-19 on the economic, social and political conditions of South Asian countries had been critical as these countries had been faced with a health crisis beyond the capacity of management. As per the opinion of Stone (2020), the South Asian countries such as Bangladesh, India, Pakistan, and Bhutan and so on had been affected critically due to the dense population of the nations. The densely populated structure of the countries, along with the presence of poor slum areas, the government of the countries had been forced to impose nationwide lockdown. Consequently,

the rising cases in these regions had also affected economic activities as the government had been forced to restrict domestic and international transportation. Additionally, the risk of contagion also required proper testing and medical support. Hence, it has become a catalyst for ensuring that beneficial relationships are being maintained with the neighbouring nations. Contrarily, the nations had to preserve domestic resources to ensure that the citizens are provided with proper medical support. Hence, a critical duality had been introduced among the suffering counties of the South Asian region.

Management of migrants had also suffered due to the transportations restrictions, leading to unrest among the citizens situated in other countries. Management of international relations to provide proper resources to the estranged citizens has created tension among the countries as well. In many cases, the inability to provide adequate opportunities for regional and domestic travelling had affected the political relations among the countries. As per the words of Shakya (2020), Nepal, recognised as one of the poorest countries in the South Asian region, had faced allegations of critical mismanagement. Corrupted internal government infrastructure had led the way for an intersectional crisis. Lack of proper regional political relations has further restricted the COVID response of the country and the divisions within the ruling party have affected the government's conduct during the crisis. Therefore, COVID-19 in these nations has essentially indicated the necessity of developing diplomatic and mutually beneficial political relations with each other.



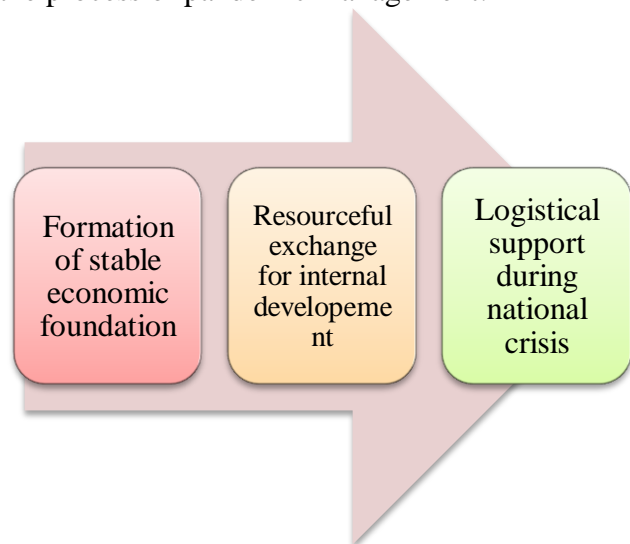
**Figure 1: Impact of COVID-19 on South Asian political relations**  
(Source: Self-developed)

**Theme 2: Impact of COVID-19 various political goals of South Asian countries**

The response of the government to COVID-19 crisis among the nations of South Asian countries is intricately related to the formation of beneficial political relations. The various political goals of a county generally entail the development of stable and sustainable economic foundation and providing adequate resources to the citizens. During a health crisis of a large magnitude, these political goals are preserved by providing the citizens with resources that are obtained from neighbouring nations. As per the words of Schrama (2019), retaining beneficial political relations among the neighbouring countries enables the government to access valuable information. This information helps in the process of mitigating a crisis. As stated by Davies and Wenham (2020), The WHO has played an important role in coordinating the advice of various nations, aiding the management process of the COVID-19 outbreak. However, access to WHO had not been available readily to the South Asian nations. Thus, it had been necessary to develop diplomatic relations with neighbouring nations to ensure public health and safety.

The political relations of the South Asian countries had been developed based on the

foreign and domestic policies. As mentioned by Reddy *et al.* (2018), financial stability and sustainable development of a country can be advanced through the formation of beneficial political relations. On the other hand, formation and preservation of beneficial political relations may be beneficial with the presence of schemes between resourceful countries. The prime issue faced by the South Asian countries is the absence of resourceful neighbouring countries, leading to critical conditions in attaining the political goals. Therefore, the impact of COVID-19 among the political goals and relations of the South Asian nations had been negative in terms of obtaining resources yet positive in terms of creating a collaborative political environment to support the process of pandemic management.



**Figure 2: Political goals of South Asian political relation formation**  
(Source: Self-developed)

**Theme 3: Necessity of maintaining diplomatic political relations in South Asia**

Maintaining diplomatic political relations with neighbouring countries helps in developing the internal infrastructure of a country. Formation of an infrastructure for the South Asian countries is necessary as countries such as India, Nepal, Pakistan, Afghanistan, and Vietnam and so on are regarded as economically developing countries and are further necessary for attaining resourceful support. As mentioned by Paranjpe and Thomas (2019), the potential for development with the aid of international and regional cross-border cooperation enhances connectivity,

leading to the development of the infrastructure. Strategic policies for developing positive political interrelationships among regionally enable countries to expand business, logistics exchange and information exchange. The scope of constituting a large-scale and cross-border supply chain is presented to the countries.

The impact of COVID-19 has further indicated the necessity of formulating optical relations among South Asian countries. As mentioned by Barua (2018), connectivity attained between the regional countries helps in supporting the surplus of a country. In essence, the development of political relations among the South Asian countries during and after COVID-19 crisis is likely to support the economic recovery of the countries. Hence, it can be stated that it is highly necessary and significant to maintain diplomatic political resources, especially among the developing South Asian countries to maintain economic and political stability and sustainability.

### Conclusion:

Evaluation of the scenarios related to the research topic indicates that COVID-19 has a significant impact on South Asian political relations. The main reason behind this can be termed as the high population of these countries. The pandemic caused by COVID-19 clearly indicates that the existing system is not capable of handling such a large wave of patients. This is resulting in problems for the entire healthcare system and the quality of healthcare is also declining at an alarming rate. From the perspective of the government, this is problematic as the increase in the infected number of people requires more resources. On

the other hand, the lockdown has resulted in a halt of economic activities, resulting in more complications from the overall economy.

In most of the Asian countries, the average household income is significantly lower. Therefore, it can be concluded that the people are not always able to afford expensive healthcare from private sources. This is being portrayed as an inability of the government to provide services towards the population. In accordance with the political goals, the mismanagement or the inability of a country to provide healthcare services towards its people can act as a chance for other political parties to criticise the government. The prime issue faced by the South Asian countries is the absence of resourceful neighbouring countries, leading to critical conditions in attaining the political goals. Overall, the impact of the pandemic is mostly negative as none of the Asian countries were prepared enough to handle these complications. It can thus be recommended that the countries should participate actively in SAARC and modify the current political relations among each other, in order to generate mutually beneficial political schemes to attain economic recovery. Additionally, the development of mutually beneficial political schemes will also help in the process of economic recovery through the exchange of resources required for both agricultural and industrial development. The result of COVID-19 on South Asia had been critical, essentially indicating the necessity to formulate coordinating diplomatic relations and utilizing the heterogeneous resources available in the South Asian region.

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**BANDWIDTH ENHANCEMENT OF MICRO STRIP SQUARE PATCH ANTENNA WITH PARTIAL GROUND PLANE FOR WIDE BAND APPLICATIONS****Suneetha Thalluru<sup>1\*</sup>, Dr.S NagaKishore Bhavanam<sup>2</sup>**<sup>1</sup>Research Scholar, ECE Department, Acharya Nagarjuna University, Guntur, Andhra Pradesh, India<sup>2</sup>Asst.Prof, HOD, ECE Department, Acharya Nagarjuna University, Guntur, Andhra Pradesh, India  
E-mail:suneethalluru@gmail.com**ABSTRACT**

*This study aimed to tackle two problems: building a wide-bandwidth antenna and an antenna that can be utilized for several wireless technologies operating at various frequencies. When it comes to constructing micro strip patch antennas, bandwidth is the most important consideration. Patch antennas are narrow-band by nature, yet large data rates are prevalent in today's wireless communication technologies, Wide bandwidth is necessary to accommodate these large data rates. The partial ground plane approach is utilized in this work to increase the antenna's bandwidth. CST Microwave Studio was used to design and construct a square patch antenna for wideband applications operating in the 2 to 8 GHz frequency range. The findings of measurements and simulations are compared and found to be in good agreement. WiMAX (2.3-5.7 GHz), Bluetooth (2.4GHz), X-band satellite applications (7.1-7.76 GHz), and WLAN (2.4, 5.1-5.8 GHz), The planned antenna will cover them all.  $gl=27.9$  and  $pl=pw=17$  mm, is the recommended antenna, and has a broad bandwidth of 5.5 GHz, a fractional bandwidth of 111 percent, and a return loss of less than 10dB throughout the whole frequency range.*

**Keywords:** Return Loss, Wireless Personal Area Networks, Wireless Applications

**Introduction**

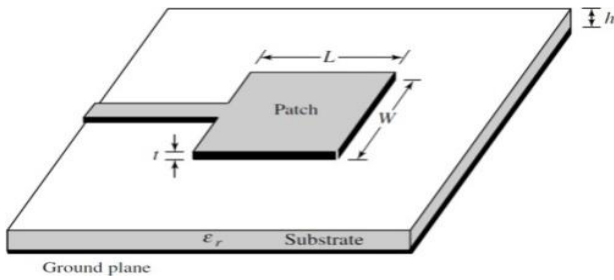
Because of its multi- and wideband properties, the antenna's compact size is the most demanding aspect in current communication systems [1, 2]. Owing to its low cost, tiny size, less weight, low profile, and conformal shape, designers chose micro strip antennas (MSAs) to meet the compact size antenna requirement [3,4]. These characteristics make MSAs both desirable and necessary for growth. Contemporary communication systems may support multiple wireless applications running at different frequencies, the need for multiband and wideband antennas [5-8] is rising in today's environment. Because a single device may be used for several applications such as text, music, video, and multimedia streaming [9], the need for wideband antennas is rising as wireless technologies advance. The requirement for high data rates and channel bandwidth is always a major problem in modern wireless communications, prompting the FCC to open the unlicensed radio communication spectrum (3.1GHz-10.6GHz) to the public [10]. This unlicensed frequency is used by wireless personal area networks [WPAN] [11]. For UWB functioning, the antenna bandwidth should be higher than 1.5 GHz [12]. Researchers in the field of wideband

antennas have been doing a lot of work. Modifying the ground structure like partial ground and introducing defects in the ground, monopole patch, fractal patch, and micro strip patch are some of the approaches used to produce wideband characteristics [9-11, 13-15, 17-25].

**Design Concept**

Figure 1 depicts the traditional MSA structure. It is made up of three layers: top, substrate, and bottom. The top layer is made up of two parts: a patch that can take any geometric shape and a micro strip feed line that can take any geometric shape. On the substrate, this layer is photoengraved. FR4 is the most often utilized substrate layer because it is easily accessible and has a low loss tangent value. Controlling the thickness of the substrate 'h' can enhance antenna performance; therefore it is a key element to consider when evaluating antenna performance. Low permittivity thicker substrates can be utilized to enhance antenna characteristics, resulting in an increase in antenna size. As a result, a compromise between antenna size and antenna performance should be made [16]. The ground plane layer, often known as the final layer, is used to improve the bandwidth of MSA. The antenna's

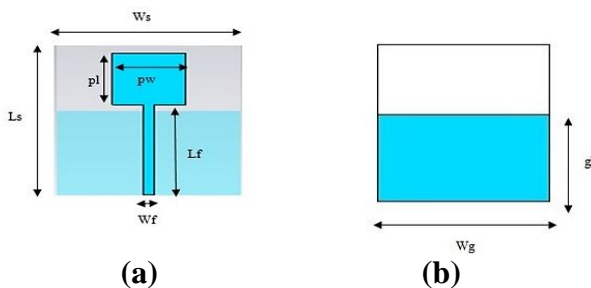
operational parameters can be affected by the ground plane's shape. Ground plane can be partial or full.



**Figure 1. Physical Structure of MSA**

**Geometry of Antenna**

The suggested model is based on the partial ground plane idea, which involves shortening the ground plane in order to increase bandwidth. CST Microwave Studio software is used to create and simulate a micro strip square patch antenna. The suggested antenna's geometry is shown in Figure 2. The substrate used is FR-4, with a height of 1.6 mm, has a loss tangent of 0.02, and has a relative permittivity of 4.3. The substrate needs be 42x50 mm<sup>2</sup> in order to make a square patch antenna. The square patch antenna has a width of 17 mm, a length of 17 mm, and a width of 2.6 mm and a length of 29.91 mm. As a feeding method, the 50 micro strip line was employed.



**Figure 2. Square patch antenna with Partial Ground Plane**

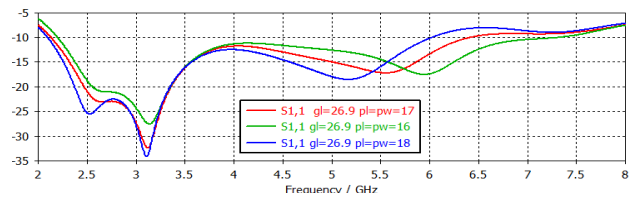
(a) Top view (b) Bottom view

Ws=42mm, Ls=50mm, Pl=Pw=17mm, Lf=29.91mm, Wf=2.6mm, gl=27.9mm.

**Parametric Analysis**

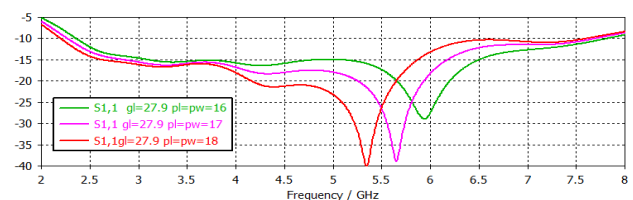
Various design factors such as ground length, patch length, and patch width are investigated to see how they affect the proposed antenna's return loss and impedance bandwidth. Figure 3 shows several resonances at 3.14 GHz and 5.95 GHz for gl=26.9 mm and pl=pw=16 mm, and the antenna is working in the range 2.19-7.29

GHz, resulting in a bandwidth of 5 GHz. Multiple resonances occur at 3.12 GHz and 5.63 GHz for gl=26.9 mm and pl=pw=17 mm, and there is a minor change in the lower cut off frequency of the antenna, but the higher cut off frequency is reduced to 6.34 GHz and the bandwidth is reduced to 4.19 GHz. Multiple resonances occur at 2.5 GHz, 3.1 GHz, and 5.2 GHz for gl=26.9 mm and pl=pw=18 mm, and there is a minor change in the lower cut off frequency of the antenna, but the higher cut off frequency is dropped to 6 GHz and the bandwidth is further reduced to 3.9 GHz.



**Figure 3. Return Loss plot for gl=26.9 for different values of patch width and patch length**

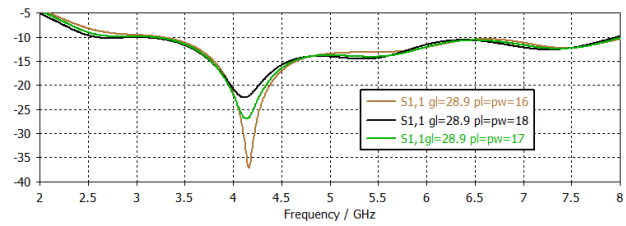
Figure 4 shows that by increasing gl=27.9 mm and pl=pw=16 mm, the lower cutoff frequency is increased to 2.39GHz, the higher cutoff frequency is increased to 7.79 GHz, and the bandwidth is increased to 5.43GHz. By raising the pl=pw=17 mm, we can see that the lower cutoff frequency drops to 2.2 GHz and the higher cutoff frequency does not change significantly, resulting in an increase in bandwidth of 5.5GHz. The lower cutoff frequency remains same when the pl=pw=18 mm is increased, while the upper cutoff frequency is reduced to 7.5 GHz, resulting in a bandwidth of 5.38 GHz.



**Figure 4. Return Loss plot for gl=27.9 for different values of patch width and patch length**

Figure 5 shows that raising the gl=28.9 mm and pl=pw=16 mm increases the lower cutoff frequency to 3.28 GHz, the higher cutoff frequency to 8 GHz, and the bandwidth to 4.72 GHz. We may witness the same behavior by

raising the  $pl=pw=17$  mm. The lower cutoff frequency is reduced to 2.5 GHz by raising the  $pl=pw=18$  mm, while the higher cutoff frequency remains the same, resulting in a bandwidth of 5.5 GHz.



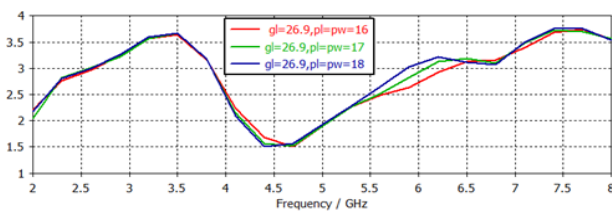
**Figure 5. Return Loss plot for  $gl=28.9$  for different values of patch width and patch length**

The impact of ground plane length and patch width and lengths on antenna operating characteristics such as resonant frequency, returns loss, bandwidth, and impedance bandwidth is summarized in Table 2.

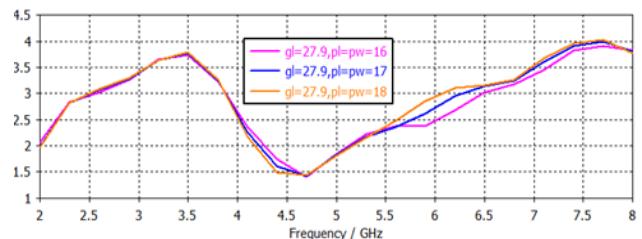
**Table 2. Parametric Analysis results**

Length of ground ( $gl$ )	Patch Length( $pl$ ) =Patch Width ( $pw$ )	Resonances	S11(dB) Return Loss	Bandwidth	Impedance Bandwidth (%)	
26.9 mm	16	3.14GHz	-27.53	5GHz	105.3	
		5.95 GHz	-17.51			
	17	3.12GHz	-32.32	4.2 GHz	98.8	
		5.63 GHz	-17.18			
	18	2.5 1GHz	3.11 GHz	-34.05	3.9 GHz	96.2
			5.23 GHz	-18.42		
27.9mm	16	5.93 GHz	-28.92	5.43 GHz	106.9	
	17	5.6 GHz	-38.86	5.5 GHz	111	
	18	5.3 GHz	-39.96	5.38 GHz	97.7	
28.9mm	16	4.16 GHz	-37.15	4.72 GHz	78.3	
	17	4.72 GHz	-27.01	4.72 GHz	85.7	
	18	4.11 GHz	-22.58	5.5 GHz	104.7	

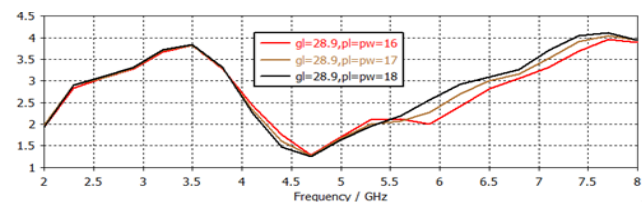
The graphs below illustrate gain vs. frequency for various ground lengths, patch lengths, and patch widths. The gain varies between 1.4 and 3.9 dB for  $gl=26.9$  mm with varied values of  $pl$  and  $pw$ . The gain varies between 1.4 and 4 dB for  $gl=27.9$  mm with varied values of  $pl$  and  $pw$ . The gain varies between 1.2 and 4 dB for  $gl=28.9$  mm with varied values of  $pl$  and  $pw$ .



**Figure 6. For  $gl=26.9$  plotted Gain versus frequency**



**Figure 7. For  $gl=27.9$  plotted Gain versus frequency**

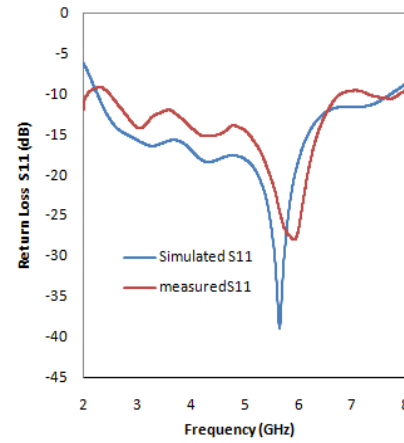


**Figure 8. For  $gl=28.9$  plotted Gain versus frequency**

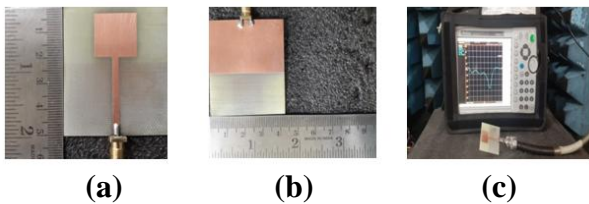


**Prototype Antenna And Measured Results**

Figure 9 depicts the front and back views of the completed prototype antenna. The antenna is made of FR-4, which is 1.6 mm thick and has a loss tangent of 0.02 and a relative permittivity of 4.3. The substrate's dimensions are 42x50 mm<sup>2</sup>. The proposed antenna's return loss is analyzed with an Anritsu MS2037C combinational Analyzer and compared to simulated results. The simulated and observed return loss values are shown in Figure 10. The suggested antenna's radiation pattern is seen in Figure 11.



**Figure 10. The proposed antenna's simulated and measured return loss**



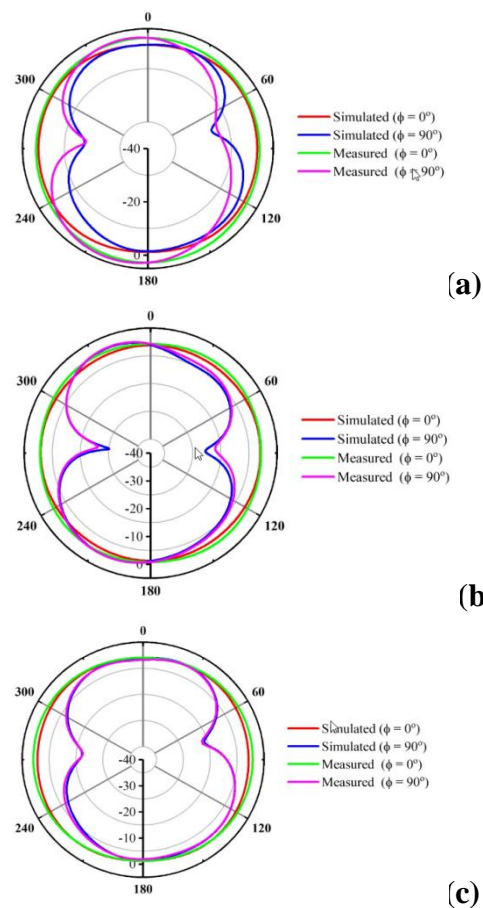
**Figure 9. Prototype of the proposed antenna (a) Front view (b) back view (c) S11 measurement setup**

The observed and modeled antenna bandwidths are 5.5 GHz (2.2-7.7 GHz) and 5.3 GHz (2.2-7.5 GHz), which correspond well. WiMAX (2.3-5.7 GHz), Bluetooth (2.4GHz), and X-band satellite applications (7.1-7.76GHz), and WLAN (2.4, 5.1-5.8 GHz) can all benefit from the suggested antenna. The suggested antenna construction is compared to other previously published results in terms of antenna size, bandwidth ratio, and frequency bands [17-24]. In comparison to most of the current designs, the suggested antenna is wideband and simple, tiny, and compact in overall dimensions, as shown in Table 3.

**Table 3. A review of antenna findings with previously reported findings**

References	Frequency band (GHz)	Dimensions (mm <sup>3</sup> )	Bandwidth ratio
[17]	2.2 (3.4–5.6)	70 X 70 X 1.6	1.6:1
[18]	2.46 (2.71–5.17)	35 X 35 X 1.5	1.9:1
[19]	1.8 (2.4–4.2)	90X 40 X 0.79	1.8:1
[20]	3.13 (2.23–5.36)	37 X37 X 1.6	2.4:1
[21]	0.62 (1.9–2.52) and 1.2 (5.0–6.2)	58 X 62 X 2.0	1.3:1 and 1.2:1
[22]	5.76 (2.94–8.7)	26 X 26 X 1.6	3.0:1
[23]	4.8 (2.0–6.8)	50 X 55 X 1.5	3.4:1
[24]	0.41 (2.26–2.67) and 3.78 (3.0–6.78)	24 X 35 X 1.6	1.2:1 and 2.3:1
Proposed Antenna	5.5(2.2-7)	42 X 50 X 1.6	3.1:1

**Patterns of Radiation**



**Figure 11. Polar Plots of measured and simulated Radiation patterns at a) 2.9GHz b) 5.5 GHz c) 7.5 GHz**

### Conclusion

An antenna for wideband applications in the frequency range 2-8 GHz was developed, simulated, and manufactured using CST Microwave Studio. The bandwidth of this square patch micro strip antenna with partial ground plane was higher. For the frequency range stated, the antenna has a return loss of less than 10dB for ground lengths ranging between 26.9 mm and 28.9 mm. The suggested antenna type has a broad bandwidth of 5.5 GHz and a fractional bandwidth of 111 percent with  $gl=27.9$  mm and  $pl=pw=17$  mm. This suggested square patch antenna may be utilized for different applications like WiMAX (2.3-5.7 GHz), Bluetooth (2.4GHz), X-band satellite (7.1-7.76 GHz), and WLAN (2.4, 5.1-5.8 GHz), according to modeling and measurement findings.

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**DYNAMIC POTHOLE DETECTION AND REPORTING SYSTEM****Sourabh Deshmukh<sup>1</sup>, Savani Suranglikar<sup>2</sup>, Tanmay Jain<sup>3</sup>, Vinay Nair<sup>4</sup>, Aditya Vadalkar<sup>5</sup>,  
Tanuj Agrawal<sup>6</sup>**<sup>1,2,4</sup> Department of Information Technology, Pune Institute of Computer Technology, Pune, India<sup>3,5,6</sup> Department of Computer Engineering, Pune Institute of Computer Technology, Pune, IndiaEmail: <sup>1</sup>sourabhdeshmukh13@gmail.com, <sup>2</sup>savani.456@gmail.com, <sup>3</sup>tanmayj000@gmail.com,<sup>4</sup>vinaynair2k@gmail.com, <sup>5</sup>adityavadalkar@gmail.com, <sup>6</sup>tanujagrwal223@gmail.com**ABSTRACT**

The problem of bad roads and potholes is one of the most pressing concerns in cities. It can be traced to two major issues – inefficient manual reporting and recording of potholes and/or lack of accountability with regard to repairing roads. To automate the process of reporting and recording potholes/bad patches of road, we propose a dynamic pothole detection and reporting system which gathers reports from the user and streamlines the flow of information among the concerned authorities and civilians, ensuring transparency. The system is bilateral in nature as it includes two components, namely, an android application for the civilians, and a web application for the concerned civil department. The android application has two modes – Driving Mode and Pedestrian Mode. Through the Pedestrian Mode, the user can capture an image of the pothole to report. The Driving Mode includes a dynamic, on-the-go pothole detector that uses the accelerometer & gyroscope built into the user's smartphone. A Support Vector Classifier is used to classify the jerks recorded by the accelerometer & gyroscope as potholes. The real-time GPS location is dynamically recorded in both modes. The Web Application includes the reported potholes/bad patches of roads with their location and functionalities such as hierarchically delegating tasks among the maintenance personnel, progress monitoring using deadlines, progress bars, etc., and finally, notifying users on completion of tasks.

**Keywords:** Dynamic pothole detection, SVM, Accelerometer, Gyroscope, GPS, Repair progress, Android, Web application

**Introduction**

Starting out as a tiny crack on a road, a pothole on abrasion and the force of water creates a grave depression in the surface of the road. As a result, it poses a severe threat to people driving on the road, leading to accidents, which could be fatal in many cases. In India, according to the Ministry of Road Transport and Highways, over 9300 deaths were reported in the last three years due to potholes. The figures highlight a major area of improvement in present systems designed for the maintenance of roads.

The causes can be narrowed down to two prime concerns - Poor reporting/ recording of potholes and/or lack of accountability and transparency in authorities concerned with the repair/maintenance of roads. This research aims to tackle both these issues with the proposed end-to-end system, taking a step towards smarter cities. The application facilitates reporting of potholes by enabling manual reporting as well real-time dynamic detection of potholes using the location of the users as they encounter a pothole and

experience a subsequent jerk, which is classified as a pothole using an SVC.

Furthermore, this data is passed on to a workflow management system designed for analysing the pothole data as well as an effective delegation of tasks within the appointed personnel, along with a continual display of progress bars and notifications to the users (civilians) to ensure accountability and transparency throughout the process. Existing related works are discussed in detail under Section II. Section III details the methodology of the proposed system, followed by the experimental results listed in Section IV.

**Related works**

Given that potholes remain a pressing issue regardless of any geographical conditions, many research opportunities have been created to solve them. Considering this research aims to provide a cheap and effective smartphone-based application, it is crucial to understand works that are related to this particular subsection of applications.

[1] describes accelerometer data-based pothole detection algorithms for deployment on devices with limited hardware/software resources and their evaluation on real-world data acquired using different Android OS-based smartphones. They've created a new algorithm (G-ZERO) in order to optimize their results. The novelty regarding the detection of potholes using a smartphone is great, but their project is limited to just detection.

Another interesting application was presented in [2] wherein a mobile application which used the phone's accelerometer and gyroscope readings to feed into a machine-learning algorithm to enable visualization of any area on any popular map such as Google Maps.

One of the technologies easily used to detect road damage is computer vision. In [4], A. Rasyid et al. built a system that could detect a pothole on the road which is captured by the camera. The camera used here is a wireless portable camera. Also for the location tagging, the GPS sensor is used here.

Another good example of using AI to detect potholes is that of [3] wherein deep networks have been provided to classify pictures of roads.

Cases, where legitimate systems for detection and consequent alerting of the authorities are concerned, are quite slim. However, there have been quite unique approaches there too. In [8], Bansal et al propose a machine learning based pothole detection system called DeepBus for real-time identification of surface irregularities on roads using Internet of Things (IoT). DeepBus uses IoT sensors to detect potholes in real-time while an end-user is driving vehicles on the road. The location of these potholes would be available on a centrally hosted map which can be accessed by both end-users and civic authorities. Thus, it would serve as a warning system to all users as well as a database of potholes with their locations to the authorities for quick repair and action

Given these projects, it's essential to note that not a lot of them consist of actual systems to alert the concerned authorities after the classification is done. This involves a higher risk since, even if the model is highly accurate, it might be of inconvenience to the authorities if it predicts a false positive. That problem has been tried to be nullified in this research.

### Methodology

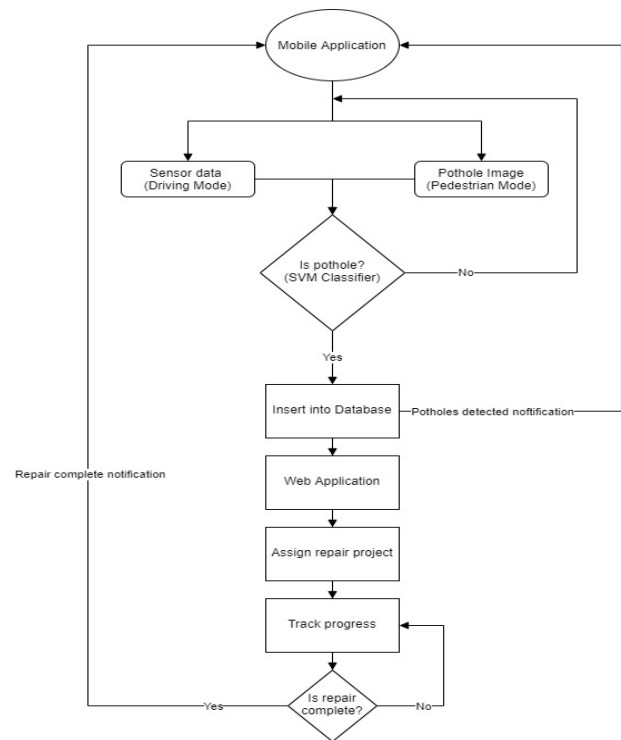


Fig. 1 Flow Diagram

#### A. Client Applications

Our proposed solution for Pothole detection and Reporting System consists of two major application:

- Mobile app for detection and reporting
- Web app for processing the report

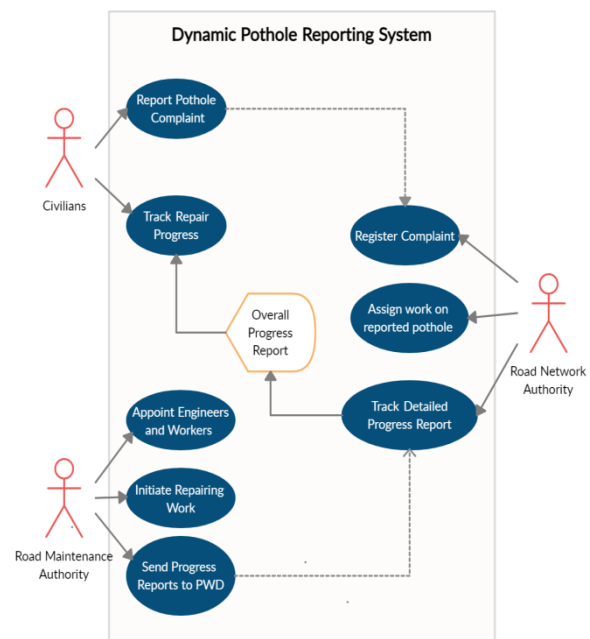


Fig. 2 Use Case Diagram

1) *Mobile App*: To detect/report a pothole we propose a mobile application which will be made available to the general public. The app is made using Android Studio and coded in Java. The app will consist of two modes based on the state of the user, Pedestrian mode and Driving mode.

The Pedestrian Mode should be used by a user when he/she is a pedestrian. It allows the user to capture a picture of a pothole when he/she sees one, and then the image is sent to the database to be verified along with the user's geolocation which will be recorded in the app after the user gives the permission for the same.

To implement this feature in our app, we made use of the camera2 API or the android.hardware.camera2 library available in android. This library makes use of the device's internal hardware to access the camera for which the user needs to provide permission. Apart from this, to record the accurate geolocation of the user we access the user's FINE and COARSE location which can provide us with the accurate latitude and longitude coordinates of the device. android.permission.ACCESS\_FINE\_LOCATION and android.permission.ACCESS\_COARSE\_LOCATION are the two permissions required for the same.

The main drawback of the pedestrian mode is that it is not suitable for a non-static user. For instance, suppose a user is driving his vehicle and they experience a pothole on their way. Now it is very inconvenient for them to get off their vehicle then capture the picture of the pothole to report it. Hence we propose a Driving mode for such users.

The Driving Mode, as earlier stated, is proposed for users under the motion of a vehicle while driving. In this mode, the user just needs to keep the app open while driving and place it somewhere safe. The work will be handled by the app itself as explained below.

When placed in driving mode the app will constantly record the following values: Timestamp, Accelerometer(x,y,z) values, Gyroscope(x,y,z) values, geolocations(latitude, longitude), and speed of the device. Accelerometers in mobile phones are used to detect the phone's orientation. By tracking

rotation or twist, the gyroscope, or gyro for short, adds another dimension to the information provided by the accelerometer. An accelerometer measures linear movement acceleration, whereas a gyroscope measures angular rotational velocity. Both sensors measure the rate of change; they just measure different rates of change. In practice, this means that an accelerometer will measure a device's directional movement but will not be able to accurately resolve its lateral orientation or tilt during that movement unless a gyro is present to fill in the blanks. You can get a really "noisy" info output that is responsive from an accelerometer, or you can get a "clean" output that is sluggish. However, when a 3-axis accelerometer is combined with a 3-axis gyro, you get an output that is both clean and responsive at the same time."

These Accelerometers and Gyroscope values of our mobile devices can be recorded in our app with the help of Android Sensor Libraries which provides us with x, y, z coordinates of both of them, along with the speed of the device as well. These values, while driving, are recorded continuously at constant intervals and stored in a JSONObject format. This object, at fixed intervals, will be sent to an SVM Classifier Model.

This SVM Classifier Model will collect the values received, and check whether a pothole was detected or not. If it detects a pothole the data will be sent to the database and stored there. It will ignore the non-pothole data.

2) *Web App*: The workflow management system (WMS) is a web application designed to make the receipt and management of reports more efficient as well as fast. The main objectives of the WMS are i) To make the pothole repair process transparent between the users and the authorities and ii) To provide an efficient and user-friendly interface for the authorities to manage the repairs of the potholes.

The pothole reports will be stored in the database along with information such as pothole location, user id (the user who reported the pothole), number of reports from the same location, etc. The data is stored in a NO-SQL type database which will help manage the scalability of the system data as well as provide better malleability for the future. The WMS

reads the pothole data from the database and displays the required information in easy-to-read tabular form.

To enhance user experience the reports can be sorted according to the date of report, the number of reports from the same location, etc. Once the reports are sorted, we can assign a specific person to oversee the progress of a pothole repair process. Since roles for the users will be pre-defined by the authorities, it will be easier to allow the repair projects.

Once the projects have been allotted, the user overseeing the project will be able to assign specific roles and tasks to other individuals and so on, similar to a branching effect. The users will be able to view their own tasks and the tasks which they have assigned. Such a process will create a hierarchical structure and hence create a smooth flow of information between the entities involved in the repair project.

Consider a scenario where there are 4 levels of hierarchy and the person on the 4th level is overseeing the project. The users on the 2nd level will be able to view the progress of the whole 2nd level as well as the 1st level. The progress of the 2nd level is basically a summary of the progress of the first 2 levels. Similarly, the users on the 3rd level will be able to see the tasks and progress of their own level and one level below i.e., not the 1st level. This is because the 3rd level is already receiving the progress summary of the lower levels from the 2nd level's progress. This will help reduce clutter and make the experience more organized.

As each task gets completed, the progress gets updated and when all the tasks on the lower levels are completed the overseeing user can view the summary of the completed tasks, which can be verified later physically. Once the repair of the pothole is verified, the completion status is reported back to the users who reported the pothole.

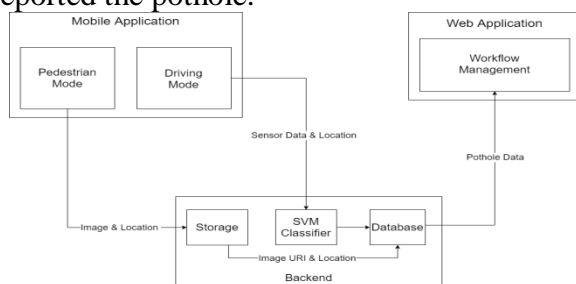


Fig. 3 System Architecture

**B. Pothole SVM Classifier**

“Support Vector Machine” (SVM) is a machine learning algorithm (supervised) which is used for classification or regression problems. In this algorithm, each data item is plotted as a point in the n-dimensional space where n is equal to the number of features [9]. Each feature is represented by a particular coordinate. Further, classification is done by finding the hyper-plane that can differentiate between two classes with considerable accuracy.

To differentiate triggers caused due to potholes from other kinds of triggers (such as speed bumps), we trained a Support Vector Classifier that takes into consideration the jerk along both y-axis as well as z-axis. As a result, the SVC basically helps us to determine whether a particular jerk recorded is a pothole or not.

**C. Parameters Recorded**

The sensors of the smartphone - accelerometer, gyroscope record the acceleration, angular velocity and the orientation of the device in real-time. The position of the device is also recorded in real-time, using which the speed of the vehicle is estimated. Ten consecutive data points recorded are then grouped and various statistical measures are then calculated for each interval and fed into the SVM model as input. This is discussed in further sections.

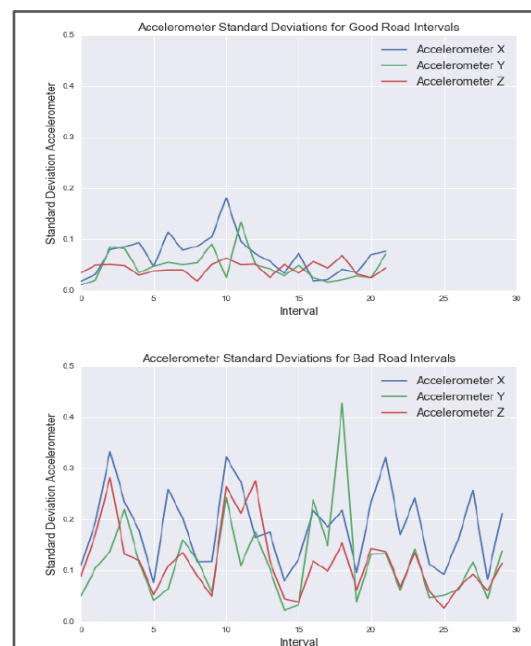


Fig. 4 Standard Deviation comparison Bad vs Good Road

## Experiments and Results

### A. Dataset

The dataset used to train the SVM model contains a total of 10,500 data points. This data was recorded manually by the team by creating a smartphone application specifically developed for data collection. The application captured the time stamp, gyroscope readings, accelerometer reading and speed in real time and stored it in a database. An individual seated in the car with the smartphone application was responsible for pressing a button present in the app each time the vehicle would encounter a pothole on the road. However, these absolute real-time readings are not used as input for the SVM model. This is because the impact of the encountered pothole cannot be captured properly by a single absolute recording but instead by a series of consecutive recordings. This way regular speed bumps can also be distinguished from potholes. Ten consecutive readings are grouped together and various measures are computed for each group interval. These measures are mentioned in table 1.

**TABLE I: Dataset features**

Sr No.	Sensor	Statistical Measure
1.	Accelerometer (x, y, z)	Mean, Median, Standard Deviation, Variance, Skew
2.	Gyroscope (x, y, z)	Mean, Median, Standard Deviation, Variance, Skew
3.	GPS	Latitude, Longitude, Avg. Speed

### B. Hyperparameter Tuning

To find out the optimal hyperparameter values of the SVM model ( $\gamma$  and  $C$ ), we implemented 5-fold cross validation on the test set. We set the range for  $\gamma$  values as  $[2^3, 2^2, \dots, 2^{-8}]$  and for  $C$  values as  $[2^8, 2^7, \dots, 2^{-2}]$ . From these set of values,  $\gamma=2^{-4}$  and  $C=2^7$  delivered the best performance. We used the Radial Basis Function (RBF) as our Kernel of choice.

**TABLE II: Hardware Specifications**

Sr. No.	Motion sensors built in OnePlus 6		
	Sensor	Vendor	Version
1.	Accelerometer	BOSCH	34744578
2.	Gyroscope	BOSCH	34744578

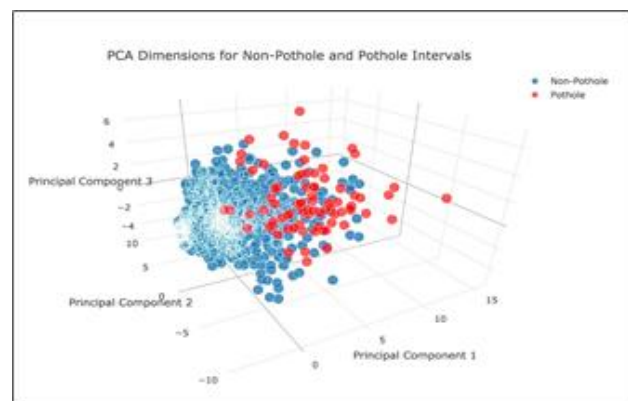
### C. Results

**TABLE III: Result of our work compared with other works**

Sr. No.	Research Work	Method	Accuracy (%)
1.	[1]	G-ZERO	73
2.	[2]	C4.5 Decision Tree Classifier	98.6
3.	[7]	LS-SVM	89
4.	[8]	ANN	90-95
5.	This research	SVM	93

The results of our work are present in Table III which also contains results of related works. (Note: The datasets used for the works presented in the table vary from each other). We used roughly 20% of our dataset as the test set and evaluated the accuracy of our SVM model on it. The SVM model delivered a promising accuracy of 93%.

Fig. 5. is the PCA analysis plot for our SVM model. Two distinct clusters can be visualized from it which shows that our SVM model is able to classify between a pothole and a smooth road accurately.



**Fig. 5 PCA Analysis Plot**

## Conclusion

The Android application can be used to effectively record and report potholes and bad roads. The SVM then automates the classification of potholes and verifies them with excellent accuracy. The important data



related to the verified reports are then sent to the database from where the Workflow Management System (web application) can retrieve it. On the WMS, the authorities can therefore see the verified reports with their important details and assign the maintenance personnel for a repair job by creating sub-tasks. The progress of these tasks is then monitored through an intricate hierarchical system and the completion of the task is then indicated at the

end. Hence with the help of this end-to-end application, the process of reporting and repair of bad roads/potholes can be streamlined.

### Acknowledgement

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**IMPACT OF DIGITAL MARKETING ON CUSTOMER AWARENESS****Monika Pathak<sup>1</sup>, Rahul Hakhu<sup>2</sup>**

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**ABSTRACT**

*Digital Marketing is a very imperative platform in the current era for which the companies are evolving constantly around the customer's belief. Digital Marketing generates the strong bond with Customer which eventually propels for interest toward the products. Aim of this study is to identify the critical factors through an extensive Review of literature which will make us comprehend the evolution of Digital Marketing and consequently the impact on the Customer for responsiveness in his or her decision making. Outcome of advertisements in the recent past through digital platforms have amplified the business and leveraging the strategy by the companies for further evolution. More and more audiences are getting connected through the Digital platforms and companies make an effort to utilize this prospect for promoting products all the way through online for creating awareness. Outcome of this study has précised the significance of Digital Marketing with the determined plan by Companies in creating the customer attentiveness towards its products.*

**Keywords:** Awareness, Customer, Digital Marketing

**Introduction**

Digital marketing is an umbrella term for marketing of products or services using digital technologies as internet, mobile phones and displays [1]. It helps in generating sales and helpful in brand recognition & brand loyalty. A digital source of marketing helps the consumers to search the product variety available according to their tastes and preferences. Digital marketing is constantly in a flux to accommodate both the rising number of e-users and latest innovations that are coming up. For promoting product and services, digital marketing uses various techniques. Due to the rapid increase of competitors in the market, the behavior of customers vary day to day basis. So, to satisfy customers and retain those companies need to understand the ever changing behaviour of customers and fulfill their demands. The world is continuously shifting from analogue to digital. People visited various e-commerce sites by using different digital means such as laptops, mobile phones, desktop computers etc. for purchasing. The Evolution has transformed since the old buying process in 1900 for Attention-Interest-desire-action (AIDA) model which was a linear path from the first contact with brand to the final purchase act. Hence, the

marketing strategy of the companies should be changed as buying behavior consumer is changing with change in technology and era, and they should focus on digital marketing instead of traditional marketing techniques. In 2000, Attention-Interest-Search-Action -Share (AISAS) model was non linear model in this through advertisements producers get attention from customers to create their interest in their product, after that consumer make search of that product with the different digital advertisements and reviews on that products for taking further action of purchased that or not, if taken decision of purchasing that they share their experience related to product or service purchased. The ways over 100 years reveal the connectivity with the importance of relationship between a company and customer on built-up mode till the latest technique of Digital Marketing [2].

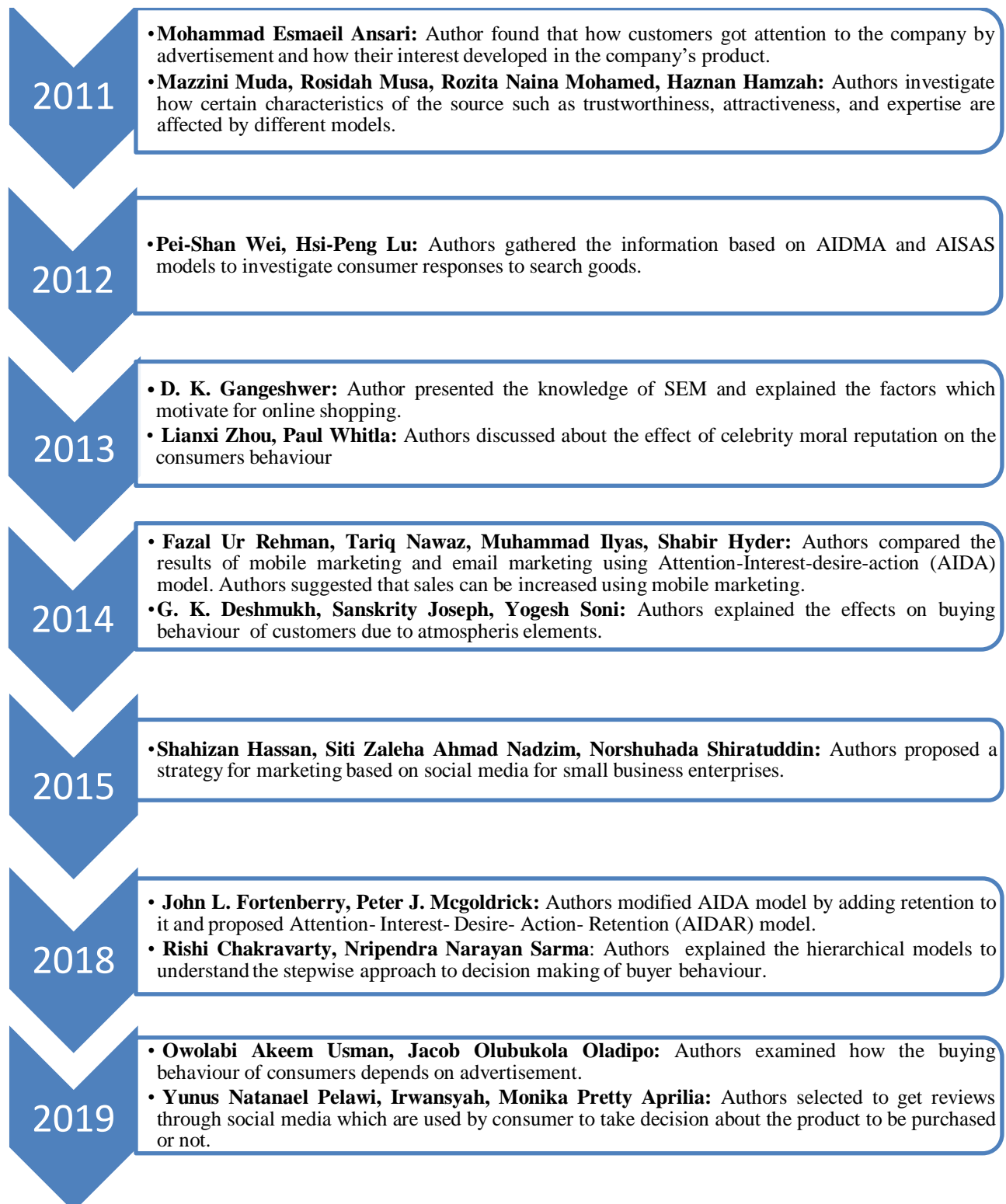
**Review of Literature**

To purchase products and services, advertisement plays an important role. Companies spend lot of money on advertisement for their products. This is a very critical factor which should be taken in to account. Previously, advertising agencies prepare ads for a company and float in the

market by various channels, which have very less impact on customers. Moreover, sometimes the advertisement of one company may have positive effects on the competitors. So, advertising companies are always trying to find new ideas to make advertisement effective. In this paper, Mohammad Esmaeil Ansari et al. [3] examined the effects of advertisement via TV of Iran's big clothing company Avishan. Mazzini Muda et al. [4] examined the impact of celebrity endorsercredibility on advertising effectiveness. Authors collected data from 422 consumers and analyses the data using multiple regression methods. Celebrities are often used as brand ambassador by the companies to promote their product. Pei-Shan Wei et al. [5] compared the online customer reviews on female shopping behavior. Results showed that consumer got more attention, desire, and action if an advertisement is endorsed by a celebrity. Consumer's perception somewhat depends on the moral reputation of celebrities. Lianxi Zhou et al. [6] explored the consumer reactions to negative celebrity publicity. Search engine marketing (SEM) is a form of online marketing that involves the use of search engine result pages to promote business websites. D. K. Gangeshwer [7] presented the conceptual knowledge of SEM for current and future aspects of e-commerce. This paper is very useful for the researchers and academicians. Fazal Ur Rehman et al. [8] assessed the effectiveness of mobile and email marketing channels using AIDA model. Authors collect data based on questionnaires from a mega store and analyze the same using logistic regression. Market depends on the customer that's why marketers always spend lot of money, time and energy to convince them by producing goods as per their needs. Due to this reason they are

regarded as the kings of market. G. K. Deshmukh et al. [9] explained the effects of atmospheric elements on the buying behaviour of customers. Social media is a best tool of marketing for small business. In this paper, Shahizan Hassan et al. [10] proposed a strategy for marketing based on social media for small business enterprises. This strategy is based on the AIDA model. This model is used for online marketing strategy. Authors gathered data of twenty two small business entrepreneurs and analyze them on the basis of AIDA model. Large displays boards are used by the companies for advertising their products, generally known as bill boards. These boards are used to generate awareness which is then measured by awareness-tracking studies. John L. Fortenberry et al. [11] examined the effects of billboards on the customers. On the basis of AIDA model they showed that billboard not only arose the interest of customers but retain the customers also. A consumer has to pass through different phases before making a final decision of purchasing a product. These phases are termed as 'Hierarchy of effects'. Rishi Chakravarty [12] explained the hierarchical models to understand the stepwise approach to decision making of buyer behaviour. Yunus Natanael Pelawi et al. [13] explained the AISAS model which is an extension of AIDA model. According to the proposed model, the first step is to find the product whose source of information is social media.

As per Figure 1, it can be seen from Reviews of about last one decade that there has been a growth for Digital Marketing which emphasis the implication with the determined plan by Companies in creating the customer attentiveness towards its products.



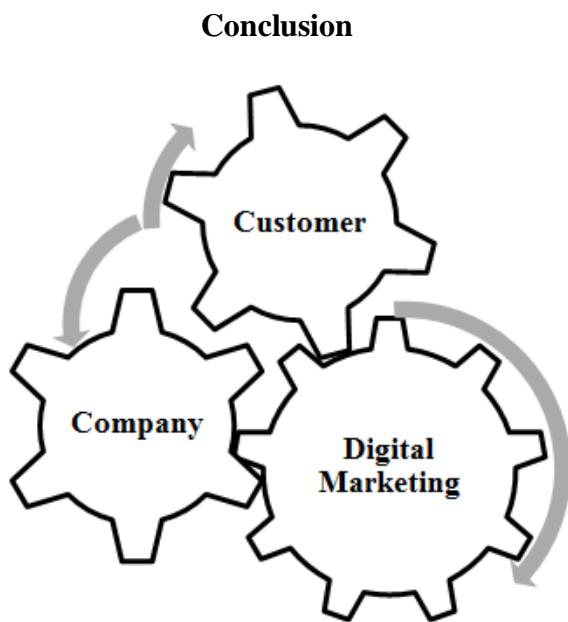
**Figure 1: Reviews of about last one decade**

**Critical Factors**



**Figure 2: Critical Factors**

As per Figure 2, three major critical factors; Social Media Marketing, Search Engine Marketing and Marketing Content through an extensive Review of literature are obtained which will make us comprehend the evolution of Digital Marketing and consequently the impact on the Customer for responsiveness in his or her decision making.



**Figure 3(Theoretical Framework for Digital Marketing)**

As per Figure 3, it can be seen in the course of the theoretical framework that the relationship between Company and Customer is reliant on Digital Marketing and it can be fulfilled that the state of mind of customers amidst ever

increasing expectations has a assortment of challenges for companies which they make the best possible efforts to carry on with the actions for placing in the Digital Marketing to endure in the present day circumstances. This study reveals about the significance which is concerning the relevance of Digital Marketing with its evolution and importantly with the ever increasing awareness level of customers. As per the Review, this study plays an important role for devising of theoretical framework in lieu of ever increasing globalization and digitalization. Outcome of advertisements in the recent past through digital platforms have amplified the business and leveraging the strategy by the companies for further evolution. More and more audiences are getting connected through the Digital platforms and companies make an effort to utilize this prospect for promoting products all the way through online for creating awareness. Conclusion of this study has précised the significance of Digital Marketing with the resolute plan by companies in creating the customer attention towards its products.

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## “GREEN MARKETING: A STUDY OF CONSUMER PERCEPTION FOR FEW SELECTED COMPANIES IN INDIA”

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### ABSTRACT

*"Let's face it - there's no planet B," French President Emmanuel Macron famously uttered while addressing US lawmakers in 2018. In 2014, during a landmark climate march in New York City, former United Nations Secretary General Ban Ki-Moon used similar words. Although the call to "Go green" has been in vogue recently, since the 19th century, the notion of environmentalism has been around. In the 60s and 70s, green activism gained momentum; millions were encouraged to pursue lifestyles that were more environmentally sustainable and ecologically responsible. So how can companies especially start-ups function so that we do not have to move to Mars to maintain a safe life on our planet? "Green Energy" offers the solution, which could reverse our detrimental influence on the Planet and slow down the effects of climate change. The International Energy Agency estimates that by 2040, the World will depend on green energy for 40% of its energy demand. The key drivers of this transition will be rapidly developing areas in Asia such as China and India, as they search for cheaper ways to generate electricity. Solar and other forms of renewable energy are highly promising to become extremely cost-effective, opening the door to attracting new business solutions that not only make our planet a safer place to live, but also produce income.*

*It is the human propensity to aspire for growth. But the new growth should not be at the expense of the future generation's misery. Therefore, the slogan of sustainable growth has been chanted by the whole world. Any progress that is made in terms of environmental protection is well known and sponsored. Green finance, green economy, green chemistry, green marketing, green economics, green marketing. Some of the concepts which have gained attention in recent years are transportation, organic farming, etc. No organization can claim it is 100 percent environmentally friendly.*

*In the marketing sector, green marketing can be regarded as such an innovative step. Goals of green marketing include implementing sustainable business practices, demonstrating social responsibility, reducing expenses (packaging, transportation, energy/water usage, etc.) and demonstrating how safe and mindful products or services are. Because of these developments, business companies understand the need to follow green philosophy in their business practices with constantly changing environmental factors and growing concerns about the environment. This has led businesses to innovate and implement a new category of goods with environment-friendly features such as energy conservation, recyclability, environmentally friendly packaging, non-toxic materials, biodegradability, etc.*

*In India, the marketing of green goods is a recent development, as there are still questions about the factors influencing Indian consumers' green preferences. The primary objective was to research the relationship between green marketing and purchase behavior by consumers. Here the quantitative research method was utilized. A survey was conducted with a hundred participants residing in different cities in India. This survey covered lifestyle measures, perception measures, attitude measures, buying intentions and demographics of the participants for generic questions about Green Marketing along with questions about products offered by three Indian brands - Amul, Mother Dairy and Patanjali.*

**Keywords:** Green Marketing, Consumer Perception, India, Corporates

### Introduction

Globalization is booming exponentially across the world, contributing to many environmental concerns. These days, some of these environmental issues have begun to come to light and people have started talking and pondering about them. People are trying to look for environmentally friendly products. In return, businesses have introduced their own plans to meet customer expectations and introduce environmentally sustainable goods to the market, also known as green products.

In recent years, sustainable development has become increasingly relevant, as most countries face severe environmental problems. It is no longer preferable to achieve development at the expense of over-exploitation of natural resources. In this context, the analysis of eco-friendly enterprises and their contribution to the country's development is significant. Sustainable company is an enterprise that has the least negative effect on the climate, the culture, society, and the economy. In this respect, the government has been promoting green organizations. Moreover, the market for green

goods has been increasing. Because of the increased understanding of environmentally sustainable goods, people favor eco-friendly products.

### 1.1 Definition and an Overview of the concept of Green Marketing

Customers frequently link green selling with footings such as reclaimable, refillable, ozone friendly and environmentally friendly (Polonsky, 1994 and Li, 2008). Although these pillars are green selling statements, green selling is a much wider construct in general. Green sale refers to consumer products, manufactured goods and services that are all healthy. Green selling has been described by the American Marketing Association (AMA) as the sale of goods that are not harmful to the natural environment (Anonymous, 2011). Similarly, Pride and Ferrell (1993) notified that the word 'green sale' represents the attempts of an administration to prepare, advance, pricing and handle items that do not affect the environment (cited in Grove et Al, 1996). Polonsky (1994) subsequently suggested a definition of green sale that has a wider focus than that of other researchers and contains all the key elements of other definitions as well. His explanation is as: Green or Environmental Marketing consists of all activities designed to bring forth and ease any exchanges intended to fulfil human demands or wants, such that the satisfaction of these demands and wants occurs, with minimum damaging impact on the natural environment."

As per Peattie (2001), green marketing's evolution can be divided into three phases: ecological, environmental, and sustainable. All marketing efforts during ecological phase (first phase) in 1980s were concerned with supporting environmental issues and providing solutions for environmental problems to the companies like oil industry, chemical industry, and mining, as these have direct effect on environment. During environmental green marketing (second phase) in 1990s, it had an emphasis was on sustainable technologies, which included the creation of creative new products that took care of pollution and waste, mainly for the products used in home like papers, cleaning items etc. Then sustainable green marketing (third phase) came into

limelight in late 1990s and early 2000, that was concerned with the production of high quality goods that can meet the needs of consumers by concentrating in an environmentally friendly way on quality, efficiency, pricing and convenience.

There is no definite and acceptable description on green products. However, some common characteristics of goods commonly recognized as green, including products, are based on various definitions of green marketing as following:

- ✓ Renewable
- ✓ Uses the least resources
- ✓ Lower hazardous emissions
- ✓ Safe and/or healthy products
- ✓ Comes with eco-friendly packing
- ✓ Has reduced or zero plastic footprint
- ✓ Has reduced or zero carbon footprint
- ✓ Can be recycled, reused and is biodegradable in nature
- ✓ Water and Energy efficient (both in use and in production)
- ✓ Grown without the use of toxic chemicals and within hygienic conditions
- ✓ Is eco-efficient (least environmental impact while manufacturing the product)
- ✓ Third party certified to public or transport standard (e.g., organic)

### 1.2 Overview and Green Initiatives of the brands - Amul, Mother Dairy and Patanjali

#### *Amul*

Amul, located at Anand in the Indian state of Gujarat, is an Indian milk cooperative society. Founded in 1946, it is a cooperative brand operated by the Gujarat Co-operative Milk Marketing Federation Ltd. (GCMMF), a cooperative body currently jointly owned by 36 lakhs (3.6 million) Gujarat milk producers. Amul sparked the White Revolution of India, which made the nation the largest producer of milk and milk products in the world. Under the guidance of Sardar Vallabhbhai Patel, Amul was spearheaded by Tribhuvandas Patel. Consequently, Kaira District Milk Union Limited was founded in 1946 (later renamed to Amul). Tribhuvandas became the organization's founding chairman and led it until his retirement in the 1970s. In 1949, he employed Dr. Verghese Kurien. Amul belongs



to Dairy and Fast-Moving Consumer Goods (FMCG) industries. Current revenue is ₹38,550 crore (US\$5.4 billion). Employees include 1000 marketing members and 36 lakh (3.6 million) milk producing members.

In 2010, the International Dairy Federation also awarded Amul Green as the Best Environment Initiative in the "Sustainability category" The Strong Green Governance Award from Srishti has also been awarded for four consecutive years since 2007.

In 2011, Amul was rated as the Top Indian Green Brand by the Global Green Brands Study which reveals current consumers' attitudes and perceptions towards green issues. The findings of 2011 emphasize that brands must not only establish environmental strategies to address their environmental effects but must also communicate with customers on a market-by-market basis in a convincing and meaningful manner. Today, it is not enough to be just eco-friendly; brands should be both green because consumer-friendly, and only this will help them win big. The Amul model has shown that it takes sustainable care of consumers, producers and of the environment.

In 2012, GCMMF's managing director R S Sodhi received Green Globe Foundation award during the 4<sup>th</sup> Green globe awards ceremony held at the 12<sup>th</sup> Delhi Sustainable Development Summit 2012. GCMMF received this award for its mass tree plantation drive and contribution to environment by the milk producers of Gujarat "The 30 lakh milk producers of Gujarat have planted more than 312 lakh trees in 15,000 villages of the state in the last five years," a GCMMF release said, adding, "Amul has set an example for all the cooperatives and other institutions to turn India green in the era of global warming and environmental crisis."

In 2013, Amul adopted green tech for its chocolate plant. The Kaira District Co-operative Milk Producers Union Limited (KDCMPUL) popularly known as Amul Dairy has adopted low carbon technology at the Amul chocolate plant at Mogar in Anand district. This project was executed by Amul, The Energy and Resources Institute (TERI), New Delhi, the Institute of Global Environment Strategies (IGES), Japan and the Japan International Cooperation Agency (JICA). After its green initiatives involving

lakhs of farmers to plant over 312 lakh saplings to make Green Gujarat and its green project at Virar in Maharashtra, the first of its kind in the dairy sector of the world, the District Milk Union's initiative came in. This project aimed at fostering energy conservation and environmentally friendly technology in small and medium-sized Indian enterprises. In 2016, Amul started selling food items under Amul Green. In 2020, the latest news about Amul is that Amul Green Outlet initiative may launch wheat atta. The business is rumored to have gone beyond milk with the blessings of over 3.6 million farmers linked to Amul. Apart from dairy products, the business has already forayed into Amul sandwich bread, Amul bun and Amul butter cookies. Amul has won the support of 36 lakh farmers and 138 Indian crores and is truly regarded as a vocal leader in local campaigning. It will be another trusted commodity in Amul's basket and customers will have the opportunity to enjoy healthier choices in Amul's category of packaged foods for cereals and grains.

#### ***Mother Dairy***

As a wholly owned subsidiary of the National Dairy Development Board, Mother Dairy (Mother Dairy Fruit & Vegetable Pvt Ltd) was commissioned in 1974 (NDDDB). It was an initiative to make India a milk-sufficient nation under Operation Flood, a milk production program. Mother Dairy provides a large portion of its demand for liquid milk from dairy cooperatives and farmer-centric organizations at the village level. It belongs to Food processing industry and is headquartered in Noida, Uttar Pradesh. Dr. Omveer Singh is Dy Managing Director. Mother Dairy offers dairy, pulses, fruits, vegetables, vegetable oil products. Mother Dairy, Safal, Dhara, Dailycious are its successful brands. Mother Dairy is a trusted brand that has been known in Delhi and NCR for consistently supplying milk for 35 years and has become an integral part of the lives of millions of people living in the region. In the branded milk segment in Delhi, Mother Dairy has been a market leader and sells close to 28 lakh litres per day in the city. Mother Dairy has a national presence across all major Indian cities, offering its customers a delectable range of items. The company sells milk products under the "Mother Dairy" brand.

Safal is the fruit and vegetable arm of Mother Dairy. It operates a large number of fruit and vegetable stores in the NCR, and also has a significant presence in Bengaluru.

Mother Dairy's green initiatives save 1,700 tons plastic a year. While it may be just a daily affair at Mother Dairy, the Milk Giant, through an extensive incomparable network of nearly 750 booths, 25 mini milk shops, 1,400 insulated container outlets and 800 containers on wheels, selling almost 11 lacs of loose pasteurized and homogenized milk every day, covering the farthest corners of Delhi, where even a two wheeler cannot pass and yet contributing to a larger one. Through doing so, it not only provides every segment of society with healthy, unadulterated, hygienic milk, but also modestly helps society save 1,700 tons of plastic every year from entering the world. Many organisations today donate a portion of their income to Corporate Social Responsibility (CSR), but the process is a CSR at Mother Dairy, allowing less plastic to reach society and serving the customer in Delhi's most remote corner. Truly, by reassuring their confidence in bulk sold loose milk, Mother Dairy consumers leave a green footprint every day.

In 2008, At the prestigious International Dairy Federation (IDF) Marketing Awards, held at the World Dairy Summit in Mexico in November 2008, Mother Dairy's 'Nutrifit Campaign' was recently awarded as the best campaign in the 'Nutri Marketing Category'.

In 2015, Safal concluded risk mitigation in agriculture at 'All India Farmers Meet' in New Delhi. This was to educate farmers about how to mitigate the different weather risks involved in farming and how to protect crops because of these impacts. This event saw overwhelming involvement from about 200 farmers across 12 states. This curriculum has demonstrated on a single platform many of the latest innovations, new crop varieties and plant safety technologies. Farmers were also told about the changing demand for the market and the value of requirements for food safety.

In 2016, Mother Dairy went Green, to provide its customers across all Mother Dairy Milk and Safal F&V Booths with jute carry bags (at a nominal cost) at outlets. This 'green initiative' was unveiled in the presence of Mother Dairy

officials at a ceremony in Udyog Bhawan by the Honourable Union Minister of Textiles, Shri Santosh Kumar Gangwar. This was a move to benefit millions of farmers. This is the only company which provides Token Milk through our milk booths, thereby saving a huge amount of plastic. By offering jute carry bags to our consumers at a nominal cost we not only address the need for an environment-friendly alternative of carry bags but also benefit millions of our farmers engaged in cultivation of jute. Mother Dairy sees it as a good mix of benefits for the consumers, farmers, and environment at the same time.

In 2018, Mother Fruit & Vegetable Dairy Pvt. Ltd. launched its Organic range of fresh fruit and vegetables and other kitchen under its horticultural brand Safal in selected 100 Safal booths across Delhi NCR, along with Safal's existing line of edibles, the new product range, branded as 'Safal Organic' was made available. Safe's newly established organic supply has been set up as per the mandate of National Programme for Organic Production (NPOP), Government of India and it also conforms to the 'Jaivik Bharat' initiative of FSSAI. For 'Safal Organic' farms with NPOP certification are selected and duly audited by Mother Dairy experts. The extracted commodity is also subject to rigorous testing by certified laboratories for 127 pesticidal residues. In addition, organic logistics is duly distinguished at all levels and processing, along with packaging storage and customer touchpoints, has also been distinguished to ensure compliance with existing standards. Safal, the founder of organized fresh fruit and vegetable retailing, currently sells horticultural goods that are not chemically altered or in any way synthesized. The brand has been instrumental in supplying directly purchased fresh produce from farmers at reasonable prices with precise weighing and in full compliance with the parameters of food safety.

In 2020, Safal distributed 1000 saplings of Holy Tulsi (Basil) in its Delhi-NCR shops. In the wake of the COVID-19 outbreak, Safal took the initiative to supply 1000 Tulsi (Basil) plants to its selected shoppers on the occasion of World Environment Day, 5 Jun 2020, taking into account the importance of immunity

boosting steps undertaken by the Ayush Ministry of Government of India.

### **Patanjali**

Ramdev established the Patanjali Ayurved Limited in 2006 along with Acharya Balkrishna, with the objective of establishing science of Ayurveda in accordance and coordination with the latest technology and ancient wisdom. Founded in 2006, Patanjali is the fastest growing FMCG company in India. It is an Indian consumer goods company. Its manufacturing units and headquarters are located in the industrial area of Haridwar, Uttarakhand while the registered office is located at Delhi. The company manufactures mineral and herbal products. Gradually, it diversified its activities to food and cosmetics. The company Patanjali has pursued green practices such as chemical-free products, the use of renewable resources, waste recycling and the development of by-products such as dish washing bars. In organic farming technology, field experiments are given greater significance. A biogas plant has recently been introduced. There were cultivated herbal gardens. More significantly, the goods are free of contaminants that are harmful. Toxic free production is guaranteed by three levels of quality control. Without any second guessing, the expired items are smashed. The business uses natural ingredients such as citric acid to the greatest degree possible, including for preservatives. The mechanized form of manufacturing results in waste reduction. Within the premises at the Haridwar production facility, battery-charged vehicles are used. Baba Ramdev proudly claims of producing eco-friendly and safe products. Patanjali manufactures a broad variety of items, including personal care such as hair oil, toothpaste, moisturizing cream, face scrub, wellness products, ayurvedic medicine, sticks of incense, and products such as corn flakes, choco flakes, biscuits, and even noodles.

Patanjali wanted to go green and its eyes were on solar equipment manufacturing sector. Getting into solar is in line with the swadeshi movement. Patanjali wanted to diversify into solar power equipment manufacturing by expanding its business beyond the FMCG. In early 2017, Patanjali acquired Advance Navigation and Solar Technologies Pvt. Ltd.

and it was reported to invest Rs 100 crore in its new factory in Greater Noida (Uttar Pradesh) and decided to diversify into solar power after they decided to use solar power in all their factories. "Patanjali Renewable Pvt. Ltd" is an extension of the vision of Baba Ramdev and Acharya Ji to concentrate on and encourage the products of "Make in India." "Patanjali Anant Urja Srot" is a front runner of the Green Revolution in India by reducing the use of fossil fuels and making the most of the infinite sunlight, proudly saving the planet by reducing the carbon emissions produced by other conventional types of electricity. In India, this solar panel maker is meeting energy targets and helping companies go green. It seeks to empower the nation to solve electricity problems in rural and urban areas of India by making solar energy affordable and available. "Patanjali Urja Kendras" will help the company to resolve the issue of accessibility in various cities, villages, and towns of the country. The company's mission is to go beyond and beyond the call of duty to provide every household in India with a bouquet of energy-efficient goods, from supporting farmers with solar water pumps to installing solar street lights in remote areas without electricity. Their current production capacity is 150 MW, and their goal is to achieve 500 MW production capacity by the end of 2021.

The business could soon come up with a 'swadeshi' line of clothes for men, women, and children. Patanjali has roped in retired army and police officers to train with Ramdev's "Parakram Suraksha Private Limited" recruits who will serve as private security guards. In addition, Patanjali Ayurveda also plans to enter the restaurant industry dominated in India by McDonald's, Kentucky Fried Chicken and Subway. The launch of its 'Divya Jal' packaged drinking water was also announced by Patanjali in September 2017.

### **Literature Review**

Green marketing has gained unprecedented recognition from researchers across the globe over the years. The entire special issue (February 2011) of the Journal of the Marketing Academy focused on the issue of sustainability and highlighted the increasing role of marketing through the production and

promotion of green goods in protecting and preserving the environment (Huang and Rust, 2011; Hult, 2011).

While the idea of the marketing of green goods (popularly known as green marketing) began to be debated in the 1960s, the concept began to be formalized and expanded only in the late 1980s and early 1990s (Akehurst et al., 2012). Green marketing was described in the workshop held by the American Marketing Association in 1974 as the study of positive and negative aspects of pollution and energy source depletion (Akehurst et al., 2012).

Green marketing, as defined by another term, consists of all planned activities to generate, and promote exchanges to meet human needs and desires with the least possible environmental effect (Polonsky, 1994). Green marketing was described by Peattie and Charter (2003) as the comprehensive management mechanism responsible for profitable and sustainable detection, anticipation, and fulfillment of consumer needs. The holistic approach towards green marketing is highlighted by this concept. This implies that green marketing requires green campaigns, from new product creation to marketing mix changes and from packaging to ads.

In their article "strategic green marketing," MacDaniel S.W & Rylander (1993) claimed that the future of business is taking shape with the main green marketing strategies. In their research article entitled "Developing Green Products: Learning from Stakeholders based on Australian and US markets, Rosenberger, Polansky & Ottman (1998) listed. The study illustrates the relationship between green product creation and the attitude and perception of stakeholders towards them. The paper's finding also indicates that stakeholders with a "high potential to influence should be involved in the green product creation process.

The reasons for the failure of green marketers have also been discussed by Ottman et al. (2006) and a notion of green marketing myopia was introduced. Green marketing, as already stated elsewhere, must concentrate on better environmental efficiency as well as customer satisfaction. Misjudging either of them or over-emphasizing the improved quality of the environment results in the green marketing

myopia crisis. Ottman et al. (2006) suggested that many green goods struggles because advertisers overemphasize the product's greenness but disregard customers' wider standards.

In his paper, Chan (2013) revealed that numerous green marketing practices exist, such as sustainability in raw material sourcing, green manufacturing, product eco-labelling, recycling, green transport, and product green pricing.

Prakash (2002) said that green marketing not only covers the promotion of eco-friendly product characteristics, but also requires the promotion of business companies' structures, policies and processes that generate and sell green goods.

Mayank Bhatia and Amit Jain (2013) acknowledged that the research has consequences for both advertisers and customers and makes a clear case for the beginning of an age of green marketing in India. Since the research has focused on a restricted geographical area, it has limited generalizability, but offers good insights into consumer behavior towards green goods. In terms of analyzing their green values and priorities, future research might concentrate on the psychographic segmentation of consumers. To get more insights into consumer behavior and to learn more about green trends, the research can be repeated on a larger scale.

Sangeetha (2015) said that green marketing strategies combine a sustainable approach from product planning to customer handling in all areas of organizational success. Companies would have to look at green marketing as an opportunity to stay in a competitive world by adopting environmentally sustainable activities such as waste management, water recycling, air quality initiatives and eco-product standardization.

In their study, Sumit Narula and Dhruv Sabharwal (2016) acknowledged that green marketing is a chance to choose globally. To keep the environment safe from pollution, it will bring some intense changes in the domains of organizations and all nations are expected to develop strict policies and principles.

## Objectives and Methodology

### 3.1 Need for the study

As it can have competitive advantages, green marketing has now emerged as one of the main areas of focus for marketers. However, in terms of technology enhancement, process modification, communicating benefits to clients, etc., investment is required. Due to some government regulations, many of the companies in India have now begun to advertise themselves as green organizations and change in customer preference around the world. However, not much research has been done in India about green marketing, and there is a concern about consumer perception of green goods.

Also controversial is the attitude of Indian consumers towards green goods and the relationship between attitude and actions. As green marketing varies from conventional marketing, marketers need to consider the variables that convince customers to purchase green goods. The purpose of this study is to answer the research questions to identify consumer affiliation with green marketing practices, to explore the preferences of consumers with respect to eco-friendly products and to explore the factors that affects the persuasion of customers to purchase eco-friendly products.

### 3.2 Objectives and Hypotheses

#### Objectives:

1. To identify consumer affiliation with green marketing practices to recognize the brands (or organizations) that offer eco-friendly products.
2. To explore the preferences of consumers with respect to eco-friendly products.
3. To explore the factors that affects the persuasion of consumers to purchase eco-friendly products.

First objective can be analyzed as per lifestyle measures of the consumers. Second objective can be analyzed as per perception measures and attitude of the consumers. Third objective can be analyzed as per demographics, purchasing decision and intentions measures of the consumers.

#### Hypotheses:

H01: There is no significant difference in the preference for green products in relation to the consumer's educational background.

H02: There is no significant difference in the purchasing behavior for green products in relation to the consumer's educational background

H03: There is no significant difference in the preference for green products in relation to consumer's income.

H04: There is no significant difference in the purchasing behavior for green products in relation to consumer's income.

H05: There is no significant difference in the preference for green products in relation to consumer's gender.

H06: There is no significant difference in the purchasing behavior for green products in relation to consumer's gender.

### 3.3 Scope of the study

The scope of the study can be defined in terms of the coverage of topics and the coverage of respondents along with the statistical tool used. In this study, topics covered are lifestyle measures, perception measures, attitude measures, buying intentions and demographics of consumers.

### 3.4 Research Methodology and Data Analysis

The unit of analysis in this study is the consumer level. Questionnaire survey was applied in this study to collect information from the consumers (*refer Annexure section 1.0 for survey questionnaire*). Information collected through consumer survey is utilized for further analysis and verification of hypotheses. The consumers were asked to fill the questionnaire in Google Form. The respondents were asked to rate the statement on a 5-point scale ranging from strongly disagree to strongly agree. Since the neutral point on the scale was 3, those means above 3 suggests overall agreement with the statement and the mean below 3 reflects disagreement. 102 responses for the survey were received.

- SPSS tool was used to conduct the hypothesis testing.
- Data was normalized.

- Following statistical test method was used to test all the hypotheses
  - ANOVA test for hypotheses based on educational background.
  - ANOVA test for hypotheses based on income.
  - T-test for hypotheses based on gender.
- Both ANOVA and T-test were conducted using 95% confidence interval.
- The Significance level or p-value was generated for each test. For p-value < 0.05, the null hypothesis was rejected. With p-value > 0.05, we failed to reject the null hypothesis.

**SPSS:** It is short for Statistical Package for the Social Sciences, and it's used by various kinds of researchers for complex statistical data analysis.

**ANOVA test:** An ANOVA test is a way to find out if survey or experiment results are significant. In other words, they help figuring

out if we need to reject the null hypothesis or accept the alternate hypothesis. Basically, we test the groups to see if there is a difference between them.

**T-test:** A t-test is a statistical test that is used to compare the means of two groups. It is often used in hypothesis testing to determine whether a process or treatment influences the population of interest, or whether two groups are different from one another.

**Significance level:** It is conditional upon the null hypothesis being true is unrelated to the truth or falsity of the research hypothesis. A p-value higher than 0.05 (> 0.05) is not statistically significant and indicates strong evidence for the null hypothesis.

After generating the data, the first step was to make the data suitable for final analysis. Data was coded by assigning symbols and characters to variables in the questionnaire. The codes have been presented in the table below:

S. No	Type of Data	Coding
1.	Items based on Likert scale	Strongly Disagree = 1; Disagree = 2; Undecided = 3; Agree = 4 and Strongly Agree = 5
2.	Gender	Female = 1, Male = 2
3.	Education	Postgraduate =1, Undergraduate = 2, Professional qualification =3, Diploma = 4
5.	Income	5-15 lacs =1, > 25 lacs = 2, 15-25 lacs = 3, 0-5 lacs = 4

## Chapter 4- Empirical Study

### 4.1 Survey Building and Data Collection

Survey was in the form of a questionnaire having questions based on lifestyle measures, perception measure, purchasing intension, demographics, and attitude measures of the consumers. The survey was opened for one week's time and sent out to nearly 350 people, of which 102 responded to the survey. Refer Annexure Section 2.0 for the distribution of respondents based on their pay scales, educational background, and gender.

### 4.2 Results

These results correspond to the objectives and hypotheses mentioned in section 3.2

**Objective 1: To identify consumer affiliation with green marketing practices to recognize the brands (or organizations) that offer eco-friendly products.**

**Result:** 42.2% of consumers bought eco-friendly products once a week. 26.5% bought once a month while 31.4% less than a month 56% of consumers bought Amul products, 11.8% Mother Dairy, 21.6% Patanjali.

### Objectives 2 & 3:

**To explore the preferences of consumers with respect to eco-friendly products. To explore the factors that affects the persuasion of consumers to purchase eco-friendly products.**

Following are the hypotheses under these two objectives along with their respective results:

### HYPOTHESIS H01

**There is no significant difference in the preference for green products in relation to the consumer's educational background.**

**Result:** Significant difference was found in the perception and attitude towards green products with respect to academic qualification of consumer, with significance level of 0.000, and

0.000 respectively, rejecting the null hypothesis and stating that qualification of consumers affected their perception and attitude towards the green products.

ANOVA test result Summary				
Dependent	Factor	Significance level	Hypothesis result	Summary
Perception	Postgraduate, Undergraduate, Professional qualifications, Diploma	0	Reject null hypothesis	There is significant difference in the preference for green products in relation to the consumer's educational background.
Attitude	Postgraduate, undergraduate, Professional qualifications, Diploma	0	Reject null hypothesis	

Findings from SPSS tool:

Descriptives									
Perception									
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum	Between-Component Variance
					Lower Bound	Upper Bound			
Postgraduate	413	3.8039	1.16285	0.05722	3.6914	3.9164	1.00	5.00	
Undergraduate	210	3.3238	1.33410	0.09206	3.1423	3.5053	1.00	5.00	
Professional qualifications	84	3.5238	1.30316	0.14219	3.2410	3.8066	1.00	5.00	
Diploma	7	4.0000	0.81650	0.30861	3.2449	4.7551	3.00	5.00	
Total	714	3.6317	1.24666	0.04666	3.5401	3.7233	1.00	5.00	
Model	Fixed Effects		1.22994	0.04603	3.5413	3.7220			
	Random Effects			0.18432	3.0451	4.2182			0.07323

ANOVA						
Perception						
		Sum of Squares	df	Mean Square	F	Sig.
Between Groups		34.078	3	11.359	7.509	0.000
Within Groups		1074.047	710	1.513		
Total		1108.125	713			

Descriptives									
Attitude									
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum	Between-Component Variance
					Lower Bound	Upper Bound			
Postgraduate	472	3.9682	1.03703	0.04773	3.8744	4.0620	1.00	5.00	
Undergraduate	240	3.3958	1.31835	0.08510	3.2282	3.5635	1.00	5.00	
Professional qualifications	96	3.6563	1.30447	0.13314	3.3919	3.9206	1.00	5.00	
Diploma	8	4.1250	1.35620	0.47949	2.9912	5.2588	2.00	5.00	
Total	816	3.7647	1.18830	0.04160	3.6831	3.8464	1.00	5.00	
Model	Fixed Effects		1.16203	0.04068	3.6849	3.8446			
	Random Effects			0.22167	3.0592	4.4702			0.10915

ANOVA						
Attitude						
		Sum of Squares	df	Mean Square	F	Sig.
Between Groups		54.373	3	18.124	13.422	0.000
Within Groups		1096.450	812	1.350		
Total		1150.824	815			

#### HYPOTHESIS H02

**There is no significant difference in the purchasing behavior for green products in relation to the consumer's educational background.**

**Result:** No significant difference was found in the purchasing decision towards green products with respect to academic qualification of consumer, with significance level of 0.223, failing to reject the null hypothesis and stating

that qualification of consumers did not affect purchasing decision towards the green products.

Significant difference was found in the purchasing intension towards green products with respect to academic qualification of consumer, with significance level of 0.000, rejecting the null hypothesis and stating that qualification of consumers affected purchasing intension towards the green products.

ANOVA test result Summary				
Dependent	Factor	Significance level	Hypothesis result	Summary
Purchasing decision	Postgraduate, undergraduate, Professional qualifications, Diploma	0.223	Fail to Reject null hypothesis	There is no significant difference in the purchasing decision for green products in relation to the consumer's educational background.
Purchasing intension	Postgraduate, undergraduate, Professional qualifications, Diploma	0	Reject null hypothesis	Differences among the means are significant.

#### Findings from SPSS tool:

Descriptives								
Purchasing decision								
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Postgraduate		1.7797	0.49368	0.06427	1.6510	1.9083	0.00	2.00
Undergraduate		1.5667	0.56832	0.10376	1.3545	1.7789	0.00	2.00
Professional qualifications		1.8333	0.38925	0.11237	1.5860	2.0807	1.00	2.00
Diploma		2.0000					2.00	2.00
Total	102	1.7255	0.51042	0.05054	1.6252	1.8257	0.00	2.00

ANOVA						
Purchasing decision						
	Sum of Squares	df	Mean Square	F	Sig.	
Between Groups	1.145	3	0.382	1.486	0.223	
Within Groups	25.169	98	0.257			
Total	26.314	101				



Descriptives								
Purchasing intention								
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Postgraduate		3.2833	1.30519	0.06422	3.1570	3.4095	1.00	5.00
Undergraduate		2.8476	1.45938	0.10071	2.6491	3.0461	1.00	5.00
Professional qualifications		3.3571	1.24806	0.13617	3.0863	3.6280	1.00	5.00
Diploma		4.4286	0.53452	0.20203	3.9342	4.9229	4.00	5.00
Total	714	3.1751	1.36018	0.05090	3.0751	3.2750	1.00	5.00

ANOVA						
Purchasing intention						
	Sum of Squares	df	Mean Square	F	Sig.	
Between Groups	41.138	3	13.713	7.618	0.000	
Within Groups	1277.979	710	1.800			
Total	1319.116	713				

**HYPOTHESIS H03**

**There is no significant difference in the preference for green products in relation to consumer’s income.**

with respect to consumers’ income, with significance level of 0.000, and 0.000 respectively, rejecting the null hypothesis and stating that consumers’ income affected their perception and attitude towards the green products.

**Result:** Significant difference was found in the perception and attitude towards green products

ANOVA test result Summary				
Dependent	Factor	Significance level	Hypothesis result	Summary
Perception	5-15 lacs,> 25 lacs,15-25 lacs,0-5 lacs	0	Reject null hypothesis	Differences among the means are significant.
Attitude	5-15 lacs,> 25 lacs,15-25 lacs,0-5 lacs	0	Reject null hypothesis	Differences among the means are significant.

**Findings from SPSS tool:**

Descriptives										
Perception										
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum	Between-Component Variance	
					Lower Bound	Upper Bound				
5-15 lacs	231	4.0303	1.12827	0.07423	3.8840	4.1766	1.00	5.00		
> 25 lacs	154	3.4610	1.02984	0.08299	3.2971	3.6250	1.00	5.00		
15-25 lacs	147	3.5306	1.11224	0.09174	3.3493	3.7119	1.00	5.00		
0-5 lacs	182	3.3516	1.51511	0.11231	3.1300	3.5732	1.00	5.00		
Total	714	3.6317	1.24666	0.04666	3.5401	3.7233	1.00	5.00		
Model	Fixed Effects		1.21676	0.04554	3.5423	3.7211				
	Random Effects			0.16651	3.1017	4.1616				0.09921

ANOVA					
Perception					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	56.964	3	18.988	12.825	0.000
Within Groups	1051.161	710	1.481		
Total	1108.125	713			

Descriptives									
Attitude									
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum	Between-Component Variance
					Lower Bound	Upper Bound			
5-15 lacs	264	4.1629	0.97106	0.05976	4.0452	4.2806	1.00	5.00	
> 25 lacs	176	3.5966	1.12214	0.08458	3.4297	3.7635	1.00	5.00	
15-25 lacs	168	3.4226	1.25492	0.09682	3.2315	3.6138	1.00	5.00	
0-5 lacs	208	3.6779	1.30295	0.09034	3.4998	3.8560	1.00	5.00	
Total	816	3.7647	1.18830	0.04160	3.6831	3.8464	1.00	5.00	
Model	Fixed Effects		1.15475	0.04042	3.6854	3.8441			
	Random Effects			0.17032	3.2227	4.3067			0.10588

ANOVA					
Attitude					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	68.057	3	22.686	17.013	0.000
Within Groups	1082.766	812	1.333		
Total	1150.824	815			

**HYPOTHESIS H04**

**There is no significant difference in the purchasing behavior for green products in relation to consumer’s income.**

**Result:** No significant difference was found in the purchasing decision towards green products with respect to consumers’ income, with significance level of 0.423, failing to reject the null hypothesis and stating that consumers’

income did not affect purchasing decision towards the green products.

Significant difference was found in the purchasing intension towards green products with respect to consumers’ income, with p-value of 0.000, rejecting the null hypothesis and stating that consumers’ income affected purchasing intension towards the green products.

ANOVA test result Summary				
Dependent	Factor	Significance level	Hypothesis result	Summary
Purchasing decision	5-15 lacs,> 25 lacs,15-25 lacs,0-5 lacs	0.423	Fail to reject null hypothesis	There is no significant difference in the purchasing decision for green products in relation to consumer’s income.
Purchasing intension	5-15 lacs,> 25 lacs,15-25 lacs,0-5 lacs	0	Reject null hypothesis	Differences among the means are significant.

Findings from SPSS tool:

Descriptives								
Purchasing decision								
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
5-15 lacs	33	1.8182	0.46466	0.08089	1.6534	1.9829	0.00	2.00
> 25 lacs	22	1.5909	0.59033	0.12586	1.3292	1.8526	0.00	2.00
15-25 lacs	21	1.7619	0.43644	0.09524	1.5632	1.9606	1.00	2.00
0-5 lacs	26	1.6923	0.54913	0.10769	1.4705	1.9141	0.00	2.00
Total	102	1.7255	0.51042	0.05054	1.6252	1.8257	0.00	2.00

ANOVA						
Purchasing decision						
	Sum of Squares	df	Mean Square	F	Sig.	
Between Groups	0.738	3	0.246	0.943	0.423	
Within Groups	25.575	98	0.261			
Total	26.314	101				

Descriptives								
Purchasing intention								
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
5-15 lacs	231	3.5628	1.21376	0.07986	3.4054	3.7201	1.00	5.00
> 25 lacs	154	2.9870	1.29850	0.10464	2.7803	3.1937	1.00	5.00
15-25 lacs	147	2.9184	1.26875	0.10464	2.7116	3.1252	1.00	5.00
0-5 lacs	182	3.0495	1.54947	0.11485	2.8228	3.2761	1.00	5.00
Total	714	3.1751	1.36018	0.05090	3.0751	3.2750	1.00	5.00

ANOVA						
Purchasing intention						
	Sum of Squares	df	Mean Square	F	Sig.	
Between Groups	52.727	3	17.576	9.854	0.000	
Within Groups	1266.389	710	1.784			
Total	1319.116	713				

**HYPOTHESIS H05**

**There is no significant difference in the preference for green products in relation to consumer's gender.**

**Result:** No significant difference was found in the perception and attitude towards green

products with respect to consumers' gender, with significance level of 0.25, and 0.41 respectively, failing to reject the null hypothesis and stating that gender of consumers did not affect their perception and attitude towards the green products.

t-test result Summary				
Dependent	Factor	Significance level	Hypothesis result	Summary
Perception	Male, Female	0.25	Fail to reject null hypothesis	There is no significant difference in the preference for green products in relation to consumer's gender.
Attitude	Male, Female	0.411	Fail to reject null hypothesis	

Findings from SPSS tool:

Group Statistics					
Gender		N	Mean	Std. Deviation	Std. Error Mean
Perception	Female	154	3.7338	1.35300	0.10903
	Male	560	3.6036	1.21558	0.05137

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper	
Perception	Equal variances assumed	3.653	0.056	1.148	712	0.251	0.13019	0.11341	-0.09246	0.35285
	Equal variances not assumed			1.080	225.422	0.281	0.13019	0.12052	-0.10730	0.36769

Group Statistics					
Gender		N	Mean	Std. Deviation	Std. Error Mean
Attitude	Female	175	3.7314	1.32954	0.10050
	Male	640	3.8266	1.13952	0.04504

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper	
Attitude	Equal variances assumed	13.775	0.411	-2.925	813	0.004	-0.29513	0.10089	-0.49318	0.09709
	Equal variances not assumed			-2.680	248.194	0.008	-0.29513	0.11014	-0.51205	0.07821

**HYPOTHESIS H06**

**There is no significant difference in the purchasing behavior for green products in relation to consumer’s gender.**

**Result:** No significant difference was found in the purchasing decision and intension towards

green products with respect to consumers’ gender, with significance level of 0.091, and 0.75 respectively, failing to reject the null hypothesis and stating that gender of consumers did not affect their purchasing decision and intension towards the green products..

t-test result Summary				
Dependent	Factor	Significance level	Hypothesis result	Summary
Purchasing decision	Male, Female	0.091	Fail to reject null hypothesis	There is no significant difference in the purchasing intentions for green products in relation to consumer's gender.
Purchasing intension	Male Female	0.75	Fail to reject null hypothesis	

Findings from SPSS tool:

Group Statistics					
Gender		N	Mean	Std. Deviation	Std. Error Mean
Purchasing decision	Female	22	2.3636	1.00216	0.21366
	Male	80	2.5750	1.25057	0.13982

Independent Samples Test											
		Levene's Test for Equality of Variances		t-test for Equality of Means							
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference		
										Lower	Upper
Purchasing decision	Equal variances assumed	2.912	0.091	-0.730	100	0.467	-0.21136	0.28953	-0.78578	0.36305	
	Equal variances not assumed			-0.828	40.845	0.413	-0.21136	0.25534	-0.72710	0.30437	

Group Statistics					
Gender		N	Mean	Std. Deviation	Std. Error Mean
Purchasing intension	Female	154	3.1753	1.35826	0.10945
	Male	553	3.1917	1.36047	0.05785

Independent Samples Test											
		Levene's Test for Equality of Variances		t-test for Equality of Means							
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference		
										Lower	Upper
Purchasing intension	Equal variances assumed	0.102	0.750	-0.132	705	0.895	-0.01636	0.12391	-0.25964	0.22693	
	Equal variances not assumed			-0.132	245.131	0.895	-0.01636	0.12380	-0.26021	0.22749	

### Conclusions And Limitations

#### 5.1 Conclusions

Significant percentage of consumers purchase eco-friendly products frequently. Close to 50%

of respondents purchased Amul and Mother Dairy products. Due to increased awareness, consumers perceive that the eco-friendly products are good for environment, have a

better quality/performance than conventional products, have a reasonable price, are well promoted, are accessible or available in supermarket. Some of consumers were undecided whether the eco-friendly products are healthy and that products are of good quality/performance. Hence marketers should focus on consumers' awareness of eco-friendly products quality and health benefits.

Consumers have shown positive attitude and positive purchasing decision towards green products at the same time they did not appreciate eco-friendly packaging and concerned with the price of such products, and advertising. This implies that Marketers should focus on the attractive packaging design, low pricing, and advertising to make consumers pay attention

Responses have been moderately supportive, and we can infer that customers are not suspicious of the organizations' green claims. In order to protect the environment, customers

may prefer green products over traditional products because of increased awareness and concern. As customers have shown willingness to purchase green goods if they are affordable, marketers should make green products available to consumers for their use.

## 5.2 Limitations

Since the study is based on a small geographical area, it has limited generalizability but offers good insights about behavior of consumers towards green (or eco-friendly) products. Future research may concentrate on psychographic segmentation of consumers in terms of evaluating their green values and preferences. To get more insights into consumer behavior and to learn more about green trends, the research can be done on a larger scale. Also, future research can replicate this work in the sense of product categories such as electronics, automobiles, etc. to gain deeper insights.

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**ANNEXTURE**

1.0 Survey

**SURVEY - Purchasing actions and attitudes towards eco-friendly items sold in your supermarket**

Dear Respondent,

We are conducting a survey to clarify the understanding of customers about Green Marketing practices followed by different brands or organizations. For this reason, we request your sincere answers. Thanks for taking the time to fill out this questionnaire. All the answers will be anonymous and used for our research paper’s purpose only. Please carefully read all the questions. This questionnaire is about eco-friendly items that you can find in your store (which cause minimal to no harm to the environment). Please be advised that by

conventional products we mean products which are not eco-friendly.

**Lifestyle measures**

1. How much in the last three months have you bought eco-friendly products?
  - Once a week or more often
  - At least once a month
  - Less than once a month

2. Which of the following eco-friendly brands you have chosen for your purchases in last three months? (A response is must in every row.)

	The least purchased	Medium frequency	The most purchased
Amul			
Mother Dairy			
Patanjali			

**Perception Measures**

3. To what extent do you agree or disagree with the following statements about the eco-friendly products:

Eco-friendly Products	Strongly	Disagree	Undecided	Agree	Strongly
1. Are good for the environment					
2. Are healthy					
3. Have a good quality/performance					
4. Have a better quality/performance than conventional products					
5. Have a good taste and/or good smell					
6. Have reasonable price					
7. Are well promoted					
8. Are accessible or available in supermarket					

4. Tick two features which you will look most in a green product.

- No use of pesticides
- No preservatives or additives
- Should contain Ayurvedic or natural ingredients
- Less environmental impact while manufacturing the product

- Completely biodegradable
  - Mostly biodegradable
  - Recyclable
  - Trusted brand
  - A brand which does a lot of green initiatives
5. Based on your answers to above questions, choose your brand preference:
- Amul
  - Mother Dairy
  - Patanjali

**Attitude measures**

6. To what degree do you agree or disagree with the following eco-friendly product statements?

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
1. I appreciate the eco-friendly product design/package					
2. I understand the information on environmental-friendly packaging					
3. For an eco-friendly product, I am willing to pay a premium price (e.g. +10%)					
4. I am paying attention to eco-friendly advertisements					
5. I understand where the environment-friendly displays are located in my Supermarket					
6. I find eco-friendly items conveniently in a supermarket.					
7. I hear and pay attention to the viewpoints of my friends/family concerning eco-friendly products.					
8. I recommend eco-friendly products to my family/friends.					

**Purchasing decision**

7. Will you purchase eco-friendly products in the next month?
- Yes
  - No
  - May be

**Purchasing intension**

8. Why would you purchase eco-friendly products? Because:

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
1. My image gets better.					
2. I want the world to be protected.					
3. I just like eco-friendly products.					
4. When I buy eco-friendly products, I feel trendy/fashionable.					
5. If I do not buy, I might be judged by people.					
6. On unplanned decisions in a supermarket, I purchase eco-friendly products.					
7. I was happy with most of the eco-friendly products I purchased.					



**Demographics**

8. Gender

- Male
- Female

9. What is your age?

- 18-24
- 25-34
- 35-44
- 45 – 54
- Above 55

10. What is the highest level of education you have completed?

- Diploma
- Undergraduate
- Postgraduate
- Professional qualifications

11. Which of the following best describes your current occupation?

- Employed
- Unemployed
- Student
- Retired

12. Your salary (per annum) best fits in:

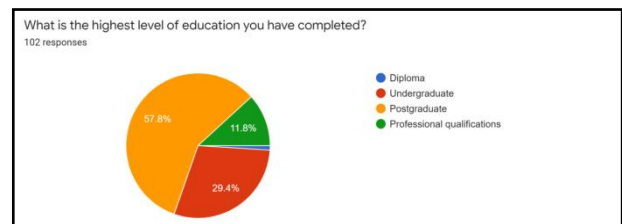
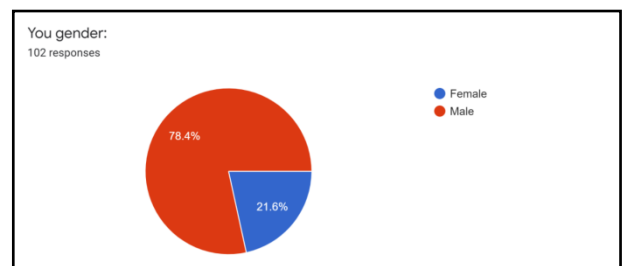
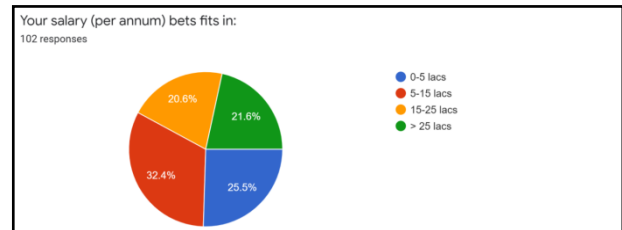
- 0-5 lacs
- 5-15 lacs
- 15-25 lacs
- > 25 lacs

13. Which of these best describes your location?

- Urban

- Rural

2.0 Distribution



## APPROACHES TO DEAL WITH BIGGER SIGNATURES FOR POST-QUANTUM TRANSITION

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### ABSTRACT

Powerful quantum computer will be reality in coming 10 years. With existence of quantum computer, cryptographic algorithms used today will be vulnerable – particularly public key encryption algorithms and digital signature algorithms. To deal with the problem, the researchers all over the world are doing research in quantum cryptography and post quantum cryptography (PQC). The challenge here is to integrate these PQC algorithms in existing protocols. So, the researchers are exploring different ways of deployment for smooth Post-Quantum (PQ) migration. The main drawback of post-quantum signature primitives is larger key size and larger signature size than traditional digital signature primitives used today. In this paper, different approaches to deal with bigger signature are discussed for smooth PQ transition.

**Keywords:** Digital Signature, Post Quantum Cryptography, Combined Signature, KEM

### Introduction

Digital signatures are extensively used today to achieve integrity, authentication and non-repudiation. Real world applications of digital signature includes interbank payments, EMV cards, certificate authority (CA), TLS, Fast Identity Online (FIDO) Authentication, Blockchain, Email, code-signing, PDF(AES, QES) [1]. Existing digital signatures are under threat with invent of powerful quantum computer. NIST has already started standardization of post-quantum cryptographic primitives including digital signatures.

While post-quantum algorithms generally have larger public keys, ciphertexts, and signatures compared to pre-quantum elliptic curve schemes, the gap is bigger for post-quantum signatures than post-quantum key encapsulation mechanisms (KEMs). Among existing post-quantum candidates, signature schemes generally have larger public key/signature sizes compared to the public key/ciphertext sizes of KEMs [2]. If a signature scheme determines that key sizes need to be higher than 10,000 bits in size to achieve 128-bit security, but the application can only support key sizes of 2,048 bits due to restrictions within the platform, then the signature scheme is not suitable for the application, regardless of the security or operational efficiency. Efficiency of digital

signature is measured by the size of the public key and signatures and by computational cost of signature generation and verification.

### Discussion

National Institute of Standards and Technology (NIST) is in the process of standardization of post-quantum (PQ) cryptographic algorithms for key encapsulation mechanisms / public key encryption and digital signatures schemes. The current PQ digital signatures under standardization have bigger signature size and key size. Due to which there is difficulty in deploying these signature primitives as it in most of the protocols and applications. The research is going on for the suitable parameters for the primitives or different solution.

By the time, these primitives are standardized and accepted, there are other different approaches which can be considered for the deployment. These approaches are discussed in the paper to deal with bigger signature and key size:

1. Signatures with Message Recovery
2. Adjustments of the Protocol to use KEMs for Authentication (KEM-TLS, PQ Wireguard)
3. Stateful Hash-based Signatures

Thereafter different ways to combine classical and post-quantum signature for smooth PQ transition are discussed in the paper. At the

end, an approach to combine signature using message recovery is proposed.

#### *Signatures with message recovery*

Message recovery in the context of a digital signature schemes minimizes the amount of information transferred. Some signature algorithms (Ex: RSA) can recover full message from the signature. If message is small, full recovery is possible. If message is big, partial recovery can be done.

#### *Adjustments of the Protocol to use KEMs for Authentication*

Post-quantum signatures are quite a bit bigger than KEMs, quite a bit slower than KEMs and it requires quite a bit extra code. In case of post-quantum TLS without handshake signatures, implicit authentication is done via KEMs. It saves bytes on the wire and server CPU cycles. KEM-TLS is an alternative to the TLS 1.3 handshake that uses key-encapsulation mechanisms (KEMs) instead of signatures for server authentication [2] [3]. PQ-WireGuard is a post quantum variant of the handshake in the WireGuard VPN protocol. PQ-WireGuard does not only consider post-quantum confidentiality (or forward secrecy) but also post-quantum authentication. To achieve this, the Diffie-Hellman based handshake is replaced by a more generic approach only using key-encapsulation mechanism (KEMs).

#### *Hash-based Signatures (HBS)*

A Hash-based signature scheme is constructed using a One Time Signature (OTS) scheme or Few Time Signature (FTS) scheme and a hash tree [4]. One-time signature schemes, unlike most other signature schemes, require only a secure cryptographic hash function and no other hardness assumption. The signature size of a hash based signature scheme depends upon core OTS / FTS scheme used. The key size of a hash based signature scheme depends on both – core OTS / FTS scheme and size of hash tree. There are few alternates for OTS schemes like Lamport OTS (LOTS), Winternitz OTS (WOTS), WOTS+, Novel OTS (NOTS) [5]. Hash-based signatures can be stateless, stateful or hybrid. Stateless and stateful HBS with advantages and disadvantages are discussed in the following sections. A reasonable compromise for stateless and stateful HBS is the hybrid scheme. A hybrid scheme is a

hierarchical signature scheme with a stateless scheme at the root level of hash tree while the other levels are stateful.

#### *Stateless Hash-based Signatures*

In stateless hash-based signatures algorithms, signature sizes are significantly higher than stateful HBS. The SPHINCS hash-based signature scheme is stateless, and thus avoids the synchronization delay and cloning problems. It can sign a nearly arbitrary number of messages, but unfortunately, it is less efficient than stateful hash-based signatures; its signatures are over 40KB in length, and they take a relatively long time to generate. SPHINCS+ is selected in NIST standardization as Round 3 alternate candidate.

There are different variations of SPHINCS schemes as mentioned below:

- SPHINCS: It uses HORST FTS and WOTS+ as its base scheme.
- Gravity-SPHINCS: It uses PORS and WOTS as its core scheme.
- SPHINCS-Simpira: Efficient version of SPHINCS

#### *Stateful Hash-based Signatures*

Hash-based signing algorithm is stateful meaning with each message being signed, the private key must change. In a stateful scheme, when a private key is long-lived, it must be stored in nonvolatile memory, and the version of the private key in memory must continuously be synchronized with that in volatile memory (e.g. RAM). State synchronization is especially important because it is critical to the security of the system; if two distinct messages are signed with the same private key, then an attacker can use those signatures to construct a forgery. Thus, after signing one message, the signer must update the state so the same key is not reused. Key synchronization also requires a time delay between signatures that can lead to a significant performance penalty [6].

Stateful hash-based signature schemes are secure against the development of quantum computers, but they are not suitable for general use because their security depends on careful state management. They are most appropriate for applications in which the use of the private key may be carefully controlled and where there is a need to transition to a post-quantum

secure digital signature scheme before the post-quantum cryptography standardization process has completed.

There are number of stateful hash-based signature schemes as listed below:

- Merkle Signature Schemes (MSS): Pioneer HBS Scheme which uses WOTS as its base OTS scheme.
- eXtended Merkle Signature Schemes (XMSS): HBS Scheme which uses WOTSPRF as its base OTS scheme. (Improved version of MSS)
- Multi-Tree XMSS (XMSSMT): Enhanced version of XMSS.
- Leighton-Micali Signature Schemes (LMS)
- BLISS

### Combined signatures

Any signature scheme that consists of two (or more) signatures on a common message is called as Dual Signature. Composite Signature is a type of dual signature that combines multiple component keys / signatures into a single object [7].

The following are different approaches to combine two signatures schemes (one classical or traditional digital signature scheme and another post-quantum (PQ) digital signature scheme):

#### Concatenation

The Composite Signature algorithm generates a single composite signature by using multiple private keys to apply multiple signature algorithms to the input message, with the resulting signature effectively being the concatenation of the individual signature values.

$S1 \leftarrow \text{Sign1}(m)$  and  $S2 \leftarrow \text{Sign2}(m)$

Here, message (m) and two signatures (S1, S2) concatenated together is sent to the receiver for verification of the message.

#### Weak-Nesting

$S1 \leftarrow \text{Sign1}(m)$  and  $S2 \leftarrow \text{Sign2}(S1)$

In this case, signature generated by one algorithm is again signed by another algorithm. The message (m) and two signatures S1 and S2 are sent to the receiver for the verification.

#### Strong-Nesting

$S1 \leftarrow \text{Sign1}(m)$  and  $S2 \leftarrow \text{Sign2}((m, S1))$

This is similar to weak nesting but message and first signature are concatenated and then signed by second signature primitive.

In above notations, Sign1 and Sign2 can be traditional digital signature or PQ digital signature, but Sign1 and Sign2 should not of same type at any given instance. Security notions considered for hybrid signatures are unforgeability (Existential UnForgeability under Chosen Message Attack (EUF-CMA)) and non-separability [8].

### Proposed Approach - Combined Signature using Message Recovery

It is similar to weak-nesting mentioned earlier. But in this case first signing algorithm to generate signature (S1) is fixed as post-quantum digital signature algorithm (Ex. Falcon, Rainbow etc) and the signature (S1) is again signed by traditional digital signature algorithm with message recovery (Ex. RSA). The sender only needs to send message (m) and signature (S2) to the receiver for the verification of the message. The receiver is able to retrieve PQ signature (S1) from signature (S2) because of full recovery of the message (i.e. S1). The PQ signature (S1) is ultimately used to verify the message received for integrity, authentication and non-repudiation.

$S1 \leftarrow \text{PQ\_Sign}(m)$  and  $S2 \leftarrow \text{Traditional\_Sign}(S1)$

The channel bandwidth is saved as only small sized traditional signature need to be sent to the receiver. The bigger PQ signature need not be sent and recovered at the receiver side.

The approach is tested in python by combining Rainbow and RSA algorithm. But, still there are number of limitations to this approach and more research need to be done to enhance it to sign bigger PQ signatures.

Limitations:

- The traditional signature algorithm should do full recovery to retrieve the PQ signature.
- For RSA-n, the size of message to be signed should be less than  $n / 8$  bytes.
- Increasing RSA key size increases key generation time also.

### Conclusion

An approach is proposed to handle bigger PQ signatures. But, the approach needs to be used with suitable traditional and post-quantum algorithms to be useful. It is tested full proof with Rainbow (signature size 64 bytes) and RSA-1024. But, signature size for some PQ

signature primitives is in range from 64 bytes to 34 KB approximately. RSA algorithm is not able to successfully sign and verify such big message (PQ signature). There is need to find an alternate to RSA for message recovery for bigger PQ signatures.

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## ANALYZING THE ADEQUACY OF PRIVACY AND DATA PROTECTION LAWS IN INDIA WITH SPECIAL REFERENCE TO PERSONAL DATA PROTECTION BILL, 2019

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### ABSTRACT

As per the information published, India recorded around 624 million internet users in July 2021 and ranks second in world as far the numbers of internet users is concerned. Due to this increases in number of internet users, the business organizations are switching to online model along with the traditional way of conducting business. Almost all the goods and services are made available to customers online. Although this technological advancements is beneficial to customers as it provides ease in purchasing goods or availing services but the fact that customer's personal information is collected, processed and stored in this process cannot be overlooked. 'Personal Information' is undoubtedly an essential aspect of 'right to privacy'. Hence it becomes paramount that breach of 'personal information' by these organizations is properly dealt with appropriate laws and regulations in place to uphold 'right to privacy' which is now a fundamental right under Part III of the Constitution of India. This paper aims to discuss concept and scope of 'privacy' in India and to evaluate provisions under the IT Act, 2000 along with the Rules, 2011 relating to privacy and data protection to provide clear understanding on present legal regime in this regard but the major focus of the paper is to critically analyze the provisions of Personal Data Protection Bill, 2019, compare it to international standard and to find out whether it will be a comprehensive and adequate law to provide sufficient protection to 'personal information' of people.

**Keywords:** Privacy, Data Protection, Personal Information, Right to Privacy, Personal Data Protection Bill

### Introduction

The right to privacy is one of the most basic human right that enables an individual to live freely without unnecessary interference from others. It is a well-recognized right in the area of International Law as it finds mention in important international documents such as "Universal Declaration of Human Rights" (hereinafter referred to as "UDHR")<sup>1</sup>, "International Covenant on Civil and Political Rights" (hereinafter referred to as "ICCPR")<sup>2</sup> and "European Convention of Human Rights" (hereinafter referred to as "ECHR")<sup>3</sup>. Article 12 of "UDHR" emphasizes on the right to privacy by stating that "no one shall be subjected to arbitrary interference with his privacy". This is reiterated in "ICCPR" and "ECHR" as well.

It is very difficult to give a specific and definitive definition to "privacy" as it is a concept that keeps on evolving with time.

According to an expert on human rights, "the right to privacy has famously eluded a concrete definition".<sup>4</sup> Because of this, privacy has been linked with different concepts such as "secrecy", "confidentiality", "the right to be let alone" etc. There are many authors who have made an effort to define 'privacy' in different contexts in their research works.<sup>5</sup> However, the Supreme Court of India has recently made an attempt to conceptualize 'privacy' by stating that "the right to privacy is essential for liberty, autonomy and the ability to live with dignity".<sup>6</sup> As far as India is concerned, the term 'privacy' does not find any mention in Part III of the "Constitution of India". However, the Supreme Court has emphasized on existence and importance of this right from time to time.<sup>7</sup>

<sup>4</sup>Ruth Gavison, 'Privacy and The Limits of Law' (1980) 89 The Yale Law Journal 421.

<sup>5</sup> Tom Gaiety Jack Hirshleifer Samuel D. Warren & Louis D. Brandeis

<sup>6</sup> K. S. Puttaswamy v. Union of India (2017) 10 SCC 1.

<sup>7</sup> See Kharak Singh v. State of UP, AIR 1963 SC 1295; Gobind v. State of M.P, AIR 1975 SC 1378; R Rajgopal v. State of TN, AIR 1995 SC 264; PUCL v. UOI, AIR 1997 SC 568.

<sup>1</sup>Universal Declaration of Human Rights, art 12

<sup>2</sup> International Covenant on Civil and Political Rights, art 17

<sup>3</sup> Convention for the Protection of Human Rights and Fundamental Freedoms, art 8.

Apart from the judgements that advocate existence of “right to privacy”, right to privacy also finds mention in different forms (explicitly or implicitly) in different statutes in India. There are certain crimes in “Indian Penal Code” (hereinafter referred to as “IPC”), that provides punishment for intruding privacy in some or the other way. A model example could be Section 509 of IPC that criminalizes intrusion on privacy of woman by either word spoken, gestures or act. Similarly, provisions of the Criminal Procedure Code also respect privacy of individuals by providing exceptional situations in which a person can be searched or arrested. The Information Technology Act also has some provisions that deal with ‘privacy’ either directly or indirectly.

Since the “right to privacy” is not explicitly mentioned as fundamental right, there was difference in the opinion of different benches of the Supreme Court. Initially, the courts followed ‘literal interpretation’ and opined that it is not a fundamental right.<sup>8</sup> Subsequently, the Supreme Court acknowledged the existence of ‘right of privacy’ but still held that it is not a fundamental right.<sup>9</sup> Later on, a smaller bench of Supreme Court opined that right to privacy is included under ‘right to life’ but is not absolute.<sup>10</sup>

This controversy was settled recently when the constitutionality of AADHAR Act was questioned in the Supreme Court.<sup>11</sup> A three-judge bench of the Supreme Court, while dealing with this case, addressed the question whether ‘right to privacy’ is a fundamental right or not. It was argued by the State that since the larger bench of Supreme Court has answered this question in negative, the ‘right to privacy’ cannot be held as a fundamental right. Therefore, this case was referred to a larger bench consisting of five Judges and thereafter to even larger bench of nine judges to put the uncertainty to rest. Finally, the nine-judge bench of the Supreme Court held that “right to privacy is a fundamental right and is an

intrinsic part of the right to life and personal liberty”.<sup>12</sup>

The individual’s right to privacy and increasing technological advancement resulting in transmission and storage of wide amount of personal information are inter-connected. This is because, personal information is a facet of individual’s privacy, and hence its protection is vital.

In the present digital age, we depend largely on online services provided by business organizations and government agencies. The number of business organizations that deal with personal information in any way are increasing tremendously.<sup>13</sup> Along with the increase in online businesses and services, the number of internet users is also on a rise. As per the government data<sup>14</sup>, there are around 450 million internet users in India and this figure is continuously burgeoning.<sup>15</sup> While these services are quite beneficial to consumers, the question if these organizations are utilizing the personal information only for the specific purpose agreed upon by the consumers cannot be ignored.

There is a lot of ‘personal information’ that is either stored, shared or transferred while using these services. The term ‘personal information’ is wide enough to include wide variety of information such as sexual orientation, relationship status, current location, bank account details etc. Personal information shared online can be made accessible to persons without even consent of the person whose information is being shared. Therefore, there are concerns relating to protection of ‘personal data’ of individuals.

To address the concerns relating to protection of ‘personal information’ countries are enacting legislations in this regard. A data protection legislation seeks to regulate the collection, storage and processing of information of individuals by public and private corporation.

At present, India does not have any specific legislation relating to protection of data. But

<sup>8</sup>M. P. Sharma v. Satish Chandra

<sup>9</sup> Kharak Singh v. State of UP

<sup>10</sup> Govind v. State of Madhya Pradesh, (1975) 3 S.C.R 946

<sup>11</sup> Justice K. S. Puttaswamy v. Union of India, AIR 2017 SC 4161.

<sup>12</sup> Justice K. S. Puttaswamy v. Union of India, AIR 2017 SC 4161

<sup>13</sup>Uber, Facebook, Zomato, Airbnb etc

<sup>14</sup>Available at <https://digitalindia.gov.in>

<sup>15</sup> Estimated growth rate of 7-8%, Available at <https://digitalindia.gov.in>

there are certain provisions in different legislations such as the “Information Technology Act, 2000” (hereinafter referred to as “the IT Act”), “IPC” etc. that either directly or indirectly entails provision relating to ‘privacy’. So far, the “Information Technology (Reasonable Security Practices and Procedures and Sensitive Person Data or Information) Rules 2011” (hereinafter referred to as “the SPD Rules”) is the most direct piece of legislation on privacy and data protection in India.

However, the IT Act and the SPD Rules address the issues relating to data protection in a limited way and are outdated. The need for having a specific and updated legislation that covers the emerging issues due to speedy technological advancement on data protection was felt and India has taken certain steps towards it.

A Committee of Experts under the Chairmanship of “Justice B N Srikrishna” who is a former judge of the Supreme Court of India was constituted in 2017 by the Ministry of Electronics and Information Technology to identify the issues relating to data protection and to suggest recommendations to overcome those issues. The committee submitted its report after thorough research and gave certain recommendations on framing data protection legislation along with the draft “Personal Data Protection Bill, 2018”.

After incorporating suggestions from different stakeholders on draft provisions of the “Personal Data Protection Bill, 2018”, a revised “Personal Data Protection Bill, 2019” (hereinafter referred to as “the Bill”) was approved by the cabinet in 2019.

Although India has been a primary location for outsourcing for a long time, the citizens of India were not concerned about the privacy breach issues initially.<sup>16</sup> But with the exponential increase in e-commerce and e-governance set up, people are slowly becoming more concerned about their privacy.<sup>17</sup>

<sup>16</sup>PRIVACY INTERNATIONAL, PRIVACY LAW IN ASIA: FINAL REPORT OF SCOPING PROJECT 21 (Nov. 2009), Available at [http://www.privacyinternational.org/issues/asia/privacy\\_in\\_asia\\_phase\\_1\\_report.pdf](http://www.privacyinternational.org/issues/asia/privacy_in_asia_phase_1_report.pdf)

<sup>17</sup> Commented by Kamlesh Bajaj of Data Security Council of India; Atul Sethi, Wherever You Click,

Moreover, due to various incidents of privacy breach which occurred in past few years, people have become more aware that their sensitive personal information is secured and is utilized only for the purpose for which they have consented. One of the most shocking incidents was breach of sensitive information like bank account numbers, bank balances etc. of almost 422 million Indians by the State Bank of India.<sup>18</sup> Another incident that shook the entire world was leak of information by ‘Facebook’ which affected around 5 lakh Indians as well.<sup>19</sup>

To analyze people’s attitude towards privacy, various surveys have also been conducted by different organizations. One of such surveys was conducted by CUTS International.<sup>20</sup> The survey involved 2160 internet users who were supposed to answer a set of questions relating to privacy. Around 60% of these people answered in affirmative when they were asked if they fear that their personal information was prone to unauthorized access. Majority of them also felt the need to create awareness among people about their right to privacy.<sup>21</sup> Similarly, in another survey<sup>22</sup>, more than 75% of respondents specified their concern that their

Someone’s watching, TOI, Jan. 3, 2010, Available at <http://timesofindia.indiatimes.com/home/sunday-toi/specialreport/Wherever-you-click-someoneswatching/articleshow/5406045.cms>.

<sup>18</sup> Available at <https://economictimes.indiatimes.com/industry/tech/8-biggest-data-leaks-of-2019-that-hit-indianusers-hard/sbi-leaves-its-server-without-any-password-protection/slideshow/72839059.cms>

<sup>19</sup> Report on A Free and Fair Digital Economy: Protecting Privacy, Empowering Indians, Committee of Experts under the Chairmanship of Justice B.N. Srikrishna, Available at [https://meity.gov.in/writereaddata/files/Data\\_Protection\\_Committee\\_Report.pdf](https://meity.gov.in/writereaddata/files/Data_Protection_Committee_Report.pdf)

<sup>20</sup> It is a non-profit organization committed to fulfilling the developmental aspirations of the poor.

<sup>21</sup> Shariq Khan, 60% Online Users Fear Unauthorised Data Collection, Only 11% Users Read Privacy Policies: Survey, ET, Mar. 11, 2019, Available at <https://economictimes.indiatimes.com/small-biz/policy-trends/60-onlineusers-fear-unauthorised-data-collection-only-11-users-read-privacy-policies-survey/articleshow/68355981.cms>

<sup>22</sup> Smita Sinha, Annual Consumer Survey on Data Privacy In India 2018, Analytics India, Available at <https://analyticsindiamag.com/annual-consumer-survey-on-data-privacy-in-india-2018/>



data could be sold to any third party and expressed that they do not want that even if that is in exchange of some features like speed etc.

Hence it can be stated that privacy concerns of people are well founded and majority of countries (108 countries) have included data protection legislation in their regime to address this concern.<sup>23</sup>

However, the latest Data Protection Bill, 2019 has faced a lot of criticisms by the researcher community on several grounds such as narrow extra-territorial applicability, narrow definition of 'sensitive information', unfettered power given to the central government etc.

Therefore, there is a need to critically analyze existing set of laws relating to data protection, compare it to the international standards and analyze recent development in the area of data protection and its implications on data privacy regime in India.

### Concept of Privacy and its Evolution in India

The concept of privacy has been in existence for many centuries but its scope and extent kept on changing with time. Although the term 'privacy' emerged from Latin word '*privus*' meaning 'single' but it is much more complex than this meaning. In general parlance, it simply refers to restricting something to oneself only.

The Black's Law Dictionary defines the right to privacy as "right to be let alone; the right of a person to be free from unwanted publicity; and the right to live without unwarranted<sup>24</sup> interference by the public in matters with which the public is not necessarily concerned".

It is not an easy task to conceptualize 'privacy' as well as the 'right to privacy'. Efforts have been made by many jurists and researchers to define privacy. Tom Gaiety<sup>25</sup> opined that, "right to privacy is bound to include body's inviolability and integrity and intimacy of personal identity including marital privacy."

Cooley<sup>26</sup> explained the law of privacy and has asserted that "privacy is synonymous to 'the right to be let alone'." Warren and Brandis<sup>27</sup> have made considerable contribution in conceptualizing privacy. According to them, "once any civilization makes a distinction between rights inherent and inalienable and rights that are in the power of government to give and take away, between public and private, between society and solitude, it becomes impossible to avoid the idea of privacy by whatever name it may be called- the idea of a private space in which man may become and remain himself".<sup>28</sup>

As far as the evolution of concept of privacy in India is concerned, it relies majorly on common law conceptions of privacy in tort and constitutional law. The Constitution of India does not provide 'right to privacy' in express terms but it is protected under Article 21 of the Constitution of India<sup>29</sup> as a necessary facet of Right to life and personal liberty.

Right to privacy has been given wide interpretation to include "Human Dignity"<sup>30</sup>, "Personal Liberty"<sup>31</sup>, "Secrecy"<sup>32</sup>, "Self-evaluation"<sup>33</sup> etc. Therefore, it can be stated that judiciary has contributed a great deal in interpreting the concept and scope of right to privacy.

Since the right to privacy is not expressly mentioned in Part III of the Constitution of India, the question whether it comes within the purview of fundamental right or not was asked for the first time in as early as 1950s in the landmark judgement of *M.P Sharma v. Satish Chandra*<sup>34</sup>. In this case, the court made a

<sup>26</sup> THOMAS M COOLEY, A TREATISE ON THE LAW OF TORTS 29 (2nd ed. 1888)

<sup>27</sup> Samuel D. Warren & Louis D. Brandeis, The Right to Privacy, 4 Harv.L. Review 193, 197 (1890)

<sup>28</sup> Samuel Warren, Louis Brandeis, "The Right to Privacy" 4 HLR 193 (1890).

<sup>29</sup> It says- No person shall be deprived of his life or personal liberty except according to procedure established by law

<sup>30</sup> *Olmstead v. U.S.*, 277 U. S. 438, 478 (1928) & *Maneka Gandhi v. Union of India*, AIR 1978 SC 597.

<sup>31</sup> *Kharak Singh v. State of U.P.*, AIR 1963 SC 1295

<sup>32</sup> *Allgeyer v. Louisiana*, 165 U.S. 578 (1897)

<sup>33</sup> Alan F. Westin, *Science, Privacy And Freedom*, 66, CLR, 1003 (1966)

<sup>34</sup> *MP Sharma v. Satish Chandra*, A.I.R 1954 S.C. 300 (India)

<sup>23</sup> UNCTAD, Global Cyber Law tracker, Available at [http://unctad.org/en/Pages/DTL/STI\\_and\\_ICTs/ICT4DLegislation/eCom-Global-Legislation.aspx](http://unctad.org/en/Pages/DTL/STI_and_ICTs/ICT4DLegislation/eCom-Global-Legislation.aspx)

<sup>24</sup> Blacks Law Dictionary

<sup>25</sup> Tom Gaiety, Right to Privacy, 12 Harvard Civil Rights Civil Liberties Law Review 233

comparison to the Fourth Amendment of the US Constitution which clearly provides protection against unwarranted search and seizure and emphasized that the Constitution of India does not use similar language. The court resorted to literal interpretation and held that the right to privacy is not a fundamental right. In *Kharak Singh*<sup>35</sup>, the Supreme Court recognized the existence of 'right to privacy' to certain extent by nullifying the Police Regulation in question that legalized domiciliary visits during the night time and stated that it is an "unauthorized intrusion into a person's home and a violation of ordered liberty." The court held that surveillance, if intrusive, is violative of freedom of movement under Article 19 of the Constitution of India.<sup>36</sup> However, it is noteworthy that at the same time, the bench did not grant the status of fundamental right to the Right to Privacy. The dissenting opinion in this judgement given by Justice Subbarao is of importance as he asserted that "even though the right to privacy is not expressly mentioned as a fundamental right, it is an indispensable and essential ingredient of personal liberty under Article 21".

This was the status quo till 1975 when while deciding on similar facts in the case of in *Govind v. State of Madhya Pradesh*<sup>37</sup>, the Supreme Court acknowledged that right to privacy can be implied from various provisions of the Constitution of India.<sup>38</sup> But the court highlighted that since it is not explicitly mentioned in the Constitution, it can be limited by any law made to uphold public interest.

Although the Supreme Court did not explicitly state that right to privacy is a fundamental right but various aspects of privacy were recognized by the court in different judgements. For example, in *Peoples Union for Civil Liberties v. Union of India*<sup>39</sup> the court highlighted that telephone conversations are very confidential and private in nature and hence telephone tapping, unless it is permitted under the

procedure established by law is violative of Right to life and personal liberty under Article 21. Similarly, subjecting accused to narco-analysis and lie detection tests<sup>40</sup>, requiring clients to fill up questionnaires that include questions relating to menstrual period and pregnancies have also been held violative of right to privacy.<sup>41</sup>

The debate regarding the status of right to privacy under the Constitution of India gained momentum in the year 2012 when the Central Government came up with Aadhaar scheme. The provisions of Aadhaar were challenged in the Supreme Court by the retired Justice K.S. Puttaswamy as violative of right to privacy.<sup>42</sup> The petitioner argued that collecting and compiling biometric and demographic information of citizens is violative of right to privacy.

Since there was no clarity regarding the position of right to privacy, the matter was referred to nine judge bench of the Supreme Court to conclusively decide on status of right to privacy in India. The bench finally declared it to a fundamental right and stated that "the right to privacy is intrinsic to and inseparable from human element in human being and core of human dignity."

#### **Analysis of Provisions under the Information Technology Act 2000 relating to Privacy and Data Protection**

The need for protecting data stems from the individual's right to privacy.<sup>43</sup> Right to privacy and data protection implies that an individual should be able to control the movement of his information. Data protection makes sure that an individual's personal information is not made available to others without his permission or consent. Therefore, data protection laws are set of legislations, rules etc. that provides legal

<sup>35</sup> Kharak Singh v. The State of U.P., (1963)1 S.C.R 332

<sup>36</sup> Article 19(1)(g) says- All citizens shall have the right to move freely throughout the territory of India

<sup>37</sup> Govind v. State of Madhya Pradesh, (1975) 3 S.C.R 946

<sup>38</sup> Articles 19(1)(a), 19(1)(d) and Article 21

<sup>39</sup> AIR 1997 SC 568

<sup>40</sup> Selvi v. State of Karnataka, (2010) 7 SCC 263

<sup>41</sup> Neera Mathur v. LIC, (1992) 1 SCC 286

<sup>42</sup> Justice K.S. Puttaswamy (Retd) v. Union of India, WP (CIVIL) NO. 494 OF 2012

<sup>43</sup> Vinita Bali, Data Privacy, Data Piracy: Can India Provide Adequate Protection for Electronically Transferred Data, 21 Temp. Int'l & Comp. L.J. 103 (2007)

safeguard to individuals from dissemination of personal information and its misuse.<sup>44</sup>

As stated earlier, India does not have any direct and specific law providing data protection presently. In this situation, the most significant and chief legislation in this regard is the Information Technology Act 2000 (hereinafter referred to as IT Act). Although it is a general legislation dealing with multiplicity of subjects such as cyber-crimes, e-commerce etc. but it still contains certain provisions that aim at protecting privacy and data of individuals. Some of the important ones are discussed below:

### 1) Liability of the Corporate

The IT Act has a specific provision for making the corporate liable in case of negligence in handling personal data or information.<sup>45</sup> According to this provision, a body corporate is liable to pay compensation in case it is negligent in dealing with or handling any individual's "sensitive personal information."<sup>46</sup> But the provision also puts a condition that the body corporate would be liable only in situation wherein such mishandling results in "wrongful loss" or "wrongful gain" to any individual.

Although the provision was added with good intention of providing data protection yet it suffers from certain defects. The major problem with the provision is regarding use of term, "sensitive personal information". The IT Act does not define this term thus making this provision ambiguous. The decision regarding the determination of what categories of information would fall under the umbrella of "sensitive personal information" is been entrusted to Central Government in consultation with professional bodies.<sup>47</sup>

### 2) Penalty for breaching the confidentiality and privacy

Section 72 of the IT Act is one of the most important provisions in the IT Act from the standpoint of privacy and data protection as it

deals directly with privacy.<sup>48</sup> This section was included to prevent misuse of the information by officials who have been given power under this legislation as well as rules made under this legislation. It is clear from the mere reading of the provision that it has very limited scope as it applies only to abovementioned officials engaging in breach of privacy and confidentiality. Therefore, any individual using internet from across the world can conveniently breach privacy without having to face liability.

### 3) Disclosure of information in breach of lawful contract

Section 72A<sup>49</sup> was included in the IT Act by the IT (Amendment Act, 2008) to further consolidate data protection regime by including in its purview "any" individuals committing breach. Although its scope is not as limited as Section 72 yet it is far from all-inclusive because of requirement to prove 'intent'. The liability of individuals depends on whether they committed the breach with the intention to cause "wrongful loss" or "wrongful gain". Therefore, it does not make mere disclosure of information an offence.

<sup>48</sup> It reads as 72) Penalty for breach of confidentiality and privacy.-Save as otherwise provided in this Act or any other law for the time being in force, if any person who, in pursuance of any of the powers conferred under this Act, rules or regulations made thereunder, has secured access to any electronic record, book, register, correspondence, information, document or other material without the consent of the person concerned discloses such electronic record, book, register, correspondence, information, document or other material to any other person shall be punished with imprisonment for a term which may extend to two years, or with fine which may extend to one lakh rupees, or with both.

<sup>49</sup>It reads as- 72A) Punishment for disclosure of information in breach of lawful contract. -Save as otherwise provided in this Act or any other law for the time being in force, any person including an intermediary who, while providing services under the terms of lawful contract, has secured access to any material containing personal information about another person, with the intent to cause or knowing that he is likely to cause wrongful loss or wrongful gain discloses, without the consent of the person concerned, or in breach of a lawful contract, such material to any other person, shall be punished with imprisonment for a term which may extend to three years, or with fine which may extend to five lakh rupees, or with both

<sup>44</sup>Shiv Shankar Singh, Privacy and Data Protection In India: A Critical Assessment, 53 JILI 663 (2016)

<sup>45</sup> The Information Technology Act, No. 21 of 2000, s. 43A

<sup>46</sup>*Id*

<sup>47</sup> Umang Joshi, Online Privacy and Data Protection in India: A Legal Perspective , 7 NUALS L.J. 95 (2013)

#### 4) Cyber Voyeurism

Another provision introduced by the IT (Amendment) Act, 2008 is Section 66E which deals with cyber voyeurism and aims to protect physical privacy of individuals. The provision makes any “intentional capturing, publishing or transmitting the image of a private area of any person without his or her consent a punishable offence”. This provision protects different aspect of privacy i.e. physical aspect instead of protection personal data.<sup>50</sup> With the huge increase in number of internet users the fear of misuse of technology has also increased and therefore this provision targets unlawful taking and spreading of obscene images online.

#### 5) Offences by Companies

The IT Act prescribes vicarious liability of companies for breach of privacy committed by its employees under Section 85. According to this provision, persons accountable for day to day working of company are to be held liable for the acts of the employees provided they indulge in breach knowingly or if there is failure in exercising due diligence on their part. Therefore, the emphasis is again on establishing ‘intent’ to make them liable.<sup>51</sup>

#### **Information Technology (Reasonable Security Practices and Procedures and Sensitive Personal Data or Information) Rules, 2011**

These Rules were formulated under Section 43A of the IT Act, 2000 with the objective of strengthening the data protection regime. These Rules were formulated to define “sensitive personal information” and to prescribe “reasonable security practices” that are to be complied by the body corporates. The Information Technology (Reasonable Security Practices and Procedures and Sensitive Personal Data or Information) Rules, 2011 (hereinafter referred to as the SPD Rules) also prescribe the compliances related to collection<sup>52</sup>, disclosure<sup>53</sup> and transfer<sup>54</sup> of the “sensitive personal information”.

According to the SPD Rules<sup>55</sup>, “sensitive personal data” is defined as- “Sensitive personal data or information of a person means such personal information which consists of information relating to password, financial information such as Bank account or credit card or debit card or other payment instrument details, physical, physiological and mental health condition, sexual orientation, biometric information, medical records and history etc.” However, there is an exception mentioned in the proviso to this provision that excludes “any information that is freely available or accessible in public domain or accessible under the Right to Information Act, 2005”.

The SPD Rules directs the Body Corporates dealing in “sensitive personal information” to have the “privacy policy for handling of or dealing in personal information including sensitive personal data or information” in place and also mandates that this policy shall be published in their website where it can easily be accessible by the providers of information.<sup>56</sup> The privacy policy shall clearly state the type of “sensitive personal information” to be collected along with the purpose of collecting that information and reasonable security measures adopted by the body corporate.

The SPD Rules provide for some safeguards relating to collection of “sensitive personal information”.<sup>57</sup> The Body corporate is supposed to obtain consent from the information providers before collecting information from them. Moreover, the information shall be collected for lawful purpose connected with a function or activity of the body corporate and only if the collection of such information is necessary for fulfilling that lawful purpose. The SPD Rules also puts restriction on body corporate from retaining information longer than required.<sup>58</sup> The provider of information have also been vested certain rights such as right to review and right to correction<sup>59</sup>, right to withdraw consent<sup>60</sup>

<sup>50</sup>TALATFATIMA, CYBER CRIMES 191(Eastern Book Company 1st ed. 2011).

<sup>51</sup>The Information Technology Act, No. 21 of 2000, s. 85(1)

<sup>52</sup> Rule 5 of Data Privacy Rules, 2011

<sup>53</sup> Rule 6 of Data Privacy Rules, 2011

<sup>54</sup> Rule 7 of Data Privacy Rules, 2011

<sup>55</sup> Rule 3 of Data Privacy Rules, 2011

<sup>56</sup> Rule 4 of Data Privacy Rules, 2011

<sup>57</sup> Rule 5 of Data Privacy Rules, 2011

<sup>58</sup> Clause 4 of Rule 5 Data Privacy Rules, 2011

<sup>59</sup> Clause 6 of Rule 5 Data Privacy Rules, 2011

<sup>60</sup> Clause 7 of Rule 5 Data Privacy Rules, 2011

The SPD Rules also cover provisions relating to disclosure of information by the body corporate to any third party. The disclosure of information to third party is permitted under the Rules but with the condition that the body corporate takes prior permission from the information provider.<sup>61</sup> However, this prior permission would not be required if any Government Agency requires the information under any law in force in India.<sup>62</sup>

The intention of the government behind framing the SPD Rules should be appreciated as the steps were taken not only to strengthen the existing data privacy regime but also align data privacy regime in India with that of the international standards. However, it cannot be ignored that these rules are not adequate in present times as it suffers from many shortcomings like narrow definition of “sensitive personal data or information”, limited scope as it only applies to India, lack of many important definitions, rights of information providers, unwarranted powers of the government and its agencies. Moreover, one of the major drawbacks of these rules is that if body corporates are dealing with sensitive personal information under any contractual obligation then they are exempted from application of Rules 5 and 6.<sup>63</sup>

### **General Data Protection Regulation (GDPR)**

Right to privacy is an intrinsic part of the ‘European Convention on Human Rights’.<sup>64</sup> To ensure protection of this right, the European Union passed the “European Data Protection Directive” in 1995 to put in place minimum standards of privacy and security for its member states to follow while enacting laws to implement the directive. However, due to massive technological advancements and increase in incidents of data breach, it was felt

that there was a need to update the said Directive and make it more comprehensive. As a result, General Data Protection Regulation (hereinafter referred to as GDPR) was drafted which came into force on May 25, 2018. The GDPR aims to protect personal data of its citizens irrespective of the fact whether it was processed within its territory or not. Following are the key features of GDPR:

**Principles Relating to Data Protection-** The GDPR lays down eight principles that are to be followed while processing data of individuals such as lawfulness, fairness, transparency, data minimization, accuracy etc.<sup>65</sup> These principles form the very basis of any data protection legal regime.

**Conditions for Consent-** The GDPR lays down the conditions for obtaining consent from data principals in a clear manner and sets emphasis on free will of data principals in giving as well as withdrawing consent.<sup>66</sup>

**Rights of Data Subjects-** To strengthen the basic right to privacy, GDPR has recognized and provided certain rights to the data subjects such as the “Right to Access<sup>67</sup>”, “Right to rectify<sup>68</sup>”, “Right to Erase<sup>69</sup>”, Right to object<sup>70</sup>” etc. It not only provides rights to data principals but also puts an obligation on controllers of data to facilitate exercise of these rights.<sup>71</sup>

**Provisions regarding transfer of data to third countries-** Personal Data of individuals may be transferred to any third country for the purpose of processing only when the third country provides adequate level of protection to the personal data. This adequacy shall be determined after considering various aspects such as legislations in place for data protection, security measures, existence of supervisory authority for data protection etc.<sup>72</sup>

**Establishing Authorities-** Apart from enlisting provisions for data protection and rights of data subjects, the GDPR also establishes authorities to ensure smooth

<sup>61</sup> Rule 6 of Data Privacy Rules, 2011

<sup>62</sup> Id

<sup>63</sup> Ministry of Communications & Information Technology, Clarification on Information Technology (Reasonable Security Practices and Procedures and Sensitive Personal Data or Information) Rules, 2011 Under Section 43A of the Information Technology ACT, 2000, August 24, 2011; Available at (pib.nic.in/newsite/erelease.aspx?relid=74990.)

<sup>64</sup> European Convention on Human Rights, 1950, art.8- “Everyone has the right to respect for his private and family life, his home and his correspondence.”

<sup>65</sup> GDPR, art. 5

<sup>66</sup> GDPR, art. 7

<sup>67</sup> GDPR, art. 15

<sup>68</sup> GDPR, art. 16

<sup>69</sup> GDPR, art. 17

<sup>70</sup> GDPR, art. 21

<sup>71</sup> GDPR, art. 12

<sup>72</sup> GDPR, art. 45

implementation of its provisions. At the ground level, the controllers and processors are supposed to appoint a Data Protection Officer (DPO) to monitor compliance of provisions of GDPR.<sup>73</sup> Moreover, on a much higher level, the member states are required to establish an independent supervisory authority to monitor compliance at the level of Union.<sup>74</sup>

### Analysis of the Personal Data Protection Bill, 2019

The efforts for drafting a legislation on Data privacy and Data Protection began in 2017 when the Ministry of Electronics and Information Technology (hereinafter referred to as MeitY) constituted a committee of experts under the chairmanship of the retired Supreme Court judge Justice B. N. Srikrishna. The main objective of the committee was to find out gaps in existing data protection regime in India and come up with a comprehensive piece of legislation for addressing these gaps. A draft Bill was published in 2018 and the MeitY invited comments and suggestions on the bill from various stakeholders, public, ministers etc. The MeitY made the required changes in the bill on the basis of the suggestions received and finally a revised Personal Data Protection Bill, 2019 (hereinafter referred to as the bill) was presented before the Parliament.

**Objective of the Bill:** The central objective behind drafting the bill was to protect the right to privacy of citizens of India and to create an environment where they can trust the controllers of data that their privacy will be protected.<sup>75</sup> With the increasing dependency on digital forum for communication and business, the bill entails the provisions to uphold the principles of “free and fair digital economy”.

**Scope and applicability of the Bill:** The territorial applicability of the bill is quite wide as it not only includes within its purview the data collected, disclosed or processed within India or by any corporation incorporated under Indian law but also data processed outside the territory of India in certain conditions such as, if the processing involves data of Indian citizens or processing is done in connection with any business conducted in India.<sup>76</sup>

However, the bill clearly specifies that it does not apply to anonymized data.<sup>77</sup>

**Definitions:** Due to absence of any specific legislation on data protection in India, many terms which are central to any data protection legal regime were not defined. This inadequacy has been taken into consideration and effort has been made to define these terms such as “consent”<sup>78</sup>, “data principal”<sup>79</sup>, “data fiduciary”<sup>80</sup>, “financial data”<sup>81</sup>, “genetic data”<sup>82</sup>, “personal data breach”<sup>83</sup>, “processing”<sup>84</sup> etc. Moreover, it has significantly enlarged the scope of “sensitive personal data” as compared to its definition under the SPD Rules by including information such as health data, genetic data, sex life etc. within its purview.<sup>85</sup>

However, the central government (in consultation with the independent authority) has been given the authority to declare further categories of personal data as “sensitive personal data” resulting in dilution of powers of the independent authority.<sup>86</sup> It is noteworthy that this power was supposed to be given to the independent authority as per the recommendations made by the Committee of the Experts.<sup>87</sup>

**Obligations of Data Fiduciary:** To regulate processing of data by the data fiduciaries, the bill puts certain obligations which are to be fulfilled by them. There is a restriction imposed by the bill on the processing of data unless and until the purpose of the processing meets the criteria of being “clear, specific and lawful”.<sup>88</sup> In cases where processing is permissible, the data fiduciaries are obligated to ensure that the processing is done in “fair

<sup>77</sup> Clause 2 (B) of the Personal Data Protection Bill, 2019

<sup>78</sup> Clause 3(10) of the Personal Data Protection Bill, 2019

<sup>79</sup> Clause 3(15) of the Personal Data Protection Bill, 2019

<sup>80</sup> Clause 3(13) of the Personal Data Protection Bill, 2019

<sup>81</sup> Clause 3(18) of the Personal Data Protection Bill, 2019

<sup>82</sup> Clause 3(28) of the Personal Data Protection Bill, 2019

<sup>83</sup> Clause 3(29) of the Personal Data Protection Bill, 2019

<sup>84</sup> Clause 3(31) of the Personal Data Protection Bill, 2019

<sup>85</sup> Clause 3(36) of the Personal Data Protection Bill, 2019

<sup>86</sup> Clause 15 of the Personal Data Protection Bill, 2019

<sup>87</sup> Report on A Free and Fair Digital Economy: Protecting Privacy, Empowering Indians, Committee of Experts under the Chairmanship of Justice B.N. Srikrishna, Pg. 30, Available at [https://meity.gov.in/writereaddata/files/Data\\_Protection\\_Committee\\_Report.pdf](https://meity.gov.in/writereaddata/files/Data_Protection_Committee_Report.pdf)

<sup>88</sup> Clause 4 of the Personal Data Protection Bill, 2019

<sup>73</sup> GDPR, art. 39

<sup>74</sup> GDPR, art. 51

<sup>75</sup> Preamble to the Personal Data Protection Bill, 2019

<sup>76</sup> Clause 2 (A) of the Personal Data Protection Bill, 2019

and reasonable manner” and only for the purpose for which the data principals have given consent. Data fiduciaries are further obligated to make sure that the right to privacy of the data principals is not violated at any time during processing.<sup>89</sup>

The bill also requires the data fiduciaries to keep the data principals informed about the purpose for which their data is collected, their right to withdraw consent, any third-party transfer, if involved in processing etc. in “clear, concise and comprehensible” manner via notice.<sup>90</sup> Additionally, data fiduciaries are restricted from retaining personal data after the purpose for which it was being processed is completed.<sup>91</sup> The burden of upholding the provisions of the bill is placed on the data fiduciaries.<sup>92</sup>

**Consent:** “Consent” plays a very important role in data protection legislation and therefore it becomes vital that the term is defined and conditions for valid consent are laid down properly in any data protection law. The bill does not give any specific definition as to what does “consent” mean but it lays down conditions for “valid consent”. The person who wishes to process personal data of data principals will have to seek consent from them before commencing the processing. The consent to be valid shall be free, informed, specific, clear and capable of been withdrawn.<sup>93</sup>

The standard for determining whether the consent was given freely or not would be same as specified in Section 14 of the Indian Contract Act, 1872. The question whether the consent obtained is an ‘informed consent’ or not will be addressed by determining whether the conditions under Clause 7 of the bill<sup>94</sup> have been fulfilled or not.

As far as “sensitive personal data” is concerned, the bill imposes stricter conditions for “valid consent” such as informing the data principal of significant harm that could be caused to him, giving the choice to data

principal for separately consenting for different categories of “sensitive personal data”. Moreover, the burden of proving that consent obtained by the data principal is “valid consent” lies on data fiduciary.<sup>95</sup>

However, there are certain situations specified in the bill wherein the consent of data principal personal data is not required. Processing of personal data can be done without the consent of data principal in situations where the government is performing function under any law to benefit the data principals or to provide certain services or certificate, license etc.<sup>96</sup>

**Rights of Data Principals:** The bill provides various rights to the data principals such as right to confirmation as to processing of personal data, right to access the identities of data fiduciaries with whom his personal data are shared<sup>97</sup>, right to correct, complete, update and erasure of personal data subject to certain conditions<sup>98</sup>, right to discontinue disclosure of personal data to data fiduciary.<sup>99</sup>

However, these rights are not absolute and are subject to certain restrictions that vary for different rights. But there are some conditions that are to be fulfilled in assertion of all the rights such as making a written request to data fiduciary. The data fiduciary can even refuse such request after providing sufficient reasons for it. Generally, data fiduciary is obliged to comply with the request except when compliance with the request in anyway harm the rights of other data principals.<sup>100</sup>

Although it is understandable that like any other right, the rights of the data principals are not absolute, however, certain provisions weaken the very purpose of certain rights. For example, the data fiduciary is obligated to notify about the breach of privacy to the authority, which in turn will verify if such breach would cause “harm” to the data principal or not and will notify the data principals about the breach only when the breach may cause “harm” to data principals. Therefore, breach of privacy per se is not notified to the data owners.

<sup>89</sup> Clause 5 and 6 of the Personal Data Protection Bill, 2019

<sup>90</sup> Clause 7 of the Personal Data Protection Bill, 2019

<sup>91</sup> Clause 9 of the Personal Data Protection Bill, 2019

<sup>92</sup> Clause 10 of the Personal Data Protection Bill, 2019

<sup>93</sup> Clause 11 of the Personal Data Protection Bill, 2019

<sup>94</sup> Lays down provision regarding the requirement of notice for collection or processing of personal data.

<sup>95</sup> Clause 11 of the Personal Data Protection Bill, 2019

<sup>96</sup> Clause 12 of the Personal Data Protection Bill, 2019

<sup>97</sup> Clause 17 of the Personal Data Protection Bill, 2019

<sup>98</sup> Clause 18 of the Personal Data Protection Bill, 2019

<sup>99</sup> Clause 20 of the Personal Data Protection Bill, 2019

<sup>100</sup> Clause 21 of the Personal Data Protection Bill, 2019

Moreover, the right to withdraw consent is severely weakened by the requirement to give “valid reasons” for such withdrawal. What all is included under “valid reasons” is not even defined in the bill thus leading to ambiguity.<sup>101</sup>

**Data Protection Authority:** According to the bill, the central government shall establish Data Protection Authority of India (hereinafter referred to as the Authority)<sup>102</sup> with the responsibility of protecting interest of data principals, preventing the misuse of personal data and promoting awareness among public.<sup>103</sup> The Authority shall be a ‘body corporate’ having perpetual succession, common seal, power to acquire, hold and dispose property. The Chairperson and other members of the Authority shall be appointed by the central government in consultation with selection committee.

Establishment of the authority is in line with the requirement of creating an independent authority under GDPR. The GDPR greatly emphasizes on “independence” of the authority and its exclusion from external influence. Moreover, it is regarded as one of the important features of any strong data protection regime.

However, the authority under the bill is not that “independent” as it is bound by the directions (related to policy) given to it by the central government. In fact, the decision whether the direction is related to policy or not also lies with the government.<sup>104</sup> Therefore, it can be easily said that powers of central government supersede the powers of the authority and majorly dilute its independence.

**Significant Data Fiduciary:** Data Fiduciaries can be further classified into “significant data fiduciary” (hereinafter referred to as SDF) by the Authority after considering factors such as the data fiduciary deals with large volume of personal data, deals with sensitive personal data, has high annual turnover, using new technology for processing etc. Social media intermediaries having high number of users (threshold to be declared by the central

government) shall also be considered as SDF.<sup>105</sup>

This classification is vital because they have to observe stricter compliances such as conducting data protection impact assessment<sup>106</sup>, maintenance of certain records<sup>107</sup>, conducting audits in timely manner<sup>108</sup>, appointment of Data Protection Officer<sup>109</sup>. They have stricter obligations considering the impact that they may have in case of breach as they deal in either large quantities of data or data that is highly sensitive in nature.

Since there are stricter regulations for SDF, the power to declare a particular data fiduciary to be a SDF should be given to an independent authority to eliminate bias of the executive. However, the bill confers the power to the central government (in consultation with the Authority) to declare any “social media intermediary” to be an SDF.

**Transfer of Personal Data outside India:**

Transfer of sensitive personal data for the purpose of processing is permissible under the provisions of the bill provided explicit consent is taken by the data principals and the contract for transfer is approved by the Authority. However, there are exceptions where transfer cannot take place such as for the purpose of storage of sensitive personal data or transfer of critical data for the purpose of processing or storage.<sup>110</sup>

Since there are different regulation for different categories of data for the purpose of transfer, there are concerns among the data fiduciaries. The central government has the power to declare any personal data as “sensitive personal data” and “critical data”, therefore affecting their data localization requirement. Hence, the central government along with the authority possess huge discretionary power regarding what kind of data is to be localized.

**Exemptions from the provisions of the bill:**

The central government has been given authority under Clause 35 of the bill to exempt

<sup>101</sup> Clause 11(6) of the Personal Data Protection Bill, 2019

<sup>102</sup> Clause 41 of the Personal Data Protection Bill, 2019

<sup>103</sup> Clause 49 of the Personal Data Protection Bill, 2019

<sup>104</sup> Clause 86 of the Personal Data Protection Bill, 2019

<sup>105</sup> Clause 26 of the Personal Data Protection Bill, 2019

<sup>106</sup> Clause 27 of the Personal Data Protection Bill, 2019

<sup>107</sup> Clause 28 of the Personal Data Protection Bill, 2019

<sup>108</sup> Clause 29 of the Personal Data Protection Bill, 2019

<sup>109</sup> Clause 30 of the Personal Data Protection Bill, 2019

<sup>110</sup> Clause 33 and 34 of the Personal Data Protection Bill, 2019



any agency of the government from the application of the provisions of the bill if it deems it necessary in the interest of sovereignty and integrity of India, security of the state, preventing incitement to any cognizable offence etc.<sup>111</sup>

These exemptions are restrictions on right to privacy of individuals and therefore it has to meet the requirements set forth in the *Puttaswamy*<sup>112</sup> judgement. One of the requirements is that restriction can be imposed by a law passed by parliament only. However, Clause 35 of the bill restricts the right to privacy an executive order passed by the central government and therefore is not a fair restriction.

### Conclusion

We live in highly digitalized world today and are extremely dependent on internet for availing various services. From ordering vegetables and groceries from mobile apps<sup>113</sup> to arranging marriages with the help of mobile apps.<sup>114</sup> While we benefit from these services, we have to understand that we are sharing large amount of sensitive personal data in this process.

There is growing concern relating to online privacy around the world and different countries have been coming up with Data Protection and Data Privacy Laws from time to time. More recently, the EU framed GDPR which is the most comprehensive and direct data protection regulation so far. It can be seen as a standard for the countries that in process of drafting data protection laws.

As far as India is concerned, the IT Act, 2000 along with the SPD Rules is not adequate as it is not a special law to deal with issues relating to privacy and the data protection. To overcome this inadequacy, the Personal Data protection Bill has been drafted. This is welcome step by the government to strengthen the existing data privacy and protection regime in India. The bill clearly provides definition of important terms such as “personal data”, “sensitive personal data” etc. It lays down right of data principals as well as obligations of data

fiduciaries. To ensure protection of privacy, it contains stricter liabilities. The bill is based on GDPR and efforts has been made to make it as comprehensive as possible by including various aspects of data privacy. It can definitely be seen as a progressive piece of legislation.

However, there are certain provisions in the bill which raise concern and need to be addressed. The most debatable point regarding the bill is huge unwarranted powers given to the central government like binding nature of directions to the independent authority by the central government, the power of exemption to any agency of the government from requirement of bill, power to enlist further “personal data” as “sensitive personal data”, power to decide the categories of information that will qualify as “critical data” etc.

Moreover, the bill has adopted “harm-based approach” throughout its provisions. Although the decision of adopting this approach is reasonable but the bill has used ambiguous terms such as, “loss of reputation”, “any discriminatory treatment” while defining “harm” which will result in difficulty in establishing liability of data fiduciary. Therefore, there is a need to further strengthen the bill.

Our reliance on technology has increased more than ever due to outbreak of coronavirus. All the official meetings, classes etc. are taking place online, payment through digital platform such as Paytm, Google Pay etc. has gained momentum as it offers no physical touch transaction of money, e-governance and e-courts models has been proposed. Some of these models may stay with us for a long period of time due to convenience and practicality. It is also noteworthy that India ranks very low in protection of privacy of its individual as per a report.<sup>115</sup> This shows the need to implement a strong data protection legislation in India and it should be the priority of the government. It is not wrong to assert that it is the need of the hour to have a comprehensive and flexible data protection legislation in India.

<sup>111</sup> Clause 35 of the Personal Data Protection Bill, 2019

<sup>112</sup>(2017) 10 SCC 641

<sup>113</sup> Apps such as Big Basket, Grofers etc.

<sup>114</sup> Apps such as Jeevansaath, Shaadi.com etc.

<sup>115</sup>Paul Bischoff, 'Surveillance States: Which countries protect privacy of their citizens', Available at <https://www.comparitech.com/blog/vpn-privacy/surveillance-states/>

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## THE HUMAN COST OF COUNTER-TERRORISM IN INDIA

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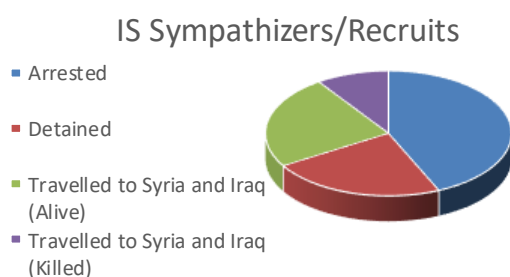
### ABSTRACT

*Terrorism makes for one of the biggest challenges to global security owing to its constant but evolving nature. Counter terrorism measures having an adequate balance of rigour and fairness are the ultimate aim under the universal understanding of human rights. An acknowledgment and understanding of the creation of this balance travels through criminal justice mechanisms. What is also imperative in the increased mindfulness of the new-age terrorist with regard to existing counter terrorism measures. Methods of terrorism have changed; however, counter terrorism measures continue to be based on the same global understandings and principles making such measures an anti-thesis to their very purpose. In India, the Constitution, along with special legislations dealing with terrorism have been aimed at formulating and implementing counter-terrorism strategies believed to be best suited for it. Similar to the global trend, India has witnessed numerous shifts in the way terrorism affects it however, no exponential change has been seen in the offense against such acts. The lack of a clear definition of the term “terrorism” creates great scope for improper application at the very offset. This paper seeks to understand this changing trend of terrorism in India and around the world in light of the human rights implications that come with counter terrorism.*

**Keywords:** Terrorism, Human Rights, Accused

### Introduction

The means and methods of terrorism are constantly evolving; as many as 76 active terrorists or insurgent groups are believed to be functioning within India (South Asian Terrorism Portal, 2020) with the threat from them increasing at a steady pace. The excessively porous borders on both sides has been a problem ever since the inception of independent India.



**Source:** South Asian Terrorism Portal (2017)

The threat however, has gained a more international flavour with the slight but noticeable presence of the Islamic State (IS) in India. The strategies of counter terrorism on the other hand, do not seem to have changed in India over the past six decades. Repressive counter terrorism laws continue to exist despite protests which have ranged from “nude marches” to hunger strikes, the most infamous

being Irom Sharmila’s 16-year long fast (Haragopal & Jagannatham, 2009).

The administration of Criminal Justice, especially in India, is known to protect the interests of the accused. The procedure in respect of the terrorism and security laws however, function on the pretext of “national security” and hence are of a more stringent nature. The protection of this national security often comes at the expense of human rights. This paper seeks to understand this interplay between counter-terrorism strategies and human rights interests of terrorist-accused in India.

### Objective

To examine protection of rights of an accused in cases of terrorism in India

### Research Methodology

Doctrinal Research Methodology, also known as armed chair research, has been employed in the completion of this paper. All data used has been assimilated from primary and secondary sources like authentic websites, statutes, commentaries, conventions, journals, etc.

### Scope and Limitations

This paper limits itself to analysing the situation in India by way of the main constitutional and special law provisions mentioned. It does not delve extensively in the judicial side of interpretation.

### Literature Review

The existing literature on terrorism has no limits. The literature used herein covers an analysis of general and special laws in India, developed out of the legislative intent of curbing terrorist activities and international publications critiquing traditional understanding of terrorism. This paper aims to achieve a common ground; understand the intent of the old approach and bring in the new and aims to bridge this generational gap. What was viewed as terrorism 20 years ago is not the same as what will be terrorism 20 years from today, those affected by it however, will always be human. It is this dilemma that this paper wishes to address.

The literature reviewed is categorized under **three main themes**. The first among these themes is the **Indian Perspective** spanning from the colonial understanding of terrorism to the present-day militancy and ideology-based scheme of things.

*“Colonial Continuities: Human Rights, Terrorism, And Security Laws in India”* (Conroy, Kalhan, Kaushal, Miller & Rakoff, 2006) tries to understanding the colonial underpinning in the recent security and anti-terrorism laws in India and draws inference to the way in which human rights were given importance in the past and reflects on the same in the present times. *“Terrorism and Human Rights: Indian Experience with Repressive Laws”* (Terrorism Portal, 2020) and *“Judiciary’s Skewed Vision of Natural Justice”* (South Asia Human Rights Documentation Centre, 2011) evident from their titles, are aimed at showcasing the fallacies in the way in which the Indian State has understood and implemented humanitarian principles adopted worldwide. While the former highlights a legislative and executive aspect of the problem with regard to anti-terrorism laws, the latter calls the judiciary out on its way of understanding the principles of natural justice. Vidhi Centre for Legal Policy’s Report on *“Anti-Terror Law in India”* (Bhandari, Das,

Gupta & Sen, 2015) looks at existing laws and decisions of the Indian judiciary up until 2014 giving a wholistic idea about the way terrorism is dealt with in India. It lays down the entire prosecution process which terrorism cases in India follow and also quantifies its distance from the constitutional ideals of due process.

*“Jurisprudence of Anti-Terrorism Laws: An Indian Perspective”* (Garge, 2019) goes into the schematics of the law and brings out loopholes in the investigation and legal mechanics of anti-terrorism practices in India. It focuses on the complexities of the federal structure in which these practices function. Prof. (Dr.) Ranbir Singh’s *Critique of Recent Legislations on Terrorism in India from Human Rights Perspective - Do We Need Special Laws?* (Singh, 2009) provides plausible recommendations to address the multiple fallacies identified in the current system.

The *“Committee on Reforms of Criminal Justice System Report”* (Ministry of Home Affairs, 2003) is a primary source by the Government of India capturing the need for greater recognition of the rights of accused and the various factors like money and drugs that figure into the terrorism situation in India.

The second theme focuses on a **psychological and ethical approach** to terrorism and its application. The reviewed literature seeks to understand the psychological bend of the “new” terrorist and the newer challenges that accompany this mindset.

*“Dealing with the Modern Terrorist: The Need for Changes in Strategies and Tactics in the New War on Terrorism”* (Albini, 2001) brings into picture the new, more sophisticated and technologically advanced terrorist who has found a way around conventional anti-terrorism mechanism. *“The Situational Prevention of Terrorism: Some Ethical Considerations”* (Clark & Newman, 2007) focuses on the ethics of the way in which terrorism continues to be viewed and understands that a terrorist is fuelled by human rationales and decision-making abilities.

*“Utilitarianism and the Morality of Indefinite Detention”* (Roberts, 2011) highlights the implications of the terrorist obsession on the failure of the existing counter-terrorism strategies. The work is based on finding a

balance between individual liberty and the need to maintain collective security. *“Detecting mental health problems and suicidal motives among terrorist and mass shooters”* (Lankford, 2016) analyses how terrorists or prospective terrorists can be identified from mental health issues. It studies these individuals not as terrorists but as subjects and studies both their origins and their prospective future actions.

The third theme is **International**. Studying the efforts of the United Nations (UN) and organisations like the International Criminal Court, the literature reviewed in this theme aims to bring into light a universal aspect of the idea. Through the recent UN Publication *“International Instruments related to the Prevention and Suppression of International Terrorism”* (United Nations, 2019) the various universal treaties and conventions that have been promulgated till date with regard to terrorism are understood and the text acts as a great reference to see the evolution of the way in which terrorism has changed with time. *“Report of the High-level Panel on Threats, Challenges and Change”* (High-level Panel on Threats, Challenges and Change, 2004) further understands the changing face of terrorism in the early stages of the 21<sup>st</sup> century.

The *“United Nations Global Counter-Terrorism Strategy”* (United Nations General Assembly, 2006) lays down strategic guidelines in the form of a plan with four broad measures targeting the conditions conducive to terrorism. In continuation of this strategy, the Office of the United Nations High Commissioner for Human Rights came out with a fact sheet on *“Human Rights, Terrorism and Counter-terrorism”* (Office of the United Nations High Commissioner for Human Rights, 2008) assessing the human cost of the strategy and raising awareness about the impact of the strategy on the human rights of all.

The authors then review works highlighting the functioning of the ICC in matters of terrorism. Both *“Humanizing Terrorism Through International Criminal Law: Equal Justice for Victims, Fair Treatment of Suspects, and Fundamental Human Rights at the ICC”* (Maloney-Dunn, 2010) and *“Prosecuting Terrorists at the International Criminal Court: Re-evaluating an Unused Legal Tool to Combat Terrorism”* (Cohen, 2012) elaborate

the workings of the ICC and spell out how cases of terrorism are understood in the international sense. Highlighting the fair treatment issues and technicalities of prosecution in the ICC respectively, both the works provide a wholistic understanding of the ICC system with regard to terrorism.

The paper provides a case study analysis of the Israeli system which, in the opinion of the authors comes closest to the setting within which India exists. The system is understood from *“The Israeli Model for Policing Terrorism: Goals, Strategies, and Open Questions”* (Jonathan, Perry & Weisburd, 2009) It explains in explicit detail the working of the Israeli counter-terrorism mechanism and provides great reference points for adoption.

With the cumulative understanding of the themes, the authors wish to draw attention to the need to bring about reform in the Indian counter-terrorism strategies by learning from the past and moving towards a better future.

### **Constitutional Protection to the Rights of Accused**

Before getting into the specifics of counter terrorism laws, it is important to reflect upon the existing constitutional principles in the Indian context. The Indian Constitution, the edifice of all laws in India has, conferred certain rights under Part III, i.e. Fundamental Rights. The Constitution empowers the accused not to be prosecuted and tried for the offence more than once by way of Article 20 and also protects the accused from giving evidences against themselves. Article 22 ensures that an accused is produced before the nearest judicial magistrate within 24 hours of his/her arrest and informed of the grounds of their arrest. Additionally, Article 21 has been crafted over time to include within its ambit, the right to a free and fair trial, becoming one of its essential elements.

The Indian Constitution recognises the accused as a human first and hence, has been structured accordingly; upon declaration of sentences, the accused can approach the President of India for remission, suspension or commutation of sentence. The question of their implementation however, is based on the gravity of the acts constituting terrorism and makes the applicability of the terrorism laws in India

more deep-rooted than the simple interpretation of rights of accused guaranteed by the Constitution.

However, it is imperative to keep in mind all laws are to flow from the Constitution which is the origin of all legislation in India as has been held in *Vikas v. State of Rajasthan*. The considerations of personal liberty have often been reiterated at the various stages of an investigation. A case in point is *Joginder Kumar v. State of UP* which laid down the guidelines for arrest and while doing so highlighted a key distinction between the existence of the power to arrest and the justification for the exercise of such power. Denying an individual their liberty is a serious matter and the same cannot be done on the mere basis of the suspicion of an offence. The scope of liberty is not just restricted to the complete arrest of an accused individual but has also been extended to handcuffing. Giving it a wider ethical consideration, it has been held in *Prem Shankar Shukla v. Delhi Administration* that insurance against escape does not compulsorily require hand cuffing.

These general principles continue to guide and formulate paths for the creation and implementation of criminal justice measures in the country however the same have to be studied in the context of terrorism in India. A collective understanding of such principles brings out the much greater human rights question looming over the criminal justice system.

### Statutory Safeguards

#### 4.1. The Code of Criminal Procedure, 1973

Provisions under the Code of Criminal Procedure, 1973 range from those of the need for warrants and the qualifications for bail to the methods of recording a First Information Report. Prosecutors, have been established as a separate wing to ensure the absence of any bias. The generality of these provisions continues to be applicable even to special anti-terrorism laws or counter terrorism strategies developed unless they become inconsistent with the special provisions. The interplay between the general and specific is important to keep in mind while understanding the investigative machinery when it comes to cases of terrorism. Most instances of human rights

violations, owing to the lack of scrutiny by the magistrates in an adversarial system and under the garb of the special rules of procedure, take place during investigation. The safeguards of the general criminal procedure do little to stop these occurrences.

#### 4.2. The Indian Evidence Act, 1872

The presumption of innocence in favour of the accused sets the standard of beyond reasonable doubt for the prosecution. It is only when an exception is claimed that the burden shifts to the defence. Keeping up with the natural justice principles of avoiding any bias against the accused, the burden of proof has been set to a standard where the evidentiary value aims to ensure that no innocent is ever convicted. The overriding effect of special laws, however, provides for different rules of evidence governing terrorism instances. The need for a different standard is justified owing to the grave nature of the offence however, the need for balance is still felt.

#### 4.3. Legal Services Authorities Act, 1987

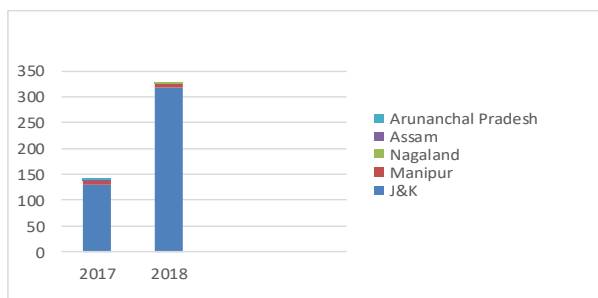
*Hussainara Khatoon v. Home Ministry, State of Bihar*, for the first time in the history of India, highlighted that a special law was needed for protection of accused through free and fast legal aid. The matter was heard in light of the fact that thousands of accused simply languished in the jail without trial not being able to afford counsel owing to their poor circumstances and illiterate background. Such circumstances make for easy arrest by the police, often without keeping in mind the guidelines of arrest in accordance with the fundamental right principles. Justice Bhagwati, suggested the creation of a comprehensive legislation for the assurance of fair and speedy trial. Not a single accused can be tried without the presence of adequate representation in the form of a legal counsel. The legislative intent under the Legal Services Authorities Act also ensures that proper formalities under the Constitution are upheld.

### Terrorism Laws in India

The determination of crime in terms of statistics is what helps interpret the criminal policy. The addition of a new category of crimes under the heading "Crimes committed

by Anti-National Elements” (National Crime Records Bureau Statistics, 2017) without a justification had become a matter of questioning. The use of words like “Jihadi terrorists” and “Anti National Elements”, without a proper definition provide scope for arbitrary use. Terrorism cases in India have been dealt with existing provisions under the Indian Penal Code however, the gravity of such acts has logically driven the Centre and State governments to formulate specific anti-terrorism laws.

India’s approach to terrorism, formulated in 1980s has not seen any significant changes foundationally since the Terrorist and Disruptive Activities (Prevention) Act or TADA. Subsequent anti-terrorism laws have been made on similar footings without taking into account previous failures and misuses detrimental to human rights (“TADA: Hard Law for Soft State, 2000). Terrorist activities however, have not stopped.



**Source: Ministry of Defence**

The Prevention of Terrorism Act, 2002 (POTA) enacted post the 2001 Parliament Attack widened the scope of what constituted an act of terrorism causing widespread protests. Numerous attacks took place after POTA was repealed; however, it was the 26/11 Mumbai attacks that created the demand for a change in the legislative policy while dealing with cases of terrorism. The National Investigation Agency Act and amendments to the Unlawful Activities (Prevention) Act, 1967 in 2008 followed suit. Both the NIA Act and the UAPA have been amended recently in 2019 and form the central offensive against terrorist activities in India. The NIA Act brought back provisions of Special Courts, burden of proof on the defendant, the right to follow summary procedure, and the right to proceed ex-parte without the defendant, which is a clear

deviation from the natural justice principle of *audi alterum partum*. The scope of NIA thus, has been made broader than POTA, covering offences newer in character. The effects of the NIA Act and UAPA amendments were made evident in the case of *Mohammed Ajmal Mohammad Amir Kasab @ Abu Mujahid v. State of Maharashtra*, wherein the lone gunman, Ajmal Kasab was tried in a special court. The trial presented a variety of due process concerns like the fact that the defense counsel was permitted a mere fifteen minutes per day to meet Kasab and that all client-attorney communication took place in police presence (Chandrashekhar, 2010, as cited in Shetty, 2010).

There also exists a lack of external check in the new UAPA amendments and the NIA Act drawing attention to the lack of checks and balances. Moreover, the grounds which led to discontinuing the practice of special courts; low conviction rates; selective prosecution on ethnic and religious grounds, which questioned the very legality of special courts in the past highlighted in *Kartar Singh v. State of Punjab*, have been neglected while reinstating the status of special courts. The unique federal structure of India provides for the States to enact laws dealing with terrorism. Most debated amongst these state laws is the Maharashtra Control of Organized Crime Act (MCOCA). An analysis of the MCOCA and similar states laws indicates that the focus of these laws is more towards organized crime and gang violence however, the concerned states treat these laws as serious anti-terrorism mechanisms (Garge, 2019).

The gravity of the fallacies creates a larger ethical and moral question on the manner in which terrorism is dealt with in India. The roots of the system can be traced back to the British administration. The enactment and the subsequent repeal of the POTA substantiates the continuing pattern that India’s anti-terrorism and security laws have followed (Conroy et al, 2006). Even when special laws have been created and continue to be created, the first line of defence continues to be those trained to deal with conventional crimes. These officers are neither aware nor trained for counter terrorism and more so, have been indoctrinated with the ideals of the present



criminal system in a manner such that they function as an antithesis to the entire concept of counter-terrorism. What needs to be understood is that the act of terrorism is not the problem but is a manifestation of deeper social problems (Albini, 2001). The false narrative of catching all terrorists solving the problem and the denial to acknowledge the underlying social factors make for questionable policy decisions and the resort to unethical infringement of human rights (Clarke & Newman, 2007).

### **Malimath Commission Reforms**

In systems following the inquisitorial pattern, a prosecutor guides police officers and legal expertise of prosecutors is applied from the very beginning stages, i.e., pretrial stage of the case. Investigation is done by Investigating Magistrates meaning the judiciary is involved early. Offices of prosecutors are generally in the court buildings or chambers so, there are maximum chances of mutual discussions amongst police, prosecutors and judges. The burden of proof is equally divided amongst the defence and prosecution and these methods have ensured that such systems have a higher conviction rate than India.

Drawing from the foundations of the Indian Constitution itself, the Committee (Home Affairs, 2003) spoke extensively on the rights of the accused and stressed upon the need for a change in the basis on which the standard of “beyond reasonable doubt” is met. Instead of testing the favourability of the evidence to accused’s case, the evidence should meet the standard of truth. This shifts the focus from the accused to the extent that it does not become detrimental to his/her rights. Beginning from trying to define the term “terrorism” to the discussion of the existing anti-terrorism laws and their challenges, the committee recommended to address the interplay that money laundering and drugs trafficking have in addition to the inflow of foreign funds to fuel the spread of terrorism. Issues like morale boosting and tenure and transfer security are some of the issues that the committee identified as plaguing the existing Police Act and suggested the creation of an entirely new act which focuses on the creation of a more holistic approach to policing.

### **The Modern Terrorist**

Social factors play an important, yet under-recognised, role in the functioning of the “modern” terrorist. The first amongst such factors, understanding the mental outlook of the perpetrator, hardly ever figures into counter terrorism narratives. Radical Islamic ideologies continue to remain the biggest player in the global terrorism context and are known to recruit and employ suicide bombers to disseminate terror however it is important to understand why this is so. The social stigma surrounding the concepts of mental health and suicide and the insistence of radical Islamic propaganda that suicide attackers are “holy martyrs” undermines the medical factor of these problems making them more prone to opt the path of extremism (Lankford, 2016). Additionally, the concepts of coerced suicide have also been highlighted wherein the consequences post the refusal to commit suicide are so grave that the individual is forced into becoming a terrorist (Lankford, 2016).

The actual act of terror is increasingly being made into a bargaining chip, wherein the perpetrator has an alternate interest/object in mind which is aimed to be fulfilled by way of manipulation. Such manipulation and other tactics rig the political systems into creating an atmosphere which stimulates negotiation with the leaders of these terrorist organisations (Clarke & Newman, 2007). Better equipped with technology and modern mediums of communication through the use of social media, the modern terrorist has mastered the art of blending in; it is imperative to understand that old techniques and strategies no longer aid in deterring terrorist activities. Extensive periods of detention have been used most often in the hope that the terrorist will reveal their network however such measures have proved to be more counter-productive than counter terrorism (Roberts, 2011).

### **International Perspective**

The concept of terrorism does not function on the pillars of nationality and plagues the global community irrespective. Seeing how terrorism affects different nations in different manners,

means and measures are periodically suggested keeping the common ideals of protection of human rights and the collective goal of maintenance of international peace and security, as formalised by the United Nations charter, in mind. International commitments to human rights and the principle of rule of law form the fundamental basis of the fight against terrorism; to the present day, the international community has promulgated 19 universal counter-terrorism legal instruments (United Nations, 2019). Adopted in Tokyo in 1963, The Convention on Offences and Certain Other Acts Committed on Board Aircraft is hailed as the first international treaty against terrorism; from this to the latest United Nations Global Counter-Terrorism Strategy (General Assembly, 2006), which states four broad measures; measures addressing concerns of conditions conducive to the spread of terrorism; a direct offensive to prevent and combat terrorism; building State capacity for the same and strengthening the United Nations role in facilitating such capacity and; provisions ensuring that basic principles of human rights and the rule of law are made and continue to remain the fundamental basis of the fight against terrorism; the idea of terrorism has evolved globally. This change is most evident from the 1999 International Convention for the Suppression of Financing of Terrorism which recognised the key role the financiers played in aiding to create or acquire a conducive situation that helped terror outfits. The establishment of the UN Counter-Terrorism Committee (UNCTC) (United Nations Security Council, 2001) was a step further in the direction of global solidarity against terrorism.

However, a bigger challenge that now faces global counter-terrorism efforts is the social contingencies attached to the concept. Recruitment by international terror organisations is fuelled by socio-economic conditions of poverty, foreign occupation, and the absence of a democratic set-up advancing the goals of upholding human rights (Panel on Threats, Challenges and Change, 2004). Additionally, universal treaties on counter-terrorism require an explicit compliance with the various aspects of international human rights law besides the general obligation of a

nations to function within the bounds of human rights as members of the free world (High Commissioner for Human Rights, 2008).

### **8.1. International Criminal Court**

The global nature of the acts of terrorism make for a jurisdictional nightmare and the result is nothing but an increased delay in justice for the victims and an uncertainty of the fate of the accused. The International Criminal Court (ICC), established by the Rome Statute is a neutral and pragmatic body to deal with such situations. The level of due process exercised at the ICC is of the highest standard, making the organisation much more effective than most domestic systems. Further, the level of protection available to the accused at the ICC forum is unmatched (Maloney-Dunn, 2010). Even though the ICC follows the principles of fair trial to the maximum, the absence of “terrorism” as a separate crime becomes a technical obstacle in the jurisdiction that the ICC can exercise in taking cognizance of such matters. The four existing crimes enumerated under Article 5 of the Rome Statute deal with situations which are circumstantial in nature and terrorism does not necessarily manifest itself here. The crimes against humanity though most suited, require a very broad context of systematic and planned attacks leaving the newer trend of isolated attacks out of its scope. The recently added crimes of aggression have been often termed as irrelevant owing to the exclusion it provides to acts committed by non-state actors (Cohen, 2012).

### **8.2. Case Study: Israel**

Much like India, Israel continues to be under a consent threat of aggression owing to the ongoing Palestine-Israel conflict and faces terror challenges on a daily basis. In spite of the similarity of circumstances, the management of conflicts at both ends seems to be starkly different with the Israel having a specific mechanism to deal with such matters of urgency. The reason for their control stems from the fact that their local police is trained to deal with situations of terrorism, making for a strong first response in the advent of a terrorist attack. The Israeli National Police (INP) has made anti-terror its core function having developed strategies and organizational

approaches over the years. The INPhence becomes an interesting case study not only about how police should respond to terrorism, but also about what implications such a response plausibly has for the police as an organisation. In furtherance of their strategy, the INP functions in a three-pronged manner in the event of a terrorist attack, focused on early prevention, the first step is interdiction, and treatment of sources of terrorism; second, is carrying out response activities once the attack has been launched; and, third, response activities once the attack has occurred (Jonathan et al, 2009). The calculated response helps uproot infrastructure supporting terrorist activities and hence constitutes *high policing*.

The lack of global coordination however stems from multiple reasons, primary among which are, the lack of a global consensus on what constitutes “terrorism” making for the absence of a concrete global counter terrorism policy; ineffectiveness of multilateral action owing to inadequate compliance with the existing instruments and; the uneven and lagging progress of counter radicalisation and de-radicalization efforts (Council on Foreign Relations, 2011). Though the global response did become highly more prominent in wake of USA’s “Global War on Terror”, the manifestation of the ultimate method of eradication has yet to see the light of day.

### **What Can Be Done**

The absence of a comprehensive definition of the term “terrorism” gives the executive impetus to add new, and occasionally unrelated, offences within the spectrum of terrorism. A clear definition will lay down the appropriate scope and ensure that counter terrorism measures are focused towards the factors contributing to the spread of terror and not the terrorist. Moreover, it is important to acknowledge that the evils of terrorism are changing form but are well established as issues threatening the integrity of India. The pattern of enactment and subsequent repeal of special laws has not proved useful as an effective offensive and the legislative need is of a comprehensive set of counter-terrorism laws which have permanent stature aimed at achieving long-term stability. Stringent provisions to address issues of terror financing

also need to be incorporated within the framework of counter-terrorism strategies. (Singh, 2009).

A greater deal of importance needs to be placed on the formulation of a counter-terrorism policy as against a framework to address the existing lacunas within the system. All and any actions in the furtherance of anti and counter terrorism need to be taken within the mandate set by such a policy. A specific policy especially highlighting the standards of use of force need to be articulated and introduced into the training of our first responders.

On a global platform and subsequent mostly to USA’s call for a War on Terror post the attacks of September 2001, a variety of international instruments and mandates have been developed addressing the global security tenets in the wake of terrorism. Existing Indian legislations need to be brought within the standards of these instruments and additionally establish structures facilitating international cooperation on threats functioning globally by way of sharing intelligence and adopting common patterns of targeted defence. A step in this direction is a greater push for the establishment of a Comprehensive Convention on International Terrorism (CCIT) at the United Nations platform (Thakker, 2018). The most important requirement in the Indian setting however, is the development of an effective and assertive border management policy which aims at curbing the menace of infiltrations and is targeted at hitting the factors contributing to demographic destabilization. All these measures will be in vain if proper implementation and sustenance mechanisms are not insured post their enactment highlighting the need for greater action than deliberation.

### **Conclusion**

In the Indian context, it is important to note that terrorism has been inspired by political, ideological and ethnic factors. At its worst, it has aims to destroy the social fabric of a nation and create a sense of loss of security, generating an intractable conflict situation. It is pertinent therefore, that counter-terrorism methods are developed having taken in considerations, these goals. The goals of justice based on the principles of fair trials ensure that

rights of accused are protected to an extent under the adversarial system. However, the present system also is not without a need of improvement. The presence of repressive laws and the abuse of power by security forces, which has not gone unnoticed in the international domain (Ganguly & Tayler, 2011), acts as a blow to the India's need to meet international standards of human rights. At the same time, it is also imperative to note that the terrorism laws fail to maintain the rights of the victims of such acts of terror and hence it is imperative that a balance be maintained on both ends of the spectrum. The underlying principles of natural justice should continue to formulate the basis of all criminal administration.

Drawing from the Malimath Committee recommendations, the central authorities need to develop mechanisms providing for greater administrative and judicial oversight of investigative and prosecutorial decision-making, and transparency in decision-making,

to advance and implement nationwide uniformity and adherence to fundamental rights. The CCIT aims at hitting the resources lives illegal funds, safe havens and armed technology available to such terror organisations to destroy their foundation. A necessary push for the global ban of all terror outfits and the creation of special laws for the world is also something that India strongly advocates (Jaishankar, 2019).

A relook at the domestic and international methods of counter terrorism are the only way forward to aim to eradicate the blot of terrorism however, the same will not be possible without recognising the underlying social considerations and human rights concerns. It is necessary to understand the concerns of the public and bring in non-governmental agencies closer to the decision-making process. It is only when the context is looked at from a bird's eye view that the actual gravity of the problem of terrorism be understood and countered.

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## DETERMINATION OF WEIGHT FOR BATSMAN BASED ON BATTING POSITION FOR TWENTY-20 CRICKET WITH SPECIAL REFERENCE TO IPL

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### ABSTRACT

*Cricket is one of the most popular physical sports after football. The game is held between two teams. It is played in three different formats viz—Test, One-Day and Twenty-20. Twenty-20 cricket is the most popular among the three formats because of its length. This format consists of 20 overs on each side. The Indian Premier League (IPL) is a professional Twenty20 cricket league in India. The performance of bowlers and batters is crucial in winning the matches and, finally, the tournament. Thus quantification of performance for both bowlers and batters is necessary. Thus, the study mainly deals with evaluating the performance of bowlers in IPL 2020. Different measures are available for quantifying the bowling measures, such as strike rate, average and economy rate. Nevertheless, these measures are crude, neglecting some crucial factors like the importance of the wickets taken by the bowler and the relative importance of runs conceded by the bowler. Since all the wickets taken by the bowler does not have identical weight, the computation of batting position-specific weight for IPL is undertaken in this paper. They are coalescing this with Combined Bowling Rate (CBR\*) as developed by Lemmer (2005) aids us in evaluating the performance of bowlers for IPL 2020. It is found that Rashid Khan from Sunrisers Hyderabad is the best bowler of IPL 2020, followed by Jofra Archer from Rajasthan Royals and Jasprit Bumrah of Mumbai Indians. These bowling measures can help the team selectors identify the good bowlers among their team and select them in their team to increase the team's performance.*

**Keywords:** IPL 2020, CBR\*, Position Specific Weight, Bowling Performance

### Introduction

Cricket is one of the most popular physical sports in the World. The game involves bat and ball and is played between two teams comprising of eleven players each. In cricket, using the resources available to the teams, they try to score the maximum number of runs. The second batting team try to score more than their opponent to beat them, and if they fail to do, so the opponent wins the game. Internationally cricket is played in three formats, namely Test, ODI and Twenty-20. Test cricket is the oldest form of cricket and started in 1877. In 1971, the second form of cricket, namely One Day International, started. However, in 2007 with the first edition of ICC Twenty-20 World Cup, the gain in popularity of Twenty-20 cricket started. Also, with the discovery of different Twenty-20 leagues around the World, the popularity of Twenty-20 cricket among the audiences has seen a considerable jump. With the popularity of Twenty-20 cricket, researchers have also undertaken different research work related to Twenty-20 cricket. The Indian Premier League (IPL) is a professional Twenty20 cricket league

in India. Presently there are in total eight teams competing in IPL for the trophy. For winning a tournament, the team must have some good bowlers and batsmen. The performance of bowlers and batters is also crucial in winning the matches and finally the tournament. Thus quantification of performance for both bowlers and batters is necessary. Thus in this paper, we shall deal with quantifying the performance of bowlers in IPL 2020.

### Motivation of the Study

The performance of bowlers is very crucial for the overall performance of a team. A team shall be in good position if the bowlers of the team performs well. There are different measures available for quantifying the bowling measures viz strike rate, average and economy rate. But, these measures are only crude, where it neglects some crucial factors like the weight of the wickets taken by the bowler, relative importance of runs conceded by the bowler etc. Thus for obtaining the bowling performance Combined Bowling Rate (CBR\*) developed by Lemmer (2005) is used. Thus the study mainly deals with evaluating the performance of bowlers in IPL 2020.

**Review of Literature and Research Gap**

In Lemmer (2002) combined all the measure bowling average, economy rate and bowling strike rate using harmonic mean and an bowling index CBR is given by

$$CBR = \frac{3R_i}{W_i + B_i + W_i \frac{R_i}{B_i}} \dots \tag{1}$$

Where,

$R_i$  = Total number of runs conceded by the  $i^{th}$  bowler.

$W_i$  = Total number of wickets taken by the  $i^{th}$  bowler.

$B_i$  = Total number of balls bowled by the  $i^{th}$  bowler.

Later, Lemmer (2005) improved the CBR to an adjusted measure CBR\*, where in place of W (Total number of wickets taken by the  $i^{th}$  bowler),  $W_i^*$  is considered.  $W_i^*$  is the sum of the weights of the wickets taken by a bowler, whereas in W only sum of the wickets taken by a bowler is considered, which is not a good measure because in CBR all the wickets weighted equally.

$$CBR^* = \frac{3R_i^*}{W_i^* + (\frac{B_i}{6}) + W_i^* (\frac{R_i^*}{B_i})} \dots \tag{2}$$

Where,

$R_i^*$  = Sum of the adjusted runs conceded by the  $i^{th}$  bowler

$W_i^*$  = The sum of weights of wickets taken by the  $i^{th}$  bowler.

$B_i$  = Total number of balls bowled by the  $i^{th}$  bowler.

Lemmer( 2005) provided batting position specific weight in case of ODI and TEST cricket respectively. While the weights for T-20 cricket is devised in the doctoral work of Bhattacharjee(2020).

**Table 1: Batting Position Specific Weight For ODI, Test & T-20**

BATTING POSITION	ODI*	TEST*	T-20I**
1	1.30	1.20	1.78
2	1.35	1.31	1.74
3	1.40	1.42	1.62
4	1.45	1.53	1.44
5	1.38	1.47	1.22
6	1.18	1.25	0.99

7	0.98	1.02	0.76
8	0.79	0.79	0.56
9	0.59	0.56	0.40
10	0.39	0.34	0.27
11	0.19	0.11	0.17

Source: \*Lemmer (2005) & \*\*Bhattacharjee(2020)

There is no such work which encountered the problem of devising batting position specific weight for Twenty20 leagues. Thus in this paper an attempt is made to quantify the batting position specific weight for IPL and using this performance of bowlers is being evaluated for IPL 2020.

**Objective of the Study**

1. To develop batting position specific weight for IPL.
2. To quantify the performance of bowlers using CBR\* for IPL 2020.

**Methodology**

**5.1 Methodology for Determination of Batting Position Specific Weight in IPL**

Now for determining the batting position specific weight for batsman in IPL cricket data is collected for each batsman about their runs scored, balls faced in a match from IPL 2016 to IPL 2019. Now we shall calculate the Strike Rate of the Batsman by the following formula,

$$SR_{ijt} = \frac{\text{Runs Scored by the } i^{th} \text{ batsman in the } j^{th} \text{ position in the } t^{th} \text{ match}}{\text{Number of Balls Faced}} \times 100 \dots \tag{3}$$

Now we will calculate the Adjusted Runs(AR) Scored by the batsman for the following formula given by Lemmer (2005),

$$AR_{ijt} = R_{ijt} \sqrt{\frac{SR_{ijt}}{SR_t}} \dots \tag{4}$$

$R_{ijk}$   
= Runs Scored for the  $i^{th}$  batsman in the  $j^{th}$  position in the  $t^{th}$  match.  
 $SR_{ijt}$   
= Strike Rate for the  $i^{th}$  batsman in the  $j^{th}$  position in the  $t^{th}$  match  
 $SR_t$  = Match Strike Rate of the  $t^{th}$  match.

For each batsman the Average Adjusted Runs (AAR) for the  $i^{th}$  batsman for the  $j^{th}$  position is given by the following formula,

$$AAR_{ij} = \frac{\sum_t AR_{ijt}}{\text{Number of Innings batted in the } j^{th} \text{ position by the } i^{th} \text{ batsman}} \dots \tag{5}$$

Average Adjusted Runs (AAR) for each batsman with respect to their batting position is calculated and plotted using curve expert, and

obtained best possible curve which fits the data. The best fitted curve is MMF curve. The equation for MMF curve is given by,

$$y = \frac{ab+cx^d}{b+x^d} \dots \tag{6}$$

Where,

Variables/Parameters	Description/Value
y	Estimated Average Adjusted Runs
x	Corresponding Batting Po
a	-0.57324552
b	0.00099873
c	28.97491241
d	-3.83322715

Source: Authors Computation

**5.1.1. Data Source and Collection Process for Determination of Batting Position Specific Weight in IPL Cricket**

The data for determining weight is based on secondary data. Data is collected from espnricinfo.com with the help of online software, Web Harvy. It is a priced online web scraper used for extracting data from a website. IPL matches played between 2016 to 2019 is considered for data collection. Also, The batsman who satisfies criteria discussed below is taken as the basis for this study

- Played at least 5 innings.
- Played at least 1 out innings.
- Played at least 10 balls.
- Scored at least 10 runs.

**5.2. Methodology for Determination of Bowling Performance in IPL 2020**

Now for quantifying the performance of bowlers in IPL 2020 CBR\* given by Lemmer(2005) is used which is given by,

$$CBR^* = \frac{3R_i^*}{W_i^* + (\frac{B_i}{6}) + W_i^* (\frac{R_i^*}{B_i})} \dots \tag{7}$$

Where,

$R_i^*$  = Sum of the adjusted runs conceded by the  $i^{th}$  bowler

$W_i^*$  = The sum of weights of wickets taken by the  $i^{th}$  bowler.

$B_i$  = Total number of balls bowled by the  $i^{th}$  bowler.

Since CBR\* has a negative dimension. Thus, CBR\* is converted to get the value of S, Where

$$S = \frac{1}{AVG(\frac{1}{CBR^*})} \dots \tag{8}$$

**5.2.1 Data Source and Collection Process for the Determination of Bowling Performance in IPL 2020**

The data for evaluating bowling performance is based on secondary data. Data is collected from espnricinfo.com with the help of online software. The data for all the IPL 2020 matches played between 19 September 2020 to 10 November 2020 is considered for data collection. The bowlers, based on the criteria discussed below,

- Taken at least 7 wickets.
- Bowled at least 15 overs.

**Results and Discussion**

Using the fitted equation, Estimated Average Adjusted Runs are calculated, and weights are found by scaling down the Estimated Average Adjusted Runs such that the weights add up to eleven. Thus Table 2 explains position-specific weight for IPL. It can be observed that the batting positions from 1 to 5 have significant importance in IPL with more onus of scoring on the top-order batsman. The weights gradually decline for positions six and above. In the all-rounders category, positions 6 and 7 becomes prominent.

**Table 2: Batting Position Specific Weight for IPL**

Batting Position	Estimated Average Adjusted Runs	Weight
1	28.94	1.87
2	28.56	1.85
3	27.11	1.75
4	23.99	1.55
5	19.42	1.26
6	14.50	0.94
7	10.23	0.66
8	7.01	0.45
9	4.75	0.31
10	3.21	0.21
11	2.16	0.15

Source: Authors Computation



Using CBR\*, we quantify the performance of bowlers in IPL cricket. For calculation purposes sum of the weights of the wicket taken by the bowler is considered here. Rashid Khan from Sunrisers Hyderabad is the best bowler of IPL 2020 who has taken 20 wickets in the tournament with a 1.50 bowling index. The second best bowler of IPL 2020 is Jofra Archer from Rajasthan Royals, which has a bowling index of 1.44. The third best bowler is Jasprit Bumrah of Mumbai Indians. Also, it is seen that among the top ten bowlers, six of them are Indians which is a good sign for the Indian Cricket Team [Table 3].

**Table 3: Top Ten Bowlers of IPL 2020 Based On CBR\***

BOWLER NAME	TEAM	WICKETS TAKEN	S	RANK
R Khan	SRH	20	1.50	1
J Archer	RR	20	1.45	2
J Bumrah	MI	27	1.32	3
Y Chahal	RCB	21	1.24	4
T Boult	MI	25	1.23	5
Varun C	KKR	17	1.15	6
S Sharma	SRH	14	1.11	7
M Siraj	RCB	11	1.08	8
W Sundar	RCB	8	1.07	9
M Shami	KXIP	20	1.05	10

Source: Authors Computation

**Table 4: Top Bowlers For Each Team in IPL 2020**

BOWLER NAME	TEAM	WICKETS TAKEN	S	RANK
R Khan	SRH	20	1.502039	1
J Archer	RR	20	1.448614	2
J Bumrah	MI	27	1.322946	3
Y Chahal	RCB	21	1.23737	4
Varun C	KKR	17	1.150521	6
M Shami	KXIP	20	1.050768	10
K Rabada	DC	30	1.028235	12
S Curren	CSK	13	0.977804	19

Source: Author Computation

Mumbai Indians and Delhi Capitals are the two best tournament teams and the finalist; thus, we

observe that Jasprit Bumrah for Mumbai Indians and Kagiso Rabada for Delhi Capitals are the best bowlers for their respective teams. Although Rabada had taken more wickets than Bumrah, the index value of Bumrah is higher, indicating that the overall performance of Bumrah is better than Rabada, which is the main merit of this method CBR\* which is not only based on the number of wickets taken by the bowler but takes care of other prospective of the bowling such as weight of the wickets taken by the bowler, i.e. whether the wickets taken by the bowler is a good batsman or not, runs conceded relative to opponent team total etc. This fact is also supported by the fact that Mumbai Indians won the IPL 2020 trophy [Table 4].

### Conclusion and Future Work

It can be observed that the batting positions from 1 to 5 have a significant reputation in IPL. It is found that Rashid Khan from Sunrisers Hyderabad is the best bowler of IPL 2020, with the second-best bowler being Jofra Archer from Rajasthan Royals and Jasprit Bumrah of Mumbai Indians is the third-best bowler. These bowling measures can help the team selectors identify the good bowlers among their team and select them in their team to increase their team's performance. Also, on the other side, the batsman can identify the formidable bowlers whom they try to avoid taking risks not to lose a wicket and keep up scoring. Also, in IPL 2021, there is a mega auction, so this study may help the team owner identify the performance of bowlers and target them in the auction to buy them. In future, we can measure the batting position weight for other Twenty20 leagues such as Big Bash Premier League, Caribbean Premier League, Bangladesh Premier League, Pakistan Premier League & Lanka Premier League etc. Thus using this weight, we can easily quantify the performance of bowlers in such leagues.

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**DOUBLE TAXATION AGREEMENTS IN ETHIOPIA: A BLESSING OR CURSE?****Worku Kassaw Tsegaye**ORCID ID: <https://orcid.org/0000-0003-2349-8369>**ABSTRACT**

Countries sign bilateral double taxation agreements (DTAs) to prevent or reduce double taxation on cross-border economic activity. In the age of globalization the effect of double taxation is very rare to ignore. The DTA was signed to assign tax coverage between the two countries and to avoid tax disputes between the taxpayer and the country concerned. Countries like Ethiopia have simplified their FDI laws and entered into double taxation avoidance agreements to attract investment as individuals and companies face daily practical problems due to double taxation. However, the primary purpose of these agreements is to enforce the agreed tax rates between the two countries depending on the final outcome of negotiations on the DTA. Developing countries like Ethiopia face losses in tax revenue. Due to the current disparity in FDI, tax cuts for domestic investors will not offset these losses. However, the actual impact of the DTA on the inflow of foreign direct investment has been debated. Ethiopian DTAs have not been well studied, especially in terms of their ability to attract FDI and generate domestic revenue. The purpose of this article is to explore the nature of the blessing or curse of the DTA concluded by Ethiopia and to suggest possible remedies.

**Keywords:** *Treaties, Double Taxation, Remedies, FDI, DTAs, Negotiations*

**Introduction**

Double taxation<sup>116</sup> occurs when a single income is subject to two or more taxes, creating barriers to trade and investment across borders<sup>117</sup>. The development of double taxation agreements was closely linked to the progress of the neo-liberal economic and political

project, which sought to prevent and provide solutions to the serious problem of high capital accumulation in the 1970s. Within the framework of national tax structures, the development of the DTA was seen as an integral part of the generalization trend towards reducing the tax burden on capital and moving towards workers. In contrast, taxes on foreign trade have become less important and the focus has shifted to value-added taxes and severely regressive tax structures.

If two business rules are applied simultaneously to a business entity, it is taxed at both ends and the operating cost is prohibited internationally and the global business process is halted. However, each country also allows international taxation based on one or more linked factors of income generated in its territory, such as location of sources<sup>118</sup>, residence<sup>119</sup> of the taxable entity,

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<sup>116</sup> Double taxation can be simply defined as taxing the same person twice on the same article or piece of property, or taxing it as one person's property and another's property; But it does not include the same property tax separately, or the same property tax levied when different people have different interests or are different in their hands. Indicates different values, or when there is a tax on capital and also on the value of their stock shares in the hands of particular shareholders.

<sup>117</sup> Klaus Vogel, *Double Tax Treaties and Their Interpretation*, Berkeley Journal of International Law, 1986, Vol. 4, Issue1spring, Article1, pp.1-85, at P.4. Available

<<http://scholarship.law.berkeley.edu/bjil/vol4/iss1/1>>

Accessed on January 5, 2018 [Here in after, Klaus, *Double Tax Treaties and Their Interpretation*]

<sup>118</sup> For Example Article 6 and 7 of the Federal Income Tax Proclamation, Proclamation No. 979/2016 stated the notion of Source Principle as the territorial limitation on the imposition of the tax under Article 7 and the foreign income rules in Articles 45, 46, and 64(3). Article 7 provides that the Proclamation applies to the worldwide income of residents of Ethiopia and the Ethiopian source income of non-residents. Besides, the article specifies income that is Ethiopian source income. Any income that is not Ethiopian source income is foreign income (sub-article (5)). This is relevant to the foreign tax credit applicable to resident persons in respect of foreign income derived (Articles 45 and 64(3)) and the

quarantining of foreign losses (article 46). Additionally, Sub-article (1) provides two alternative tests for determining whether employment income (defined in Article 12) is Ethiopian source income. First, employment income is Ethiopian source income to the extent that it is derived (i.e. received) in respect of employment exercised in Ethiopia, regardless of where it is paid (paragraph (a)). Thus, place of performance is the basic rule for determining the source of employment income. If an employment is performed partly in Ethiopia and partly outside Ethiopia, then the employment income must be apportioned between those sources. Apportionment is provided for by the words “to the extent” in paragraph (a). Second, employment income is Ethiopian source income if it is paid by, or on behalf of the Government of Ethiopia, regardless of where the employment is exercised (paragraph (b)). Sub-articles (2) and (3) of the Proclamation provide the basic rules for determining when business income is Ethiopian source income. These rules apply unless a specific rule in sub-article (4) applies. Sub-article (2) provides that business income derived by a resident of Ethiopia is Ethiopian source income except to the extent that the income is attributable to a business conducted by the resident through a permanent establishment outside Ethiopia. “Resident of Ethiopia” is defined in Article 5(1) and “permanent establishment” is defined in Article 4. The effect of this rule is that all business income of a resident of Ethiopia is Ethiopian source income except when the income is attributable to a fixed overseas business operation of the resident. Sub-article (3) provides that business income derived by a non-resident person is Ethiopian source income if it satisfies one of three alternative tests. The main test is in paragraph (a), which provides that the business income of a non-resident is Ethiopian source income to the extent to which it is attributable to a business conducted by the non-resident through a permanent establishment in Ethiopia. “Non-resident” is defined in Article 5(7) and “permanent establishment” is defined in article 4. This rule is the same as the taxing rule in Article 7 of the OECD Model Double Tax Convention on Income and Capital and the learning under tax treaties is relevant in the interpretation of paragraph (a). Paragraphs (b) and (c) are intended to back up the main test in paragraph (a). Under paragraph (b), business income of a non-resident person is Ethiopian source income to the extent to which it is attributable to sales in Ethiopia by the non-resident of goods or merchandise of the same or similar kind as those sold through a permanent establishment in Ethiopia of the non-resident. This would apply, for example, if the head office of a non-resident made direct sales to customers in Ethiopia of the same goods that it sells through a permanent establishment in Ethiopia. Such direct sales could be made, for example, over the internet. Under paragraph (c), business income of a non-resident is Ethiopian source income to the extent to which it is attributable to other business activities (such as the provision of services) conducted by the non-resident of the same or similar kind to that conducted by the non-resident through a permanent establishment in Ethiopia.

<sup>119</sup> In determining its scope of application, the Federal Income Tax Proclamation, Proclamation No. 979/2016 Sub-Article 7 and 5 dictates that Sub-article (1) provides that the following are residents of Ethiopia:

- 1) A resident individual (defined in sub-articles (2), (3), and (4)).
- 2) A resident body (defined in sub-article (5)).
- 3) The Government of Ethiopia and any regional or local government in Ethiopia.

Sub-article (2) provides three alternative tests for determining whether an individual is a resident individual. Paragraph (a) provides that an individual who has a domicile in Ethiopia is a resident individual. In broad terms, the “domicile” of an individual is the place where the individual has a permanent home. Paragraph (b) provides that a citizen of Ethiopia who is a consular, diplomatic, or similar official (such as a trade official) posted abroad is a resident individual. The inclusion of Ethiopian Government officials working abroad as residents is necessary as often they will be exempt from tax in the country of service, particularly under international agreements (such as the Vienna Convention on Diplomatic Relations and the government service article in tax treaties). The exemption applies in the country of service on the assumption that the foreign government official will be taxed in their home country. Paragraph (c) provides that an individual is a resident individual if the individual is present in Ethiopia for 183 days in any one-year period. This test is primarily relevant to foreign nationals working on assignment in Ethiopia. Such persons will normally have a home outside Ethiopia, but are considered to be a resident if they are present in Ethiopia for the 183-day period. The 183-day period may be consecutive days or the aggregate of several periods of presence within the relevant one-year period. The 183-day period is tested by reference to any one-year period and not the tax year. If the 183-day period were tested by reference to the tax year, then an individual whose physical presence in Ethiopia straddles the end of a tax year (so that they are in Ethiopia for part of two tax years) can be present in Ethiopia for substantially more than 183 days without being a resident in either tax year. The Regulations will provide guidance on the counting of days under this test. On the same fashion, Sub-article (7) provides that a non-resident is a person who is not a resident of Ethiopia. Taking account of sub-articles (1) and (5), the following are non-residents:

- 1) A foreign national who is not present in Ethiopia, continuously or intermittently, for more than 183 days in any one-year period.
- 2) A body that is incorporated and formed outside Ethiopia and has its place of effective management outside Ethiopia.

place of residence, citizenship or property status, etc. International law allows tax on foreign financial transactions between the taxpayer and the taxing state. Doubling the tax on equal income would incur additional costs on the future of international trade<sup>120</sup>. Therefore, even in the age of globalization, double taxation remains a major obstacle in the development of international economic relations<sup>121</sup>.

To prevent double taxation, the OECD and UN models provide an alternative to double taxation relief: both countries may use the exemption or credit method prescribed by the OECD and UN model agreements. The contracting states may choose between them<sup>122</sup>, in formulating their separate agreement. Therefore, the purpose of tax treaties is to provide taxpayers with certainty about their potential tax liability abroad<sup>123</sup>. Tax agreements assign tax rights between the taxable contract and the persons between the partners. The goal of double taxation agreements is to eliminate double taxation, encourage foreign direct investment (here after FDI) and prevent tax evasion<sup>124</sup>. Double taxation avoidance agreements (here after DTA) have become so important that these days, there are over three thousand DTAs worldwide<sup>125</sup>.

Following in the footsteps of most countries in the world, Ethiopia has signed nearly 18 DTAs,

the main goal of which is to prevent double taxation on income on every country that signs a bilateral agreement with Ethiopia and Ethiopia. Despite the benefits of the DTA, there are also revenue losses and many costs to the contracting parties. In the absence of an agreement between the capital import (source) country and the capital export (residence) country, as a general practical point, the first right to tax all income within the jurisdiction rests with the source country. However, if the tax rights of the country of origin are limited by a treaty or completely removed by an agreement, there is a possibility of a change to more tax rights in the investor's country of residence. Thus, the number of income tax-paying countries increases tax rates. The increase in cross-border investment has led to an increase in international double taxation cases.

DTAs cause a number of problems with their design specifics and the way tax revenue is distributed among contract states. Conflict arises between those who aim to eliminate or reduce double taxation on the benefits of developed countries (traditionally capital-exporting economies), which are very strong in the international political arena, and less economically developed countries such as Ethiopia, which have little influence on the international stage, on tax design and distribution, by emphasizing the importance of cooperation on economic and financial issues. Ethiopia is in many cases a source of international and foreign direct investment, where profits are generated. Ethiopia should therefore not relinquish its tax rights by unilaterally signing double taxation treaties, resulting in abuse of the agreement with transfer of profits and tax exemption. Therefore, the author tries to examine whether the existing agreements actually benefit Ethiopia or are a curse that exists only for the benefit of companies and other contracting countries, while Ethiopia loses much needed tax revenue. To this end, this article addresses three basic issues. Under the first topic, some aspects of the Ethiopian Double Taxation Treaties (DTAs) are discussed. The second topic deals with some of the fundamental issues on the importance of investment protection in Ethiopia in relation to double

3) A foreign government or political subdivision of a foreign government.

4) An international organization.

<sup>120</sup> Supra note at 2, pp. 77

<sup>121</sup> Supra note at 2, pp. 82-91

<sup>122</sup> Paul Baker, „An Analysis of Double Taxation Treaties and their Effect on Foreign Direct Investment“, University of Cambridge. Draft Version\_23 May 2012 p.4, available at <https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.406.3042&rep=rep1&type=pdf>, accessed on June 2021

<sup>123</sup> Ibid

<sup>124</sup> UNCTAD, Recent developments in international investment agreements“, IIA MONITOR No. 2 (2005),

UNITED NATIONS, New York and Geneva, 2006, pp.7-8, available at [https://vi.unctad.org/resources-mainmenu-64/digital-library?task=dl\\_doc&doc\\_name=709\\_how\\_to\\_utili](https://vi.unctad.org/resources-mainmenu-64/digital-library?task=dl_doc&doc_name=709_how_to_utili), accessed on June 19, 2021.

<sup>125</sup> Ibid

taxation agreements. The third topic discusses the nature of blessings or double taxation curses for Ethiopia, followed by brief conclusion comments and possible ways to avoid problems arising from entering into bilateral double taxation agreements.

### **Double Taxation Agreement and Ethiopia**

One of the main objectives of the Double Taxation Avoidance Agreements (DTAs) is to prevent double taxation and to provide relief in the case of double taxation. The DTA Judicial Double Taxation focuses on the taxation of a single taxpayer by two or more different states on the same income. DTAs delegate tax authority between states and propose ways to prevent double taxation when this happens. Ethiopia has signed double taxation agreements with eighteen countries. However, some double taxation avoidance agreements have not yet been ratified by Ethiopia or other parties. As already mentioned in previous chapters, double taxation avoiding treaties allows investors to avoid paying double tax on the same declared income. Tax agreements assign tax rights between Ethiopia and the agreement partners. Double taxation agreements, eliminate double taxation, promote FDI and prevent tax evasion. That's why double taxation avoidance agreements are so important and why there are so many DTAs around the world these days. Following the footsteps of most countries of the world, Ethiopia has signed 18 Double Tax Treaties, with the main purpose of avoiding the double taxation on income both in Ethiopia and in each country that has signed a bilateral agreement with Ethiopia<sup>126</sup>.

### **Double Taxation Agreement and Investment Protection in Ethiopia**

Foreign direct investment in Ethiopia has been on the rise for the past ten years. Of the total investment projects licensed during 2012-2019, the share of FDI was approximately 20%. At

that time France, Germany, Italy, the Republic of Korea, Saudi Arabia, the United Kingdom and the United States were the main sources of FDI. Of the total 392 FDI projects licensed by 2019, 12.7% are agriculture and mining, 46.57% are manufacturing and processing and 40.7% are trade, hotels and tourism. Ethiopia is the third largest FDI recipient in Africa by 2019, up 240% from 2018 overall. The country has registered a significant increase in its FDI and the amount of foreign investment in the economy. According to a report released by UNCTAD on June 24, 2019, FDI inflows into the country reached \$ 953 million in 2018, up from \$ 279 million last year. Its foreign direct investment inward stock reached \$ 6.1 billion in 2019, up from \$ 941 million in 2018. At the regional level, inflows from Ethiopia and Kenya increased the region's FDI inflows by 15% to 6.2 billion, the report found Dollar<sup>127</sup>.

In addition, investments from China (814 projects with a capital of 14,531,756), Turkey (164 projects with a capital of 22,325,176) and India (324 projects with a capital of 7,177,924) are the main sources of growth overall. Foreign investment in Ethiopia To promote the flow of investment with these countries, Ethiopia has provided tax holidays for investments in selected sectors as part of the agreement. Selected areas will be determined in other discussions. Neumayer argued that the importance of the DTA would undoubtedly increase the amount of FDI. Also, the reduction in tax revenue has the opposite effect in developing countries such as Ethiopia. This loss is greater than what they get from FDI through DTA. Therefore, if tax evasion contracts are without benefits, the benefits of contracts may be futile in removing all barriers to investment. However, it is difficult to determine the actual impact of the Ethiopian tax treaties on FDI. However, it is clear that FDI is affected by a number of factors. To accurately assess the effects of a bilateral tax agreement on Ethiopia's FDI activity, FDI's co-founding factors must also be regulated, including: tax competition with neighboring countries, tax breaks, very liberal tax incentives, countries size, geographical

<sup>126</sup> Esteban Serrani, et al (ed(s).), Double Taxation Agreements in Latin America, Analysis of the Links among Taxes, Talleres gráficos Manchita. Buenos Aires, August 2013, pp. 23 available at [http://www.oid-ido.world/IMG/pdf/Double Taxation Agreements in Latin America- LATINDADD- full version.pdf](http://www.oid-ido.world/IMG/pdf/Double_Taxation_Agreements_in_Latin_America- LATINDADD- full_version.pdf), accessed on June 27, 2021

<sup>127</sup> Ibid

location, tax, bilateral investment agreements, financial indicators etc.<sup>128</sup>

### **Are double taxation agreements a blessing or a curse for Ethiopia?**

The current structure of the Ethiopian economy is increasing the country's government revenue and making it harder to choose its tax structure. Reducing trade tariffs significantly reduced revenue from border taxes, while increased mobility of capital and the intense use of financial shelters changed the conditions for taxing income and wealth. In addition, Ethiopia's tax competition with neighboring countries is likely to trigger an economic "bottom race" in an effort to attract and retain foreign investors. Corporation and income tax rates fell similarly in developed and developing countries, while the incidence of value-added taxes and other indirect taxes increased<sup>129</sup>.

However, Ethiopia's tax revenue increased by an average of 25.6% between 2011/12 and 2018/19 and increased by 38% over the past five years. Total household income, including tax-free sources, achieved an average annual growth of 23.8%, which is less than the increase in tax revenue. Between 2011/12 and 2018/19, domestic indirect taxes recorded a higher growth rate than other types of taxes. Taxes are the main source of government revenue and are crucial in ensuring sustainable and high economic growth. Foreign trade tax is the main source of domestic income. Foreign trade tax collected from fully imported goods was 44.1% of total revenue in 2011/22-2018/19 and 36.5% in the pre-reform period. On the other hand, the share of domestic indirect taxes fell from 22.3% to 22.7% in the period before the reform. This suggests that the Ethiopian government relies heavily on foreign trade taxes and tariffs which are easy to collect and administer<sup>130</sup>.

There are various reasons why developing countries lose out when signing tax treaties with developed countries. According to McGoran, this is due to irregularities between capital import and capital-export economies in relation to passive income. There is also no reciprocity of revenue gains and losses, as capital-importing states do not benefit from the double taxation agreement partner state with increased revenue from taxes on income from their capital investments because they do not exist<sup>131</sup>.

A question is raised here about whether FDI in Ethiopia was not a major source of domestic income in those years. As already mentioned above, the foreign trade tax collected from imported goods is 44.1% of the total revenue as compared to the domestic indirect tax figure (22.7%) in 2011/12-2018/19. So, what is Ethiopia's double taxation agreement negotiating with partner states to boost FDI? In addition, the following three main factors are likely to limit Ethiopia's inability to raise tax revenue: (1) the definition of permanent establishment; (2) withholding tax rates; and (3) Capital Gains Tax.

#### **4.1 Definition of Permanent Establishment**

<sup>128</sup> UNCTAD, International Investment agreements and their interpretations, accessed at <https://investmentpolicy.unctad.org/publications/1245/international-investment-agreements-and-their-implications-for-tax-measures>, accessed on July 07, 2021.

<sup>129</sup> Ibid

<sup>130</sup> UNCTAD, Investment and innovation policy review of Ethiopia, <https://unctad.org/en/docs/poiteipcm4.en.pdf>,

<sup>131</sup> Ibid

## The permanent establishment<sup>132</sup> of business profits in a country and the definition of taxes

<sup>132</sup> For Example Federal Income Tax Proclamation of Ethiopia, Proclamation No 979/2016 in its Article 4 defines “permanent establishment” for the purposes of the ITP. The term is relevant in determining whether income is Ethiopian source income (Article 6), the taxation of certain payments made to non-residents (Article 51), the transfer pricing rules (Article 79), the withholding of tax (including self-withholding) from certain payments (Articles 89, 90, and 93). The definition of “permanent establishment” follows closely the definition in tax treaties and it is intended that the learning on tax treaties is relevant to the interpretation of the definition, particularly the Commentary to the OECD Model Tax Convention on Income and Capital. Sub-article (1) states the basic notion of a permanent establishment, namely a fixed place of business through which the business of a person is conducted. This means that there must be: (i) a place of business; (ii) the place of business must be fixed (i.e. have a degree of permanency); and (iii) a business activity must be conducted through the place of business (for example, it cannot just be a vacant office). The requirement, therefore, is that a place of business must be established. There is no time limit for a place of business to constitute a permanent establishment, although the 180-day time period in sub-article (3) may provide some guidance on this to avoid very short-term operations from being a permanent establishment. The definition has five specific including Sub-article (2) specifically treats certain presences as a permanent establishment. Sub-article (2)(a) treats a place of management, branch, office, factory, warehouse, or workshop as a permanent establishment. These places are largely illustrative of the types of places that can qualify as a permanent establishment under the general principle stated in sub-article (1). Each inclusion is to be interpreted broadly. For example, “office” includes any office no matter what activity is conducted through the office. However, there is an exception for an office that has representation of the person’s business as its sole activity (i.e. the office is merely a liaison office). This exception is necessary because the activities of a liaison office (being merely representation) are too remote from the derivation of income for an amount of income to be accurately allocated to the activity. To qualify for the exception, the liaison office must not engage in the negotiation of contracts of sale or supply. The negotiation of contracts is not simply a liaison or representative function, but rather is a core business activity. Sub-article (2)(b) treats a mine site, oil or gas well, quarry, or other place of exploration for, or extraction of, natural resources as a

permanent establishment. “Natural resources” is not defined and, therefore, has its ordinary meaning, namely any naturally occurring materials or things that have economic value. The main examples of natural resources are minerals, oil and gas, timber, water, and fish. Again, the listed establishments are largely illustrative of the types of places that can qualify as a permanent establishment under the general principle stated sub-article (1). Sub-article (2)(c) treats the furnishing of services as a permanent establishment but only when the services continue for the same or a connected project for a period or periods aggregating more than 180 days in any one-year period. The ninety-day period is tested over any one-year period and not by reference to the tax year. The 180-day period may comprise two or more periods within any one-year period provided they relate to the same or a connected project. A person may furnish services personally or through employees or other personnel (such as an independent contractor). The Regulations will provide guidance on the meaning of “connected project”. Sub-article (3) treats a building site, or a construction, assembly or installation project, or supervisory activities (such as the services of a consulting engineer) connected with such site or project as a permanent establishment, but only when the site, project, or activity continues for more than ninety days. The Regulations will provide a rule to prevent fragmentation of activity between related persons so as to avoid the ninety-day threshold. The stated article specifies two situations when an agent is treated as a permanent establishment of the principal. The first is when the agent regularly concludes, or substantially negotiates, contracts on behalf of the principal. This is the case regardless of whether the contracts are concluded in the name of the principal or agent. The second is when the agent maintains a stock of goods from which the agent regularly delivers goods on behalf of the principal. The ability to make timely delivery of trading stock is considered to be a central part of any sales activity. In both cases, an agent is not a permanent establishment if the agent is of independent status. Sub-article (6) defines “agent of independent status” to mean an agent that acts for a number of principals as clients, such as a share broker or general import agent. The definition makes clear that an agent who acts solely or principally for one person will be an agent of independent status only if the commercial and financial relations between the agent and the principal are consistent with such relations that would exist between independent persons. This is particularly relevant when the agent and principal are related persons (e.g. the agent may be a member of the same multinational enterprise as the principal).



allow that country to tax a subsidiary of a foreign multinational company in its own right as a tax resident. In cases where a multinational company earns revenue regardless of a subsidiary, the DTA allows countries to levy tax if they limit the activities of foreign multinational companies to the limit set by the agreement definition of "permanent establishment" (PE). The definition of permanent establishment is broadly the same grounds as in many DTAs of Ethiopia. However, the Ethiopia-Seychelles, Ethiopia-UAE, Ethiopia-China and Ethiopia-Netherlands agreements have some provisions that follow the OECD model and the United Nations model. The PE definition in these agreements and other agreements is also signed by Ethiopia with Algeria, Portugal and Saudi Arabia, which are narrow and limit Ethiopia's ability to deal with tax evasion. However, these agreements include some provisions that follow the United Nations model and some provisions that follow the OECD model.

Furthermore, service treatment<sup>133</sup> is a common strategy used in tax exemption schemes, one of the most important regulations that Ethiopia must pay attention to when registering a service provision under a reduced tax jurisdiction. If Ethiopia can define services as a permanent establishment in its home country, the artificial registration of those services abroad will not prevent Ethiopia from taxing the benefits associated with that provision of service. However, Ethiopia tax evasion agreements do not include services as permanent entities in China, Algeria, Portugal, Saudi Arabia, Seychelles, the United Arab Emirates and the Netherlands as these agreements appear to have been inspired by the OECD Model Convention.

In the above agreements, even if the service is permanently established, Ethiopia will not be able to obtain tax rights because the provision of services has specific characteristics and if the countries of origin are to be treated fairly and equally<sup>134</sup>, it shall be deemed a condition unpredictable. In addition, the limited meaning of technical services by MoFED may differ from the meaning of technical services in some

double taxation agreements with the Ethiopian party. Therefore, some agreements are clearly broader than the definition of MoFED, while others are very limited on the meaning of technical services. However, the United Nations model contains a provision relating to permanent establishment services, which are defined as permanent establishments that provide services for more than six months in any twelve-month period in total, and the country of origin is entitled to tax rights.

#### 4.2 Building Sites

Not all DTAs mentioned above follow the same pattern in all respects. However, these DTAAs conform to the UN model in terms of defining a building / construction site as a permanent establishment after six months, without the need for Ethiopia to wait twelve months for tax-related activities as described in the OECD model. However Ethiopia can provide permanent installation service after less than six months<sup>135</sup>.

#### 4.3 Withholding Tax Rates

Withholding taxes (WHT) are dividend<sup>136</sup>, interest<sup>137</sup>, royalty<sup>138</sup> and technical fee taxes<sup>139</sup>. These WHTs are levied by the government on the basis of certain types of foreign payments. Technically, they were imposed on the foreign company that received the payment, but the local company was "discontinued". WHT taxes are probably the most visible part of the contract, the most obvious effect of negotiations between contract partners. Tax agreements set maximum limits at the WHT level that a country may impose on dividends, interest payments, royalties and technical service fees. It is common for Ethiopia to close lower rates on most agreements presented in model conventions such as agreements with the Netherlands, Seychelles and the United Arab

<sup>135</sup> Taddese Lencho, The Ethiopian Income Tax System: Policy, Design and Practice, A Dissertation paper in the Graduate School of the University of Alabama, TUSCALOOSA, ALABAMA, 2014, [Unpublished], pp. 42-45

<sup>136</sup> See Article 10 OECD & UN Model,

<sup>137</sup> See Article 11 OECD & UN Model,

<sup>138</sup> See Article 12 UN Model ,

<sup>139</sup> See Article 13 UN Model,

<sup>133</sup> See Article 5.3b of the UN Model Convention

<sup>134</sup> See the provisions in other treaties Ethiopia have PE in service such as the UK, Czech, Egypt and India.

Emirates, although Ethiopia is following a more restrictive OECD model in the region. The withholding tax rate for the portfolio is 15% as determined in the OECD model. Ethiopian agreements suspend tax rates of less than 15%<sup>140</sup>.

#### 4.4 Capital Gains Tax

Despite being at the center of some prominent examples of treaty abuse, capital gains tax (CGT) is the most neglected aspect of tax treaties signed by developing countries. This happens when one of the contract partners is in a lower tax haven or a tax haven such as the United Arab Emirates (Dubai), Israel or South Africa<sup>141</sup>. The agreement stipulates that profits are taxable in the country of origin by disposing of the property, excluding movable property only on the basis of fixed property and efficient maintenance attached to the taxable PE, ship or aircraft. However, any capital gain arising from the sale of assets or the transfer of assets is subject to CGT. Such terms of the agreement may be beneficial to other resident shareholders who are stabilizing shares in Ethiopian companies<sup>142</sup>.

If DTAs exclude source CGT on shares acquired from real estate greater than 50% of their value, such deals are the worst deals for Ethiopia. Other DTAAs, on the other hand, are CGT's sources on fixed and certain types of movable property (e.g. Ethiopia-UK DTA) based on the alienation of assets attached on a consistent basis to provide independent personal services<sup>143</sup>. Loosen out allows the tax authority to levy capital gains tax, stamp tax and dividend tax from the share transfer, along with all other taxes related to the business transfer, if both the transaction shares and the business property are considered a transfer. A good example of this can be seen between the Ethiopian Tax Authority and Oil Libya (the ancestor of the shell Ethiopia). Both companies did not notify the tax authority of the transfer of both shares and business assets. 119 million Br capital gains tax and 91 million Br dividend

taxes including interest and penalty were paid, which Shell Ethiopia must honestly declare and pay. Those sources said the company's shareholders could also be held criminally responsible for not declaring the exact amount of the share transfer<sup>144</sup>.

#### Alienation of share

The alienation of shares includes a provision covering the sale of shares in companies with a high proportion of assets formed as a vehicle for owning the original assets<sup>145</sup>. Without this provision, it is very easy to build in a way that completely avoids capital gains tax when selling a mine or large business ownership. The Ethiopia-China agreement also omits a provision found in the United Nations Model<sup>146</sup>, which allows a country CGT to charge on the sale of shares when a foreign resident sells his stake in a domestic company if his share exceeds 50%. Under this provision, investors can design FDI to gain immunity from CGT if they sell or sell less than 50% of their investment. It could lose millions of dollars in revenue on a single transaction. Of course, there are indirect transfers of assets, where the sale is built to take place through offshore holding companies, thereby avoiding capital gains tax. Shell said there were 16 million beer deals between Ethiopia and Libyan Oil. It is not just a transfer of shares; it is also a business transfer. Subsequently, a capital gains tax dispute arose and the tax was Br 16 million. This is the biggest problem in Ethiopian taxation<sup>147</sup>.

Indirect transfers from developing countries were highlighted in a recent report. Profits earned by the owner when selling the property are often not taxed in the country where the property is located, the report said. In some cases artificial structures are used to make "indirect transfers", for example by selling shares in a company that owns the property rather than selling the property. Libya Oil

<sup>140</sup> Ibid

<sup>141</sup> Ibid

<sup>142</sup> Ibid

<sup>143</sup> Article13(2), of the Ethiopia-the UK double taxation agreement

<sup>144</sup>John Donovan, Fortune, Shell fraud and tax evasion in Ethiopia, Fortune. May 4th, 2011, accessed at <http://royaldutchshellplc.com/2011/05/04/shell-fraud-and-tax-evasion-in-ethiopia/>.

<sup>145</sup> See the UN model and the OECD model (since 2003)

<sup>146</sup> Article13(4) Double taxation Avoidance agreement between Ethiopia and China

<sup>147</sup> Ethiopian Investment Agency

Ethiopia Limited (OiLibya), the shell Ethiopia buyer, did not give advance notice for fear of diversion of funds. However, there is a capital gains tax on the transfer of property from Shell to OiLibya, including interest and penalty<sup>148</sup>.

### The Way Forward

Unfortunately, DTAs are not properly spread in Ethiopia's tax administration because most tax treaties with Ethiopia have symbolic diplomatic values<sup>149</sup>. In addition to summarizing these agreements to avoid double taxation between the contracting states, these agreements should at least authorize the authorities to interpret domestic tax laws or to understand domestic tax law should be prompted to edit this development. However, this is partly due to the lack of an official policy framework governing and overseeing the DTAs<sup>150</sup>. This is an obstacle to properly negotiating Ethiopia with a clear mandate to strengthen the economy through the most important legal means for trade and taxes.

This article highlights the need for the Ethiopian government to carefully assess who benefits from the DTAs. Therefore, Ethiopia should evaluate and re-negotiate both of its double taxation agreements with these countries. This tax incentive competition with neighboring countries would do more harm to these countries than double taxation agreements. Therefore, it would be better for Ethiopia to reconsider all its DTAs and take timely and appropriate action to re-negotiate its DTAs, rather than suppressing its economy by competing with neighboring countries for the best tax incentives. Israel, South Africa, the Seychelles and Dubai (UAE) tax havens are among the participants in the eighteen double taxation agreements signed by Ethiopia. This means that all of the countries listed above are generally subject to lower taxes, specializing in providing corporate and commercial services to non-resident offshore companies and individuals, and in investing offshore funds. It

<sup>148</sup> Yohannes Woldegebriel, Tax Reclaim Contradicts Universal Canons, AddisFortune, Vol.12, No.604, Published on Nov 27, 2011, Available at [http://addisfortune.com/Vol\\_12\\_No\\_604\\_Archive/economic\\_commentary.htm](http://addisfortune.com/Vol_12_No_604_Archive/economic_commentary.htm), accessed on June 21, 2021

<sup>149</sup> Supra note at 20, pp. 138

<sup>150</sup> Ibid

is often combined with a certain level of mystery.

Developing countries regularly report that different types of payments between companies within the same MNE group can rationally eliminate their tax base<sup>151</sup>. They report that it is very difficult to assess whether such payments are related to the actual value received, or whether they are excessive or unreasonable. These payments are usually for finance (such as interest payments), services (such as management fees) or intellectual property (such as royalty payments). These types of payments occur in both developed and developing countries, but the risk of tax payments in developing countries may be higher because MNE partners in developing countries are generally more receptive than finance, services, and intellectual property providers<sup>152</sup>.

However, it is difficult for developing countries to obtain the complete information needed to assess it. Royalty payments to MNE colleagues are also common. The ability to assess whether any such payments are appropriate or whether they are high again requires considerable knowledge and high technical ability. Communication and assistance in tax collection played a major role between the two agreeing states. The purpose of this agreement is to assist the tax administration in reducing tax barriers to border business and investment and in sharing information<sup>153</sup>.

### Concluding Remarks

The development of these international tax treaties was closely linked to the progress of the neo-liberal economic and political project, which sought to prevent and provide solutions

<sup>151</sup> Ibid

<sup>152</sup> Tax Justice Network, Offshore Business Magazine, (September 20, 2006 edition), pp. 66-67, accessed at [http://www.magverlag.com/offshore\\_magazine09.pdf](http://www.magverlag.com/offshore_magazine09.pdf), accessed on June 18, 2020

<sup>153</sup> Michiel van Dijk, et al., The Netherlands: A Tax Haven, Offshore" can be used as another word for tax havens or secrecy jurisdictions, Offshore Business Magazine (September 20, 2006 edition), pp.66-67, accessed at [http://www.magverlag.com/offshore\\_magazine09.pdf](http://www.magverlag.com/offshore_magazine09.pdf), accessed on June 18, 2020.

to the serious problem of high capital accumulation in the 1970s. Within the framework of national tax structures, the development of the DTA was seen as an integral part of the generalization trend towards reducing the tax burden on capital and moving towards workers. DTAs cause a number of problems with their design specifics and the way tax revenue is distributed among contract states. Such design and distribution results from the conflicting interests of countries with traditionally capital-exporting economies and less developed economies those are relatively strong in the international political arena.

In developed countries at the same level, from a revenue distribution perspective, signing a DTA is not a problem. In fact, they can become a beacon of international cooperation, strengthening economic and trade ties between countries in the same region. However, identified power disparities between states put vulnerable states and small economies such as Ethiopia at risk, and signing DTAs with developed countries poses a serious risk to them.

In addition to the disproportionate dynamics that DTAs can create through international (and national) legal channels, their development is partly associated with illegal processes because some tax treaties are signed between states. Who really is, and will do heaven, pretend to do so. Because of its role in banking and financial privacy, distorted transfer pricing, tax evasion and tax fraud, such relationships have opened the door to wide areas of ambiguity in the accumulation of international capital.

In addition, the complexity of the provisions of the DTA and international tax law, as well as technical difficulties and the limited availability of resources affecting tax administration in Ethiopia, provide an opportunity for multinational companies to have what is known as a "tax plan". "Even though it is kept at the level of relative legitimacy, the tax plan leads to aggressive tax evasion, which brings a serious problem of morality and political legitimacy.

Signing international tax treaties, such as DTAs that do not prioritize or meet Ethiopia's requirements, can become a significant

obstacle to funding its development and social infrastructure; The unequal distribution of revenue, the connection of DTAs to ash accumulation areas (evasion, capital flight, tax haven), the lack of principles (source or residence) and tax management technology to ensure the effective implementation of complex networks around the world but the simplification of the tax planning process Does.

In conclusion, we can say that DTAs are not a blessing to Ethiopia because Ethiopia has not developed a national policy framework to clarify the minimum standards and benchmarks for discussing DTAs, and as a result, Ethiopia double taxation agreements. It is used only for diplomatic use purpose, while Ethiopia loses much needed tax revenue. Ethiopia is sometimes better off without a DTAA than developed countries such as the UK, the Netherlands, Israel and Portugal, as these countries do not require taxes from their multinational companies. In addition, many countries with lower tax rates; Like other OECD countries the tax rates are less than 20% and tax haven countries like UAE (Dubai), Seychelles and South Africa etc. can be considered as a possible place to move revenue.

The author makes the following recommendations.

- ♣ Evaluation and review of current DTAs completed in Ethiopia to determine whether they have met the expected goals such as encouraging investment, eliminating cross-border trade and dual taxes, increasing tax revenue, preventing economic evasion and promoting one-sided investment. On the other hand considering whether cancellation or re-negotiations with the intention of effectively protecting national interests is not the best option.
- ♣ Develop a clear policy for negotiations, approval, implementation and monitoring of the DTA in Ethiopia.
- ♣ The government of Ethiopia should also prepare a comprehensive list of countries with lower tax rates and no tax exemptions for their multinational companies before coming to MoFED negotiations. It should also identify countries with lower tax rates

or countries that are considered tax havens, to help eliminate loopholes in national tax codes and tax treaties that allow tax haven transactions. This comprehensive list of countries helps Ethiopia's dual tax treaties to be more generous to taxpayers, thereby losing significant tax revenues.

- ♣ To get the most out of deals like the benchmark, Ethiopia must develop its own DTA model to suit its specific circumstances. At the very least, it would

be a more useful basis for negotiating UN model tax treaties that emphasize taxation on the source of income.

- ♣ The inflow of foreign direct investment into Ethiopia is not an end in itself but a means of boosting employment and growth as well as increasing the tax base and post-tax revenue. If DTAs do not provide these basic benefits, they should be re-negotiated or canceled.

## LESSON PLANNING PROFICIENCY OF BSED GRADUATING STUDENTS OF ESSU-MAYDOLONG

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### ABSTRACT

*Lesson plans are meant to guide the student-teacher and teachers in the service in facilitating teaching and learning. It is a common misconception that student-teachers lack the necessary skills in writing the lesson plan due to their being uninitiated in the service. It was the aim of the study to determine the proficiency level in lesson planning of the BSED graduating students as an input to instruction and policy formulation for student-interns. An adapted questionnaire was utilized by the 61 teacher-respondents from the six public secondary schools in the service areas of ESSU-Maydolong. Weighted mean was used to determine the cooperating teacher's evaluation of the lesson planning proficiency of the BSED graduating students. The study found out that the cooperating teachers were unanimous in saying that the graduating students "always allocate time in accordance with objectives and exhibit congruency between objectives and subject matter, writes clearly defined objectives" and "are able to indicate transition procedures from one activity to the next." The study also found out that the graduating students need guidance to "exhibit coherence with objectives and teaching procedure" and "relate subject matter to other aspects of life." The study concluded that the student-teachers are Highly Proficient in planning lessons as evaluated by their cooperating teachers.*

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**Keywords:** *lesson planning, planning proficiency, descriptive, Eastern Samar, Philippines*

### Introduction

An important step in effective instruction is to plan ahead in order to identify a course of action that can effectively help teachers reach the lesson's goals and objectives. A lesson plan tells learners what they will learn and how their learnings will be assessed. It helps instructors organize content, materials, time and instructional strategies and assessment in the classroom. A lesson plan is a schedule that tells what to do for a specific group of learners about a certain topic. It is defined as the roadmap or framework used to plan in the conduct of every class during the school year. A written lesson plan ensures that the teacher has created a logical and systematic learning process that is needed to make sure that students will learn in the least time possible (13). The lesson plan is also viewed as a useful tool that serves a combined guide, resource and historical document reflecting the teaching philosophy, students, textbooks, and most importantly the goals of the students (19). With a written lesson plan, the teacher is helped to shift from one step to the next to keep the students focused and encouraged to concentrate on the parts of the lessons. Effective lesson plans are important for teachers in all subject areas. It allows teachers to set a specific

learning goal for student and to identify the concrete steps and activities that will help achieve the predetermined aims. While undergoing teacher-training courses, student-teachers are taught lessons on planning activities and in organizing the teaching-learning process that will bring about the attainment of the lesson's objectives (10). It is a known fact that student-interns lack the skills and capability to perform with success the role of the teacher due to their limited exposure while undergoing their pre-service education. By the time they are fielded as student-teachers in public schools, it is a common misconception that they lack knowledge in planning their lessons. It is also an observation by internship supervisors and even by the cooperating teachers themselves that the written lesson plan lack clearly defined objectives, incongruent teaching procedures, haphazardly prepared formative tests, and invalid assignments. Considering these facts, it is imperative for the researcher being an instructor in pre-service education to conduct this study.

It was the aim of the study to determine the proficiency in lesson planning of the BSED graduating students as an input to instruction and policy formulation for student-interns.

Specifically, it sought to answer the following questions: 1). How do the cooperating teachers evaluate the proficiency level in lesson planning of the BSED graduating students of ESSU-Maydolong? 2). What inputs to instruction and policies to be formulated with regards to student-teaching?.

**Methodology**

The descriptive method was used to find out the evaluation of the proficiency level in lesson planning of the BSED graduating students. The 61 teacher-respondents came from the six secondary schools in the service areas of ESSU-Maydolong namely: Maypangdan National High School, Maypangdan, Borongan City; Lalawigan National High School, Lalawigan, Borongan; Maydolong National High School, Maydolong; Balangkayan National High School, Balangkayan; Lorente National High School, Lorente and Pedro E. Candido Memorial National High School, all in the province of Eastern Samar, Philippines. A 15-item checklist adapted from the study of Roble and Bacabac (34) was used as the research instrument. Weighted mean was used to determine the proficiency level in lesson planning of the graduating students. A letter requesting permission to conduct the study was sought from the Campus Administrator. Once permission was granted, a letter to the concerned principals was also presented seeking assistance in the distribution of the checklist. The checklists were retrieved right away and the collated data was subjected to analysis and interpretation.

**Results and Discussion**

The results can be gleaned from the following table.

Items 1-4 would fall under the pre-planning stages when writing a lesson plan. The evaluation of the cooperating teachers rated those items with a weighted mean of 4.16 - Highly Proficient. This finding is corollary to the guidelines set by Corpuz and Salandanan

(12) that the lesson objectives must integrate the cognitive, psychomotor and affective domains for a holistic lesson. It must be aligned with the aims of education found in the Constitution of the country and the vision-mission statements of the school where they are teaching. It only goes to show that the student-teachers are aware of the importance of writing relevant objectives covering the three domains of learning (Sejnost, (35), Laforteza, et. al. (19), Jao, (18), Bulusan, (10), Bunga, (9), Austria-Torreliza, et.al.(5).

Items 5-11 can be categorized under the implementing stage of the lesson planning. As expected, the cooperating teachers rated the former with 3.89 -Highly Proficient. This is the common misconception that student-teachers lack the necessary skills and capabilities to perform with success the role of the teacher for the simple reason that student-teachers are still undergoing training to become facilitators of teaching and learning ( Resurrecion, (33), Penetrante,et.al.(31), Pawilen, et.al.(28), Pasco, (27), Zarate, (38), Naldo, (25), Magalona et.al., (24), Magalona, et.al. (23), Leano, et.al. (20), Habulan, (16), Go-Monilla, et. al. (15), Go-Monilla, e.t al. (14), Espique, et.al. (13), Bulaong, et.al. (8),Brawner, et.al. (7), Bilbao, et.al. (6), Arcilla-Serapio, (4), Ancheta, (3), Alata, et.al.(2), Alata, et. al. (1). Finally, items 12-15 covered the post -planning stage of lesson planning. The cooperating teachers rated them 3.86 interpreted as Highly Proficient. It is a common observation that student-teachers oftentimes give evaluation and assignment that are not in accord with the purpose of the lesson, hence the need for proper guidance when they teach and hopefully they will be given guidelines set by their cooperating teachers on testing (Prieto, et.al. (32), Pawilen, (29), Pawilen, (28), Ubina-Balagbas, et. al. (36), Navarro, et. al. (26), Llagas, et. al. (21, 22), Cajigal, et. al. (11).

**Table 1. Lesson Planning Proficiency of BSED Graduating Students**

Item	Cooperating Teacher's Evaluation	Adjectival Description
1.I have clearly defined objectives.	4.48	Very Highly Proficient
2.The ST allocate time in accordance with	4.40	Very Highly Proficient

objectives.		
3. There is congruency between objectives and teaching procedure.	3.89	Highly Proficient
4. There is congruency between objectives and subject matter	3.89	Highly Proficient
5. The ST indicate transition procedures from one activity to the next.	4.18	Highly Proficient
6. The ST link the subject matter to the student's interest.	4.08	Highly Proficient
7. There is coherence with the objectives.	3.89	Highly Proficient
8. The ST use relevant examples.	3.78	Highly Proficient
9. The ST clearly identified sequential development activities.	3.75	Highly Proficient
10. The ST include a variety of learning activities.	3.75	Highly Proficient
11. The ST relates the subject matter to life.	3.75	Highly Proficient
12. There is congruency between objectives and assignment.	3.85	Highly Proficient
13. There is coherence between objectives and formative test.	3.83	Highly Proficient
14. The ST indicate evaluation procedure	3.83	Highly Proficient
15. The written lesson plan is well-prepared.	3.78	Highly Proficient
<b>TOTAL WEIGHTED MEAN</b>	<b>3.94</b>	<b>HIGHLY PROFICIENT</b>

In sum, the cooperating teachers of the six schools in the service areas of ESSU-Maydolong rated the proficiency in lesson planning of the BSED graduating students as Highly Proficient although the same need guidance and monitoring in some areas in order for them to become effective and efficient teachers in the days to come.

### Conclusions

The study was geared towards finding out the level of proficiency of the graduating students as evaluated by their cooperating teachers. It also found out that the cooperating teachers were unanimous in saying that the student-interns "always allocate time in accordance

with objectives, exhibit congruency between the objectives and the subject matter, write clearly defined objectives" and are "able to indicate transition procedures" and "relate subject matter to other aspects of life." The same study concluded that the student-teachers are Highly Proficient in their lesson planning as evaluated by their cooperating teachers. The study suggests that the results be disseminated to the concerned agencies in order to maximize the learning and teaching potentials of the student-teachers. The same study also recommends that the cooperating teachers be oriented on the expected roles they will play in handling the student-teachers assigned them.

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**CATALYTIC ROLE OF DAIRY COOPERATIVE FOR WOMEN EMPOWERMENT: A  
CASE STUDY OF WOMEN COOPERATIVE LEADERSHIP DEVELOPMENT  
PROGRAM OF GOKUL, KOLHAPUR DISTRICT OF INDIA**

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**ABSTRACT**

*Dairy cooperatives are breeding grounds to develop local enterprise access to women by enhancing their knowledge and capacities to achieve women empowerment. Kolhapur Zilla Sahakari Dudh Utpadak Sangh Ltd, one of the leading cooperative dairy from Kolhapur district of India, popularly known as 'Gokul,' has initiated the "Women Dairy Cooperative Leadership Development Program" (GWCLDP) to empower rural women. The program intends to increase women's empowerment through dairy cooperatives and providing scientific cattle rearing inputs to increase milk production. Here the impact of the program on women's empowerment is assessed using the Women's Empowerment in Agriculture Index (WEAI)'s 5DE sub-index. The study has adopted a randomized controlled design. Women from both program-implemented and non-program-implemented villages were contacted using a multistage stratified random sampling. The study result shows that the program effectively develops leadership skills, participation in social group activities, and credit access to women in program-implemented villages. The study outcome reinforces that the program effectively achieves the goal of women's empowerment and can be replicated in other cooperative setups in developing countries.*

**Keywords:** Women empowerment, Cooperative dairy, WEAI, 5DE, Gokul

**Introduction**

In developing countries, rural women are more disadvantaged and most vulnerable. UN Women and the World Bank's collaborative study unveil that more women than men live in poverty (UN Women, 2019). Women and girls represent half of the world's population and, therefore, half of its potential (Verba et al., 2014). In most developing countries, women produce 60-80 percent of food and account for half the world's food production (FAO, 1997). The evidence confirms that if women have access to the same resources, they are equally productive as men (Doss, 2010). However, women in many parts of the world face discrimination in access to land, housing, property, and other productive resources, have inadequate access to technologies and services that could reduce their work burdens. Limited access to resources alleviates agricultural productivity, livelihood security, increased poverty, migration, and increased risk of violence (World Survey, 2009). By contrast, promoting Women's empowerment is a lynchpin of creating a prosperous, safe, and

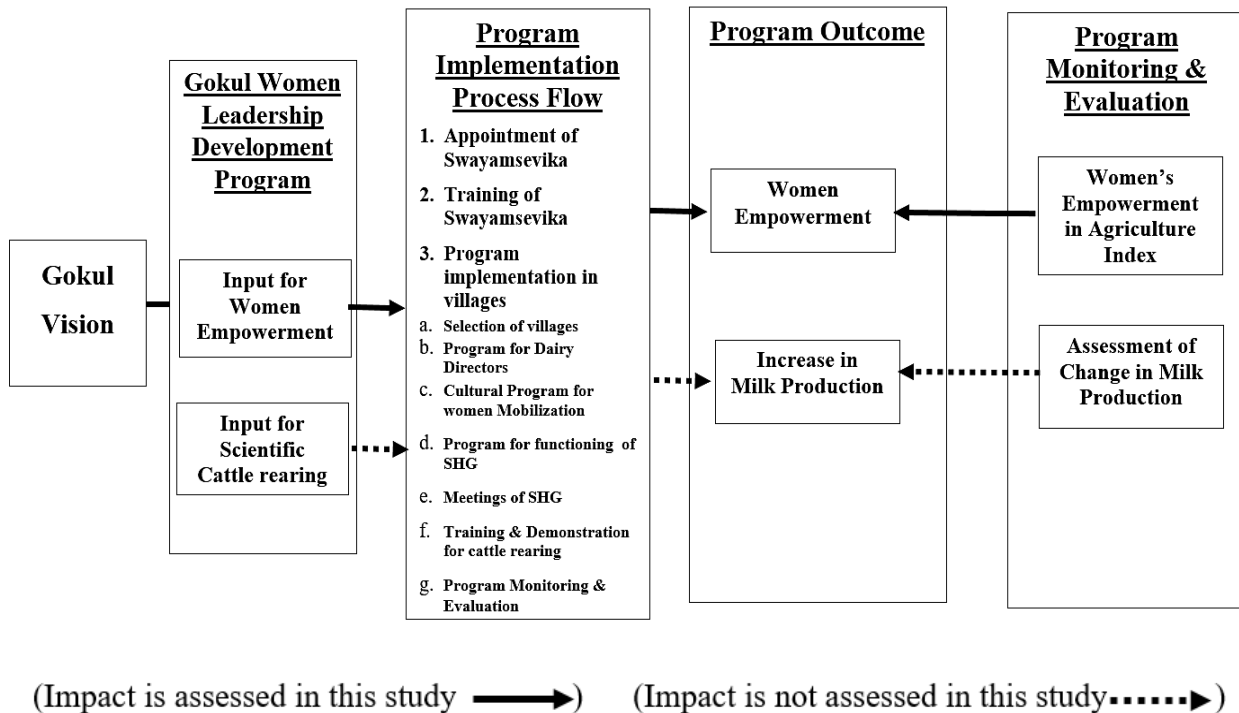
peaceful world (United Nations, 2010). As an outcome of better access to health services, education, and involvement with local enterprises, women earn additional income for their families, which replaces the family's vicious cycle with a virtuous one (Mitchell, 2013). Dairy cooperatives are a breeding ground to create local enterprise access to women by enhancing their specific knowledge and capacities to achieve women's empowerment (Tesfay & Tadele, 2013). Primarily, rural women are engaged in cattle rearing activity. Women conduct more than 77 percent of livestock farming work, accounting for 55 percent of employed livestock-farming labor. Besides, 93 percent of people employed in dairying are women (RNCOS, 2006). Dairy Cooperatives have played instrumental roles in enhancing dairy farmers' income and employment (Kumari & Malhotra, 2016). Kolhapur Zilla Sahakari Dudh Utpadak Sangh Ltd, well known by its brand name 'Gokul,' is Operation Flood cooperative dairy project established on March 16, 1963. Gokul Dairy has a 15 Lakh Liters per day milk handling capacity, and during the year 2019-2020, the

average milk procurement was 10.64 Lakh Liters per day. Gokul has played an imperial role in the economic and social development of Kolhapur district visas vis the state of Maharashtra, India(Koli, 1994). Gokul has acknowledged the significant role of women in dairy cooperatives. Gokul has initiated the various program that allows women for participation in decision making. To empower rural women involved in dairy farming, the organization has started the "Gokul Women

Cooperative Leadership Development Program" (GWCLDP).

**Gokul's Women Cooperative Leadership Development Program (GWCLDP):**

The program has two main components: increasing women empowerment through dairy cooperatives and providing inputs for scientific cattle rearing to increase milk production. The nature and execution of the program are discussed here in detail.



**Figure-1: Model of Gokul Women Cooperative Leadership Development Program**  
 Source: Author

**Gokul Vision:** "Improving the farmer's livelihoods, human resource development, and acquisition of customers trust Gokul will be leading organization in India."

**Program Implementation Process Flow:** Step by step program implementation process is followed:

- **Appointment of Swayamsevika (Lady Instructors):** In the selected villages, the program is implemented through a well-trained lady instructor called Swayamsevika. Swayamsevika is a young, dynamic lady who at least completed her secondary level education; inclinations towards women empowerment is appointed as Swayamsevika. She has been offered an honorarium that creates an

additional source of income and opportunity for self-development.

- **Training to Swayamsevikas:** Appointed Swayamsevikas are given intensive training. The training includes behavioral training to develop leadership skills among women and cattle rearing practices to boost milk productivity. Under the behavioral training, they are trained for public speaking, counseling, and motivational training, offering solutions to domestic programs. They are also introduced for scientific cattle rearing, fodder processing, and domestic medication for livestock. Training for the formation of self-help groups and their functioning is also given to the Swayamsevikas.

- **Implementation of the Program:** Once the village is selected, systematic step-by-step program implementation occurs through a well-defined procedure. The steps are as follows:
  - 1. Selection of Villages:** Every year, seven villages are allocated per Swayamsevika. While selecting villages' preference is given to most deprived comparatively undeveloped villages, from talukas.
  - 2. Inspiration Program for Cooperative society's Director:** After selecting villages, the program's implementation starts through an inspirational program for cooperative dairy society's directors. Gender sensitization and motivational program are organized for directors of the dairy society in the village. The Dairy board of directors is enlightened about women's role in dairy farming and the need for women's empowerment to increase society's milk supply and benefits.
  - 3. Women education program:** The next step is women mobilization. With the dairy society's support, women supplying milk to dairy are mobilized by organizing informal meets and cultural programs. In that program, Swayamsevika establishes a friendship with the village women and educates them to join the program.
  - 4. Formation of Self Help Group Program:** Further, women are convinced to form a self-help group. The women are educated and enlightened about the benefits of joining a self-help group. Next, women include self-help groups and encourage other women to join. Women elect president and secretary of the SHG, and SHG formation takes place. Finally, women mobilize their small savings and offer credit to other members.
  - 5. Training for Functioning of SHG:** Women are trained for bookkeeping, banking transactions, depositing and withdrawing money from the bank, maintaining the minutes of the meeting of SHG, and other functioning of the SHG.
  - 6. Regular meetings of SHG:** Every fortnight regular meeting of SHG is being held by the SHG members, where they discuss the functioning of SHG. Mobilizations of small savings and decisions of credit disbursement are being taken in the meeting. In addition, SHG offers socializing platforms for women to make new friends and share their feelings and emotions.
  - 7. Different Training:** Various training programs are being held in the village throughout the year. Training involves both women empowerment and scientific cattle rearing practices. Women have been trained on her right, health hygiene, sanitation practices, public speaking, and SHG participation under women empowerment training. It also includes instruction in scientific cattle farming. The training includes cattle rearing practices, preparing fodder, type of fodder to be offered, different processes on fodder, certain family-based domestic medicines, calf rearing, and animal fertilization practices; information about other Gokul schemes is being given. Various training methods are being offered for effectiveness, such as on-the-job training, demonstration, group presentations, seminars, and educational tours to ideal models.
  - 8. Program monitoring and evaluation:** Program monitoring and evaluation is a continuous ongoing process. Whereas at the end of the year the changes in the villages are monitored and noted. Swayamsevika working in the villages monitors the outcome of the program for the villages. Other officials involved in the program keep track of the program outcome. Further, any particular program, corrective gap-filling actions, if required, are conducted in the village.

#### **Objectives of the Study:**

The study intends to suffice two broad objectives; they are as follows:

1. To generate baseline data on the Gokul Women Leadership Development

Program's outcome. The collected data for impact assessment of the program.

2. To assess the impact of the Gokul Women Leadership Development Program on women beneficiaries.

### Materials and Methods

**Research Design:** The study has adopted a randomized controlled design. The randomized control trial (RCT) is a trial in which subjects are randomly assigned to two groups. One (the experimental group) receiving the intervention that is being tested, and the other (the comparison group or control) receiving an alternative (conventional) treatment (Kendall J M, 2003). Gokul has implemented the program in selected villages from each taluka of the Kolhapur district. The program-implemented villages are considered the treatment group, and the non-program implemented villages are considered a control program.

**Survey Instrument:** The Women's Empowerment in Agriculture Index Scale (WEAI) was adopted to assess the respondent women's empowerment status. WEAI assesses the empowerment of the surveyed women and gender parity in agriculture regarding their family members. Further, it also suggests critical areas in which empowerment needs to be strengthened and track progress in empowerment status over time.

The WEAI comprises two sub-indexes. 5 Domains of Empowerment (5DE) and the Gender Parity Index [GPI]. The first, 5 Domains of Empowerment (5DE), assesses how women are empowered in five empowerment domains (5DE) in agriculture. Along with measuring the combined empowerment status, it also evaluates the percentage of individual domains in which women are empowered. The 5 Domains of Empowerment (5DE) are (1) decisions about agricultural production, (2) access to and decision-making power about productive resources, (3) control of the use of income, (4) leadership in the community, and (5) time allocation. The 5DE comprises ten indicators with specified weights. Each indicator measures whether the respondent individual has reached a specified threshold (has adequate achievement) of empowerment. A woman who has adequate achievements in any four of the

five domains or whose weighted indicators empowerment score is at least 80 percent of total adequacy is defined as empowered. The empowerment score signifies the weighted percentage of dimensions in which a woman has achieved adequacy. Along with providing the women's empowerment status, the index identifies areas of disempowerment. The 5DE sub-index has a 90 percent weight contribution to the WEAI.

The second sub-index (the Gender Parity Index [GPI]) examines whether women are equally empowered as the men in their households. GPI identifies the empowerment gap for those households not equal in gender that needs to be bridged for women to achieve the same empowerment level as men. For further details of WEAI, please refer (Alkire, Peterman, & Vaz, 2020).

WEAI yields empowerment status for women and women concerning men in their households. In this study, women's empowerment status is assessed using 5 Domains of Empowerment (5DE) in the program implemented and non-program implemented villages to assess the program's effectiveness. Gender parity is not assessed in this study. The details of domains, indicators it is scoring, and weights are given in Table No: 3

**Sampling Design:** To contact the respondent women Multistage Stratified Random sampling method was used. In the first stage, six talukas from Kolhapur District were selected using the randomization method. Next, each taluka was divided into two strata; they were program-implemented villages and non-program-implemented villages. From each taluk, three villages out of total villages where the program was implemented and three villages from the taluka where the program was not implemented were selected using the randomization method. From program-implemented villages, ten women who participated in the program were selected using the randomized method. From a non-program implemented village out of total household supplying milk to Gokul dairy, ten women respondents were contacted using the randomized method. In totality, a 360 respondents sample size was determined for the study. Wherein 180 women respondents from program-implemented villages and 180

women respondents from the program not implemented villages. Extra respondents were approached in each village to prevent data collecting problems due to non-response. In a way total of 377 respondent women were contacted under the study.

**Tools for Data Analysis:** Women empowerment status was estimated using a 5DE score of WEAI. Using the Chi-Square test association between adequacy status and type of village was evaluated. Further, the score of each indicator was estimated. Finally, the Independent sampling t-test was used to evaluate whether the indicator score significantly differs amongst the type of village.

### Review of Literature:

**Definition of Women Empowerment:** The concept of empowerment is multifaceted and very much personal in nature. Every individual has his unique definition of empowerment, for someone he or she is empowered if has the power to decide about their things, life and action, for others it is the ability to improve quality of life, someone who is independent, having money or the ability to work jointly and well together (Alkire et al., 2020). Considering the multidimensionality of the concept of women empowerment, different authors have defined empowerment differently. Batliwala (1994) defines "the extent of influence people or society has over her external actions that matter to their welfare." Three experimental approaches of empowerment were suggested they were integrated development, economic empowerment, and consciousness-raising. (Batliwala, 1994). Narayan (2005) defined empowerment as "the expansion of assets and capabilities of poor people to participate in, negotiate with, influence, control, and hold accountable institutions that affect their lives." The definition stresses four main elements of empowerment: institutional climate, social and political structures, poor people's assets and capabilities, and Poor people's collective assets and capabilities (Narayan, 2005). Kabeer (1999) stresses that "empowerment for women is a process by which those who rejected the right to make strategic decisions for life gain the capacity to do so" (Kabeer, 1999). Alsop,

Bertelsen, and Holland (2006) defined empowerment as "the process of enhancing an individual's or group's capacity to make purposive choices and to transform those choices into desired actions and outcomes" (Alsop, R., M. Bertelsen, and Holland 2006). The definition has two sub-components the concept of agency highlight the ability to act on what is valued and reason to value. The next component is about the institutional environment. It offers people the power to utilize agency prolifically.

The agriculture sector is claimed to be an engine of growth and development. Women play a significant role in agriculture (Gollin, 2009). National Government and Non-government organizations initiate agriculture interventions for women empowerment. However, the non-availability of valid tools for impact assessment of the interventions on empowerment limits measures the change in income or other measurable outcomes. Gender equity assessment Indexes and indicators have little coverage of the agricultural sector, and agriculture-related indicators have no coverage for gender (Malhotra & Schuler, 2005). The Women's Empowerment in Agriculture Index (WEAI) is the solution to the dilemma. It measures the empowerment, agency, and inclusion of women in the agricultural sector. Besides measuring the state of empowerment and gender parity in agriculture, it also identifies critical areas to strengthen empowerment and keep track of progress over time (Alkire et al., 2020).

**Role of Dairy Cooperative in Women Empowerment in India:** Women play a prominent role in dairying; as per National Dairy Plan-I, women's total time spent on dairying is 64 percent (Baseline Study Report). Some studies argued that dairying created hidden costs to women's increased workload (Sharma & Vanjani, 1993). Along with their household responsibilities, women have to undertake the taxing job of cattle rearing (Trivedi, Priyan, & Bhinde, 2011). Besides, numerous studies spotlighted the imperative role of dairy cooperatives in women's socio-economic and political empowerment.

Manisha Gangwar, Nita Kandekar, Mandai, (2004) study shows that membership of a dairy

cooperative helped women become economically independent, social participation improved their social prestige, and made them self-confident (Manisha Gangwar, Nita Kandekar, Mandai, 2004). Kumar & Malhotra (2016) highlighted that dairy cooperatives are instrumental in enhancing rural women's income and livelihood. The dairy cooperative allows women to participate in management committees, membership on boards of milk unions and state federations. They can borrow money from their relatives and repay the loan from the dairy income. The most significant impact of the dairy cooperative is witnessed in leadership. The dairy cooperative has improved women's participation in various decision-making in political, economics, and public life (Vivek, Unni, Jeemol, Modi, Pratik, & Sharma, 2016). The Women's dairy cooperatives create additional employment opportunities, contribute to family income, it enhances women's social status (Dash & Sarangi, 2017). Singh et al. (2018) highlighted a significant increase in employment, annual household income, and access to home appliances among women's dairy cooperative societies. Whereas, there is scope ahead to work on areas through which access to finance,

confidence in financial transactions, and ownership of assets can be created for women (Singh et al., 2018). Binita & Ravinder (2019) argued that women who are a member of dairy cooperatives are more empowered than non-members, and member women show a higher gender parity than a non-member (Binita & Ravinder, 2019).

Sudan (2019) underlined the role of the dairy cooperative in achieving the sustainable development goal. Dairy cooperative stimulates democratic practices, social inclusion, gender equality, job security, better working conditions, competitive wages, additional income, profit-sharing, poverty reduction, food, nutritional and health security, and increased decision-making self-help community (Sudan, 2019).

**Data Analysis & Interpretation:**

Data analysis performed under the study is divided into two components, one testing the association between women's empowerment status and the program. Second the score computation for each indicator and testing whether the indicator score differs from the program implemented and non-implemented villages.

**Table No.1 Association between Empowerment Adequacy and the program implementation**

Indictor	Program Implemented village's Percentage Women Achieved Empowerment Adequacy (n=192)	Non-Program Implemented village's Percentage Women Achieved Empowerment Adequacy (n=185)	Chi-square value X <sup>2</sup>	P-value
Input in production decisions	98.4	96.2	1.80	0.180
Autonomy	43.2	40.5	.280	.597
Ownership of Assets	96.4	97.8	.732	.392
Purchase and Sale of Assets	88	85.4	0.56	0.454
Access to Credit	62.0	41.1	16.4	.00
Access to credit without self-help group	31.8	35.7	0.64	.423
Income	100	100	-	-
Speaking in Public	95.8	82.7	17.12***	000
Participation in Social Group	98.4	85.9	20.7***	000
Participation in Social Group Without milk and self-help Group	23.4	21.6	0.178	0.67
Workload	81.8	74.6	2.85	0.91
Satisfaction with the time available for leisure activities	92.7	90.3	.721	.396

Note. Df=1, \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

Source: Field survey

**Indicator Score Comparison:**

As per the WEAI Index, if the respondent woman has achieved in the indicator, she has



been considered empowered. Each indicator is a construct of multiple items. Here score for each indicator is computed. Further, each item is given a score of one, and the overall score of the indicator is calculated. The minimum score for the indicator is 0, and the maximum score is the total number of items in the indicator.

Using the independent sample t-test, a significant difference for indicator empower score in the program implemented and the non-implemented village is tested. The results are presented in table No.2.

**Table No. 2 Indicator Score Comparison:**

Name of the Indicator	Rang of Score	Program Implemented village's Indicator's Mean Score (n=192)	SD	Non-Program Implemented village's Indicator's Mean Score (n=185)	SD	t test value df=375	P value
Input in production decisions	0-10	6.67	1.74	6.02	2.13	3.21***	.001
Autonomy	0-4	.989	1.36	1.010	1.46	0.146	.884
Ownership of Assets	0-8	3.312	1.70	3.156	1.73	.878	.381
Purchase and Sale of Assets	0-6	2.416	1.34	2.17	1.33	-1.766	0.78
Access to Credit	0-5	0.770	0.716	0.491	0.66	-3.928***	0.00
Income	0-11	7.63	2.21	7.63	1.69	3.78	
Speaking in Public	0-3	2.75	0.716	2.35	1.15	4.05***	000
Participation in Social Group	0-6	1.708	0.87	1.36	.96	-3.588***	.00
Workload	--	8.29	2.56	8.74	3.49	1.40	.160
Satisfaction with the time available for leisure activities	1-5	4.6	0.63	4.5	0.82	1.75	0.081
Individual Empowerment Score	0-100	86.65	0.097	79.77	0.14	-5.41***	0.00

Note.  $Df=1$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

Source: Field survey

### Domain 1: Production

Production domain signifies the sole or joint participation in decision-making by women over food and cash-crop farming and livestock and autonomy in agricultural production. It has two indicators, input in productive decisions and relative autonomy in making productive decisions.

Descriptive statistics of the Input in Productive Decisions indicator reveal that the percentage of women having adequacy in both programs

implemented and non-implemented surveyed villages were considerably good. In both types of villages' percentage of women having adequacy was above 95 percent. In program-implemented villages, 98.4 percent suffice the adequacy criteria, whereas, in non-program villages, it is 98.4 percent. It indicates that the opinions of women have been considered while making decisions regarding agriculture production activities. They take decisions regarding livestock rising and give consultation

for farming practices. As a result, the high participation of women is reflected in production decisions. Here Chi-square test statistics value for the association between women's adequacy status in input in production decisions and the program is  $X^2 = 1.80$   $p=0.180 >0.05$ . It reveals no association between women's adequacy status for input in production decisions indicator and the program. Input in production decision score was computed against participation in ten activities. Here, a score of 1 is given to the respondent if she has adequacy in the activity. The total score of the woman is ranged from 0 to 10. The t-test statistic calculated value is  $t = -3.2$   $p=0.001 <0.05$  reveals that the adequacy score is slightly higher in program villages than non-program villages. It signifies the program has accelerated the women's participation in input in production decisions in program-implemented villages.

#### **Indicator-2: Autonomy**

The Relative Autonomy Indicator (RAI) measures a woman's ability to act on what she values, to her intrinsic motivations prevail over motivations to please others or avoid punishment (Alkire 2007).

Descriptive statistics of Autonomy indicator unveils that the surveyed women's adequacy is less in both program and non-program type of villages. In the program implemented in villages, 56.77 percent of women do not have the adequacy level. In contrast, 59.46 percent of women are under the non-adequacy category from the non-program village. The Chi-square test value  $X^2 = .280$   $p=0.597 >0.05$  specifies no association between women's adequacy status and the program implementation. Furthermore, the t-test statistic calculated value  $t = .146$   $p=.884 >0.05$  reveals no significant difference between program and non-program villages in terms of the level of autonomy score. This outcome contrasts with the results of input in production decisions, wherein both programs implemented and non-implemented villages adequacy level was high. The analysis exposes that although women are involved in production decisions, they do not have autonomy for decision-making. Here either autonomy is not offered, or women are not willing to decide on their own.

#### **Domain-2: Resources**

This domain concerns ownership, access, and decision-making power about productive resources such as land, livestock, agricultural equipment, consumer durables, and credit. Self-reported ownership of assets was used to assess the ownership of the assets, which means a woman feels that she has ownership of the asset. The individual's control over productive resources was assessed using three indicators. They are ownership of assets, decision-making about productive resources, and access to and decision-making about credit.

**Indicator: Ownership of Assets** The ownership indicator examines whether an individual has sole or joint ownership of land and assets, based on a comprehensive list of assets (including agricultural land, large and small livestock, fish ponds, farm equipment, house, large and small household durables, cell phone, nonagricultural land, and means of transportation).

The descriptive statistics of the ownership of assets reveal that in both program and non-program type of villages' high percentage of adequacy. In the program implemented village, 96.4 percent, and in non-program villages, 97.8 percent of women have adequacy. The Chi-square test statistics value is  $X^2 = .732$   $p=0.392 >0.05$  states no association between Women's adequacy status on ownership of asset indicator and the program implementation. The t-test statistic calculated value  $t = -.878$   $p=.381 >0.05$  reveals no significant difference between program and non-program villages in terms of adequacy score of ownership of the asset.

Furthermore, the asset-wise ownership reveals a bigger picture; 30.2 percent feel they own the agricultural land, 40.53 percentage said they own their house. The highest percentage is in the Gold ornaments' asset category; 81 percent feel they have ownership of gold ornaments. Usually, women get gold as a parental gift in her marriage, and she holds the gold ownership. Besides, it is encouraging that 71 percent of women have stated that they own large livestock. Generally, it is women who look after the livestock. Thus, it emphasizes the prominent role played by women in the dairy business.

**Indicator: Purchase and Sale of Assets** In many societies, full ownership of assets may not apply, but holding other bundles of rights, especially control rights over the Purchase and disposal of assets, can also be empowering. Therefore it was asked to the respondent, "Who is the person who can decide regarding the purchase, sale, or transfer of land and assets?" Descriptive statistics results of Purchase and Sales of asset indicator show that in both Program and Non-Program type of villages, the surveyed women's adequacy percentage is high. In the village program, 88.0 percent of women had adequacy, and 85.4 percent were under the inadequate category. It signifies women have a say in decisions about the Purchase and sales of assets. Chi-square test statistics for the association between indicator, Purchase, and sales of assets and the program implementation is  $X^2 = .560$   $p=0.454 > 0.05$ . The t-test statistic value  $t = -1.766$   $p=0.78 > 0.05$  reveals no significant difference between program and non-program villages regarding the level of adequacy for Purchase, sale, or transfer of assets score.

**Indicator: Access to Credit** this indicator examines decision-making about credit: whether to obtain credit and how to use the credit received from various sources such as non-governmental organizations, formal and informal lenders, friends or relatives, rotating savings, and credit associations. Descriptive statistics of the Access to Credit indicator unveil that in 61.98 percent, women from program-implemented villages are under the adequacy category, and 38 percent are under the inadequacy category. Here Chi-square test statistics values  $X^2 = 16.47$   $p=0.00 < 0.01$  for association between Access to Credit and the program implemented reveal significant association. The t-test statistic value  $t = -3.928$   $p < 0.05$  shows a significant difference between program and non-program villages regarding access to credit adequacy. It reveals that the program boosted access to credit in program-implemented villages.

**Adequacy Status in terms of access to Credit without Self-Help group:** Gokul promoted Self-help group activities under the program, implemented villages. While assessing the adequacy level of empowerment on access to credit, women's self-help group participation

improves access to credit and categorizes her into adequacy status. The program's level of effectiveness was also assessed by evaluating the status of adequacy by excluding the Self-help group as a source credit.

Descriptive statistics results of access to credit indicator without self-help group participation show that in both program and non-program type of villages, the percentage of the surveyed women's adequacy is almost equivalent. In the program implemented village, 35.7 percent of women are empowered, whereas 31.8 percent are under the non-empowered category in the Non-Program village. It specifies that if self-help group source is excluded, the adequacy level has drastically fallen down. Chi-square test statistics value is  $X^2 = .643$   $p=.423 > 0.05$ , signifying no association between women's adequacy status on access to credit and the program implementation access to credit through self-help group was excluded. The two tests (with Self-Help Group and without Self-Help Group) show that the program has successfully boosted the women's participation in the Self-help group.

#### **Domain-3: Income**

The individual's control over income and expenditures is evaluated using only one indicator that reflects the individual's role in decision-making regarding the use of income. The descriptive statistics of control over the use of income reveal that in both programs implemented villages, and non-program implemented villages, 100 percent of women are under adequacy. It is encouraging to note here that all women are empowered. It reflects that women have some or other role in decision-making regarding the family's use of income. The mean adequacy score for program-implemented villages is 7.63 and 6.86 for non-program villages. The t-test result  $t = -3.798$   $p=0.00 < 0.01$  shows that women in program-implemented villages have greater control over spending their money than women in non-program villages.

#### **Domain-4: Leadership**

This domain aims to capture the individual's potential for leadership and their influence in the community. Two indicators are used as proxies to measure active membership in

community groups and comfort speaking in public.

**Indicator: Speaking in Public:** Here woman's opinion was sought on whether she is comfortable speaking in public. Empowered women expressed their feelings, concerns, anger, social developments, and work and wages.

The descriptive statistics of speaking in public indicators reveal that both program and non-program type of villages have a high adequacy percentage. In the program implemented village, 95.83 percent, women are empowered, and in the non-program villages, the same rate is 82.7 percent. Here Chi-square test statistics value is  $X^2 = 17.128$   $p=0.00 < 0.001$  reveals that speaking in public indicator adequacy is associated with the program implementation. The adequacy's mean score of program-implemented villages is 2.75 and 2.35 in non-program implemented villages. The t-test value  $t=-.4.05$   $p=0.00 < 0.01$  reveals that women in the program-implemented village are more comfortable at speaking in public than non-program implemented villages. The program has offered a platform to women for socializing.

**Indicator: Participation in Social Group:** This indicator recognizing the value of social capital as a resource. It assesses whether the person is an active member of at least one social group in the village.

The descriptive statistics of the indicator show that in both program and non-program type of village the high percentage of adequacy. In program-implemented villages, 98.4 percent of women were under the adequacy category, and from the non-program village, the same rate is 85.95 percent. The Chi-square test statistic value is  $X^2 = 20.705$   $p=0.00 < 0.001$ , indicating the association between women's adequacy status for group membership and the program implementation. The t-test statistic value  $t= -3.588$   $p < 0.05$  reveals a significant difference between the program and non-program villages regarding adequacy for participation in a social group. It enforces that the program has boosted the social involvement of women in program-implemented villages. Under the program, Gokul promoted self-help group activities. Women are trained on the functioning of self-

help groups it led to increased participation in self-help groups from programmed villages.

The adequacy was assessed to get a detailed insight into women's social participation, excluding the self-help group and women's dairy participation. It is noted here that with the exclusion of dairy cooperatives and self-help groups, only 21.62 percent of women fulfill the criteria of adequacy in the non-program village. In contrast, with its inclusion, the percentage stands at 85.95 percent. Furthermore, only 23.44 percent of women in the program villages achieved the threshold level of adequacy criteria with the exclusion of dairy cooperative and self-help groups, which boosted the percentage to 98.44 percent. The Chi-square test statistics values is  $X^2 = 0.178$   $p=0.673 > 0.05$  signifies no association between women adequacy status for group membership and the program implementation. The comparative analysis with and without dairy cooperative and self-help groups reveals the program's significant role in enhancing women's participation in self-help groups and dairy cooperatives. However, the other side of the coin is discouraging. Out of the total number of women contacted, only around 25 percent of women are part of some social group than self-help group.

#### **Domain-5: Time**

The time allocation domain includes two indicators: workload and leisure. The first refers to allocating time to productive and domestic tasks; the second captures the individual's satisfaction with the time available for leisure activities.

**Indicator: Workload** The productive and domestic workload is derived from a detailed 24-hour time allocation. Respondent women were asked to recall the time spent on primary and secondary activities 24 hours before the interview, starting at 4:00 a.m. on the day before the interview. The number of hours worked is defined as the sum of the time the individual reported spending on work-related tasks as the primary activity plus 50 percent of the time they said spending on work-related functions as the secondary activity. The individual is defined as adequate on workload if the number of hours she worked per day was less than 10.5 hours in the previous 24 hours.

The descriptive statistics of daily workload indicators reveal the high percentage of adequacy in the village's program and non-program types. In programed villages, 81.77 percent of women suffice the adequacy criteria, whereas, in non-program villages, it is 74.59. Chi-square test statistics value is  $X^2 = 2.85$   $p=0.91 > 0.05$  confirms no association between women's adequacy status for daily workload and the program implementation. The t-test value of the Workload indicator is  $t = 1.407$   $p=0.160 > 0.05$  signifies no significant difference between workload hours in the program implemented and non-implemented villages.

**Indicator: Satisfaction with the time available for leisure activities.** Respondent women's satisfaction for the time available for leisure activities such as visiting neighbors, watching television, listening to the radio, seeing movies, or doing sports was assessed. Chi-square test statistics value is  $X^2 = .721$   $p=3.96 > 0.05$  signifies there is no association between woman adequacy statuses for satisfaction with the time available for leisure activities and the program implementation. The t-test statistics value  $t = -1.752$   $p=.081 > 0.05$  signifies no significant difference between program implemented and non-program implemented villages for sleep satisfaction.

#### **Individual Empowerment Scores:**

The empowerment score reflects the weighted percentage of dimensions in which a person has achieved adequacy. For example, an individual woman who has achieved sufficiency in 80 percent or more of the weighted indicators is considered empowered. Further, each of the ten indicators is assigned a value of 1 if the individual's achievement is adequate, i.e., it exceeds the defined inadequacy cut-off for the specific indicator and a value of 0 otherwise. Thus, an individual's empowerment or adequacy score is simply the weighted average of these ten indicators using the WEAI scale's weights. The descriptive statistics of empowerment status reveal that 83.9 percent of respondents are empowered in program villages, whereas an empowered percentage is comparatively less in non-program villages with 67.6 percent. Chi-square test statistics value is  $X^2 = 13.648$

$p < 0.01$  signifies no association between women empowerment status and the program implementation. However, the test clearly shows an association between the program and the empowerment status of women. Therefore, the program has significantly boosted the empowerment status of women.

The average individual empowerment score in program implemented villages is 86.55 percent, and in non-program villages, 79.77 percent. In the program implemented, the village's average score is well above threshold values of 80 percent. It is encouraging to state here that, on average, the women in program-implemented villages are empowered. In non-program villages, the score is on the edge of the 80 percent threshold value of empowerment. The calculated t-test value  $-5.410$   $p=0.00 < 0.001$ , signifying a significant difference between the empowerment score of the program implemented villages and non-program implemented villages. The results indicate that the program has stimulated the women empowerment process

#### **Conclusions:**

The study shows that the surveyed women from program implemented villages are comparatively better empowered than non-program implemented villages. From both types of villages, opinions of women are considered while considering agriculture production activities. A higher adequacy score from program-implemented villages indicates the program has enhanced women's participation in decision-making. Although women's participation has increased, they do not have autonomy in the decision, and they prefer to take a collective decision. Here either autonomy is not granted, or women do not want to enjoy the autonomy. Ownership of Assets indicator reveals that women from both programs implemented and non-implemented villages have adequacy status for ownership of assets. Women have ownership of gold ornaments, as gold is a paternal gift that women receive. It is encouraging to note here that most women feel they have ownership of the livestock, which signifies women's role in dairy farming. However, even today, Agriculture land and heavy house equipment are owned by male family members. The most

significant impact of the program is being seen in creating access to credit to women. Women from program-implemented villages have better access to credit than non-program villages. Initiating self-help group activities and training women for financial transactions is an essential aspect of the program. One of the most visible impacts of the program is developing leadership abilities among women. The women from program-implemented villages are more comfortable in public speaking. The program has offered a platform to women for socializing. That has created courage among the participating women to express their feeling, opinions socially. Comparatively, higher women participating is visible in the social group from program-implemented villages. Gokul has initiated self-help group activities that boosted women's participation in a social group. However, if the self-help group and membership of cooperative dairy are excluded, there is no significant association between program implementation and women's adequacy status. It reveals that higher participation is an outcome of Gokul initiatives of self-help groups. The total empowerment score shows that a higher percentage of women are empowered from program-implemented villages. The women from program implemented villages are comparatively better empowered than non-program implemented. The difference is not because of economic reasons, as the

villages and women randomly selected under the study are of similar socio-economic conditions. In both types of villages, the source of income in the women's is livestock farming and milk cooperative. The factors that influenced women's empowerment status are the opportunity they got through participating in the program. Thus, the Gokul program is playing a catalyst role in women's empowerment. This study has generated the baseline data of the program outcome that can be used to evaluate the program's impact. The study outcome has reinforced that the program effectively achieves the goal of women empowerment and is suitable to replicate in other cooperative setups in developing countries.

**Limitation and further direction:** in this study, to assess the impact of the Gokul Women leadership program Women's Empowerment in Agriculture Index Scale's (WEAI) 5 Domains of Empowerment (5DE) was adopted. This study has not evaluated gender parity. Further, the program's effectiveness can be assessed by evaluating Gender parity. Moreover, there is ample literature available that shows the role of cooperation in women's empowerment. In contrast, a dearth of literature unveils the association between women's empower status and milk productivity; further research is needed in this direction.

**Table No: 3. The domains, indicators weights, survey questions, inadequacy cut-offs, aggregation method in the Women's Empowerment in Agriculture Index and Indicator Score**

Indicator	Items	Inadequacy cut-off as per WEAI for the indicator *	Aggregation Method*	Range of Indicator's Score **
Input in production decisions	How much you were involved in the decision-making process of <ul style="list-style-type: none"> <li>• food crop production</li> <li>• cash crop production</li> <li>• Livestock Farming</li> <li>• The poultry decision-making process?</li> <li>• Business other than agriculture?</li> <li>• The wage decision process</li> <li>• Which seeds to buy and from where?</li> <li>• Which crop to take in agriculture?</li> <li>• When and where to sell farm produce?</li> <li>• Whether to increase or decrease the number of animals?</li> </ul>	Inadequate if 1) individual participates BUT does not have at least some input in decisions or 2) does not make the decisions nor feels s/he could to at least a medium extent	Aggregation Method: Respondent must have achievement in two (must be above the threshold for two activities)	0-10

Autonomy	<ul style="list-style-type: none"> <li>• Getting inputs for agricultural production</li> <li>• The types of crops to grow for agricultural production</li> <li>• Taking crops to the market (or not)</li> <li>• Livestock raising</li> </ul>	Inadequate if Relative Autonomy Indicator (RAI) $\leq 1$ RAI is a weighted sum of for each activity	Respondent must have achievement in at least one	0-4
Ownership of Assets	<ul style="list-style-type: none"> <li>• Agriculture land</li> <li>• Non-Agriculture Land</li> <li>• Livestock</li> <li>• Farm Equipment (Mechanized)</li> <li>• Large consumer Durables</li> <li>• Your House</li> <li>• Means of Transportation</li> <li>• Gold ornaments</li> </ul>	Inadequate if the household owns the type of asset, BUT s/he does not own it solely or jointly	Achievement if at least one asset except if only one small asset (Poultry, non-mechanized equipment, small consumer durable)	0-8
Purchase and Sale of Assets	<ul style="list-style-type: none"> <li>• Agriculture land</li> <li>• Non-Agriculture Land</li> <li>• Large Livestock</li> <li>• Small Livestock</li> <li>• Farm Equipment (Mechanized)</li> <li>• Large consumer Durables</li> </ul>	Inadequate if 1) HH does not own any asset or 2) if HH owns the type of asset, BUT s/he does not participate in ANY decisions about it	Achievement if makes at least one type of decision solely or jointly over at least one type of asset except if only one small asset	0-6
Access to Credit	<ul style="list-style-type: none"> <li>• Group savings Beeshi</li> <li>• Indigenous Money lender</li> <li>• Formal lender (bank/financial institution)</li> <li>• Friends or relatives</li> <li>• Self Help Group</li> </ul>	Inadequate if household 1) has no credit OR 2) used a source of credit BUT s/he did not participate in ANY decisions about it	Achievement in any	0-5
Income	<p>To what extent did you participate in the decision-making process of the:--</p> <ul style="list-style-type: none"> <li>• Expenditure received from the production of food grains?</li> <li>• Expenditure incurred on cash crop income?</li> <li>• Spending the income earned from Dairy farming?</li> <li>• Spending the income from poultry farming?</li> <li>• The cost of income from businesses other than agriculture?</li> <li>• Expenditure on income earned from wages or other work?</li> <li>• Wage determining your wage rate?</li> <li>• Fixing your salary /wage rate / cost of work other than your farm?</li> <li>• To buy some important items in the house. (E.g., TV, fridge, etc.)</li> <li>• buying everyday items at home</li> <li>• Which food item to prepare at home?</li> </ul>	Inadequate if 1) individual participates BUT does not have at least some input in decisions or 2) does not make the decisions nor feels s/he could to at least a medium extent	Achievement if the individual has some input in at least one activity as long as not only minor household expenditures	0-11
Speaking in Public	<p>Feel comfortable speaking up</p> <ul style="list-style-type: none"> <li>• In public to decide on infrastructure (like small wells, roads, water supplies) to be built in your community?</li> <li>• Ensure proper payment of wages for public works or other similar programs?</li> <li>• To protest the misbehavior of authorities or elected officials?</li> </ul>	Inadequate if not comfortable speaking in public on different contexts	Achievement in at least one	0-3

Participation in Social Group	<ul style="list-style-type: none"> <li>• Village panchayat/ committee</li> <li>• Agricultural/Milk Dairy committee</li> <li>• Water supply committee</li> <li>• Credit or microfinance group (including SHG)</li> <li>• Trade and business association</li> <li>• Religious Social Group</li> <li>• Other</li> </ul>	Inadequate if not part of any group	Achievement in at least one	0-6
Workload	<ul style="list-style-type: none"> <li>• Economically productive work in the primary sector</li> <li>• Economically productive work in the secondary sector</li> <li>• Economically productive work in the tertiary sector</li> <li>• Unpaid productive work</li> <li>• Unpaid productive work</li> </ul>	Inadequate if worked more than 10.5 hours in the previous day	--	--
Satisfaction with the time available for leisure activities	<ul style="list-style-type: none"> <li>• Satisfaction for time available for leisure activities like visiting neighbors, watching TV, listening to the radio, etc.</li> </ul>	Inadequate if not satisfied	--	1-5
Individual Empowerment Scores		An individual who has achieved 'adequacy' in 80% or more of the weighted indicators		

Note: \* As per Specified by WEAI Scale, \*\* Developed by Researcher.

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## AN ORDINAL REGRESSION ANALYSIS FOR EDUCATIONAL ATTAINMENT OF STUDENTS THROUGH MOOCS

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### ABSTRACT

Massive Open Online Course (MOOC) is aimed at enormous participation and open access to education online. Apart from conventional course materials such as filmed lectures, readings, and problem sets, many MOOCs provide user friendly forums to promote interactions among students and trainers. MOOCs are a recent and new generation evolution in distance education which were first announced in 2008 and emerged as new age mode of learning in 2012. Government of India has launched SWAYAM Portal as a Massive Open Online Course (MOOC). Swayam is a platform that would bind Indian higher education, both online and offline. Looking into the statistics related to global forums, this research intends to assess how ready the students are to pursue MOOCs and how the learning from it can help them fulfill their educational requirements.

**Keywords:** MOOCs, educational attainment, higher education, SWAYAM, learning

### Introduction

In 2007, when the then Prime Minister of India, Mr. Singh identified low enrollment in higher education and found 90% colleges rated below average on teaching and learning parameters. The demand drifting from public to private institutions and they having their own problems pertaining to state government rules and limited internal governance, the MOOCs brought potential revolution.

Astonishingly, the Indian students form the second largest group pursuing MOOCS as per the survey carried out by University of Pennsylvania. Though, the Moocs could not penetrate in to the areas apart from the distinguished cities and metros. The short coming pertains to technological arrangement, including computers, mobile devices, and high-speed Internet. With smart phone uprising and tablet accessibility in India intensifying along with 3G and 4G Internet access, and as prices worsen, the inclination towards MOOCs is expected to accelerate. Secondly, with India lacking in quality parameters relative to higher education, the prospective students' loose interest soon as the content gets beyond comprehension. Diana Laurillard, Professor of learning with digital technologies at the Institute of Education in London has highlighted by her states that in Britain in 1995, the first online course was offered with

enrolment of 10,000 students but only 70% completing towards the end of 20 week course period.

In 2014, the scenario rests same with 30% active learners. The data for 2020, India then and now, the data on Swayam portal reflects upsetting statistics- with 203 partnering institutes, 4024 accomplished courses, 1,84,70,424 students enrolled, 11,86,772 registered for exams, and 8,50,924 successful certification. That amounts to a very poor score of only 4.60% of completion to enrolment.

Another noticeable tendency in India is students' inclination towards foreign universities. Recent statistics of 2019 show that 5.9 lakh students opted for higher education abroad with 55% fall in the year 2020 owing to pandemic with a close of only 72k in the first three months of 2021. The Ministry of education has taken steps not only to retain its own brain but also to make India hub for other countries by launching 'study in India Program' by partnering with 117 institutions and getting students from around 50 nations. Such drive will keep the interest of Indian students opting abroad intact as well. Such initiatives have MOOCs as backbone though. With the nations New Education Policy proposed in 2020, the focus of education will be on life skills and vocation rather than traditional degree course. So reliance on online platforms with job ready courses will increase

soon. Through this research we are trying to check the penetration of MOOCs in the remotely located state Chhattisgarh.

**Literature Review**

John Daniel (2012) states that MOOCs will bring about notable change in the teaching quality as the institutions will get chance to revisit their mission. It will change the whole perspective of higher education and cost associated with them.

Philip J. Guo, Juho Kim, Rob Rubin have provided insights on the tenure of video and student engagement. The study used data from 6.9 million video watching sessions and concluded that short videos were effective in learning and attention span. They have also discussed on the short and long assignment activities and student engagement.

Katy Jordan has established the association between the course enrolment and completion trends. They have concluded that the length of the course had direct association with the completion.

Li Yuan, SJ Powell (2013). Their study reveals how decision makers in higher education institutions can increase understanding of Massive Online Open Courses (MOOCs) and think how to capitalize for their institution.

Anoush Margaryan, Manuela Bianco, Allison Littlejohn argue that though MOOCs are well designed and marketed, their instructional quality is low.

Looking in to the present status and literature suggesting the opportunities and threats underlying, the challenge is to bridge the gap between technological, educational, and cultural hurdles restricting access to these courses.

The objectives are -

- To assess that readiness of students to embrace and employ e-learning such as MOOCs has effect on their education attainment.
- To assess that learning experience of students through MOOCs has effect on their education attainment.

Data Collection –

The sample size was determined on the basis of students who pursued MOOCs at BIT, Durg across all disciplines of management and engineering sciences. The intention was to reach those students who experienced the massive open online course and 303 students data was collected through questionnaire.

The structural model

**Table- 1 Structural Model**

Construct	Details	Reference
Educational attainment	Campus recruitment, credit requirement, access to higher education	C. Osvaldo Rodriguez (2012) Jenny Mackness, Sui Fai John Mak, Roy Williams (2010)
Learning	Worth time, engaging, assignments interesting, content beyond syllabus, arouse interest for other courses, tenure suitable, better than classroom learning	Philip J. Guo, Juho Kim, Rob Rubin Lori Breslow, David E. Pritchard, Jennifer DeBoer, Glenda S. Stump, Andrew D. Ho, Daniel T. Seaton
Readiness	Need for e-learning, awareness, promotion by college, easy to register and use forum	Katy Jordan Li Yuan, SJ Powell(2011)

Model 1= Educational attainment of students is better predicted by readiness to pursue MOOCs and learning through MOOCs

There exists certain factors that have effect on the educational attainment of students through MOOCs. Such factors are identified through literature review and the study is proposed to examine those factors under the heading educational attainment, Learning Experience

and Readiness. The literature related to use these constructs is mentioned in the table.

The study measures the three constructs on five point likert scale ranging from 1= Strongly disagree to 5= Strongly agree.

In order to check how well the model fits the data, the log likelihood test is performed. The test for normality helped the researcher decide to proceed with linear regression or ordinal

regression. The following are the results of normality check.

**Table 2 Normality Check**

Case Processing Summary						
Cases						
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
ME	303	100.0%	0	0.0%	303	100.0%
MR	303	100.0%	0	0.0%	303	100.0%
ML	303	100.0%	0	0.0%	303	100.0%

Characteristics of the distributions for the responses were obtained by calculating means for each item.

**Table 3 – Descriptive**

		Statistic	Std. Error	
ME	Mean	3.6442	.02260	
	95% Confidence Interval for Mean	Lower Bound	3.5998	
		Upper Bound	3.6887	
	5% Trimmed Mean	3.6410		
	Median	3.6000		
	Variance	.155		
	Std. Deviation	.39335		
	Minimum	2.60		
	Maximum	4.80		
	Range	2.20		
	Interquartile Range	.60		
	Skewness	.120	.140	
	Kurtosis	-.191	.279	
MR	Mean	4.0495	.02133	
	95% Confidence Interval for Mean	Lower Bound	4.0075	
		Upper Bound	4.0915	
	5% Trimmed Mean	4.0439		
	Median	4.0000		
	Variance	.138		
	Std. Deviation	.37129		
	Minimum	3.00		
	Maximum	5.00		
	Range	2.00		
	Interquartile Range	.50		
	Skewness	.138	.140	
	Kurtosis	-.119	.279	
ML	Mean	3.7875	.01299	
	95% Confidence Interval for Mean	Lower Bound	3.7620	
		Upper Bound	3.8131	
	5% Trimmed Mean	3.7839		
	Median	3.7500		
	Variance	.051		
	Std. Deviation	.22611		
	Minimum	3.25		
	Maximum	4.44		
	Range	1.19		
	Interquartile Range	.31		
	Skewness	.265	.140	
	Kurtosis	-.194	.279	

The skewness and kurtosis statistics value fall in the range of (-)1.96 to (+)1.96 which suggested that the model is good fit. However the following log values also paved the way for ordinal regression.

**Table 4 Log test for Normality**

Tests of Normality						
	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	df	Sig.
ME	.112	303	<.001	.976	303	<.001
MR	.157	303	<.001	.958	303	<.001
ML	.110	303	<.001	.985	303	.002

a. Lilliefors Significance Correction

For the data to be normally distributed, the Shapiro-Wilk should be higher than significant value 0.05. But the significance values for LOG Readinesss, log learning and log educational attainment are less than 0.05 which makes us conclude that the data is not normally distributed and so linear regression cannot be resorted to. Instead Ordinal regression remains applicable.

**ORDINAL REGRESSION –**

Ordinal regression is a part the umbrella of regression analysis. As a predictive tool, it explains data and explains the relationship between one dependent and two or more independent variables. In this case the dependent variable is the educational attainment of students and the independent variables are the learning and readiness to pursue MOOCs.

Moreover it is used to identify the strength of the effect of readiness and learning (independent variable) on educational attainment of students (dependent variable).

Secondly through the analysis we can conclude that will the educational attainment of students change with the changes in readiness to pursue it and the learning through the MOOCs platform.

**Table – 5 Ordinal Regression**

Case Processing Summary			
	N	Marginal Percentage	
LOGEA	.41	2	0.7%
	.45	5	1.7%
	.48	14	4.6%
	.51	38	12.5%
	.53	54	17.8%
	.56	59	19.5%
	.58	54	17.8%
	.60	37	12.2%
	.62	24	7.9%
	.64	12	4.0%
	.66	3	1.0%
.68	1	0.3%	
Valid	303	100.0%	
Missing	0		
Total	303		

**Table – 6 Log likelihood**

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	840.835			
Final	785.114	55.722	2	<.001

Link function: Logit.

The significance value 0.001 is less than 0.05, the model fits the data.

**Table -7 Goodness of fit**

Goodness-of-Fit		
Chi-Square	df	Sig.
823.820	999	1.000
550.726	999	1.000

Link function: Logit.

The pearson and deviance values are also higher than 0.05 which adds to the conclusion of a good model fit. Both learning experience and readiness to pursue MOOCs can be concluded as predictors of educational attainment.

**Table -8 R Square Value**

Pseudo R-Square	
Cox and Snell	.168
Nagelkerke	.171
McFadden	.044

Link function: Logit.

The Nagelkerke value 0.171 suggests that the 17 percent change in educational attainment of MOOCs is due to learning and readiness.

**Table 9 Model Fit**

Parameter Estimates								
		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[LOGEA = .41]	8.460	2.831	8.930	1	.003	2.911	14.008
	[LOGEA = .45]	9.743	2.770	12.373	1	<.001	4.314	15.172
	[LOGEA = .48]	10.913	2.757	15.662	1	<.001	5.508	16.317
	[LOGEA = .51]	12.167	2.762	19.399	1	<.001	6.753	17.581
	[LOGEA = .53]	13.163	2.774	22.516	1	<.001	7.726	18.599
	[LOGEA = .56]	14.042	2.787	25.381	1	<.001	8.579	19.505
	[LOGEA = .58]	14.921	2.801	28.370	1	<.001	9.430	20.411
	[LOGEA = .60]	15.805	2.814	31.545	1	<.001	10.290	21.321
	[LOGEA = .62]	16.894	2.829	35.666	1	<.001	11.350	22.439
	[LOGEA = .64]	18.372	2.866	41.084	1	<.001	12.754	23.990
[LOGEA = .66]	19.786	2.997	43.596	1	<.001	13.912	25.659	
Location	LOGRD	-5.605	2.549	4.837	1	.028	-10.600	-.610
	LOGLG	29.708	4.207	49.863	1	<.001	21.462	37.953

Link function: Logit.

From the above table it is evident that learning through MOOCs is a significant predictor of educational attainment of students. For every unit of increase in learning, there is a predicted increase of 4.207 in the log odds of attainment.

However the negative coefficient of readiness - 5.605 and the significance value suggest that there is significant association between readiness for MOOCs and educational attainment of students.

**Table- 10 Proportional Odds**

Test of Parallel Lines <sup>a</sup>				
Model	-2 Log Likelihood	Chi-Square	df	Sig.
Null Hypothesis	785.114			
General	764.209 <sup>b</sup>	20.905 <sup>c</sup>	20	.403

The test of parameter estimates suggest that since the probability value 0.403 is greater than 0.05, we have validated the test of proportional odds as well. The proportional odds test remains non-violated with our values.

Educational attainment of students is better predicted by readiness to pursue MOOCs and learning through MOOCs as per the test conducted. These models do tend to vary from group to group and city to city. The researchers perspective was to establish the association between pursuing MOOCs and getting advantage in terms of campus recruitment, credit requirement and learning opportunity form eminent professors in the country. However the applicability of the model can be extended to finding various states and student groups.

Researchers in this field have measured solely the levels of education attainment in order to identify the trend in MOOCs. Secondly, few researchers have examined MOOCs through descriptive analysis across nations, to check the enrolment and completion rate. However the cause and effect relation can further validate that MOOCs should be promoted by institutions to avail the opportunity of higher education within the geographical boundaries.

Conclusion –

The students represent the word of mouth promotion best, and the attainment of their educational objectives through MOOCs can be treated as an indispensable means to create awareness and fulfill the higher education motives by any nation. In a remotely located District Durg in Chhattisgarh state in India, the readiness of students to pursue it and their learning experience can be treated as a parameter to analyse how MOOCs have penetrated and how its success can be assessed. Thus, the investigation of overall education attainment of students through MOOCs has important managerial implications regarding its strategies at higher education level.

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**MEASURING HOUSEHOLD FOOD SECURITY: A DIMENSION BASED APPROACH****Bishweshwar Bhattacharjee<sup>1</sup>**Former Research Scholar, Department of Economics, Assam University, Silchar, Assam, India  
Email: bbishweshwar@yahoo.co.in**ABSTRACT**

*One's nutritional status, health, physical and mental faculties depend on the food one eats. Thus, access to good quality food has been man's main endeavour from the earliest days of human existence. The importance of food for human existence brings the concept of food security into the limelight, which is getting expanded to include four aspects of food availability, food access and food utilization and stability. But to date, no research is undertaken to measure food security considering all dimensions. In this regard, the per capita calorie availability is used to assess the food availability in a household. Food accessibility is judged by the change in economic access to food. The utilization of food at the household level is judged from the processing, preparation and preservation practice of food along with health and drinking water accessibility status. Finally, for capturing the stability aspect the standard of living of the household is evaluated. This information is utilised to gauge household food security status. This sort of analysis would help in accurately classifying households concerning their food security status.*

**Keywords:** Food Security, Availability, Accessibility, Utilisation, Stability, Household

**Introduction**

Food security has more than 50 years of history of being accepted internationally in the historic Hot Spring Conference of Food and Agriculture in 1943 (Gross et al., 2000). However, the term got introduced at the World Food Conference in 1974 which later evolved, developed, multiplied and diversified over time (Maxwell, 1996). This leads to the focus shift from global to the household<sup>154</sup> level acknowledging the human right to food. Food security thus exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life (Napoli et al., 2011). Household food security is the application of this concept to the family level, with individuals within households as the focus point. This definition reflects four dimensions as food availability, accessibility, utilisation and stability (Bhattacharjee, 2017). Food availability is a concept that emphasizes the relationship between population and food. This refers to the combination of domestic food production, commercial food imports and exports, food aid and domestic food stocks. Food security is majorly determined by food availability and food trade (Burchi and De

Muro 2015), Food accessibility refers to the act of making food available to all at any particular time. For this to be ensured, all individuals within households must have sufficient resources to acquire appropriate foods (through production, purchase or donation) for a nutritious and healthy diet (Mbow et al., 2019). The nutritional impact of food on the consumer, its preparation, and overall state of health is the main priorities of food utilization (Dutta and Saikia 2018 ; Mbow et al. 2019). Food stability, the fourth dimension of food security, is the ability of people to have continuous access to food (Mbow et al., 2019). More so, there is no clear composite measure that tries to measure food security comprising all of its goals (Altman, 2009). The present study tries to bridge this gap through building a comprehensive index of food security encompassing all four dimensions of food security. This involves three steps: identification, aggregation and categorization. Identification is related to identifying various indicators, while, aggregation is concerned with deriving food security statistics for the households. Finally, categorization of households is being made across various levels of food security (Bhattacharjee, 2017).

<sup>154</sup> Household is defined as a group of people living together and eating from the same pot.



Analysts previously operate on the principle that other needs are usually satisfied when calorie intake is sufficient (**Maxwell and Smith, 1992**). So, the measurement of food security is undertaken through the use of the Calorie Gap Approach by classifying households into two categories: food secure (calories sufficient) and food insecure (calories deficit) (**Singh and Datta, 2015**). But often there is a double burden of malnutrition – undernutrition accompanied by overnutrition and obesity which raises doubt on the relevance of calories as an indicator of food access. This initiated various researchers to undertake indicators such as quantity measured by the number of meals per day; diversity measured by various food group consumption; access by sources concerning household food; and quality by the changes in the pattern of diet change in adverse situations (**Diehl, et al., 2019**). As these measures cannot be used to measure the food security in a wholesome manner, so, in the quest for measuring food security, a short-form six-item Household Food Security Scale (HFSS) (**Blumberg et al., 1999**) was constructed and subsequently revised in a four-items version including adequacy of money in buying the food, affordability of balanced meal representing a measure of dietary quality (**Gulliford et al., 2003; Gulliford et al., 2006**) occasions of skipping meals, affordability of enough food (**Agarwal et al., 2009; Bhattacharjee, 2012**). Measuring from the food insecurity side, various indicators have been used. Among these indicators, the promising tool is the household food insecurity access scale (HFIAS). The scale captures the extent of worry about households not having enough food, meals, preferred food and variety of food (**Chatterjee et al., 2012; Chinnakali et al., 2014 ; Keshari and Shankar, 2016**). With these indicators, simple derived measures such as household dietary diversity score, Body mass Index or nutritional status provide additional complementary data of the prevailing situation (**Coates et al., 2007 ; Haddad et al., 1994**) Another similar approach is the Food Insecurity Experience Scale. This scale reckons household food-related behaviours associated with difficulty in accessing food due to resource

constraints with a set of questions (**Srivastava et al., 2014**).

Some studies integrated the measurement concepts of food security and food insecurity to compute the Food Security Index. It is calculated with the difference between a minimum of four food security measurements and a maximum of two food insecurity measurements. The four components of food security developed are namely Household Diet Diversity Score, Food Consumption Score, Coping Strategy Index, Self-Assessed Food Security Scale, and two components of household food insecurity namely Household Hunger Scale and Household Food Insecurity and Access Scale.

Following **Deaton and Dreze (2009)**, casting doubt on the validity of the hunger questions, or the relevance of the calorie norms, or even both, researchers tried to follow the conventional components embedded in the definition of food security. Three mainly important components: food quantity available in the household, food quality as captured by diet diversity and stability of adequate food supplies are utilised to construct a composite food security index by incorporating several indicators (**Adjimoti and Kwadzo, 2018**). However, the literature lacks in capturing all four dimensions while dictating a measure of household food security.

### **Household Food Security: Dimension based Approach**

Household food security is a complex phenomenon. It is mainly the interaction of four aspects of food availability, food access, food utilization and stability which results in a situation of food security. Food availability, food access and food utilization and stability dimensions are not separate phenomena they overlap. (**Chambers, 1989; Foster, 1992; Maxwell, 1995**).

#### **3.1 Availability Dimension**

For estimating the food availability in a household, the per capita calorie availability of a household is taken as a proxy variable since it acts as a ‘gold standard’ indicator of food security (**Burchi and Buro, 2015; Chung et al., 1997; Maxwell et al., 1999; Riely et al., 1995**). Firstly, the nutrient content of both

produced and purchased food items for various food groups (See Appendix 1.1) is calculated in terms of kcal. We have taken a 7 days recall period (Hossain et al., 2016) (as a short duration recalling of the consumed item becomes easier) of food item in attaining information about the produced and purchased food items of the household. The value of the total calorie available to the household is divided by the adjusted household size (See Appendix 1.2) to arrive at the per capita calorie availability of a household.

$$PCCA_i = \frac{CA_i}{AHS_i} \dots \quad (1)$$

Where,

$PCCA_i$  = Per Capita Calorie Availability of the  $i^{th}$  Household

$CA_i$  = Calorie Availability in the  $i^{th}$  Household

$AHS_i$  = Adjusted Household Size of the  $i^{th}$  Household.

These values are normalised following the Max-Min Approach. Under this approach, firstly minimum and maximum values (goalposts) are chosen. Then we use the formula provided in equation (2) to get food availability index for the  $i^{th}$  Household.

$$FAVI_i = \{(CA_i - \text{Min}(PCCA)) \div \{\text{Max}(PCCA) - \text{Min}(PCCA)\}\} \dots \quad (2)$$

Where,

$FAVI_i$  = Food Availability Index for the  $i^{th}$  Household

$CA_i$  = Calorie Availability in the  $i^{th}$  Household

$PCCA$  = Per Capita Calorie Availability.

### 3.2 Accessibility Dimension

But, food availability by itself does not ensure adequate access to food: though adequate food availability is necessary for food access. Food accessibility indicates having physical, economic and social access (Bhattacharjee, 2017). From a household point of view, economic access becomes more vital. Food accessibility issues arise when food is available but people are unable to afford it (OXFAM, 2007). So, for assessing the condition of food access in a household we construct a food accessibility index which assumes values based on a comparison of household-specific food price impact index and income index as detailed in equation (5). So, a household-specific food price impact index for each

household is constructed. For this, a set of standard food baskets is selected comprising various food groups (See Appendix 1.1). The price level of these food items' is to be collected for the five consecutive periods i.e. for the period under consideration and also for the four preceding periods. Then logarithmic transformations of these values are carried on as it evens out fluctuations (Mohanty and Dehury, 2012). A base period average price ( $P_0$ ) of various items is calculated by aggregating these four preceding period price values (Chiripanhura, 2011). The current period price values would correspond to the current period price ( $P_n$ ) for various items. We shall use Fisher's Ideal Index Number Formula for calculating food price impact index as specified by equation (3).

$$HFPII_i = \sqrt{\frac{\sum P_n Q_0 \sum P_n Q_n}{\sum P_0 Q_0 \sum P_0 Q_n}} \times 100 \dots \quad (3)$$

$HFPII_i$  = Household Food Price Impact Index of the  $i^{th}$  household.

$P_0$  = Price of the  $j^{th}$  food item consumed by the  $i^{th}$  household in the base period.

$P_n$  = Price of the  $j^{th}$  food item consumed by the  $i^{th}$  household in the current period.

$Q_0$  = Quantity of the  $j^{th}$  food item consumed by the  $i^{th}$  household in the base period.

$Q_n$  = Quantity of the  $j^{th}$  food item consumed by the  $i^{th}$  household in the current period.

Secondly, we construct the household specific income index by capturing household income information accruing from six categories (See Appendix 1.3) of the household for the last five years. Then logarithmic transformations of these values are carried on. Average income of the household (Transformed) for the base period<sup>155</sup> gives rise to the average household income in base period (HIB). Current year aggregate income is calculated from the total incomes generating the broad income earning sources which yields (HIC). The values of HIB and HIC are utilised to get household specific income index as quantified in equation (4).

<sup>155</sup> Base period values of income corresponds to the average annual values of the variable for four continuous time periods preceding the current period under consideration.

$$HII_i = \frac{HIC}{HIB} \times 100 \dots (4)$$

Where,

$HII_i$  = Income Index of the  $i^{th}$  household

$HIC$  = Aggregate annual income of the household during the survey year

$HIB$  = Average annual income of the household in the base period.

Based on the values of two indices HFPII and HII, we arrive at the Food Accessibility Index ( $FACI_i$ ) for the using the criteria discussed below,

$$FACI_i = \begin{cases} 0, & HFPII > HII \\ 0.5, & HFPII = HII \dots \\ 1, & HFPII < HII \end{cases} \quad (5)$$

The food accessibility index takes value 1 to indicate the highest degree of accessibility, while it takes the value 0 to point out the lowest degree of accessibility.

### 3.3 Utilisation Dimension

Given a certain basic level of food acquisition, a household's food security level would depend on how well this food was utilized. Food utilisation ensures that an adequate diet coupled with clean water, sanitation and health care brings a state of nutritional well-being where all physiological needs are met (**NFHS 2**). The utilization of food at the household level is a function of food storage, food preparation, and the food sharing pattern followed in the household. It is also dependent on health status and accessibility status in respect of drinking water facilities. Differences in these respects yield different levels of food security given the same level of acquisition. Thus, for assessing the level of food utilization in a household, we have considered five indicators. These indicators are elaborated below with the respective scoring pattern (**Bhattacharjee, 2017**) being detailed in **Appendix 1.4**.

- **Household food storage facilities:** Proper food storage helps to preserve the quality and nutritional value of the foods one purchases, and also helps in preventing spoilage. Additionally, proper food storage can help prevent foodborne illnesses caused by harmful bacteria. So the facilities that the household has for food storage becomes important for better food utilization.

- **Household Food Preparation Practices:** Food is a prime factor of life so it is very important to prepare and manage food well. Better practices of food preparation lead to an improved level of food utilization.
- **Household Food Sharing Pattern:** Food sharing has been defined as the unresisted transfer of food from one food motivated individual to another. Proper food sharing in the household, a situation when both non-adult and adult members of the household are getting a proportionately equal share of food, leads to higher levels of food utilization.
- **Household Health Status:** Health is a state of complete physical, mental and social well-being, and not merely the absence of disease or infirmity. A good health condition of the members of the household will reflect better levels of food utilization in the household.
- **Household Safe Drinking Water Accessibility Status:** Polluted and contaminated water undermines the safety and the nutritional well-being of individuals. Studies have shown that water has a significant contribution to the food utilization level of a household.

The household's level of attainment in all these regards is captured through some scores assigned for each level of achievement for each sub-indicator and these scores are then added to arrive at a composite score. This composite score is finally standardised (**Appendix 1.5**) to get the food utilization index ( $FUTI_i$ ).

### 3.4 Stability Dimension

The last dimension addresses the stability of the other three dimensions over time. People cannot be considered food secure until they feel so and they do not feel food secure until there is stability. i.e. to be food secure, a household must have access to adequate food at all times. They should have the capacity to recover against sudden shocks (e.g. an economic or climatic crisis) or cyclical events (**Bhattacharjee, 2017**). One of the variables that can be used as a proxy variable for capturing the stability dimension of food security is the standard of living of the household as it has an implicit relationship

with competitiveness (Okrepilov, 2015; Yakovieva, 2015). Standard of living refers to the material basis of well-being. Metrics to measure living standard are most frequently identified with the valuation of life quality (Kral, 2011). Researchers used both objectively measurable indicators and indicators of perception (Diener, 2003) but social indicators research has succeeded to considerably improve the measurement of people's quality of life (Noll, 2004).

For measuring the standard of living of the household we have taken attributes like House type, Toilet facility, Source of lighting, Main fuel for cooking, Source of drinking water, Separate room for cooking, Ownership of house, Ownership of agricultural land, Ownership of irrigated land, Ownership of livestock, Ownership of durable goods along with scores (Chatterjee et al., 2012)(See Appendix 1.6). The household's level of attainment in all these regards is captured through some scores assigned for each level of achievement for each sub-indicator and these scores are then added to arrive at a composite score. This composite score is finally

standardised (Appendix 1.5) to get the food stability index ( $FSTI_i$ ) for the  $i^{th}$  household. Finally, the simple average of all four values of indices is calculated which gives the household food security index of the  $i^{th}$  household ( $HFSI_i$ ). Households are then categorised into various level of food security based on a specified criteria (See Appendix 1.7).

$$HFSI_i = \frac{1}{4} (FAVI_i + FACI_i + FUTI_i + FSTI_i) \dots \quad (6)$$

### Conclusion

Food security is a complex multidimensional phenomenon. The study tried to build a methodology through a set of indicators by capturing dimensional aspects of food availability, accessibility, utilisation and stability so as to assess the household food security status at household level. This framework can be used in analysing various dynamisms related to the concept of household food security which would be beneficial in identifying nutritional issues, providing targeted food relief and also for designing anti-poverty programs in an effective manner.

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#### Appendix 1.1: Classification of Various Food Groups Consumed by the Household

Sl. No.	Food Groups	
1	Cereals	
2	Root And Tubers	
3	Vegetables	
4	Fruits	
5	Meat And Poultry	
6	Eggs,	
7	Fish And Seafood	
8	Pulses/Legumes/Nuts,	
9	Milk And Milk Products	
10	Oil/Fats	
11	Sugar/Honey	
12	Miscellaneous Food Items	Served and Processed Food
		Packaged Processed Food
		Others

Source: Swindale et al. (2006).

#### Appendix 1.2: OECD-modified equivalence scale for Adjusted Household Size

Category	Adjusted Household Size		
	Under 14 Years	Above 14 Years	Irrespective of Age
Person living alone			1
Couple without children			1.5
Couple with	One child	1.8	2.0
	Two child	2.1	2.5
	Three child	2.4	3.0
Single parent	One child	1.3	1.5

with	Two child	1.6	2.0	
	Three child	1.9	2.5	

Source: Martin (2017)

**Appendix 1.3: Classification of Income Earning Sources of the Household**

Serial No.	Income Earning Sources
1	Agriculture
2	Livestock
3	Forestry
4	Non-farm activities
5	Income from Household Assets
6	Cash benefit received

Source: Bhattacharjee (2017)

**Appendix 1.4: Scoring Pattern of the Food Utilisation Measuring Attributes**

Serial No.	Food Utilisation Attributes	Scoring Pattern
1	Accessibility to Safe Drinking Water	3-Supply water with boiling or Filtering
		2-Supply water without boiling or Filtering
		1-Water from tube well/Hand pump without boiling or Filtering
		0--Water from any other sources without boiling or Filtering
2	Facilities for Food Storage	3- Store food in Containers designed for freezer storage
		2- Store food in the cool cabinet
		1-Store food in Plastic wrap/ plastic bags
		0-Do not have storage facilities
3	Food Preparation Pattern	3- Prepares food in LPG/BioGas stoves in a separate Kitchen
		2- Prepares food in Kerosine/coal/ charcoal fueled stoves in a separate kitchen
		1- Prepares food in chullahs using wood/ agricultural crop waste/dung cakes/ straw/shrubs/ grass as a fuel in a separate kitchen
		0-Prepares food in Chullahsor open fire with no separate kitchen
4	Food Sharing Pattern	3-Each member gets adequate food share
		2-Occasional adult share shortages
		1-Occasional children and adult share shortages
		0- Persistent children and adult share shortages
5	Household Health Status	3-No member is affected with any disease
		2- One or more member is infected with diseases caused by Bacteria
		1- One or more member is infected with diseases caused by Virus
		0- One or more member is infected with diseases caused by Parasite

Source: Bhattacharjee (2017)

**Appendix 1.5: Standardisation process of score attained by  $i^{th}$  household for  $k^{th}$  dimension of food security**

$$STSC_{ik} = TSC_{ik} / Max(SC_k)$$

Where  $STSC_{ik}$  = Standardised score of  $i^{th}$  household for  $k^{th}$  dimension of food security

$TSC_{ik}$  = Total Score Accumulated by the  $i^{th}$  household for  $k^{th}$  dimension

$Max(SC_k)$  = Maximum Score allocated for  $k^{th}$  dimension

**Appendix 1.6: Scoring Pattern of the Food Stability Measuring Attributes**

Serial No.	Attributes	Scoring Pattern
1	House type	4 for pucca,
		2 for semi-pucca, 0 for kachha
		0 for kachha
2	Toilet facility	4 for own flush toilet
		2 for public or shared flush toilet or own pit toilet
		1 for shared or public pit toilet
		0 for no facility
3	Source of lighting	2 for electricity
		1 for kerosene, gas, or oil
		0 for other sources of lighting
4	Main fuel for cooking	2 for electricity, liquid petroleum gas, or biogas
		1 for coal/coke/lignite, charcoal, or kerosene
		0 for other fuel
5	Source of drinking water	: 2 for pipe, hand pump, or well in residence/yard/plot
		1 for public tap, hand pump, or well
		0 for other water sources
6	Separate room for cooking:	1 for yes
		0 for no
7	Ownership of house:	2 for yes
		0 for no
8	Ownership of agricultural land	4 for 5 acres or more
		3 for 2.0.4.9 acres
		2 for less than 2 acres or acreage
		0 for no agricultural land/not known
9	Ownership of irrigated land	2 if the household owns at least some irrigated land
		0 for no irrigated land
10	Ownership of livestock	2 if owns livestock
		0 if does not own livestock
11	Ownership of durable goods	4 each for a car or tractor
		3 each for a moped/scooter/motorcycle, telephone, refrigerator, or colour television
		2 each for a bicycle, electric fan, radio/transistor, sewing machine, black and white television, water pump, bullock cart, or thresher
		1 each for a mattress, pressure cooker, chair, cot/bed, table, or clock/watch

Source: Adapted from NFHS 2, Available at [http://rchiips.org/nfhs/pub\\_nfhs-2.shtml](http://rchiips.org/nfhs/pub_nfhs-2.shtml).

**Appendix 1.7: Categorisation of the Level of Food Security based on Food Security Index**

Food Security Index Value	Level of Food Security
$0 \leq FSI \leq 0.20$	Very Low
$0.21 \leq FSI \leq 0.40$	Low

$0.41 \leq FSI \leq 0.60$	Medium
$0.61 \leq FSI \leq 0.80$	High
$0.81 \leq FSI \leq 1$	Very High

Source: Authors Classification



## PROMETHEAN WAYS TO ENHANCE PEDAGOGICAL LEARNING METHODS TOWARDS EFL STUDENTS - A PARADIGM SHIFT

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### ABSTRACT

*The rhetoric of teaching, learning methodologies and approaches in higher education especially towards EFL learners is fast evolving along the paradigm shift with the new era making entirely new turns in the field of education. In order to overcome traditional paradigms, active and authentic learning methods have to be reinforced which would obviously provide a platform to meet the student's demands. The focus of this study is to know the perception of the students interest towards online learning with interest and inspiration towards different entities like The Environmental Factor (EF) (Audio-lingual method), Social Factors (SF) (Technological application) and Individual Factor (IF) (Mobile application). It also helped to understand the SWCO (strength, weakness, challenges and outcomes). Based on the online questionnaire that was conducted among 100 students from Jazan University (KSA), the results of the survey reveals that students are interested in a new technological methods to that of traditional methods. Thus, designing authentic learning environment and unique methodologies focusing on both students' interests and their needs would be imperative. New methods of learning provide students with opportunities to collaborate willingly with faculty and take responsibility for their learning. It also gives the young minds chances and prospects to get a hand on experience while learning. Thus this paper will explore the dynamic and different factors and its related methodologies that would influence and enhance Language Learning Strategies (LLS). The Environmental Factor (EF) (Audio-lingual method), Social Factors (SF) (Technological application) and Individual Factor (IF) (Mobile application). In higher education scenario teacher-centred approaches still continue to be used and forced, thus learning practices are diffused and detached from the students' perception. This paper will also include EFL students learning scenarios that are inquiry-based learning (IBL) and enhanced by technology (TEL) which are proven track, more reliable and authentic where students are eager and willing to learn. Teachers should impart knowledge and develop innovative methods to deepen students' pedagogical reflections on what they learn and achieve.*

**Keywords:** paradigm shift, authentic learning, environmental factor, technology

### Introduction

In the current scenario, the style of pedagogical learning and teaching methodologies have taken a swift turn in meeting the needs and demands of the students especially EFL learners. Developing a student-teacher relationship or partnership towards the extension of learning and academic development and achievement would bring about the difference. "Because of the relative novelty of these particular student-centred approaches to learning and teaching and since what student-staff partnerships should ideally look like has not yet, perhaps, been fully explored, practices vary widely (Bovill and Felten, 2016)."

Within the middle east context of teacher education and student learning, reflections and reflective practices have played a pivotal role since the 2000s and many universities have since required reflections as an intuitive element to teacher education. Thus, teachers,

reflective practice has lead to new dimensions involving new methods and incorporating new techniques that will further focus on improving students learning as well as teaching. This is because classrooms are complex societies in which many factors have impact upon the environment (EF) . It is therefore believed that teachers benefit from sustained reflective practice to make sense of their experiences in classes.

Online learning is defined as use of information and communication technology to improve the quality of education. It is also defined as electronically supported learning that relies on the internet for teacher/student interaction and the distribution material (Cojocariu et., all. 2014).

### Objectives:

1. To know the students interest towards different technology based learning.

2. To know the strength, weakness, challenges, and outcome of the different technology based learning.

### **Research Methodology:**

A survey regarding the objectives of the study was carried out after administering a questionnaire to the students and observation was conceded on the basis of the response from the students of the Nursing College, Jazan University, Kingdom of Saudi Arabia.

**Type of study:** Observational (Questionnaire based)

**Study Duration:** 2 months

**Study Tool:** The data was collected through onsite mode using a questionnaire.

### **The Environmental Factor (EF) - Audio-lingual method:**

Nowadays, classrooms are explicitly equipped with technological gadgets with audio-visual projectors and overhead projectors which help the teachers to achieve his or her target or goal to reach the students. In this technological context to improve learning among students, various methods are adopted and one of the best practices in the classroom environment is the audio-visual method which can be considered under the Environmental Factor (EF). It will grab the total attention of the students. This method is intended to attract the attention of learners of a foreign language. Learning a foreign language needs exposure to the foreign culture and in this case, audiovisual method can act as an interception to portray the foreign culture. This could be an integral part of understanding culture and to learn their language. This will have an impact on the minds of students and they would slowly get acquainted with new vocabularies. The words introduced with visual impression is much more than mere association of the words. The audio-visual method to language teaching is attempting to relate the foreign sounds with the mental picture (Mueller, T.1955).

The most effective method of teaching the English language is the pattern that is involved in audio-visual methods based on the link between sounds, speech, and image. Through this a kinesthetics image is formed for every new word, it is further supplemented by the practical experience for example if the sounds

or words are accompanied by images they make much deeper impression and sustained in the memory of sensation that will gradually increase. This method will gradually and surprisingly improve the ability to understand and express their thoughts and to associate words will be noticeable. Syntax and grammar can be improved by this inquisitive method with wider knowledge of understanding and analysing under the classroom environment thus it is categorised under environmental factor.

Moreover the success of online learning also called an e-learning depends upon many factors including accessibility to gadgets and internet, course content, usage of appropriate methodology, teacher as well as students skill (Huang et., all. 2020).

### **Social Factors (SF) - Technological Application:**

There is no secret that technology has become more central focus in our everyday lives than ever before. It helps us in every aspect of our lives and has taken the central position in our communication and learning a new language. With the rise of tablets, kindle, iPads, and other gadgets etc have made reading more convenient and adorable. Students get accustomed to more an interactive sessions especially when it comes to reading experience and listening skills which is an awesome feature for the learners of English. Functions like click-to-define, vocabulary builders, and downloading whole texts and audios at the touch of a button are all beneficial to a learner looking for a fun and effective way to improve their reading, listening and writing in particular. It can help to expand their vocabulary and get exposed learning and knowing of different sentence structures in groups with different activities and games thus it is categorised under social factor.

### **Individual Factor (IF) Mobile Application:**

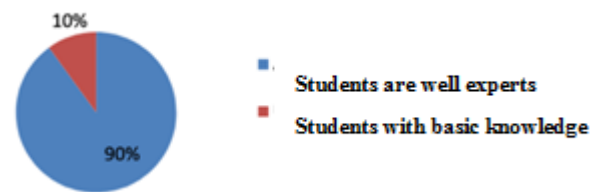
At present, hardly any younger person can imagine life without mobile technologies. They use them on a daily basis, including in language learning which is more or less becoming more accommodative. Such learning supported with mobile devices is called mobile learning, which seems beneficial especially

thanks to the unique features of mobile applications. Nowadays, mobile technologies and mobile applications (apps) are becoming an indispensable part of learning, including foreign language learning [1]. This recent methodology of their use is called mobile learning (m-learning). M-learning further expands e-learning by promoting independent and active learning and by turning educational institutions into 24/7, no-barrier learning centre's [2]. In similar vein, Klimova [3] speaks of Mobile Assisted Language Learning (MALL) as a new subdivision of Computer Assisted Language Learning (CALL). Moreover, the use of apps contributes to the enhancement of the learner's cognitive capacity, the learner's motivation to study in both formal and informal settings, the learner's autonomy and confidence, as well as the promotion of personalises learning, helping low-achieving students to reach their study goals at individuals space of learning thus it is categorised under individual factor.

#### **SWCO (strength, weakness, challenges and outcomes):**

Apart from strengths of these technological learning there are also weaknesses which can be pondered upon while using the methods of learning. Power cuts and issues related to technical installations may cause disruption during the class. Not enough charging of iPads or kindles and internet issues may cause delay in using the apps. Small screen size of mobile devices may strain the eyes for long time learning. Altogether, lack of human contact can lead to difficulty learning in time of clarification. External interference, distraction while using the gadgets. Diversified resources can also lead to chaos and confusion while dealing with certain areas. Gadgets pose their own threats and technical problems which can be encountered during the usage of apps. Furthermore a majority of studies reported positive attitude of students towards online learning, despite the process being a new one and having technical hindrances (Burac. et.,all.2019)

Fig 1: Shows the students ability in using modern gadgets:



**Students are well experts**  
**Students with basic knowledge**

#### **Observations and Results:**

1. Out of total 150 students surveyed all the students had access to gadgets like smart phones, laptops, desktops, tablets.
2. Students interested in The Environmental Factor (EF) - Audio-lingual method is 85%, students interested in Social Factors (SF) - Technological Application method is 65%, students interested in Individual Factor (IF) Mobile Application method is 75%.
3. Skills in using modern gadgets: 90% of the students were well versed. 10% had some basic knowledge in using gadgets.
4. Interest in learning through gadgets modern technological method of teaching: 80% agreed with environmental factor method while 15% agreed with social factor method and 5% agreed with individual factor with the least.
5. Preference towards advantages of technological learning: 98% agreed and 2% disagreed.
6. As far as the satisfaction of students is concerned about using technological method of learning about 92% students were highly satisfied, 5% averagely satisfied 3% were being unsatisfied.

Fig 2: Shows the interest of students in using different methods:



Agreed with Environmental Factor  
Agreed with Social Factor  
Agreed with Individual Factor

### Conclusions:

The results reveal that modern technological learning is becoming a salient feature of education as it is a great opportunity and an immense step forward in language learning. These include the enhancement of the learner's cognitive capacity, the learner's motivation to study in both formal and informal settings, the learner's autonomy and confidence as well as the fact that it promotes personalised learning and helps low-achieving students to reach their study goals. The result also shows that the students main contribution has a relationship with technological and structural aspects and also their benefit they perceive through this

type of learning. Students prefer Environmental Factors basically using overhead projectors and audio lingual method inside the classroom is much interesting to students according to the survey conducted. Thus, a classroom with well equipped gadgets and smart boards with projectors and speakers will make students enjoy and learn through the class. Although it seems to be effective overall, it is desirable to design, plan and implement these type of learning with concern, according to students 'needs, and to deliver multiple language skills in authentic learning environment.

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**ASSESEMENT OF FACTORS INFLUENCING THE USAGE OF DIGITAL BANKING BY RURAL CONSUMERS: IN CASE OF BERHAMPUR****Prasant Kumar Choudhury<sup>1</sup>, Dr. Nihar Ranjan Mishra<sup>2</sup>, G Zipporah<sup>3</sup>**<sup>1</sup> Research Scholar, Department of Business Administration, Berhampur University, Berhampur, Odisha, India<sup>2</sup> Reader in Marketing, Department of Business Administration, Berhampur University, Berhampur, Odisha, India<sup>3</sup> Assistant Professor, Pendekanti Institute of Management, Hyderabad, Telengana, India  
E-Mail: <sup>1</sup>pkc0106@gmail.com, <sup>2</sup>nrmisramba@gmail.com, <sup>3</sup>zipporah@pimhyd.ac.in**ABSTRACT**

*Era of electronics being trendy in all sectors, banking has stepped ahead at the stand point of reaching customers and serving better through distinguished digital channels. In this process, private as well as public banking corporates competitively make and execute their strategies for expanding their business operations extensively to rural areas. Though the rural adoption of digital banking is successful to a considerable extent in the age of covid-19, the dogmatic ideologies associated with certain inhibitions by rural consumers yet distract the usages of digital banking. The specific objective of the research is to assess the determinants influencing the usage of digital banking by rural consumers of Berhampur city peripherals. The method mix of descriptive and exploratory research design with blend of qualitative and quantitative approaches have been adopted for this research. Convenience sampling technique with cross sectional research has been carried out to gather the data through standard questionnaire prepared by the researcher. Multiple Regression Analysis was carried out to assess the weightages of every determinant. Certain factors have been significant since the rural demographics and psychographics are dynamic enough. The data findings unlocked hypotheses and the interpretations have led to offer specific recommendations out of management implications.*

**Keywords:** Digital Banking, Rural Consumer Behaviour, Determinants of adoption, Berhampur

**Introduction**

Banking being contagious in everyone's walk of life, the focus on the establishment of its services to all sectors in the easiest possible manner has become the trendy strategy of both government and private banking sector.

There has been a debate on the service mix separately provided by physical banking and digital banking with their properties had been there for long time, but accustomed nature of urban consumers has made digital banking domineering efficient in banking which is much associated with the perfection of transactional process, since the financial accuracy from technology is ever highlighted (Koppala Venugopal et al. 2021).

Information access at a point, through physical banking, does not serve all communities of consumers where the digital banking is explored with all kind of information and service mix make the consumer interesting enough with respect to technology adaption and benefits with which most of the strategies latently with banking corporates have been

timely fashionable and can be served better with digital applications.

Perceived ease as matter of effortlessness either to learn, operate and expertise with digital banking has been considered as one of the very important factors especially for rural people since their agreement to modern practices to have always been failed. Security being a common challenge of any online services the banking industry faces more critical problems since the business operations associated with money. The security measures, protection of consumer's personal information, recovery of online mistakes and hacking are generally the key elements which creates perceived risk in the way of insecurity. In rural areas generally negative factors such as insecurity as stated above creeps faster than the positive elements of usefulness like transactional efficiency (Koppala Venugopal et al. 2020).

**Research Study Objectives:**

The objective in general conducted for the study is to assess the rural banking services in

case of Berhampur peripheral villages and analyse rural consumer behaviour

The specific objectives are:

1. To identify the problems and prospects of digital banking
2. To assess the factors such as *Perceived Usefulness, Perceived Ease of Use, Perceived Risk, Trust and Satisfaction* influencing on the usage of digital banking services by the rural consumers of Berhampur, Odisha

### Literature Review

As Model for Technology Acceptance proposed by Davis F. D. et al. (1989) explains the purpose behind the usage of technology by any individual will be made successful by being perceived its usefulness as well as easiness. Usefulness being perceived as the level to which the customer feels that the novice technology used will upgrade his performance at work. On the other hand ease of use perceived as the degree of effortlessness while interacting with any new technology by consumer. Both perceived usefulness and ease has considerably weighty on the consumer attitude in order to create a behavioral intension to use thereby leads to actual use of the system. The execution of certain positive or negative behaviour is generated by behavioral intension could be the outcome of relationship between attitude and intention.

Yoon H. S. as well as Steege L. M. B. (2013) discussed about the elements persuading the use of digital banking and emphasized on Perceived Usefulness and Ease which are the root causes for the both are higher, the higher consumers' willing will be to use digital banking services. Consequently 16 believed that banking corporates of both private and public can study more on user intention at the stand point of the new technology being made easier and useful to improve transaction efficiency

Even Chau V. S. along with Ngai L. W. (2010) also acknowledged that the design of technology should be user friendly and show quantified usefulness. Montazemi A. R. as well as Qahri-Saremi H. (2015) explored that the usefulness perceived by customers will be higher when the perceived ease of using digital banking is higher which can conclude that both

usefulness and ease are significantly correlated. The satisfaction of the customers out of utilizing the services provided by digital banking can be achieved through higher perceived usefulness (Susanto A. et. al. 2016). While using the internet banking with higher rate of perception will be continuous ad made easier which intern brings the satisfaction for the consumer (Tsai H. T. et al. 2014).

Any technology being used by the consumers at initial stage would be slow enough because of the factor called perceived risk which will influence the decision of consumer at the stand point of consumption or usage. Lin W. B. (2008) explained in his research that consumers will be reluctant to process the transaction if they get a higher perceived risk which is acknowledged by Aboobucker I., and Bao Y. (2018) where the emphasis on perceived risk will be higher when the technology is associated with any transaction. In general perceived risk being the potential loss felt by consumers which will influence on the usage of the product and service respectively (Featherman M. S., and Pavlou P. A. 2003). Liebermann Y., & Stashevsky S. (2002) explored certain issues related with data security while using online transaction since the total data of consumers are completely gathered by the companies to use its online services. This in term will get higher rate of perceived risk where the fear of data hacking and finally leads to influence negatively on the use of online transaction. The private information of consumers being required by the companies is being misused through online malpractices and this negative information travels faster than its usefulness ( Alalwan A. A. et al. 2018). It is noted by Chiou J. S., and Shen C. C. (2012) that the consumers' private monetary information stored as a data stores the internet may be stolen and used without authorization mostly by company staff or other third parties.

Previous studies such as by Lee M. K., & Turban E. in 2001, Hanafizadeh P., & Khedmatgozar H. R. in 2012, and Martins C. et al. in 2014, explored unanimously that the use of digital banking by consumer is becoming less and null in case of the perceived risk is higher. To any commonsense application higher risk could not be tolerated as well as

turn out to be the factor for stoppage of the services. The perceived risk which was taken as one of the important factors which influence certain transaction interruptions caused by network problems, transaction errors and data hacking.

As this research has emphasized on rural consumers the perceived risk is expected to be more escalating because of usage culture is less and risk threat is high generally.

Bigne E., & Blesa A. (2003) believed that electronic transactional environment being more uncertain and risky the consumers behaviour intention would generally be lower so the critical factor to be promoted by any company could be the trust and the elements which created trust should catered to the consumers in the way of service mix. Companies can be alert enough by protecting the consumer with strong strategy formulation for security and information execution system to be explored to the optimal extent (Yiga C. and Cha K. J. 2014). Here comes the importance of physical banking where the transaction are mostly done in confrontation with people but quite contrary to digital banking where the rights and interests of consumers will be damaged due to security flaws. Where by the trust on digital banking will be decreased and rejection or refusal to use online services will be increased (Kassim N., & Abdulla A. 2006). When it comes to the intension of use for digital banking can be higher if banking corporates finds a strategy to reduce levels of insecurity and build user loyalty and trust (Koppala Venugopal et al. 2021).

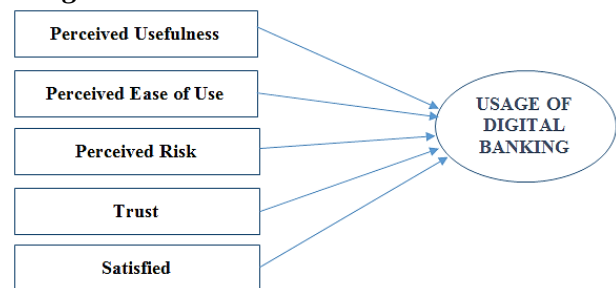
Trust to be gained from rural consumers moreover in case of technology adaption has always been highly critical when compared to urban areas. Traditional thinking and conventional pattern of consumption and complacency make the rural consumers trusting more on what have in practice rather than new things to come nevertheless a little change amongst rural consumers in the age of COVID has been found where the trust on online banking is developed even under inevitable conditions.

Consumers will continue the usage of product or service if their satisfaction levels or more hence there is a constructive correlation

between satisfaction and continuous usage (Deng L. et al. 2010).

In this study, the factors determining the usage of digital banking by rural consumers are Usefulness Perceived, Ease of Use Perceived, Risk Perceived, Trust and Satisfaction which have been taken from the theoretical, empirical and methodological review of literature. Hence the conceptual framework explaining the relationship between dependent and independent variables is portrayed as follows.

**Figure 1: CONCEPTUAL FRAMEWORK**



### **HYPOTHESIS:**

*H1: Perceived usefulness has positive influence on the usage of digital banking services.*

*H2: Perceived ease of use has positive influence on the usage of digital banking services.*

*H3: Perceived Risk has positive influence on the usage of digital banking services.*

*H4: Trust has positive influence on the usage of digital banking services.*

*H5: Satisfaction has positive influence on the usage of digital banking services.*

### **Methodology**

The study area selected for the research was the rural areas of Berhampur, Odisha. The sampling unit taken was rural consumers. The places Consists of high rural density of population and considered as one of the backward places. Though it is one of the most populous urban city, the peripheral 76 villages with rural households of 14,043 breakdown of population for male is 28,815 and female is 28,799 which accounts 57,614 as a whole. Berhampur being called as silk city is pretty famous for fruits in season and good marketing opportunities. The consumers from rural segments are gradually habituated to online banking with a moderate pace of usage. The study was accompanied with the descriptive



and exploratory research design and adopted the both qualitative and quantitative approaches. The data from journals and documents as secondary data and the data through distributing self-administered questionnaire to rural consumers as primary data was gathered through cross sectional research and multi stage sampling. The non-probable sampling method of convenience sampling technique has been adopted since the sample frame (Rural consumers of online banking) is multifaceted and complicated enough to identify and list out. The sample size determined was 248 through the formal calculation sourced from Yamane (1967) and Malhotra and Birks (2006). The data collected has been analysed with ANOVA to find the significance level of independent factors on the rural usage of online banking service. Thereby Multiple Regression Analysis was used to know the strength of each item of independent variables explaining the dependent variable through SPSS 23. Certain factors have been found highly significant with respect to rural consumer behaviour where all the analysis has

been milked with management implications and thereby offered with certain specific suggestions.

## Analysis And Interpretation

### 5.1 ANOVA

The Table 1.1 shows the relationship among the dependent variable “increase in usage of digital banking services” and the independent variables “PU (Perceived Usefulness), PE (Perceived Ease), PR (Perceived Risk), TR (Trust) and ST (Satisfaction)”. The F values between dependent variable and predictors respectively are 3.328, 3.719, 1.957, 3.337 and 1.943, as well as the respective significant values are 0.00, 0.00, 0.039, 0.00 and 0.040 which are highly significant at the level of 0.05. Conversely, we can also accomplish if there is one level in items’ upsurge, there will be the rise of 231.376 in Perceived Usefulness, 284.463 in Perceived Ease, 227.291 in Perceived Risk, 190.368 in Trust, 218.808 in Satisfaction.

**Table 5.1: ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1 (P U)	Regression	32.491	10	3.249	3.328	.000 <sup>b</sup>
	Residual	231.376	237	.976		
	Total	263.867	247			
2 (P E)	Regression	44.634	10	4.463	3.719	.000 <sup>b</sup>
	Residual	284.463	237	1.200		
	Total	329.097	247			
3 (P R)	Regression	18.693	10	1.869	1.957	.039 <sup>b</sup>
	Residual	227.291	238	.955		
	Total	245.984	248			
4 (TR)	Regression	26.693	10	2.669	3.337	.000 <sup>b</sup>
	Residual	190.368	238	.800		
	Total	217.060	248			
5 (ST)	Regression	17.867	10	1.787	1.943	.040 <sup>b</sup>
	Residual	218.808	238	.919		
	Total	236.675	248			

Source: Researchers’ Survey

Since all the variables have been significant at 0.05 level the null hypotheses formed for the study have been failed to accept. Thus the hypotheses tests are as follows

HO1 “Perceived usefulness has positive influence on the usage of digital banking services” ACCEPTED

HO2: Perceived ease of use has positive influence on the usage of digital banking services. ACCEPTED

HO3: Perceived Risk has no positive influence on the usage of digital banking services. ACCEPTED

HO4: Trust has no positive influence on the usage of digital banking services. ACCEPTED

HO5: Satisfaction has no positive influence on the usage of digital banking services. ACCEPTED

Now, it is important to assess the weightages of all items of each variable and their explaining to the dependent variable with the help of Multiple Regression Analysis.

**5.2 MULTIPLE REGRESSION ANALYSIS:**

**5.2.1 Perceived Usefulness**

**Table 5.2.1: Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	2.893	.645		4.488	.000
1 Increment of efficiency of money transactions.	.068	.087	.071	.813	.433
Increasing knowledge of banking businesses.	.185	.097	.177	2.200	.036
Updating the latest banking services	.137	.090	.124	1.479	.046
Using more banking services in a convenient manner	.048	.081	.040	.324	.572

$$y = \alpha + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + \beta_6 x_6 + \beta_7 x_7 + \beta_8 x_8$$

Where y = Dependent variable; x = Independent variable; α= Intercept; and β = Estimate

As per the Coefficients retrieved from the table X, the formula can be as follows

$$\text{Digital banking usage (DU)} = 2.893 + (.813) \text{PU1} + (2.200) \text{PU2} + (1.479) \text{PU3} + (.324) \text{PU4}$$

Digital banking usage regarding the items of Perceived Usefulness, PU1 (Increment of efficiency of money transactions) is 3.706 (2.893 - 0.813); if PU1 increases by one unit, the Digital banking usage is increased by 3.706. In the same manner, when the predictors PU1, PU2, PU3 and PU4 are increased by one

unit, the Digital banking usage will be amplified for PU 2 (Increasing knowledge of banking businesses) by 5.093; PU3 (Updating the latest banking services) by 4.372; PU4 (Using more banking services in a convenient manner) by 3.217. The predictor pertaining to the information gained by the customers about banking services has explained higher with 5.093 and the services in a convenient manner with the lowest strength of 3.217 as well.

So it can be interpreted that the information searched and gained from digital banking services is high and most of the people are not convenient with the services since the adoption of technology is critical for rural consumers.

**5.2.2: Perceived Ease of Use**

**Table 5.2.2: Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.555	.625		2.489	.013
Easy to learn using Digital banking.	.073	.096	.052	.759	.448
Easy to be acquainted with Digital banking operations	.055	.100	.038	.551	.582

Easy to the completion of banking business via Digital banking.	-.120	.090	-.099	-1.323	.187
Interface process of Digital banking is clear & easily understood	-.116	.092	-.098	-1.250	.213

Digital banking usage (DU) = 1.555 + (.759) PE1 + (.551) PE2 + (-1.323) PE3 + (-1.250) PE4.

Digital banking usage regarding the items of Perceived Ease of Use, PE1 (Easy to learn using Digital banking) is 2.314 (1.555+ 0.759); if PU1 increases by one unit, the Digital banking usage is increased by 2.314. In the same manner, when the predictors PE1, PE2, PE3 and PE4 are increased by one unit, the dependent variable Digital banking usage will be increased for PE 2 (Easy to be acquainted with Digital banking operations) by 2.106; PE3

(Easy to complete banking business via Digital banking) by 0.232; PE4 (Interface process of Digital banking is clear and easily understood) by 0.305. The predictors pertaining to the ease of learning how to use and familiarity show high strength respectively with 2.314 and 2.106; But the completion of banking business and interface process of digital banking assumed to be low and customers feel inconvenient since the lower strength represented with 0.232 and 0.305 respectively.

5.2.3: Perceived Risk

Table 5.2.3: Coefficients<sup>a</sup>

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-.472	.693		-.682	.496
Insufficient security measures	.096	.106	.061	.906	.366
Leaking consumers' personal information to other establishments	.106	.111	.064	.951	.343
Entering wrong amounts during online transactions.	.069	.099	.052	.693	.489
Mistakes during transactions.	.017	.102	.013	.167	.867
Subject to hacking and causing financial loss	.216	.104	.153	2.069	.040

Digital banking usage (DU) = -0.472 + (.906) PR1 + (.951) PR2 + (.693) PR3 + (.167) PR4+ (2.069) PR5.

Digital banking usage regarding the items of Perceived Risk, PR1 (Insufficient security measures) is 0.434 (-0.472+ 0.906); if PR1 increases by one unit, the Digital banking usage is increased by 0.434. In the same manner, when the predictors PR1, PR2, PR3, PR4 and PR5 are increased by one unit, the dependent variable Digital banking usage will be increased for PR 2 (Leaking consumers' personal information to other establishments) by 0.479; PR3 (Entering wrong amounts during online transactions) by 0.221; PR4 (Mistakes during transactions.) by -0.305; PR5 (Subject to hacking and causing financial loss) by 1.592. The predictor pertaining to the "Digital banking is likely to be subject to hacking,

which will cause financial loss to consumers" shows high strength respectively with 1.592; But surprisingly, the remaining predictors such as inadequacy of security measures, leakages of consumer data and mistakes by wrong fillings are not explaining with good strengths. Moreover the predictor related to Transactional challenges has come out with negative value as the lowest.

5.2.4: Trust

Table 5.2.4: Coefficients<sup>a</sup>

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.854	.618		3.001	.003
1 Needed enhanced mechanisms to improve security of customer data	.082	.095	.061	.869	.386
1 Needed systems backup to ensure normal use when the web is under attack.	.050	.099	.035	.500	.618
Digital services considers the interests and needs of users	-.068	.088	-.059	-.764	.446
Need to shift the risk of loss to other vendors	-.049	.091	-.043	-.532	.595

Digital banking usage (DU) = 1.854 + (.869) TR1 + (.500) TR2 + (-.764) TR3 + (-.532) TR4.

Digital banking usage regarding the items of Trust, TR1 (Needed enhanced mechanisms to improve security of data) is 2.723 (1.854 + 0.869); if TR1 increases by one unit, the Digital banking usage is increased by 2.723. In the same manner, when the predictors TR1, TR2, TR3, and TR4 are increased by one unit, the dependent variable Digital banking usage will be increased for TR 2 (Needed systems backup to ensure normal use when the web is under attack) by 2.354; TR3 (Digital services considers the interests and needs of users) by

1.09; TR4 (Need to shift the risk of loss to other vendors) by 1.322.

The predictor pertaining to the “Digital banking should employ a set of optimized security mechanisms to improve the security of transaction data” shows high strength with 2.723 followed by the predictor “Digital banking should establish several backup systems to ensure normal use of Internet banking by consumers when the web is under attack” with 2.354. Whereas the predictor “Digital banking will consider the interests and needs of users and provide the products and services they need” is considered to be the least significant with the lowest weightage of 1.09.

5.2.5: Satisfaction

Table 5.2.5: Coefficients<sup>a</sup>

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.592	.565		2.816	.005
1 Bank I deal with has a good image and reputation.	.062	.087	.048	.711	.478
1 DB updates the required data on the website anytime.	.088	.091	.066	.973	.332
1 DB has a stable and fast system	-.005	.081	-.005	-.062	.951
Customer service employees have proper proficiency and attitudes.	-.197	.084	-.185	-2.362	.019
Responses can be obtained practically when posed any query.	.155	.071	.154	2.198	.029

Digital banking usage (DU) = 1.592 + (.711) ST1 + (.973) ST2 + (-.062) ST3 + (-2.362) ST4+ (2.198) ST5.

Digital banking usage regarding the items of Satisfaction, ST1 (Bank I deal with has a good image and reputation) is 2.303 (1.592+ 0.711); if ST1 increases by one unit, the Digital

banking usage is increased by 2.303. In the same manner, when the predictors ST1, ST2, ST3, ST4 and ST5 are increased by one unit, the dependent variable Digital banking usage will be increased for ST2 (DB can update the information on the website anytime) by 2.565; ST3 (DB has a stable and fast system) by 1.53;

ST4 (Customer service employees have proper proficiency and attitudes) by -0.77; ST5 (Responses can be obtained practically when posed any query) by 3.79.

The predictor pertaining to the “Answers can be obtained regarding Internet banking in real time in case of any question” shows high strength respectively with 3.79; The items such as image and reputation as well as updating web anytime is showing good strengths respectively with 2.303 and 2.565. But surprisingly, the rural consumers blamed on the expertise and attitude of customer service personnel with the lowest negative strength of -0.77

### Conclusions

As regards to the variable Perceived Usefulness, it is found that the information searched and gained from digital banking services is high and most of the people are not convenient with the services since the adoption of technology is critical for rural consumers. Research recommends that the focus on the information with an appropriate frequency through different traditional and modern media could be surpassed to the rural consumers since their adoption to access the knowledge stuff related to digital banking services usage is higher.

As far as the Perceived Ease of Use is concerned, it can be understood that the customer in rural places feel effortless of learning and using the digital banking services but the completion with appropriateness and

interface process have been the regular and major problems faced by most of the rural people associated with certain website ambiguities and technological disturbances.

When it comes to the Perceived Risks by the rural consumers, it is understood that the consumers of rural environment probably think in generic way of technological challenges with digital banking so as responded with high weightage for the hackings and financial loss due to digital banking operations. Though other things such as security measures, leakages of consumer data, mistakes by wrong fillings and transactional mistakes influence as a note of commonsense, the regression values are explained with less prominence which can be interpreted as the rural people may not be in a position to understand the specific and integrated problems of digital service applications while banking.

It is here by understood with respect to the Trust among the rural consumers of digital banking services who feel that certain mechanism should be created and made stronger to eradicate the insecurity inhibitions of consumers which the transactions are on. They also acknowledged positively regarding backup systems for ensuring the normal use of all consumers when some malwares attack. There is also a complaint that the digital banking services does not focus on the exceptional needs and interests of rural consumers and rural consumers have less faith on the risk of potential loss through insurance.

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## DEVELOPMENT OF A NOVEL APPROACH FOR BRAIN TUMOR DETECTION AND FEATURE EXTRACTION USING BWT AND SVM CLASSIFIER

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### ABSTRACT

*In today's world, the automatic detection and extraction of brain tumor from Magnetic Resonance Images (MRI) images is main concern and also a time consuming task by medical experts. Different techniques have already been proposed regarding this context. In this article, the Berkeley Wavelet Transform (BWT) technique has been proposed to detect the tumor & Support Vector Machine (SVM) classifier is used for classification of tumor. Different features have been extracted to enhance the SVM accuracy and quality rate. The experimental results of the proposed technique have been assessed by different parameters. With the help of the proposed technique achieved accuracy is 98.2%, specificity is 94.2% & sensitivity is 97.72%. The achieved result proved the importance concerning quality parameters and accuracy in comparison to already exiting techniques. From results, it is obvious that that the technique presented in this article may help in the accurate and handy diagnosis of brain tumor with its precise location.*

**Keywords:** *Magnetic Resonance Imaging (MRI), Pre-processing, feature extraction, Morphological operation, Berkeley Wavelet Transform (BWT), Support Vector Machine (SVM) classifier*

### Introduction

E-health care system plays a vital role to provide good health care to the patients. The tumor is caused due to uncontrolled growth of cells. It can be benign or malignant. Benign tumor is a non-cancerous tumor which does not spread to different pieces of body. It comes under the category of grade-I & grade-II glioma, known as low grade tumor while malignant is a cancerous tumor and it has non-uniform structure. It comes under the category of grade-III & grade-IV glioma, known as high grade tumor [1- 4]. So, detection and prevention is necessary at the early stage. Benign tumor can be completely cured via surgical operation and clinical supervision while malignant tumor requires chemotherapy and radiotherapy for treatment [5-8]. Once the brain tumor is diagnosed, radiological assessment is required to find tumor location and size. This will lead to proper treatment [9]. In this article, various types of MRI images are utilized for detection of tumor. The Berkeley Wavelet Transform (BWT) technique has been used to detect the tumor and Support Vector Machine (SVM) classifier is used for classification of tumor.

### Related Work

Sindhushree et al proposed a technique to detect tumor from MRI Image. The process includes high pass filtering, histogram equalization, thresholding, morphological erosion and segmentation. The result have been shown in a 3d view area and volume of detected tumor [1].

Zhao & Zhang presented a review of different brain tumor segmentation based on discrete convolution neural network (DCNN). It is divided in to three main categories data sampling, random patch size training & semi supervised learning and many more. The experiment is carried out on Brain tumor dataset and the result shows the improved accuracy [2].

Tiwari & Srivastava presented a review of various trending technique for tumor segmentation & classification techniques based on standard machine learning technique and deep learning methods. The several techniques contains machine learning techniques (SVM, SOM), deep learning based technique (CNN,DCNN,G-CNN), Metaheuristic algorithm (GA, DE, PSO,ABC), data mining tools(FCM) & hybridization techniques have been used for segmentation & classification of brain abnormality. [3].

Saba et al, proposed a technique for tumor detection based on fusion of different features. Grab cut method is used to segment the glioma tumor using MRI after that segmented image is sent to deep learning model VGG19 as a result deep feature vector is obtained after which these deep feature & hand crafted feature (shape & texture) are combined serially. Further image classification is done using different classifier to detect glioma and healthy images. The result shows the maximum accuracy achieved for different classifiers. [4].

Nema et al, suggested a Rescue net brain tumor segmentation technique. Separate training for whole, core and enhance tumor is performed using three different networks. The proposed technique uses the principle of residual and mirroring. For training it uses less data & give best segmentation result on multiple testing data. Sensitivity & Dice Coefficient measure is adopted for the performance measure which gives better results than other method. The proposed approach is superior both quantitatively & qualitatively [5].

Lu et al, introduced an effective multipath feature extraction 3D CNN for multimodal brain tumor segmentation. When data is imposed on first convolution layer, a large information loss will occur. Multiple parallel branch structure is used to process data of different modes in the coding part. Different branches results are fused together to get the final segmentation result. Each branch is also added with attention mechanism & the results are compared with the traditional methods which show the improved results in proposed method. This method can also be used as a reference for other multimodal data processing [6].

Murthy et al, presented a technique based on thresholding & morphological operation. Pre-processing is done by using sobel filter to remove noise, after that image enhancement is done to improve the image quality. Further quality is improved by histogram equalization. Morphological operation is used to create binary mask. Finally thresholding & segmentation is done to detect the tumor. Some of the feature like area, perimeter & centroid are also calculated to improve the efficiency [7].

Parmar et al, compared various segmentation technique like Automatic Image Thresholding, K-means, Fuzzy C-Means, K means Weighted Fuzzy Factor (KWFLICM) and the result is evaluated which shows KWFLICM & Fast Local Laplacian filter (FLFF) filter gives better PSNR-MSE value so it is better than K-means & FCM clustering technique. It also uses less no of iterations and are also useful in 3D representation [8].

Pei et al, described two methods for brain tumor segmentation prediction, one is feature fusion based and second one is joint label fusion (JLF) based. The first method shows better segmentation results for whole tumor while JLF method offers the segmentation of whole tumor and enhanced tumor. This method shows better results over other segmentation method [9].

Tahir et al, presented the combination of pre-processing technique to apply on different dataset to segment the tumor. Rather than applying a single pre-processing technique, a combined pre-processing technique is applied and classification results are calculated using three different measures: accuracy, sensitivity & specificity. The result showed the improvement to a great extent [10].

Chen et al, described a deep convolutional symmetric neural network for brain tumor segmentation. The proposed method improved the quality of extracted feature by incorporating left right symmetric mask. It enhances the performances of DCNN. The results are good due to symmetry addition. The result also showed that the time required segmenting the image is less than 10 sec. while other methods takes up to 3 minutes, so this method is useful in terms of accuracy and efficiency [11].

Anand proposed a combined technique i.e. watershed and neural network to segment the tumor. Self-Organizing Map (SOM) is used for classification. Feature extraction is done by stationary wavelet transform (SWT). The result showed the improvement in accuracy. The work can be further extended to 3D images for segmentation [12].

Suganthe et al, suggested a Recurrent Neural Network (RNN) architecture for brain tumor detection. Accuracy of RNN & convolutional neural network (CNN) is calculated



& compared. RNN leads more accuracy as compared with CNN while the training time of RNN network is more than that of CNN Network. Overall the proposed work enhances the accuracy and reduces the loss [13].

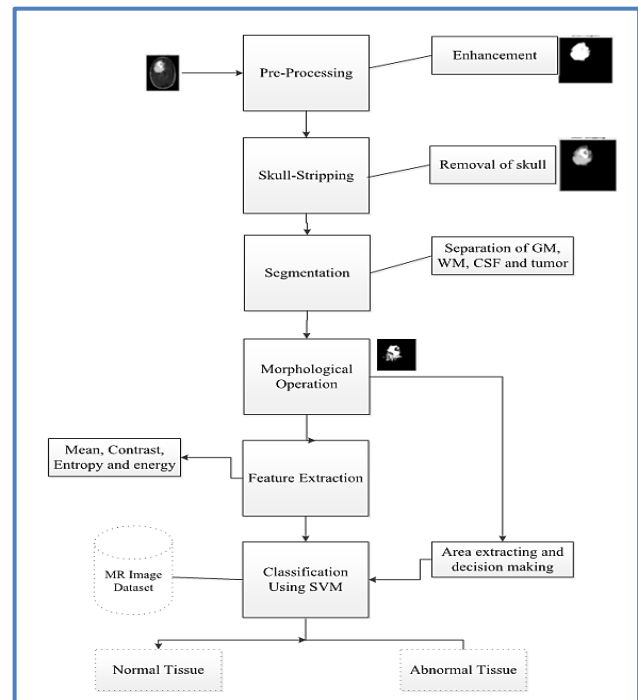
Latha et al, suggested an efficient approach to classify brain MRI Images. It uses Discrete Wavelet Transform (DWT) with principal component analysis (PCA) for feature reduction and it is compared with K-nearest neighbour (KNN) and support vector machine (SVM). The proposed result accuracy is more and improved with synthetic minority over sampling technique (SMOTE) [14].

Bahadure et al, proposed an approach for classification of brain tumor using Berkeley Wavelet Transform (BWT) and Support Vector Machine (SVM) Classifier. Different features are extracted to improve the classification accuracy. The proposed technology is compared with already existing technology and proposed SVM Classifier accomplished greatest precision of 96.51% [15].

## Proposed Methodology

### 3.1 Project Outline

The proposed technique uses a Berkeley Wavelet Transform (BWT) technique to detect the tumor and Support Vector Machine (SVM) classifier is used for classification of tumor. The block diagram of proposed technology is represented in Figure 1. In the proposed methodology different types of real MRI images of size 512\*512 are used for detection of tumor and they are converted in to grey scale for further processing.



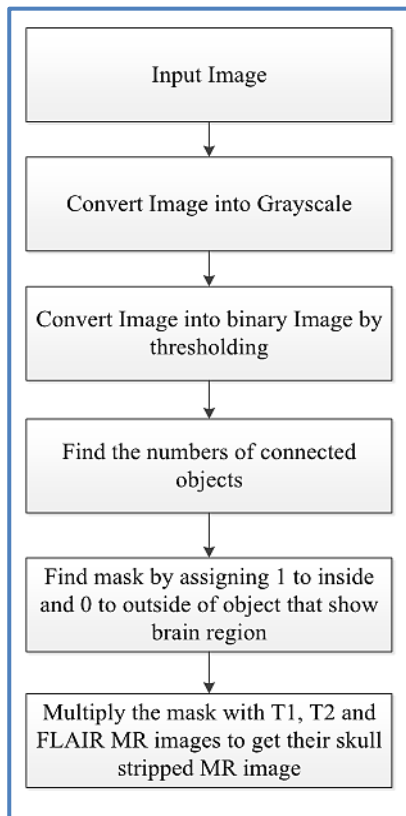
**Fig. 1. Block diagram representing different stages of proposed methodology**

### 3.2 Pre-processing

Pre-processing is an important step to enhance the quality of MR Images and to improve the nature of MR Images and to make it appropriate for additional processing. The basic steps involved in pre-processing are removal of noise and irrelevant parts of background, flatten the inner parts and protecting its edge [5]. the proposed technology has used adaptive contrast enhancement to improve signal to noise ratio and visual appearance of MR images.

### 3.3 Skull Stripping

Skull Stripping is basically used to remove all non-brain tissues like fat, skin and skull from MRI. It is an important step to make the correct examination of brain tumor [7, 12]. A no of techniques are available for skull stripping and mostly used techniques are segmentation and morphological operation based skull stripping, automatic skull stripping, histogram analysis or threshold value based skull stripping [15]. This study used threshold value based skull stripping technique. Figure 2 shows the skull stripping algorithm steps.



**Fig.2. Proposed Skull Stripping Algorithm**

### 3.4 Segmentation and Morphological Operation

During segmentation process the pre-processed image is converted in to a binary image having some cut-off threshold. The pixel value above the threshold value are marked white while rest marked as black. In the next step erosion operation is performed to remove white pixel. After that the original image and eroded region are partitioned into two equal region [11, 13]. The proposed technique uses a Berkeley Wavelet Transform (BWT) technique for segmentation. The wavelet transform technique is used to generate data or information in to various frequency components. The basic wavelet function is represented by  $\Psi(t)$ .

$$\varphi_{s,r} = \frac{1}{\sqrt{s}} \varphi\left(\frac{t-r}{s}\right) \quad (1)$$

$s$  and  $\tau$  are the scale and translation factors, respectively.

BWT is a 2D wavelet transform used to handle images or data. The mother wavelet transformation is addressed by  $\beta_{\theta}^{\varphi}(\tau, s)$  and it is a constant function [15].

$$\beta_{\theta}^{\varphi}(\tau, s) = \frac{1}{s^2} \beta_x^{\varphi}(3^s(x-i), 3^s(y-j)) \quad (2)$$

$s$  and  $\tau$  are the scale and translation factors, respectively.

The mean value of an image can be represented by a single constant term and its coefficient value is represented by  $\beta_0$ .

$$\beta_0 = \frac{1}{\sqrt{9}} \left[ u\left(\frac{x}{3}, \frac{y}{3}\right) \right] \quad (3)$$

The morphological operation consists of two basic process dilation and erosion. Dilation process is used for adding pixel to the boundary region and erosion is used for removing pixels from boundary region of the object.

### 3.5 Feature Extraction

Feature Extraction is the process of gathering higher level information of MRI like texture, contrast, shape and color. Accuracy of diagnosis system can be enhanced by selecting prominent features from MRI [4, 10]. Some of the useful statistics features are listed below.

**Mean:** Mean can be measured as summation of all the pixels to the total no of pixel value in an image.

$$M = \left(\frac{1}{m \times n}\right) \sum_{x=0}^{m-1} \sum_{y=0}^{n-1} f(x, y) \quad (4)$$

**Standard Deviation (SD):** It is characterized as deviation from its mean value [4,15].

$$SD(\sigma) = \sqrt{\left(\frac{1}{m \times n}\right) \sum_{x=0}^{m-1} \sum_{y=0}^{n-1} (f(x, y) - M)^2} \quad (5)$$

**Kurtosis:** Kurtosis is utilized to find out probability distribution of any arbitrary variable.

$$K_{urt}(x) = \left(\frac{1}{M \times N}\right) \frac{\sum (f(x,y) - M)^4}{SD^4} \quad (6)$$

**Skewness (S<sub>k</sub>):** It shows an gauge of similarity or dissimilarity [14].

$$S_{K(X)} = \left(\frac{1}{M \times N}\right) \frac{\sum (f(x,y) - M)^3}{SD^3} \quad (7)$$

**Entropy(E):** Entropy is characterized as rate of randomness of textural image.

$$E = \sum_{x=0}^{M-1} \sum_{y=0}^{N-1} f(x, y) \text{Log}_2 f(x, y) \quad (8)$$

**Contrast:** Contrast is defined as the dissimilarity in brightness between objects or regions.

$$C_{on} = \sum_{x=0}^{m-1} \sum_{y=0}^{n-1} (x - y)^z f(x, y) \quad (9)$$

**Variance:** It is calculated by average of squared deviations from its mean.

$$\sigma^2 = \frac{\sum(x-\mu)^2}{N} \quad (10)$$

**Correlation:** Correlation is defined as spatial conditions between the pixels [7].

$$C_{orr} = \frac{\sum_{x=0}^{m-1} \sum_{y=0}^{n-1} (x,y) f(x,y) - M_x M_y}{\sigma_x \sigma_y} \quad (11)$$

Where  $M_x$  and  $M_y$  are mean and  $\sigma_x$  and  $\sigma_y$  are standard deviation.

**Energy (En):** Energy is used to represent a rate of information [10, 14].

$$En = \sqrt{\sum_{x=0}^{m-1} \sum_{y=0}^{n-1} f^2(x, y)} \quad (12)$$

### 3.6 Support Vector Machine (SVM)

SVM is a supervised learning technique applied to 1-n class classification problem. It uses a SVM Kernel to convert nonlinear transformation into a linear transformation [14]. In this research paper Gaussian kernel function has used for transformation. The performance of SVM algorithm can be assessed by three parameter accuracy, sensitivity and specificity. The confusion matrix of True Positive (TP), True Negative (TN), False Positive (FP) and False Negative (FN) is displayed in table1.

**Table 1: Confusion matrix characterizing the terms TP, TN, FP, and FN.**

Expected Outcome	Ground Truth		Row Total
	Positive	Negative	
Positive	TP	FP	TP+FP
Negative	FN	TN	FN+TN
Column Total	TP+FN	FP+TN	TP+FP+FN+TN

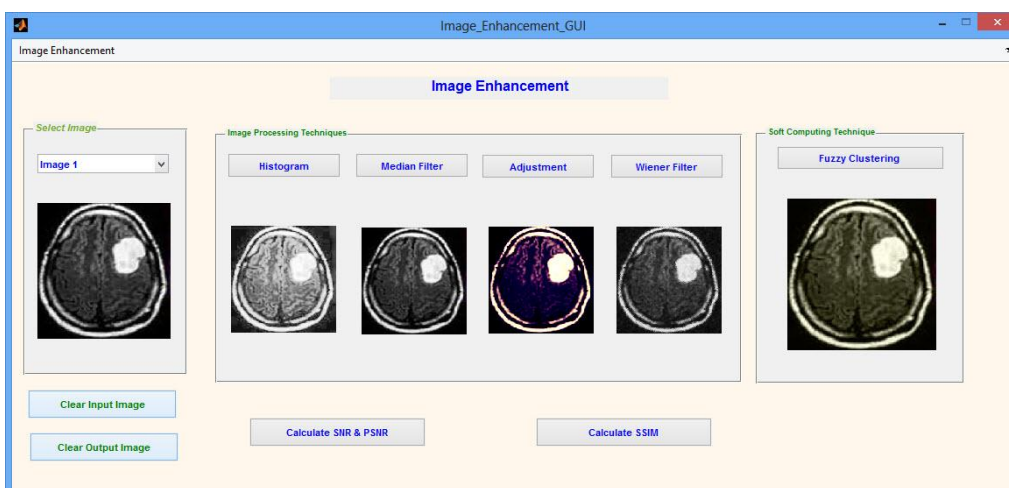
Where TP represent total no of abnormal cases correctly classified. TN represent total no of normal cases correctly classified. FP represent total no of wrongly detected cases and FN represent wrongly classified or detected normal cases. The accuracy is calculated by total correctly classified cases to the total no of cases examined [15]. The accuracy, specificity and sensitivity formulas are shown in table2.

**Table 2: Accuracy, sensitivity, and specificity formula**

Quality Parameter	Formula
Accuracy	$\frac{TP+TN}{TP+TN+FP+FN}$
Specificity	$\frac{TN}{TN+FP}$
Sensitivity	$\frac{TP}{TP+FN}$

### Results and Discussion

The complete simulation has been done on matlab2015a. Figure 3 shows the image enhancement using different types of filter. Figure 3 and 4 show the proposed project Graphical User Interface (GUI) Images in which different texture features has been calculated.



**Fig.3. Simulation Results**

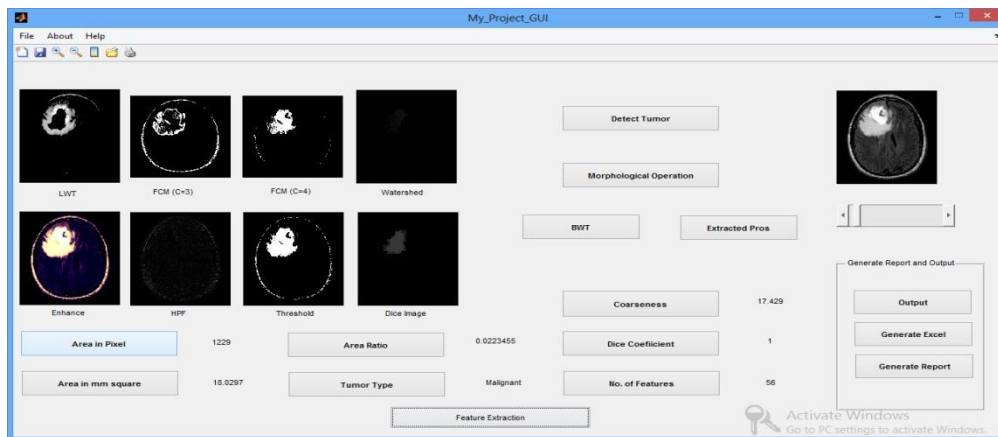


Fig.4.Simulation Results



Fig.5.Simulation Results

Table 3 represents the various statistical features extracted for different images in simulation process. Various statistical features are extracted like contrast, co-reation, entropy, energy etc. & intensity based features like mean, variance, standard deviation. Feature extraction is imporatnt to sepreate required feature of the image.

Table 3. Extracted features

Feature	Image1	Image2	Image3	Image4
Mean	41.4958	7.1498	8.66	11.81
Standard Deviation	55.9132	40.3434	43.99	49.11
Entropy	5.42104	0.496936	0.65	0.94
Homogeneity	0.947635	0.994297	0.9253	0.8633
Variance	3126.29	1627.59	1153.65	3234.09
Contrast	0.11642	0.0280913	0.2659	0.4735
Skewness	0.0260459	0.00541207	0.00553	0.00655
Energy	144.191	8.90902	10.94	16.37
Kurtosis	8.87E-06	3.40E-06	2.89E-06	2.74E-06
Angular 2 <sup>nd</sup> Moment	241110	683857	312456	453276
Correlation	0.977897	0.988879	0.9856	0.9458

Table 4 represents the evaluated parameters of proposed classifier which shows the significant improvement over the existing classifiers. The proposed technique achieved accuracy of

98.2%, specificity of 94.2% & sensitivity of 97.72%.

Table 4: Evaluated parameters of proposed classifier

Evaluation Parameter	Proposed Classifier (SVM)
True Negative	65
False Positive	4
True Positive	129
False Negative	3
Specificity (%)	94.2
Accuracy (%)	98.2
Sensitivity (%)	97.72

Table 5 represents the area of extracted tumor of different images and maximum achieved accuracy is 100%.

**Table 5: Area of the extracted tumor.**

Images	Area in Pixel	Area of extracted tumor	Area in Sq Centimeters	Area ratio	Accuracy of Area (in comparison of calculated area)
Image 1	76172	9877	1.22	0.1296	99.80%
Image 2	65792	7064	0.58	0.1073	100%
Image 3	136752	6365	1.44	0.0465	100%
Image 4	39600	7608	0.23	0.1921	99.80%

Table 6 represents the comparative analysis of various classifiers with feature extraction and without feature extraction. Support Vector Machine (SVM) classifier is compared with Adaptive Fuzzy Inference System (ANFIS), Back Propagation and K-Nearest Neighbours (K-NN). The proposed classifier shows maximum accuracy of 98.2% with feature extraction.

**Table 6: Comparative analysis**

Classifiers	Accuracy (%) without feature extraction	Accuracy (%) with feature extraction
ANFIS	86.14	90.04
Back Propagation	80.29	85.57
SVM (proposed classifier)	90.54	98.2
K-NN	84.55	87.06

## Conclusion

This article proposed a novel approach for classification of MRI brain Image using Berkeley Wavelet Transform (BWT) and Support Vector Machine (SVM) Classifier. The experiment results of the proposed technique have been assessed by different parameters. The proposed technique achieved accuracy of 98.2%, specificity of 94.2% & sensitivity of 97.72%. The experimental results showed the significant improvement as compared to manual detection done by clinical experts and time taken for classification is decreased significantly. Test results show that the proposed approach can help in the exact and appropriate recognition of brain tumor with its accurate area. Outcomes lead to the end that the proposed technique is appropriate for essential screening and finding by the radiologists or clinical specialists.

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## IMPACT OF WILDFIRES ON HUMAN LIFE AND TECHNOLOGIES/INNOVATIVE TECHNOLOGIES USED TO PREVENT

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### ABSTRACT

*Global warming caused by greenhouse gas emissions and its resultant global change in weather patterns are the factors responsible for climate change. In the middle of the 20th century, the first climate change the world has seen was when humans have had an unforeseen effect on the climate system on earth and led to a massive change across the world (Allen et al., 2012). Wildfires have been triggered due to several reasons in different countries. Climate change is just one reason behind those extreme fires observed during the past decade. Even the organizations handling wildfire management are not similar in all countries.*

*This is because different countries have different political, historical, environmental, social, and financial scenarios. Fire issues are getting more visible and pronounced, there is a huge political and public pressure to bring changes to the fire management system in the countries which are worst hit by forest fires. Especially after huge wildfire disasters, there has been a great demand for those changes. In this paper, we have discussed wildfire incidents happening in various countries and the role of humans and nature in wildfires.*

**Keywords:** wildfire, bushfire, Australia, climate change, global warming, greenhouse gas emissions, weather patterns, climate system, wildfire management

### Introduction

The greenhouse effect caused by the emission of gases is the major driver of global warming and 90% of those effects are caused by methane and carbon dioxide (Oliver & Peters, 2019). These emissions mainly come from burning fossil fuels like oil, coal, and natural gas for producing energy, and deforestation, manufacturing, and agriculture are other major drivers (US EPA, 2020). There is still no debate or objection from any national or international scientific body on the role of humans in climate change. Climate responses temper or accelerate the rise in temperature, such as rising water vapor, loss of ice cover and shiny snow, and changes to carbon sinks in the ocean or land. Rise of temperature on land is around 200% of the average rise across the world, which leads to expansion of deserts, wildfires and heat waves (Shukla et al., 2019). The Arctic Circle is also suffering from global warming, where it has lost sea ice, glaciers and melted permafrost (Poloczanska et al., 2018). The evaporation levels are also rising due to elevated temperatures and extreme weather and more intense storms can be seen (Wuebbles et

al., 2017). Extinction or migration of several species due to change in environment is one of the impacts on the environment, especially in mountains, the Arctic, and coral reefs (EPA, 2017). Some of the common risks of climate change for humans are scarcity of water, food shortage, infectious diseases, floods, financial losses, displacement, and extreme heat. Considering these human effects, the WHO has declared "climate change" as the world's greatest threat of the 21<sup>st</sup> century (IPCC, 2014). Even after successfully reducing the warming effects in future, mankind will still see some effects over the centuries, such as elevated ocean temperatures, acidification of oceans, and rising sea levels (Allen et al., 2018). Adaptation and Mitigation are some of the solutions for these impacts (NASA, 2020). Mitigation, as the name suggests, is the process of controlling climate change by removing greenhouse gases and reducing their emissions into the atmosphere (NASA, 2020). Some of the measures to make it possible are developing and deploying the sources of low carbon energy like solar and wind, forest conservation, improving energy efficiency, and phasing out the coal. On the other hand,

adaptation is the process of adapting to expected or existing climate with proper disaster management, protecting coastline, developing weather-resistant crops, and assisted colonization (NASA, 2020). However, adaptation alone is not enough to ward off the risk of irrevocable, pervasive, and devastating impacts (IPCC, 2014).

In 2015, countries agreed jointly to control their warming within 3.6°F or 2°C under the Paris Agreement with mitigation efforts. Global warming would still exceed 5°F or 2.8°C by the end of century as per the pledges made as per the contract (Climate Action Tracker, 2019). Countries have to get emissions down to 50% by 2030 and achieve almost zero emissions by 2050 by keeping warming under 1.5°C or over 2.7°F (Rogelj et al., 2019). Our climate goes through several cycles itself for decades or centuries (Delworth & Zeng, 2012). Imbalance of energy has caused other changes which are external for the climatic condition but it is not that external to the world (National Research Council, 2012). Some of the common external forces are rising greenhouse gas levels, changes in environment, volcanic eruptions, solar luminosity, and changes in orbit of the earth across the sun (Bindoff et al., 2013).

It is important to rule out the external forces of nature and internal climate changes to determine the role of humans on climate change. Determining different “fingerprints” for all common causes is an important approach and comparing the same with observed climate change patterns (Knutson, 2017). For instance, it is possible to rule out solar forcing as a key cause as the whole atmosphere receives a warming fingerprint.

### 1.1 Background

There are broad and far-reaching effects of climate change on the environment as it affects ice, oceans, and weather. It may lead to rapid or gradual changes. It is important to study climate changes in the past to modern observations to find the evidence of such effects. Heat waves and droughts have appeared constantly and rapidly since the 1950s (Oppenheimer et al., 2019). India and East Asia also witnessed extremely dry or wet events in monsoons (Ogburn, 2014). The

intensity of typhoons and hurricanes along with rainfall rate is rising (Kossin et al., 2017). Climate change has not caused the rise in frequency of tropical cyclones (Elsner & Jagger, 2009).

Extended growing season and higher levels of CO<sub>2</sub> in the atmosphere have caused global greening, while drought and heat waves have led to the decline of ecosystem productivity in some areas. Whether these opposing effects will be balanced in future is still not clear (Jia et al., 2019). Climate change has caused the expansion of deserts in subtropical regions (IPCC, 2019). Abrupt changes are being made in the environment with the speed and size of global warming (Turner et al., 2020). Overall, a lot of species are on the verge of extinction thanks to climate change (Urban, 2015).

Mostly because of changes in precipitation and warming, there have been different effects of climate change witnessed on humans. It is now possible to observe the local impacts of climate change on all the continents and various ocean areas (Cramer et al., 2014) and less developed regions are at high risk (Oppenheimer et al., 2014). Constant greenhouse gas emissions will further warm the earth and make changes in the climate in the long run, and the impacts may be irreversible, persistent, and extreme for both the environment and humans (IPCC, 2014).

The Australian bushfire was one of the most significant and deadliest examples of climate change in 2019-20. It was the period of unexpectedly extreme bushfires in several parts of the country and it was colloquially called the “Black Summer” (Tolhurst, 2020; Burgess et al., 2020). The “Queensland Fire and Emergency Service” had already warned of the onset of bushfire season in June 2019, which usually starts in August. There were multiple factors combined which led to their indication, such as lack of soil moisture, extremely dry conditions, and early Queensland fires (Withey, 2019). The southeast of Australia was hit hard by hundreds of fires throughout the summer and the major fires were recorded in December and January. According to fire and climate experts, climate change was the primary reason which increased the frequency of fires and their intensity in southeastern parts of the country (Woodburn, 2018).



## 1.2 Literature Reviews

Wildfire has been affecting both the environment and the earth for over 350 million years and it has been closely related to human society. It has been very prevalent since times immemorial and has serious and harmful effects on both human life and the environment. **Haque et al. (2021)** discussed bushfires in Australia that occurred in 2019-20 along with its fatality rate, various environmental factors, spread, consequences, and some recommendations to mitigate its effects. The bushfire of Australia was started in June 2019 and kept burning in various parts of Australia. It burnt the forests of Northern Territory, New South Wales, Queensland, Western Australia, and Victoria. 2019 was recorded as the warmest and driest year in the history of Australia and lowest rainfall became the common cause of bushfires over there. Eucalyptus trees supply oily fuel and are highly flammable. Bushfire badly affected the quality of water, soil, and air of the area, which stretched around hundreds of thousands of kilometers. It played a vital role in carbon emission and toxins. Bushfires burnt out over 143 million mammals, 3 billion vertebrates, 181 million birds, 2.46 billion reptiles, and 51 million frogs in 2020 in Australia. The study attempts to explore the overall concept of exploring the devastation of forests by bushfires, major causes and suggestions to mitigate bushfires.

Over the past decades, it is globally accepted that fire activity is highly affected by anthropogenic climate change. But the association between increased fire activity and climate changes is still not getting proper attention. **Marlon et al (2009)** found that the timing of fire activity changes is not relevant to the changes in density of human population or the timing for the annihilation of megafauna. These factors could be responsible for changes in fire regime at separate areas or at particular times.

Hagmann et al. (2021) review a multi-proxy, multidimensional evidence and century of observations about common changes in wildfire regimes and forested lands since the invasion of British colonists. A huge landscape of western North America was managed and settled well by indigenous tribes who used to

intentionally burn the lands over the last 10 millennia. Later on, Prichard et al. (2021) review the management approaches which have been applied over the centuries by some managers and native tribes to manage forests. Both of them asked ten questions about the relevance and applicability of such management approaches. **Hessburg et al. (2021)** explore the issue of progress paralysis due to extreme obedience to precautionary measures and common issues of uncertainty while suggesting policy directions and reframing management while identifying research requirements and knowledge gaps.

**Westerling & Bryant (2008)** statistically modeled the risks of wildfire under four scenarios of climate change in California as the roles of topography, hydrology, and climate. It is observed that fire risks were mitigated in some areas where flammability of fuel is lesser than fine fuel availability because of lower availability of moisture, higher temperatures, and lower precipitation. They also modeled property damages caused by wildfires to describe the density and location of residential structures. Urban/wildland interfaces were the worst hit by property damages due to climate change as compared to metropolitan regions in the Bay Area, southern coastal California, and in the foothills of Sierra located northeast of Sacramento.

## 1.3 Research Gap

Lightning, dry climate, and volcanic eruption are some of the natural causes of wildfire breakout (**Scott, 2000**). When the soil starts losing more water than precipitation through evapo-transpiration, soil turns out to be dry. These dry matters can easily come into contact with fire created by volcanic eruption, lightning, or other natural phenomena, or negligence by humans. All such factors can cause the events of wildfire which spreads dangerously with wind. The bushfires can move even faster and cause devastating effects. Burning debris, smoking, campfires, shock circuits or accidents, arson, and fireworks are some of the causes of wildfire.

In addition, wildfires affect different countries due to different causes. Lightning in Northwest China and Canada is the major cause of ignition. Human activities like burning land for

conversion, dairy, agricultural operations in Central America, Africa, Southeast Asia, Fiji, Mexico, South America, and New Zealand are the major causes of wildfires. Human negligence is the common cause in the Mediterranean Basin of China (Liu et al., 2012; De Rigo, 2017). In this study, we are trying to fill the research gap between natural and human causes of wildfires and the effects of climate change to find out the ideal measures to prevent these events.

#### 1.4 Research Question

Q. Are humans really responsible for climate change or is it just a process of nature?

Q. Who is majorly responsible for wildfires; human or climate change?

#### 1.5 Importance of the Study

Despite the causes, wildfire affects human life and the environment in different ways. The smoke and toxic substances produced by wildfires cause hazardous impact on the respiratory systems of humans. Bushfires on Victorian Black Saturday caused 173 casualties out of which 77 children, people with respiratory issues, and senior citizens died in 2009 (O'Neill and Handmer, 2012). After an Australian bushfire, fire fighters and residents around the fire suffered mental health issues for four years (McFarlane, 1997). The health risks associated with carbon monoxide (CO) was very high among the people around the fire and firefighters and other harmful components can also cause death and unconsciousness (Country Fire Authority). Hence, this study opens further paths for researchers and helps policymakers to consider the impact of wildfires seriously and bring out the best measures to protect the environment and human life.

#### 1.6 Research Objectives

- To find out the role of humans and nature in climate change.
- To determine how climate change and human negligence causes wildfire.

#### Research Methodology

##### 2.1 Research Method & Design

In order to determine the effects of wildfires across the world in the environment and human

lives, we have used secondary data and gathered information from other research papers, literature, journals, reports, news portals, and other reputed and reliable sources. This research paper completely relies on secondary data to open further research paths for the researchers to conduct more studies on climate change and issues of wildfire to help their respective governments to find and implement best measures to prevent such incidents in future.

#### 2.2 Research Approach

In this study, we followed the secondary approach to find out the solutions to prevent the common causes of wildfires. We compiled the most trusted sources to gather information about wildfires in different parts of the country and evidence about their impacts and causes.

#### 2.3 Research Limitation

Since this study is based on secondary data, it lacks the benefits of gathering information from primary and empirical research. However, it may help the researchers to choose the best research ideas to conduct further studies on wildfires and government policies to control and prevent those incidents in their countries.

#### Analysis of Data

Around 4% of global land area, i.e. 30 to 46 million sq. km, of the land surface in the world is burning every year (Figure 1) (Randerson et al., 2012). Over €2500 million is being spent every year in France, Italy, Greece, Portugal, and Spain for fire control and management, particularly for fire containment and detection (Raftoyannis et al., 2014).

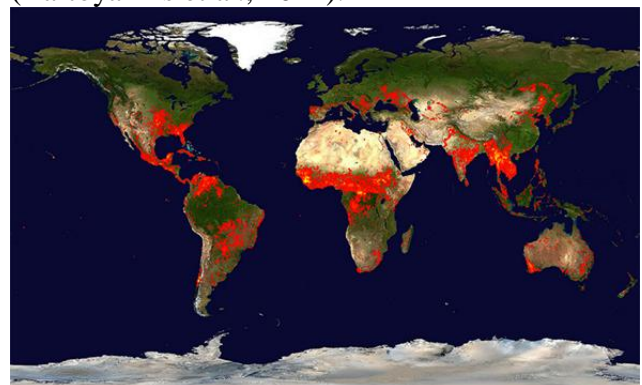


Figure 1 – Global Wildfire Map (NASA EarthData, 2021)

Every year, US\$531 million was invested on average in Canada from 2000 to 2010 for avoidance and prevention of wildfire (Gonzalez-Caban, 2013). The first wildfire in the world ever recorded happened during the Silurian period, i.e. around 420 million years ago on rhyniophytoid plant fossils that were preserved as charcoal. During the Late and

Middle Devonian period, the abundance of charcoal was associated with decline in atmospheric oxygen (Glasspool et al., 2004; Edwards & Axe, 2004). Wildfire and its devastating impacts are rising every day across the world due to global warming (Table 1).

**Table 1 – Global Wildfire Destruction 2010 to 2020**

Wildfire Events	Year	Region(s)	Timeline	Destruction (in hectares)
Bolivia Forest Fires	2010	Bolivia	August	1,500,000
Canada	2014	Northwest Territories	Summer	3,500,000
Richardson Backcountry, Canada	2011	Alberta	May-Sept	705,075
Russia Wildfires	2015	China, Inner Mongolia, and Russia	Mid of April	1,100,000
British Columbia, Canada	2017	British Columbia	July-Sept	1,216,053
Russian Wildfire	2018	Amur Oblast	May-July	321,255
California	2018	California	Feb-Dec	766,439
Sweden Wildfire	2018	Sweden	May - Aug.	25,000
Amazon Wildfires	2020	Bolivia, Brazil, Peru, Paraguay	January	906,000
British Columbia	2018	British Columbia	Aug-Sept	1,315,314
Siberia Wildfire	2019	Siberia	July-Sept	3,000,000
Alberta wildfire, Canada	2019	Central and Northern Alberta	Mar-Dec	883,414
Australian bushfire	2019-20	Entire southeast Australia	From Sept 2019 till 2020	18,636,079

*Source: Filkov et al., 2020; Haque et al., 2021*

### **Are humans really responsible for climate change or is it just a process of nature?**

One of the most significant causes behind the current climate crisis is negligence of humanity towards the environment early on. With each passage of year of inattention, the emission level reductions needed to control global warming started getting higher and higher. From fossil fuel firms to politicians, rich consumers, and developed countries, almost everyone is responsible for this ongoing climate change. If not blaming, at least it is important to know who is accountable for the choices available. By knowing for whom and how the power is used and achieved, we may start shedding light on how to start making changes to the climate.

- **Fossil Fuel Producers** – Fossil fuel companies have literally played a vital role in climate issues. According to the Carbon Majors Report 2017, only 100 fossil fuel companies produced around 70% of greenhouse gas emissions in the world over the last two decades (Griffin & Heede, 2017). Top 20 fossil fuel companies have been reported for a third of carbon emissions (Taylor & Watts, 2019). These companies have had a great impact on climate not only with their constant removal of fossil fuels, but also their efforts to turn the public narrative. Inside Climate News (2015), a US news portal, conducted an investigation and revealed that Exxon, an oil company already knew about climate change, but they always made all the

efforts to block emission control measures. Such kinds of shocking revelations have caused a strong rage among the public on fossil fuel companies. Most people argue that those companies have done every possible trick to keep burning fossil fuels for the sake of their profits (Timperley, 2020).

- **Rich Consumers** – Focusing on the effects of fossil fuel companies to control emissions in future means pushing to keep using fossil fuels and the start of supply chain. It is also possible to look at the end consumers who opt for the final products made of fossil fuels and those who take a lot more than the rest. According to a recent study conducted at the University of Leeds, the richest 10% of people in 86 countries consume over 20 times more non-renewable energy than the 10% of poorest people (Oswald et al., 2020). Richer people use transport more than poorer people, such as driving big cars to long distances, holidays, flights, etc. (Timperley, 2020)

According to Julia K. Steinberger, one of the researchers, this study may or may not blame rich people for the climate change. Rich people have a lot of options to spend their money. If you are so rich that you can buy a big car, you also have a choice to avoid it. If rich people prefer to lead lifestyles that are very wasteful, they are surely liable for this. They are also more influential in the companies and government leading towards their policy. Rich people in various roles probably have choices to make decisions (Timperley, 2020).

But it is also true that these consumers belong to a system which rewards and enables their consumption. When many countries had been in lockdown due to COVID-19 pandemic, daily CO<sub>2</sub> emissions across the world fell 17% in comparison to the levels in 2019 (Le Quéré et al., 2020). Emissions were almost similar to 2006 levels. Though the drop was temporary, it was certainly major.

- **Developed countries** – Expanding from richer people, countries which emit the most are to be blamed for climate change. The countries which had been more polluting in history should be held more responsible than others for global climate changes. The first global climate treaty was

signed in 1992 to establish a framework for upcoming negotiations in climate change. It consists of some contentious and vital principles. According to the treaty, the countries had various liabilities for emissions and abilities to cut them. Urgent action must be taken to address the issue of climate change by everyone, including the poor and the rich (Timperley, 2020).

- **Humans** – Only a few experts would argue against the demand for richer countries to be more liable. What about the people living in those countries? Should they need to be responsible for the emissions in their countries? Are humans responsible for climate change somehow or the other? The energy and products we use can be associated with unsustainable and heavy amounts of emissions. It is worth accepting the fact that we all are responsible for this bigger emission (Timperley, 2020).

### Results & Findings

The unexpected fire season in Australia caused extreme devastation in 2020 till the end of March. The fires returned during the spring to rural regions of the UK, especially because of an unexpectedly hot winter due to which vegetation ended up drying. Southwestern China also had a lot of fire breakouts by the end of March, which caused forced evacuation of over 25000 people and 19 deaths (Xinhua, 2020). Unbearable heat in the Arctic from March to July 2020 fanned huge amounts of “zombie fires” in Siberia which ripped around a huge range of permafrost and released millions of tons of carbon.

According to Dr. Mark Parrington, a senior wildfire analyst at “Copernicus Atmosphere Monitoring Service” in the EU, fires were larger and intense in June 2020 as compared to the fires in June 2019. Arctic fires were far beyond in 2019 and 2020 as compared to 2003-18. The fire season was truly record-breaking in the western US. California fires had been at their worst ever in September and the whole west coast got their land burned in 2020 as compared to any other year since the 1980s. Millions of people suffered from air pollution and smoke and 30 people were killed on the west coast. Endangered species were almost wiped out due to fires, including half of the

population of pygmy rabbits found in Washington (The New York Times, 2020).

### **Who is majorly responsible for wildfires; human or climate change?**

A wildfire is a kind of uncontrolled fire that spreads across the jungles, grasslands, pastureland, and peatlands. The fires are often started during “prescribed burning” season intentionally in a controlled way. Wildfires have affected wildlife, humans, and the economies, across the world. They are highly responsible for up to 8% of 3.3 million early deaths due to toxic air quality and greenhouse gas emissions (Lelieveld et al., 2015). Sometimes, wildfires are started by natural causes, such as lightning. Most of the time, humans start the wildfires, knowingly or unknowingly.

Only 4% of wildfires are estimated to be natural across the world (Hirschberger, 2016). However, the percentage of fires started by nature versus humans varies region by region. For example, humans cause 84% of wildfires in the US (Balch et al., 2017). However, lightning causes 55% of wildfires in Canada (Veraverbeke et al., 2017). Different regions have different wildfire seasons, especially due to dry and rainy seasons and agricultural burning caused by humans. Climate change can cause wildfires due to several reasons and such factors also vary region by region, according to a wildfire researcher at Swansea University, Dr. Cristina Santin. However, climate change is also the reason as it dries out the vegetation which further enhances the risk of extreme fires. Evaporation increases when weather gets hotter than average, which further draws out the moisture from the land and plants. Due to this reason, a spark is needed to spread the fire over large areas (Dunne, 2020).

### **Conclusion**

In a world where economies, technology, attitudes, environment, and social structures are changing day by day, the question “who is responsible for wildfires” may not be that simple to answer, as it changes country by country. Australia bushfire and wildfire in Canada are some of the biggest examples of various causes behind wildfire. There are different conditions and criteria which should be considered before analyzing. The arguments and studies discussed here don’t jump into a deep level of conclusion. Rather, this study is the first attempt to serve as a guide to the researchers and policymakers with little information behind the scenes of forest fires. This study may help them to understand the complexity and consequences of their actions, so that they can make informed decisions in future.

### **Future Scope**

Given all the details above, the important question “who should be blamed for wildfire?” is far from simple to answer. We need skilled, excellent, and dedicated people to come up with a robust fire management scheme. The build-up of fuels over time can make the situation even worse and cause devastating forest fires occasionally. So, fire management should consider the same for making long-term fire control measures. If one fire management scheme had been successful in one country, it may not be suitable for another. There are changes in economic conditions, topography, environment, sophistication of the society, and educational and social levels of people.

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## THE RELATIONSHIP OF THE LEADERSHIP STYLES OF THE COLLEGE DEANS TOWARDS THE QUALITY OF WORK LIFE OF THE FACULTY

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### ABSTRACT

*The leadership styles and quality of work life are both essential in the organization to improve faculty performance and achieve organizational success. Thus, this study was conducted to determine the relationship of the leadership styles of the college deans towards the quality of work life of the faculty. Based on the findings of the study, majority of the respondents were rated moderate extent on the leadership styles of the college deans and the quality of work life of the faculty. And both variables were significant relationship with each other. Moreover, to attract and retain the faculty, it is essential for a university to have an effective leadership styles of their college deans in order to have a high impact quality of work life of the faculty.*

**Keywords:** Leadership Styles, Quality of Work Life (QWL), HR Practitioners, Faculty, College Deans

### Introduction

Successful leaders have a greater influence to motivate people to be more effective and improve performance with the use of different leadership styles to achieve performance in the workplace. Hence, identifying employees' potentials through their quality of work life can ensure that they will provide commitment and participation to the success of the organization. It also helps employees achieve their career goals and establish high performance and accomplish organizational objectives (Gaurav, 2012).

The periodic evaluation of the leadership styles of the college deans and the quality of work life of the faculty can implicitly provide the organizations information towards the welfare of the faculty. It can also reveal factors that broadly reflect lifetime satisfaction. Additionally, improved leadership styles and quality of work life will eventually lead to excellence and achieve organizational success.

### Methodology

The respondents of this study were the permanent faculty members of the State Universities and Colleges (SUCs) with a total of two hundred sixty (260) faculty members. But beforehand, the researcher conducted a dry-run with at least 10 respondents in other school in order to test the reliability of the

questionnaire and Cronbach Alpha resulted was seventy percent (70%) reliability.

### Results and Discussion

**Table 1: The Quality of Work Life of the Faculty**

1. Quality of Work Life of the Faculty	Weighted Mean	Interpretation
1. Work Environment	2.96	Moderate Extent
2. Organizational Culture and Climate	3.02	Moderate Extent
3. Relations and Cooperation	3.12	Moderate Extent
4. Training and Development	3.11	Moderate Extent
5. Compensation and Rewards	3.06	Moderate Extent
6. Facilities	2.64	Moderate Extent
7. Job Satisfaction and Job Security	3.20	Moderate Extent
8. Autonomy of Work	2.98	Moderate Extent
9. Adequacy of Resources	2.72	Moderate Extent
Factor Average	2.98	Moderate Extent

The table 1 presents the dimensions of quality of work life of the faculty, the job satisfaction and job security got the highest weighted mean of 3.20 with an adjectival rating of moderate extent. Contrary to facilities which got a lowest weighted mean of 2.64 with an adjectival rating of moderate extent. As to the quality of work life, the overall rating was moderate extent and have a factor average of 2.98, which means that the respondents were experienced most of the time.

**Table 2: The Leadership Styles of the College Deans**

Leadership Styles of College Deans	Weighted Mean	Interpretation
1. Pace-setting Style	3.04	Moderate Extent
2. Commanding Style	2.88	Moderate Extent
3. Visionary Style	3.12	Moderate Extent
4. Affiliative Style	3.01	Moderate Extent
5. Democratic Style	3.10	Moderate Extent
6. Coaching Style	3.12	Moderate Extent
Factor Average	3.04	Moderate Extent

The table 2 reveals the leadership styles of the college deans, the visionary leaderships style was tied to coaching leadership style which got a weighted mean of 3.12 with an adjectival rating of moderate extent. While the commanding leadership style got a lowest weighted mean of 2.88 with an adjectival rating of moderate extent.

As to the leadership styles of the college deans, the overall rating was moderate extent with adjectival rating of 3.04, which means that the respondents were experienced most of the time.

**Table 3: Significant Relationship between the Leadership Styles of College Deans and the Quality of Work Life of Faculty**

Source of Variance	Computed (r)	p-value	Decision	Conclusion
Quality of work life of faculty and leadership styles of college deans	7.998	0.003	Reject Ho	Significant Relationship

The table 3 shows there is a significant relationship between the quality of work life of faculty and the leadership styles of college deans in State Universities and Colleges (SUCs). Thus the null hypothesis (Ho) was rejected. It was implied that the different leadership styles affect the quality of work life of the faculty in the state university. Thus, the finding of this study was correlated with the study of Nanjundeswaraswamy and Swamy (2012), "The leadership styles can affect quality of work life in SMEs".

**Findings**

The findings of the study were correlated to the anchored theories and concepts that the leaderships styles of the college deans and the quality of work life of the faculty are essential factors to effectively improve the productivity, and performance of the faculty as well as the attainment of their personal and organizational goals and objectives. Therefore, there is a need for improvement on the facilities and the commanding leadership styles of the college deans to increase the level of satisfaction and motivation at the same time to continually attract and retain the faculty to work in the university.

**Conclusion**

Based on the findings of the study, majority of the respondents towards the quality of work life of the faculty and the leadership styles of

the college deans was rated as moderate extent and both variables were significant relationship with each other. Moreover, to attract and retain the faculty, it is essential for a university to

have an effective leadership styles of their college deans in order to have a high impact quality of life of the faculty.

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## THE IMPACT OF THE INFORMATION TECHNOLOGY SYSTEM ON ACCOUNTING PROFESSION – AN EXPLORATORY STUDY ON PROFESSIONAL ACCOUNTANTS OF SOUTH SUDAN

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### ABSTRACT

*This study examines the impact of information technology on accounting profession-an exploratory study on professional accountants of South Sudan.*

*The most significant impact is that the majority of accountants interviewed, as well as respondents, indicated that they use a computerized accounting system to record income and track expenses. Financial reports are simple to create.*

*Some accountants have expressed the need to upgrade their accounting skills but could not make it due to the lack of an accounting body in South Sudan, which may collaborate, easily with international accounting bodies to provide the required continuing professional development courses.*

*The major findings of this research revealed that the positive impact of information technology outweighs the negative impact and both institutions and customers benefit from it. Fraud and security of accounting data in any system type is a major problem associated with information technology as it is on the increase day by day.*

*There should be training centers whereby accountants should meet at least quarterly to discuss the ongoing impact of technology on South Sudan's positive stage in catching up with technology.*

**Keywords:** *automated, backup systems, continue professional development, and develop accounting software*

### Introduction

The Accounting information system is based on and can do more than computerized accounting. With comprehensive use of modern information technology as computers, internet and intranet, and communication technology, the accounting information system is open to other business resource system, has a high degree of integration and shared information, and makes deeper and more extensive use of accounting information resources, and real-time reporting can be achieved.

The theory and methods of traditional accounting are based on manual accounting. However, they are and will go on changing with the inference of information technology.

It is known that the accounting cycle includes the following steps: journalizing the transactions, posting to ledger accounts, preparing trial balance, making adjustments and preparing adjusted trial balance, preparing financial statements, and appropriate disclosure.

In the manual accounting era, accountants have to perform the whole accounting cycle manually. Voucher classification and

summary, control ledger and subsidiary ledger posting, and accounts checking are basic theories of manual accounting. While in the accounting information system, the only thing that accountants do is to record transactions into the computers which process the other steps automatically or by a request, without worrying about posting or adding mistakes.

The advancement of information on technology in the 21st century has come in both negative and positive ways. Some years back when operating a bank you need to have more tellers to pay and receive cash from clients but due to the improvement in information technology; things became easy.

In a country like South Sudan, which is termed, to be the world's newest independent state, which gained independence from Sudan on 9 July 2011.

Currently, there is no local body of accounting, however, there are few accounting firms in which one of them is Ernst and Young operating in the country since the country got independent.

The rapid growth of IT on accounting has created a challenge for the old accountant to copy up and be competitive to do financial

services as required by the current development.

When the positive side of the IT development is considered, it shows that business continuity in an efficient way with quality services. Long ago, an accountant could spend more time preparing a financial statement however currently in only one click to get the report ready when using accounting software.

Preparing ledgers is easier than some years back. The selection of transactions for a specific need is also easier because of the many software available in making work easy.

The negative part of this as mentioned early is that there is a need period in which the certification expires and to renew it as an accountant you should be obliged to meet certain criteria for recertification. Lack of doing CPE results in rejection of accountant recertification.

### Literature Review

The Impact of IT system on accounting profession has been motivated by the widely use of computers to make accounting work easier.

However there is a huge reduction of employees in the most advanced institutions while in some intuitions which are not advanced in IT has employed many who are well skilled to meet day to day operations by deploying the qualified human resources. Development of technology and digitalization allow updates and changes in accounting profession.

Development of modern computer systems leads to reducing the workload of accountants; repetitive actions that existed in environment of traditional methods are made easy and quickly.

Technological developments, globalization and increasing competition force professions to change constantly. The accountancy profession is at the forefront of professions that is and will be most affected by technological developments and globalization. It is evident that, with technological development, many digital systems that did not exist ten years ago are now actively used in the accountancy profession (Tekbas, 2018). According to results of the research conducted by Frey et al. (2017), 702 job titles are at risk of automation, and the

accounting profession in on the top of this list with high probability of being automated and digitalized in the near future.

According to Arntz et al. (2017), many accounting tasks already are automated in many companies (especially in large companies). Those tasks are invoicing, payroll and bookkeeping and they are automated because they consist of routine, repeated, stable and structured actions. Moudud-Ul-Huq (2014) highlighted that digitalization and automation is helpful for the auditors during the following processes: audit planning, analytical review procedures, materiality assessment, internal control evaluation, risk assessment and going-concern decisions.

As result of installation of systems, many accountants are affected every time when changes arises. It became a big worry for those who has no opportunity to upgrade their skills to meet the current requirements from employers.

However, the challenges is more in developing countries in which South Sudan is one of them. Currently in the country there are many accountants are finance officers who do not know how to use accounting software. The manual accounting is still here do it jobs as it used to be in many countries before switching to automated accounting systems, which are easier for decision-making processes.

The lack of IT facilities in some part of the country remain a major challenges in which there is no rooms for an accountant to be well equipped as per current requirement for a professional in 21st century.

According to SAGE Practice of Now 2020 Report, it has been written that some traditional accountants were laid off from their jobs due to lack of knowledge in current accounting needs which is drive by current IT development.

### Objective of the Study

Objective 1: to know the impact of information technology systems on accounting profession in South Sudan whose skills are competitive in the current world of a computerized accounting system.

Objective 2: to know how accountants in South Sudan are upgrading their skills in continuing professional development (CPD). CPD enables an individual to regularly apply attention to

important areas of development and takes appropriate action to reduce any shortfalls in knowledge.

**Graph Presentations**

**Chart- 1 Distribution of questionnaires to targeted respondents according to Gender**

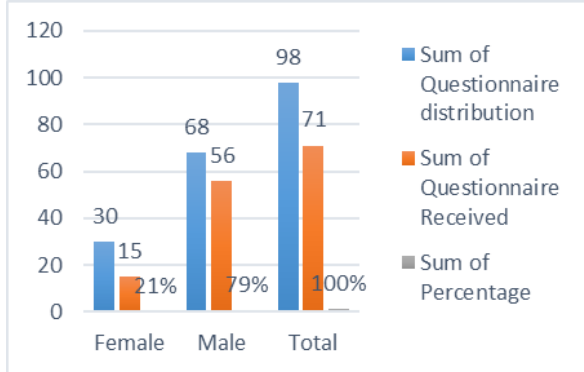
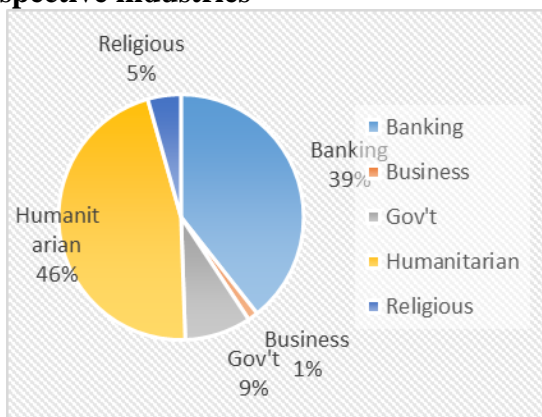


Chart -1 shows that gender wise distribution of respondents. Majority 56 (79% respondents are male and 15 (21%) are female. This table highlights that male respondents are more than female respondents.

In South Sudan the government and international development partners and agencies have come up with what they called “Girls Education in South Sudan (GESS)”. The purpose is to increase literacy rate of female in South Sudan and that is why they are underrepresented in many institutions.

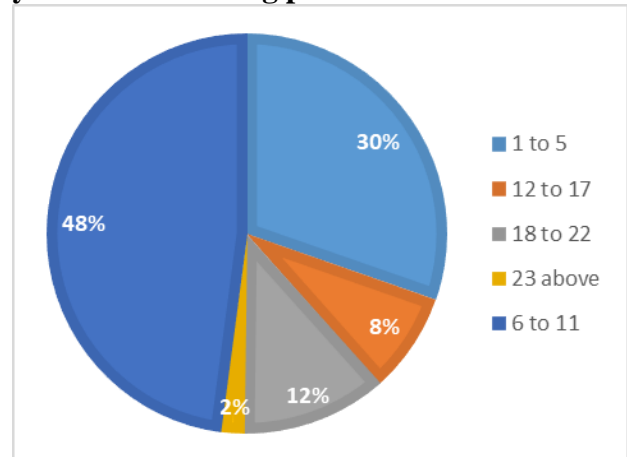
**Chart -2 Respondents according to their respective industries**



As you can see from chart 2 that majority of respondents are from humanitarian sectors. This shows that the country is hosting huge number of humanitarian agencies, which support the vulnerable people affected by the civil war, which broke out two years later after South Sudan gained independence from Sudan. The second sector highest is banking sector which of course developed due to present of

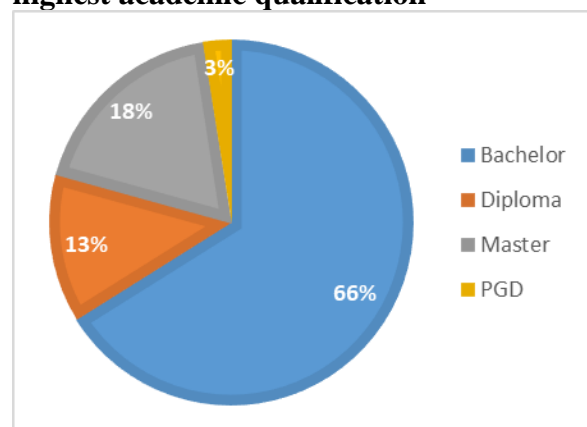
humanitarian agencies which requires technology for proper management of their funds from international donors for developed countries. Government and private businesses occupy the 4<sup>th</sup> and the 5<sup>th</sup> categories.

**Chart-3 the respondents according number years in accounting profession**



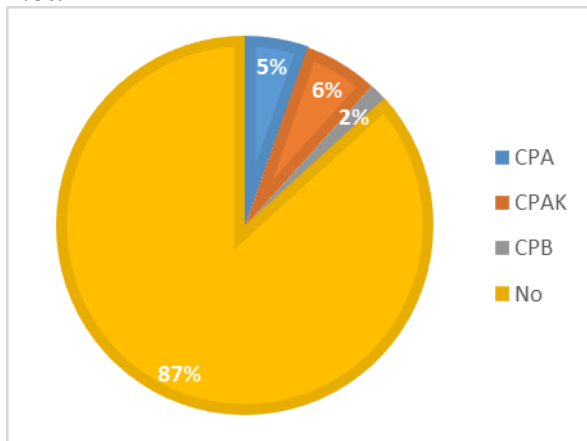
The 48% represents accountants who have experience between 6 to 11 years, while the second highest is between 1 to 5 years in profession. 12 to 17 years occupied the third group of experienced accountants. 18 to 22 is in fourth group while above 23 years is only 2% which indicated that they are almost retired given the current education in South Sudan.

**Chart-4 the respondents according to their highest academic qualification**



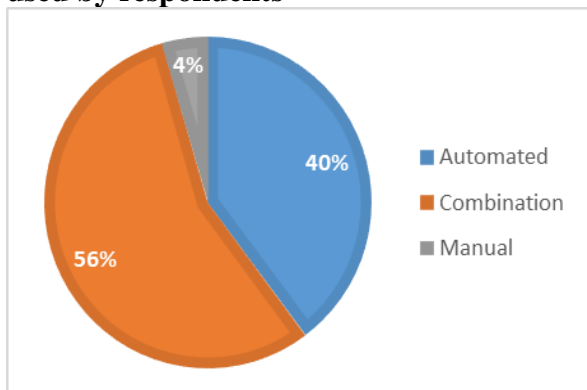
The majority of accountants of 66% confirmed to be bachelor holders and while the second group representing 18% are master degree holders. The fourth group which 13% holds diploma (associate degree) in South Sudan academic policy. The fifth group of accountants representing 3% confirmed to be holding postgraduate diploma (PGD).

**Chart-5 the respondents distribution whether they are Certified Accountants or Not.**



The majority of accountants are not certified accountants which is 87% while 6% and 5% indicated that they are certified public accountants from other countries as well as in Kenya which is indicated as CPAK. The group indicated to be Certified Professional Banker (s) CPB.

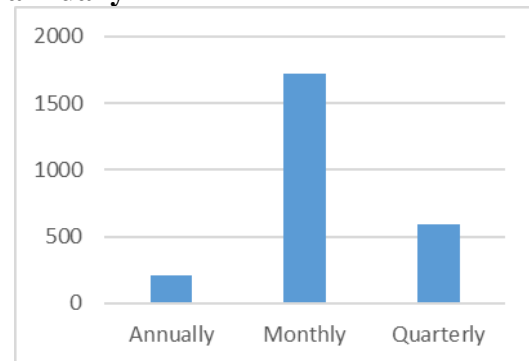
**Chart-6 According to accounting system used by respondents**



The highest score is from those accountants responded that they used combination of both automated and manual. Meaning the computerized accounting in used has some shortcoming that requires being entered manually.

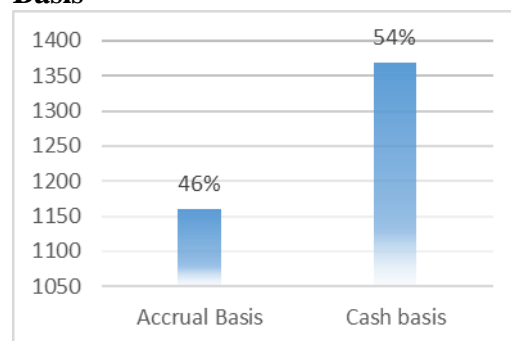
The second group confirmed automated accounting system and the banking sector is one of those. Manual accounting is used by the government and business sectors reason being government institutions are busy trying to address the people basic needs for make living simple while business sectors are trying to develop.

**Chart-7 the respondents whether they prepare financial report monthly, quarterly or annually**



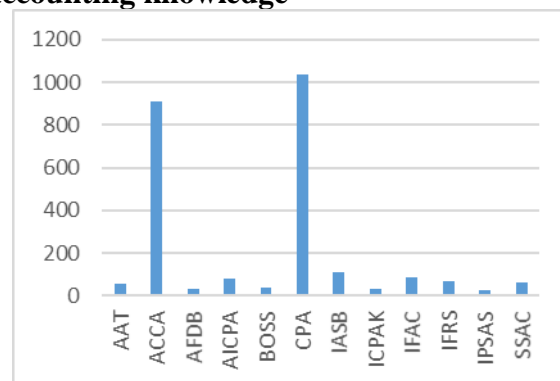
Most of accountants interviewed or who filled up the questionnaire confirmed that they financial reports monthly while second group confirmed quarterly financial reports. The third one are mostly senior financial staff who report annually to donors and board of directors.

**Chart-8 the respondents according to accounting type they use, Cash or Accrual Basis**



The 54% indicated that they used cash basis while 46% indicated accrual basis.

**Chart-9 Respondents according to their preferred institution to upgrade their accounting knowledge**



The highest number indicated that they preferred upgrading their accounting skills

from any Certified Public Accountant (CPA) Institutions while the second highest confirmed the Association of Chartered Certified Accountants (ACCA). Other respondents confirmed their preferred institutions as indicated in the chart.

### **Conclusion and Recommendations**

#### **Recommendation**

This paper is going to investigate the further details by ensuring that the need of growth in information technology is forwarded to higher level to address it.

The establishment of accounting body in South Sudan is highly recommended so that it would ease helping accountant get fully certified and upgrade their skills on time.

#### **Conclusion**

This paper is not yet concluded since it is an ongoing PhD research that would continue for the award of a doctor of philosophy in Accounting from Lincoln University College. The researcher is going to continue to update the information in his next publication.

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## WOMEN IN THE INFORMATION TECHNOLOGY WORLD: STORIES FROM THE FIELD

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### ABSTRACT

*In the field of work, challenges and issues are inevitable. Yet, readiness, flexibility, openness, and family supports are vital for survival. This study explored and described the lived experiences of women in the information technology world. It utilizes a qualitative research design. The study participants are the five (5) women working in the information and technology department. They were selected using snowball sampling, and the data saturation method was used to determine the number of participants. After collated data, transcribed it, thematic analysis and coding were used to analyze the data gathered. Nine (9) themes emerged in the study: Family is Inspiration, gender preference on co-workers. Promotion is based on the Job Performance, not by Gender, Gender equality in the workplace, Crab Mentality of other Women, Physical and Mental Strength/Readiness in the Workplace, Work and Home Responsibility, Goal-oriented Person, Contentment, Dedication, and Commitment. Thus, to sustain these challenges, a woman must be physically, mentally, spiritually, and emotionally ready before working in the industry. Moreover, family's support, intrinsic characteristics, goal-oriented, and contentment are essentials factors for a woman to sustain in a male-dominated industry. The study recommends that the government conduct and sponsor skill training and socio-psychological training for women to help prepare themselves to face reality in work.*

**Keywords:** Information Technology, Women, IT World

### Introduction

A woman can have many titles such as a daughter, a wife, a mother, and, possibly, a leader. However, there is a certain expectation for women to prioritize family over career. If a woman puts family first, she is perceived to lack professionalism, while if she prioritizes work, she is not fulfilling her role for her family. Yet, globalization has changed this notion as it has provided opportunities for women in the workplace. It recognizes that diversity in the workplace is an essential and integral part of empowerment. Thus, organizational leaders must strategically accommodate these changes (Taneja et al., 2021). As a result, it increases the number of women in the workplace.

Moreover, Women who labor in a male-dominated occupation face many challenges that vary from those who work in more gender-balanced and female-dominated fields. These challenges affect their withholding and success

in their career (Martin and Barnard, 2013). Likewise, Hartmann (2010) discussed that the challenges women face in struggling to infiltrate successfully and persist in historically male-dominated work environments originate from traditional gender pyramids and norms that succeed in the family and society. Despite gender equality and empowerment, the household has a conventional structure, making males the dominant gender.

Furthermore, women experience a relatively different work environment than men (Bobbitt-Zeher, 2011; Prescott & Bogg, 2011). Generally, a yearning for position, power, and societal comparisons is the driving force for men. On the other hand, a longing to do a good job and contribute to the function of an organization inspires women (Davey, 2008; Prescott & Bogg, 2011). Women's unique work experiences, coupled with outdated work-life role structures based on gender (Hartmann, 2010), pose unique challenges to career-

oriented women in general and, more explicitly, to women who choose a traditionally male-dominated career. Similarly, Chovwen's (2007) revealed that women stated that work and family conflict, amongst other things, was a significant burden when it comes to career progress in a male-dominated work environment. Cha (2013) further emphasizes that women's increased of work responsibilities did not change the bulk of their household responsibilities, unlike their male counterparts. Around the world, women have been prone to all forms of discrimination for decades. Besides, they have limited access to the workplace, only to positions linked to the lower occupational level of functions (Sinden, 2017).

According to Bailey (2020), in the Information Technology Industry, only twenty-six percent (26%) of computing jobs are seized by women, and the number has been on a steady decline in years. He added that from 1980 to 2010, eighty-eight percent (88%) of all information technology patents were by male-only invention teams, while two percent (2%) were by female-only inventions teams. There is an issue in the tech industry that we have known about for quite some time. Recent research indicates tech's misogynist culture stubbornly persists (Goldberg, 2019). In most industries, gender inequality is always a challenge like Information Technology, designed for men, though the trend is changing now (Trachim and Chmielewska, 2020).

Furthermore, the vital factor that encourages the women workforce to participate in the information technology sector is embracing a white-collar job with a reasonably high salary. Besides, it is easy international mobility, gender-neutral policy based on knowledge-centric skills ownership, flexible work routine and less physically challenging work course in a comfortable indoor work- environment (Shanker 2008). In like manner, Kelkar et al. (2002) observed that women working in this sector become informally transportable to live in other cities away from their male relatives and families for the sake of their works. They no longer pressure themselves to choose jobs which are close to their home town alone. Kelkar and Nathan (2002) observe that the impact of women's entrance into the

information technology sector has increased their household income, expanding their bargaining power within their homes. Besides, a more extensive work participation rate among the women advances their social mobility. In the IT sector, Individualization capacities are improved as the female employees need to make decisions very often on their own and that too instantaneously, thus, offering greater scope for boosting up their organization. Thus, in turn, it helped in redefining the traditional gender standards. Clark and Sekher (2007) have drawn the implication that the labor market is flexible in this high-tech sector which advances women employees' financial independence, greater flexibility, and larger social acceptance in a male-dominated society. These views and opinions that the researchers took the challenge to explore the lived experiences of women in the IT world. The researchers believed that this would significantly contribute to the body of knowledge because the number of women in information technology is increases. Most probably, they have encountered issues and challenges in the workplace that need to address.

### Statement of the Problem

This study aimed to explore the lived experiences of the women working in the technology professions who are empowered to work in the technology which has a passion for it. Specifically, it sought to answer the following queries;

1. What are the lived experiences of women working in the technology profession?
2. How did they describe their experiences in the workplace?
3. How did they cope with the challenges and issues in the IT profession?

### Methods and Materials

This study is mainly a qualitative phenomenological research design based on in-depth interviews of information technology workers in private companies in Cebu, Philippines. The primary purpose of this study was to explore the lived experiences of women IT workers and describe their opportunities and challenges.

The researchers were able to interview through meet-up and via google meet. Moreover, two of the participants were interviewed in a dine-in setting. In contrast, the three participants were given research questions through google mail and google meet. Furthermore, the researchers found out that the participants in this study represented occupations that have been confirmed as male-dominated industry such as a cement factory in Cebu, Philippines. This cement company runs diverse businesses, including cement, mineral resources, environmental, construction materials, real estate, engineering, data processing, finance, transportation and warehousing, chemical products, and sports businesses, and is actively developing new businesses. The other company offered services like animation, designing with illustrator, 3-D modeling, website and app development, and digital marketing. (2 of the participants are working there).

### **Research Participants**

The informants of the study are the five (5) IT workers in private companies. They are purposively selected based on the following inclusion criteria: 1.) Female; (2.) A Female who is currently working in the IT industry, (3) Work in the IT industry for at least one year, (4.) Willing to share their experiences as IT workers.

The target sample size of five was determined using data saturation, which is the point at which participants start repeating the same or similar responses to interview questions. However, data saturation was initially estimated to be reached at 10 participants, but it was actually reached after the fifth participant. Meanwhile, the participants were recruited via private chat messaging—personal messenger, google mail, and google meet.

### **Research Instrument**

The research instrument is the researcher using open-ended questions. Its purpose is for the participants to convey their experiences without hesitations and limitations. The researchers make sure that the questions do not affront the participants. During the interviews, it used an audio recording for the data analysis.

### **Data Gathering Procedures**

Snowball sampling was used in data gathering. We sought potential participants through our personal accounts of messenger and agreed with them. To effectively collect the data, every participant was scheduled for a particular date and time slot to complete their interview. Each participant was emailed a copy of the consent form with the research questions to review and sign. They guaranteed their anonymity and allowed for the content of their interviews to be used for academic purposes. At this point, the researchers recorded the interviews digitally and it all lasted, on average, around 15-20 minutes. Moreover, the research questions were structured to evoke the mechanisms present in the construction of meaning for the participants. It allows them to feel totally at ease to talk about their personal experiences without any degree of interference from the researchers. Once the interviews were completed, the verbatim extracts from the data ground the data findings. To ensure anonymity, the researchers have allocated numbers to the research participants (Participant 1, Participant 2, Participant 3, Participant 4, Participant 5).

### **Data Analysis**

Data were gathered through observation, in-depth individual interviews, and focus group discussion. Interview transcripts were analyzed using a phenomenological methodology. The researchers analyzed the data through the following steps: detailed reading and interpreting of transcripts to identify initial themes or codes; defining and redefining of codes; modifying of codes through comparing and contrasting and formulating themes as the expression of the latent content of the text.

### **Ethical Consideration**

To preserve and guard the ethical principle in conducting research, the researchers called for an individual online meeting with each of the five participants. Converse with them the justification of the research study. Revealed to them all information concerning the research study. This includes giving participants research information, such as the content and foundation of conducting the study, the motives for selecting participants, and the

possible benefits and problems of participating in the study. Moreover, participants were informed that withdrawal from the participation of the study at any time is possible. It informs them that participation is voluntary. During the interviews, the participants had the right not to reply to any of the questions. They are Guaranteed that their identities are protected throughout the study by using fictitious/pseudo names, and any information they reveal are treated with high respect and confidentially. Moreover, participants are given a guarantee that if they want to know about the study's results or finding, they will be provided to them. The participants are also given ample time to consider or decide whether to take part/not in the study, and lastly, let the participants signed and have a copy of a consent document.

## Results

### Theme 1. Family is Inspiration

The first theme that emerged from the findings of this study was family is an inspiration. It informs us that family plays an essential factor the woman as they are the source of strength in the workplace.

One participant verbalized that her family is always behind her and ready to help when she is down.

*"My family, of course, every time I'm down, naa rajud sila permi."* -participant 5

Additionally, another participant stated that she is inspired to work harder because of her family and to provide their basic needs.

*"Ang family, ang inspiration to work harder para mag provide ug needs."* -participant 3

### Theme 2. Gender Preference on Co-workers

The second theme that emerged from the findings of this study was gender preference. It describes the importance of having the same gender as a colleague in the industry. The participants have empathized that they prefer to work with women rather than men.

One participant said that she likes women co-workers because they are focused more on the job than men and added that sometimes men are absent-minded.

*"Women, kay mo focus jud sa work kay ang uban laki lutaw jud usahay ug utok so mas prefer ko nga babae"* -participant 2

Another participant agreed to this statement and said she likes women because they are more attentive and compassionate than men.

*"Women because they are more attentive and compassionate."* -participant 1

### Theme 3. Promotion is based on the Job Performance not by Gender

The third theme that emerged from the findings of this study was Promotion. It tells us that promotion in the industry now is based on performance, not by gender. The participants have stated that it is not hard for getting promoted even if you are a woman.

One of the participants uttered that *"Promotion is merit-based, based on your performance."* Additionally, she added *"Promotion is most likely based on the evaluation of your superior."* -participant 3

Another participant agreed to that, and she said *"Promotions are solely based on job performance."* and added *"Gender is not an issue."* -participant 4

### Theme 4. Gender equality in the workplace

The fourth theme that emerged from the findings of this study was men and women are equal in the workplace. It informs that both men and women are treated equally by the management.

One participant described her experience as *"It's just like normal working environment for me, it has no significant difference at all, it's just plain working environment."* Moreover, she stated that *"I don't see male as a barrier in the workplace and I don't see as dominant."* -participant 3

Another participant shared her experience with men in the workplace and stated that

*"For me, being exposed to this kind of environment is a challenge for all females—to be more open-minded because it can't be desired that there is a real difference between men and women."* Furthermore, she added that *"Men and women are given equal opportunities to excel, and promotion are based on employees' competency and work performance."* participant 4

### Theme 5. Crab Mentality of other Women

The fifth theme that emerged from the findings of this study was the crab mentality of other

women. It suggests that the Filipino crab mentality always strikes in the workplace regardless of gender and job. Some women who help other women to advance at work, and some are seemingly at odds. There is aggression like gossiping and social exclusion. In conclusion, it is widely believed that women are meaner to one another.

One participant shared her views about the women in her workplace act so oddly that instead of helping you get to the top; they will probably drag you down if they feel you are a threat to them.

*“Kay lahi man gud ang babae didto sa akung work kay imbes nga ipa taas ka nila, naay uban mostly mga babae, kung feel nila nga threat ka nila is i-down jud ka nila maayo.”* participant 2

In addition, another participant stressed out about her experience and stated that it is natural for some women to antagonize each other in her line of work, likewise, some women are too competitive. She added that it is never necessary to step into someone for you to arise.

*“Natural rajud sa amung work ang mag traydoray, nasobraan ka competitive, and akung ma advice lang jud kay we are all workers man japon- diman kitay tag-iy sa company ug unsay ma render nimu i-render, na not necessarily na tumban nimu ang isa para mo saka ka.”* -participant 5

### **Theme 6. Physical and Mental Strength/Readiness in the Workplace**

The sixth theme that emerged from the findings of this study was physical and mental health issues. It informs us of the importance of being physical and mentally healthy in a male-dominated jobs. It also reminds how strenuous the work of a woman in a male-dominated job. Thus, adequate physical and mental strength are essential to meet the demands of the industry.

One participant said that she will do regular exercise, eat healthy foods, and then cycling is her stress-free diversion to maintain good health.

*“As of now, nag maintain kos akung health; mag exercise, mo kaon ug mga healthy foods then mag bike kay mao nana akung stress free.”* -participant 2

In contrast, another participant shared her experience and quoted that sometimes, her work can be exhausting can possibly cause mental anxiety. She recommended having a break, asking for help if needed and finding diversion, like, taking a short trip, listening to music, and watching movies. Furthermore, she added that, she would never overdo or overwork during working hours and take short breaks if necessary.

*“Sometimes, work can be exhausting and can cause mental anxiety, but I would recommend taking a break, seek help if you need to or find some diversion, such as taking a short walk, listening to music, or take a trip. However, during working time be productive but overdo/overwork yourself— taking short breaks are necessary.”* - participant 4

### **Theme 7. Work and Home Responsibility**

The seventh theme that emerged from the findings of this study was work and home responsibility. This theme reminds us that women still have role to perform after work once they arrive at home. It emerged that the source participants' challenge is their different roles because they regularly needed to balance work pressures and home responsibilities.

One participant shared her opinion and stated that she had full time with her family if off work, and help out household chores. Thus, if during working hours she will give full-blown time.

*“I always have time with my family off work and helped out sa mga chores and if during working- focus rasad sa work.”* - participant 3

Moreover, another participant shared the same experience and stated that she makes time more in her personal life if work is work and after work, she makes time more in her personal life.

*“For that, actually kung work, work lang jud after work wala na, ako nanang personal life.”* - participant 5

### **Theme 8. Goal-oriented Person**

The eighth theme that emerged from the findings of this study was the strong characteristics of women. It informs us how a goal-oriented, driven woman to sustain the demands of a male-dominated job. The participants used this to cope, adjust and

remain motivated in their male-dominated occupations.

One participant had said that she is goal-driven, resilient, adoptable, flexible to all changes in her working environment, and responsible to all tasks assigned to her.

*"I have many characteristics, first is goal-driven, resilient, adoptable, flexible sa changes and the environment, and responsible do all the task assigned to me."* - participant 3

Furthermore, another participant shared the same characteristics and said that she has leadership skills, is goal-oriented, hardworking, and has perseverance.

*"Goal-oriented, I also have leadership skills, hardworking, and perseverance."* - participant 5

### **Theme 9. Contentment, Dedication, and Commitment**

The ninth theme that emerged from the findings of this study was contentment, dedication, and commitment. It describes how contentment gives satisfaction and enjoyment to a woman in the information and technology world. The participants shared that they are satisfied in their job. Thus, they are willing to give their commitment and dedication to job opportunities given to them.

One of the participants expressed her interest and stated that she would do her best to excel in all activities and opportunities.

*"I can do it by performing well like excelling in the activities or any chances or opportunities to show my expertise, I will do my best."* - participant 3

Furthermore, another participant shared the same idea and stated that by working harder and showing initiative will make her a leader.

*"By working harder and showing initiative rather than slack around."* -participant 1

One respondent said that some women are no longer looking for something else in their position. She added that some women seem content in their current position and would not thrive for promotion.

*"So far naa juy uban like na lost wala na silay direction like contented na sila sa ilang position, wala na sila ni thrive for promotion"* -participant 3

Furthermore, another participant had said that most of her women colleagues are not

dreaming of getting promoted and fully contented on the job they have.

*"Most of the women diha jud are, wala na sila or dili na sila mangandoy na mo saka pa, contented na sila"* -participant 5

### **Discussion**

The first theme that emerged was family is an inspiration. It reminds us that family is considered to be the foundation of social life for most Filipinos because it is our source of strength and motivation. Family's motivation is a potent form of pro-social motivation, as employees are more likely to be concerned about the well-being of their own families than that of any other group of people (Burnstein, Grandal, and Kitayama, 1994). Additionally, Menges (2017) has found that family motivation of employees is influential in increasing their individual work performance. It partially supports Gallimore (2019), which indicates that it is not uncommon for Filipinos to live with their parents' past age of 18 and well into their working years, contributing to the family fund with their salary. Consequently, some even assume the role of breadwinner in the family or work solely to put their younger siblings through school. This finding suggests that family is a motivation that enhances job performance when intrinsic motivation is low. Moreover, it is the belief that supporting a family provides a powerful source of motivation that can boost performance in the workplace, offer meaningful implications, and work dynamics. Family gives us strength and energy even if we did not find the job more enjoyable and compensation is not enough.

On the other hand, the second theme was about promotion is based on the job performance, not by gender. This theme was refreshing to hear because slowly the gender inequality as basis for promotion in a male dominated industry is now started to decline. It supports the call of the Philippine Commission on Women for gender balance in leadership and decision making; inclusions of women's concerns in platforms, and capacitating and preparing women to reach their ambitions. The finding reminds and encourages every woman to perform well and be productive in her chosen field, even in the male-dominated area.

Because most companies now are promoting their employees based on performance.

On the other hand, the gender equality treatment in the workplace suggests that biases and unfair treatment of a woman in a male-dominated job are now started to disappear. None of the participants in this study intended to leave their male-dominated occupations. It is meant that they are comfortable working with men. The experiences shared by the participants illustrate the pleasure and engagement they derived from their jobs. Research participant 4, for example, quoted *“For me, being exposed to this kind of environment is a challenge for all female—to be more open minded because it can’t be desired that there is really difference between men and women.”* In order to be successful in male-dominated environment, women have to experience in ways that are unnatural to them (Chowwen, 2007). Furthermore, all research participants stated that they were confident in their abilities to work in a male dominated workplace. Thus, the finding informs us women must continuously prove that they are worthy and capable to work in male-dominated industry. It supports the goal of the Department of Labor and Employment to always been upholding the rights of women in its enforcement activities, they strengthened the implementation of labor standards that affords full protection for the country’s women workers, Thus, for woman to able to take part in workplace dominated by male she has to be engaged, mindful, and have a strong belief in her abilities.

In like manner, the leadership skills of women inform us that there are skills that every woman should possess to effectively communicate with others. Grant & Taylor (2014) said that stating strong, staying concise, dimensional content, owning voice, controlling movement, and project warmth are necessary skills. Having a strong self-efficacy will exude confidence that people like to see in their leaders. Additionally, each of the participants stated that they were luck and happy to work in such a great field. It suggests that a woman with a high sense of self-efficacy in her abilities and beliefs can make her successful in a male dominated occupation. In-contrast, adjusting behaviors to align more with

masculine traits is a common coping tactic. When women display a combination of male attributes and self-monitoring, they are presented with increased opportunities for promotions and recognitions. It reveals that intrinsic characteristics of women play an essential role in a male dominated industry.

While the gender preference of a woman on co-workers informs us, that women are not going to be attracted to a particular job or field if there are no other women doing the type of work. This finding supports Home-Walsh and Turnball (2016), stated that the lack of women makes it more difficult for other women to work. It suggests that women are much happier and comfortable when they work with other women, as opposed to men. Also, study after study shows women who support women are more successful in business or any other aspect of life.

On the hand, the work and home responsibility informed that women still emphasized their prominent role in the household tasks, their work commitments and vice versa. Even without children they also felt overwhelmed by the culturally prescribed duties they have to carry out at home, thus domestic responsibilities inhibited the pace of their career progression. It suggests that despite women’s increasing role in the work force, their traditional family responsibilities persist. However, the study conducted by Davis (2001), described that the conflict between work pressures and family responsibilities are felt by both men and women. Family responsibilities force women to work part time or intermittently, and also cause work absence. The finding suggests that combining job and family responsibilities can be difficult, and the most popular presumption is that women’s health is bound to suffer from increasing employment.

The physical and mental health readiness in the workplace. It reminds that the demanding nature of labor intensives work- along with working perpetually gender hostile environment triggers, physical and mental stress. Insstrand et al. (2011), found that women, in general, reported more emotional fatigue and physical exhaustions than men. The truth is women face challenges in the workplace all the time and some of these

challenges are uniquely faced by women. In addition to this, Cha (2013) emphasized that increased work responsibilities and keeping the bulk of responsibilities in the house makes them prone to role overload. Women continue to shoulder the main responsibilities for household task and childcare. It is often suggested that women's multiple responsibilities and attendant conflict will have negative consequences for their health. It informs us that time pressure and deadlines related to job tasks have been associated with mental strain, exhaustion, and depression. It indicates that most of the working women will definitely suffer from health-related problems such as physical and mental stress, general weakness, excessive work load because of work pressure, family pressure etc. are all real issues. Thus, physical and mental strength are essential factors for women to sustain the demanding nature of work.

While crab mentality of other women. It reminds women that whether they will admit or not, all women are competitive with other women, to some extent thus, crab mentality occurs in order to get the desired ambition. According to Stacey (2015), crab mentality concept refers to a common occurrence in buckets full of crabs: if one crab attempts to escape from a bucket of live crabs, the other crabs will pull it back down, rather than allowing it to get free. Abrugar (2014) said that crab mentality is not extraordinary characteristics for us because it is one of the common bad habits of many people we know well. This finding reminds everyone that crab mentality is always around in the workplace regardless it is a male or female dominated industry. It is invisible and insurmountable obstacles existing between women, even in men, and top management, which prevent their process regardless of their success and competency (Mizrachi and Arachi, 2010). The crab mentality enables us to understand its impacts on the minority group within the

working place (Miller, 2016). The crab mentality and its effects are socially undesired phenomena because it causes negative results in the organization and employees' motivation. However, Lukas (2021), suggests that to get accustomed to crab mentality is to continue to develop your personal skills. Thus, in order to fight and overcome this mentality, every woman must hone her skills to survive. Lastly, contentment in works will always be resulted to dedication and commitment to the job. This is a welcome benefit for many men and women, but there is also a risk. Moore (1985) mentioned that job satisfaction is predicted almost exclusively by their perceptions of fewer income problems, flexibility of hours, and use of job skills. De Pater, Van Vianen, and Bechtoldt, (2010) described women are more likely to volunteer for "non-promotable" tasks than men, meaning they spend more time and energy getting selfless things done rather than focusing on getting new positions. Thus, it offers an additional source of satisfaction and happiness in life and eventually work-related challenges would be easier to manage.

### Conclusion

Issues and challenges such as discrimination, physical and mental readiness, crab mentality, and gender preference are always around in the workplace. Especially for a woman because these things are inevitable for a woman in a male-dominated jobs. Thus, to sustain these challenges a woman must be physically, mentally, spiritually, and emotionally ready before working in an industry. Yet, family's support, intrinsic characteristics, goal-oriented and contentment are essential factors of a woman to sustain in a male-dominated industry. The study recommends that the government will conduct and sponsor a skill training and socio-psychological training for women to help prepare themselves in facing the reality in the field or work.

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## AN EFFICIENT FUZZY CLUSTERING ALGORITHM FOR MINING USER SESSION CLUSTERS FROM WEB ACCESS LOG DATA

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### ABSTRACT

Data mining is extremely vital to get important information from the web. Additionally, web usage mining (WUM) is essential for companies. WUM permits organizations to create rich information related to the eventual fate of their commercial capacity. The utilization of data that is assembled by Web Usage Mining gives the organizations the capacity to deliver results more compelling to their organizations and expanding of sales. Web mining similarly enables Web based associations to give the best access courses to administrations or different promotions. In this manner analysing user's conduct is an imperative piece of website page design. With Web Usage Mining (WUM) techniques, client access patterns can be mined from web access log information. WUM is that the method of mining user browsing and access patterns. An immense amount of unessential information is present in input web access logs. By analyzing user access patterns user's preferences and inclinations can be understood. A large number of end user sessions and URL resources makes the dimension of web user session data very high. Human communications and non-deterministic browsing patterns increment equivocalness and dubiousness of client session information. The fuzzy set based approach can solve most of the challenges listed above. This paper proposes an efficient Fuzzy Clustering algorithm for mining client session clusters from web access log information to find the groups of client profiles. In addition the methodologies to preprocess the net log data as well as data cleanup client identification and session identification are going to be mentioned. This incorporates the strategy to do include choice (or dimensionality decrease) and meeting weight task assignments.

**Keywords:** Data Mining, Web usage mining (WUM), Data preprocessing, Fuzzy clustering

### Introduction

Data mining, the extraction of hid judicious information from immense informational collections, is a staggering new development with phenomenal potential to help associations revolve around the fundamental information in their data stockrooms. Information mining instruments anticipate future examples and works on, allowing associations to make proactive, data driven decisions. Utilizing a blend of AI, measurable investigation, demonstrating methods and data set innovation, information mining discovers designs and unobtrusive connections in information and construes decides that permit the forecast of future outcomes. Data mining (information disclosure from information) is the extraction of fascinating for example non-

immaterial, verifiable, ahead of time dark and conceivably important examples or information from huge proportion of information. Change locally it very well may be alluded to as information revelation (mining) in data sets (KDD), information extraction, information/design investigation, information archaic exploration, information digging, in-development collecting, business insight, and so forth .[1, 2, 3].

Web mining can be broadly portrayed as the disclosure and examination of valuable data from the World Wide Web. Web mining has two sections:

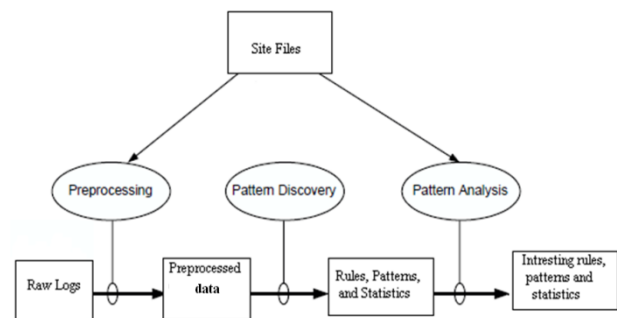
1. Web content mining
2. Web utilization mining.

Web usage mining is the programmed revelation of user access patterns from Web servers. Every organization has a substantial

measure of data gathered on day-by-day operational premise. These data are produced by web servers and it is put away in server access logs. Examining server access log data helps the organization to focus life time estimation of customers, showcasing strategies for products, effective promotional campaigns etc. It also helps in rebuilding web sites to represent the organization and promote their products and services in a better way in WWW. Web use mining is by and large isolated into two parts. First part is space subordinate; it changes web information into an appropriate exchange structure. This consolidates preprocessing, exchange ID and information incorporation. The subsequent part is space self-sufficient applications like general information mining and example coordinating with methods like clustering [3].

WUM contains three key advances: preprocessing, information extraction and results examination. The goal of the preprocessing stage in Web use mining is to change the unrefined web log data into a lot of customer profiles. Each such profile gets a plan or a lot of URLs tending to a customer session. The preprocessing stage in Web use mining changes the harsh snap stream data into a get-together of customer profiles. Each such form has an arrangement or a bunch of URLs that addresses a client session. Preprocessing uses different algorithms and heuristic systems for different preprocessing errands, for example, data fusion and cleaning, user and session identification etc. Data fusion refers to the converging of log files from several web servers. Data cleaning incorporates assignments, for example, eliminating unnecessary references to inserted objects, style documents, illustrations, or sound records, and disposing of references because of bug routes. By doing away with undesirable substance like this we can lessen the size of the input file and make the mining errand efficient. So, during preprocessing we will clean the data, identify the user by using IP address and identify user session by using time oriented heuristics. We can assign weight to URLs based on the number of times they are accessed in different sessions also weight can be assigned to a session according to the number of URLs present in it [2, 8, 10]. When user

sessions are found we can utilize them for clustering. Little sessions will be removed because it shows disturbances in the data. Rather than straightforwardly removing it, we can utilize a fuzzy set\_theoretic way to deal with it. Since direct eliminating of minimal estimated sessions may achieve loss of a gigantic proportion of data. So we can relegate weight to all sessions in light of the number of URLs got to by the session.



**Figure 1.1. Structure of web usage mining**

After this we can apply the fuzzy clustering algorithm to recognize user session clusters. Fuzzy clustering promotes fuzzy membership. Here one informational index can have an enrollment to more than one group. It suggests that one informational collection can find a place with a few bunches all the while. Every informational index will have a degree of enrollment to each group; participation to some bunch will be high while enrollment to some other bunch will be low. The participation worth will be between zeros to one. The total assessment of participation of one meeting to each bunch habitats will be one. Data fuzzy clustering ought to oversee basically fit reality. For instance if an informational index is on the limit between at least two bunches fluffy grouping will give it halfway participation among bunches [9, 14]. In fuzzy clustering each datum point is relegated a participation worth to every one of the clusters. If the membership value is zero the data is not a piece of that cluster. Non zero value shows that the data is attached to that cluster. Membership value will be always between zero and one. Here we can discover similar user access patterns i.e. same URL patterns by applying the Fuzzy clustering algorithm. The output of this step will be separate user session clusters [2, 8, 10].

Area 2 gives the Literature Review, Section 3 gives the proposed algorithm, Section 4

expounds the test results and the end and future improvement of this paper are made in Section 5.

### Literature Survey

Digitized information is easy to capture and storing it is very cheap. So gigantic measure of data has been put away in distinctive sorts of databases and other types of storages. The data storage frequency is developing at an exceptional rate. This developing data is amassed in various huge data storages. This sort of circumstance requires intense apparatuses to grasp knowledge from this ocean of information. With the exceptionally high development of data sources open on the World Wide Web, it has wound up continuously indispensable for clients to use customized instruments in finding the needed information resources, and to follow and dissect their utilization designs. So, there is a necessity to create server-side and client-side tools that mine knowledge adequately-Cooley et al.[3]. Web usage mining is the revelation of client access designs from web servers. How clients are getting to a webpage is critical to build the use of the site by clients. It has three steps.Preprocessing, pattern extraction and result analysis. In the preprocessing stage, different types of noises are removed. The user and session identification process will be completed in this stage. A wide variety of pattern extraction techniques are available like clustering, path analysis etc based on the needs of the analyst. Once web usage patterns are discovered there are different types of techniques and tools to analyze and understand them. A gigantic amount of unessential data is available in input web access logs. The large number of user sessions and URL resources makes the dimension of web user session data very high. Human interactions and nondeterministic browsing patterns increase ambiguity and vagueness of user session data. The World Wide Web is a vast, dynamic information source, and is structurally mind boggling and consistently developing. Hence it is a fruitful arena for Data mining or Web mining. Web mining can be used to get significant information from the web through the utilization of various information mining strategies. Web information is generally

unlabelled, scattered, heterogeneous, semi-coordinated, time moving and multi-dimensional. Web data can be of the following types.

- (1) Substance of real Web pages
- (2) Intra-page constructions of the website pages.
- (3) Inter page structures deciding linkage structures between website pages.
- (4) Web use information depicting
- (5) User profiles incorporate demographic and enrolment data about users.

Web Usage Mining (WUM) takes a gander at the aftereffects of customer relationship with a web worker, including web logs, click streams, and informational index trades at a website or a social event of related areas. WUM performs three guideline steps: preprocessing, design extraction and results examination [2, 8, 10].Giovanna et al.[5, 6] uses a LODAP (Log Data Preprocessor)tool to do preprocessing of web log data. To investigate Web log information, we use LODAP, a product device that cycles web access information to eliminate immaterial log passages, recognize gets to made by clients and gathering client gets to into client meetings. Every client meeting contains access data (number of gets to, season of visit, and so forth) about the pages visited by a client, henceforth it portrays the navigational conduct of that client. User Identification refers to recognizing unique users from web log data. Generally, the log document in Extended Common Log design gives simply the PC's IP address and the client specialist. Web sites that require user registration will contain additional user login information which can be used for user identification. In case if the user login information is not available we will consider each IP address as a user. After this we have to recognize user sessions. Here we will partition web log data file into diverse parts known as user sessions. Every session is considered as a single visit to a web site. Identification of client meetings from the web log record is a convoluted errand. This information can be used as the contribution for an assortment of information mining calculations [2, 8, 10].Here we are using the Fuzzy c-Means clustering algorithm for clustering user sessions. Here we need to randomly select initial cluster centers. The similarity measure is done based on the

page visit time using fuzzy intersection and union. Even after preprocessing noise is still present in the web log data.

Olfa Nasraoui et al.[7] defining the similarity between user session where compute preprocessing and segmentation of web log data into sessions. Preprocessing of web log data and cluster user sessions can achieve using the fuzzy clustering technique. This will affect the clustering result and similarity measures.

Zahid Ansari et al.[2, 10] explains an existing web usage mining framework. It uses the fuzzy set theoretic approach in preprocessing and in clustering. It improves mining results when compared with crisp approach in preprocessing and clustering. Because the fuzzy approach matches more with real world scenario. It is using the fuzzy c-means algorithm for clustering.

Castellano et al.[8] aims at clustering website users into different groups and generating session clusters by using a fuzzy c-Means clustering algorithm. Preprocessing should remove noise up to maximum because it will affect remaining operations like session identification and clustering the sessions. The fuzzy set based approach can solve most of the challenges listed above. FCM needs an initial random selection of clusters. This work focuses on designing “an efficient Fuzzy Clustering Algorithm for Mining User Session Clusters from Web Access Log Data”. It improves the quality of discovered clusters.

**Proposed System**

Here a new efficient fuzzy clustering algorithm that can proficiently mine client session clusters from web access log information is proposed. The calculation manages the least of medians while choosing group focuses. The strategy lessens mean squared mistake and takes out the impact of anomalies.

**3.1 Input Data**

The essential information sources utilized in Web utilization mining are the worker log documents, which incorporate Web server access logs and application server logs. The input server log data is downloaded from the site <https://filewatch.net>. Filewatcher is a FTP search engine that monitors more than two billion files on more than 5,000 FTP servers.

The downloaded file name is "pa.sanitized-access.20070109.gz". A sample server log file entry is given below.

1168300919.015	The time of the request
1781	The elapsed time for HTTP request
17.219.121.198	IP Address of the client
TCP_MISS/200	HTTP reply status code
1333	bytes send to the server in response to the request
GET	the requested action
http://www.quiet hits.com/hitsurfer .php - DIRECT/204.92.87.134	URI of the item being mentioned, customer client name, the hostname of the machine where we got the solicitation,
text/html	content -type of the object.

**Figure 3. A Sample Web Log file Entry.**

**3.2 Data cleaning**

Well known Web sites produce gigabytes of web log information each hour. Handling such exceptionally huge records is a troublesome assignment. By performing information cleaning, log record sizes can be diminished to lift the ensuing mining assignments. When a user requests for a web page enters or clicks on a URL usually a single request will cause several URLs to be generated like figures, scripts etc. So all URLs with a graphic extension should be removed. Data cleaning also identifies Web robots and removes their requests. A web robot (also known as Web Wanderers, Crawlers, or Spiders) automatically generates several request lines in weblog data. Robot’s request is unwanted because it is not generated by user, its generated by machine. So, we should remove robots requests as removing them will increase the accuracy of clustering results. Here we employed two methods for extracting robots requests. The first one is checking for an entry in "robots.txt" in web log data and the second one is removing HEAD requests [2, 8, 10]. Next is the removal of URLs with query strings. Normally URL with query strings is used for requesting extra details from within the web page within the same session. Since they are unnecessary, we will remove them as well [2, 8, 10].

The input file is 30.6MB in size and has 2,06,914 entries. After removing URLs with graphic contents the log file has 72,498 entries which are almost one third of the input file. After removing the web robot request we have 72,305 entries. After removing URLs with query string, we have 59,054 entries in the log file. Then we will encrypt IP Address to hide the user's identity and to have ease in future processing and the IP address will be put away in a map with its encoded id. Furthermore, each URL will be appointed a unique number and it will be put away in a URL map along with its number [2, 8, 10]. The Data cleaning algorithm is demonstrated in Table 3.1.

**Table 3.1: Algorithm for data cleaning**

Step 1: Perused each line of input file one by one.
Step 2: Remove all URLs with suffixes recorded in the above suffix list.
Step 3: Remove all URLs produced by web robots.
Step 4: Remove URLs with query strings.
Step 5: Take out the IP address and store it on a map.
Step 6: Code URL with URL number and store it on a map.
Step 7: Sort each line based on IP Address encryption code.
Step 8: Print in the required fields to a yield file.

The output file after applying the above algorithm will be as shown in Table 3.2. The output file is sorted in ascending order based on the encoded value of IP Address.

**Table 3.2: Output file after data cleaning**

IP	Time	Elapsed Time	Bytes	URL
IP1	1168300931.828	142	1599	1
IP1	1168300935.244	501	1617	2
IP1	1168300936.604	1	1617	3
IP1	1168300941.345	2	1593	4
IP1	1168300957.585	186	1585	6
IP1	1168300985.665	145	1563	10

### 3.3 User Identification

After cleaning input web log data we can distinguish users. Since the log file doesn't

contain user login information we consider each IP as a user. Next we separate all solicitations identifying with the individual user. The algorithm for user identification is shown in Table 3.3 [2, 8, 10].

**Table 3.3 Algorithm for user identification.**

Step 1: Split every line in input file into obliged fields.
Step 2: Store it (i.e. obliged fields) in a Map M1 with IP Address as the key and another Map M2 as the worth. Key of the Map M2 is the time and worth is whatever is left of the fields..
Step 3: Sort the internal map m2 taking into account the time key.
Step 4: Print content of the map M1 to the yield record.

The organization of the yield document produced after user identification is shown in Table 3.4.

**Table 3.4: Output file format after user identification**

User	Time	Elapsed Time	Bytes	URL
IP1	1168300931.828	142	1599	1
	1168300935.244	501	1617	2
	1168300936.604	1	1617	3
IP2	1168300953.645	648	260	5
	1168300990.665	143	260	14

### 3.4 Session Identification

Client Session distinguishing proof is the technique of dividing the customer activity log of each customer into sessions, each addressing alone visit to the site. Sites without client verification data generally depend on heuristic strategies for sessionization. The sessionization heuristic guides in isolating the genuine game plan of exercises performed by one customer in one visit to the site. Keeping in mind the end goal to recognize client sessions we can try different things with two distinctive Time Oriented Heuristics (TOH) as portrayed underneath [2, 10, 8]:

TOH1: The time term of a session should not surpass a limit  $\alpha$ . Let the timestamp of the main URL demand, in a session be,  $T_1$ . If another URL asks for a session with timestamp  $T_i$  it is allotted to the same session if and only if  $T_i - T_1 \leq \alpha$ . The principal URL asking for with timestamp

bigger than  $T_1 + \alpha$  is taken as the first request of the following session[2, 10, 8].

**Table 3.5: Algorithm to create User Sessions taking into account TOH1**

<p>Step 1: The given steps ought to be finished for every line in the information input file.</p> <p>Step 2 : If the Line contains User Id, then <math>UserId = User\ Id\ of\ the\ line.</math></p> <p>Step 3 : Print Line to output file under this User Id and the first session of same User Id.</p> <p>Step 4 : In case that L is the first accessed log of the user then <math>T1 = Line.time</math> else <math>T2 = Line.time.</math></p> <p>Step 5 : If <math>T2 - T1 \leq \alpha</math> at that point print Line under the same session to the file.</p> <p>Step 6 : If it is not as in the previous step i.e. Step 5 then output User Id and corresponding line under a new session, <math>T_1 = Line.time.</math></p>
---

TOH2: The time spent on a page visit should not surpass a limit  $\alpha$ . Let a URL that is most recently given to a session having a timestamp  $T_i$ . The next URL's request fits in with the same session if and only if  $T_{i+1} - T_i \leq \alpha$  where  $T_{i+1}$  is the timestamp of the new URL's request. This URL is now the first of the following session [2, 10, 8]. In our implementation for interim we are utilizing TOH1. We have chosen 30 minutes as the estimation of the limit time. The algorithm for user session identification is shown in Table 3.5 and the output file of session identification is shown in Table 3.6.

**3.5 Dimensionality Reduction**

Removing to separate the logs references to low bolster URLs (i.e. that are not bolstered by a predetermined number of user sessions) can give a powerful dimensionality decrease system while enhancing clustering. To implement this, we are removing URLs that occur only once [2, 10, 8].

**Table 3.6: Output file of Session Identification**

User Session	Time	Elapsed Time	Bytes	URL
IP1S1	1168300931.828	142	1599	1
	1168300935.244	501	1617	2
	1168300936.604	1	1617	3
IP1S2	1168302738.407	81	1623	482
	1168302745.477	138	1559	483
IP2S49	1168300953.645	648	260	5

**3.6 Session Weight Assignment**

For the clustering task, the session files can be separated to remove little sessions keeping in mind the end goal to take out the variation from the data. In any case, directly removing these little measured sessions may bring about loss of a critical measure of information particularly when the quantity of these little sessions is large. Here we allot weights to every one of these sessions taking into account the number of URLs got to by the sessions. Session weight assignment is done based on the following equation[2, 10, 8].

$$W_{s_i} = 0, \text{ if } |s_i| \leq 1$$

$$W_{s_i} = 1, \text{ if } |s_i| \geq 1$$

where  $|s_i|$  is the number of URLs accessed in a particular session.

**3.7 Development of user session matrix**

Here we represent sessions using a matrix. Every row denotes a session and the column denotes a URL. If a URL arrives in a session then the entry for that URL in the specific session will be more prominent than zero. It will be a number of events of that URL in that session. If URL is not present then that entry will be zero. Sessions are referred to by utilizing a sparse matrix in row major form. It reduces processing time upto a great extent. After all we are dividing so as to standardize the session matrix for every column by its greatest value[2, 10, 8].

**3.8 Implementation of the existing system**

Nowadays Fuzzy C-Means algorithm is mostly used for fuzzy clustering structures. So for comparing our new algorithm we have implemented the existing system with FCM[14, 2, 10, 8].



**3.9 Implementation of Proposed System.**

The proposed system can be implemented as an efficient Fuzzy clustering algorithm for mining user session clusters from web log data which is described above in section 5 i.e. "Session Clustering".The main part of processing is as follows.

At first we will take one meeting say s1 and discover the distance between this meeting to each and every other meeting (say s2; s3; s4; ::::sn)multiplied by the enrollment capacity of s1 to bunch focus 1(v1).Next we will sort these qualities in rising request and take the middle. The above step will be done for all sessions s1; s2; s3; s4; ::::sn.Now these medians obtained from the above steps will be sorted and the least value will be taken. The session relating to the least worth will be taken as the main group community in this round. All above advances will be proceeded for bunch focus 2 upto group focus c(v1; v2; v3; ::::vc).In this way we will get new arrangements of bunch focuses in one round. New group communities will be determined upto a particular number of rounds till we get ideal bunch habitats.

**3.9 Modification in Proposed System.**

Here for every cluster centre we will be selecting the smallest value of medians. However, the issue is, abruptly we are getting the same smallest median in each iteration. So in each cycle we are getting the same cluster center over and over again. So we rolled out a little improvement in this algorithm. Instead of selecting the least median in each round, we will choose the smallest median in the first round, the second smallest median in the second round, the third smallest median in the third round and so on. By actualizing like this we are showing signs of improvement in the execution of proposed algorithm which is better than FCM.

**3.9.1 Fuzzy Membership function**

Expect to be  $X = \{x1; x2; :::; xm\}$  is the arrangement of information focuses or sessions. Each point is a vector of the structure  $I = 1 \dots m$ ,  $x_i = \{x_{i1}; x_{i2}; :::; x_{in}\}$ . Let  $V = \{v1; v2; :::; v_c\}$  is a bunch of n dimensional vectors compares to c group habitats and each bunch place is a vector of the structure  $8j = 1:::n$ ,  $v_j = \{v_{1j}; v_{2j}; :::; v_{nj}\}$ . Let  $u_{ij}$  addresses enrollment

of information point(or meeting)  $x_i$  in bunch  $j$ . The  $m \times c$  enrollment framework  $U = [u_{ij}]$  shows portion of sessions to different bunch communities. It fulfills following models.

$$\sum_{j=1}^c u_{ij} = 1; \forall i = 1 \dots m$$

$$0 < \sum_{i=1}^m u_{ij} < m, \forall j = 1 \dots c$$

The participation esteem is determined by utilizing the accompanying equation [14].

$$U_{ij} = \frac{\frac{1}{d_{ij}^2(x_i, v_j)} \frac{1}{(m-1)}}{\sum_{k=1}^c \frac{1}{d_{ij}^2(x_i, v_k)} \frac{1}{(m-1)}} \dots \dots \dots (4)$$

Initial cluster centres are randomly selected from available sessions. Then the membership value of each cluster is calculated using the equation for  $u_{ij}$ . Euclidean distance between various data points and cluster centres can be calculated using the following equation [9, 14].

$$d_{ij}^2(x_i, v_j) = \sum_{k=1}^n d_{ik}^2(x_k^i, v_k^j) \dots \dots \dots (5)$$

Where n is the number of dimensions of each data point,  $x_k^i$  is the value of  $k^{th}$  dimension of  $x_i$  and  $v_k^j$  is the value of  $k^{th}$  dimension of  $v_j$  which is the  $j$ th cluster center.

**3.9.2 Cluster Center calculation**

In each iteration steps new cluster centres are calculated using the following formula:

$$D_i = \text{Median}\{(d_{ij}(s_k - s_i) * u_{ij})\}; \forall i \neq k; k = 1 \dots n$$

$$p = \text{Argmin}\{(D_i:n); \forall i = 1 \dots n\} \quad v_j = s_p$$

At first we will take one meeting say s1 and discover the distance between this meeting to each and every other session (say s2; s3; s4; ::::sn) duplicated by the enrollment capacity of s1 to group focus 1(v1). Next we will sort these qualities in climbing request and take the middle. The above advance will be accomplished for all meeting's s1; s2; s3; s4; ::::sn. Presently from these medians got from above advances least worth will be taken. The meeting relating to the least worth will be taken as the primary group place in this round .All above advances will be proceeded for bunch focus 2 upto group focus c(v1; v2; v3; ::::vc). In this manner we will get new arrangements of group focuses in one round. New group habitats will be determined upto a

particular number of rounds till we get ideal bunch communities.

**3.9.3 Objective function calculation**

The target work is utilized to quantify the exhibition of the grouping calculation. The bunch habitats which are having less incentive for the target capacity will give smaller groups or better grouping results. The presentation record is determined utilizing the accompanying target work:

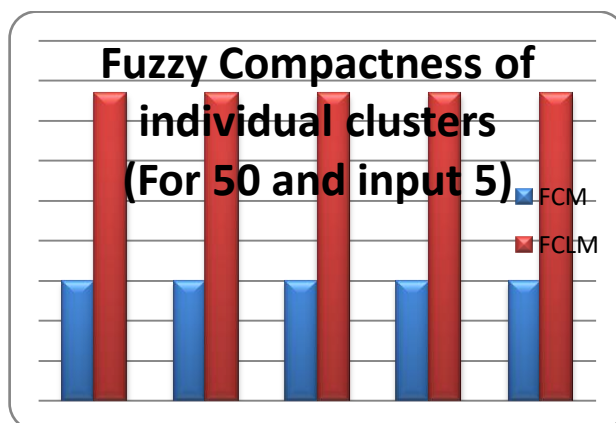
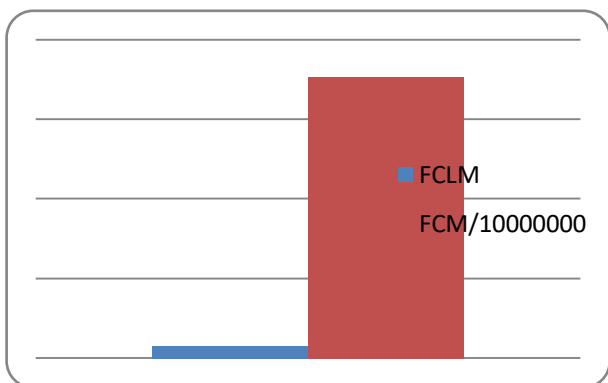
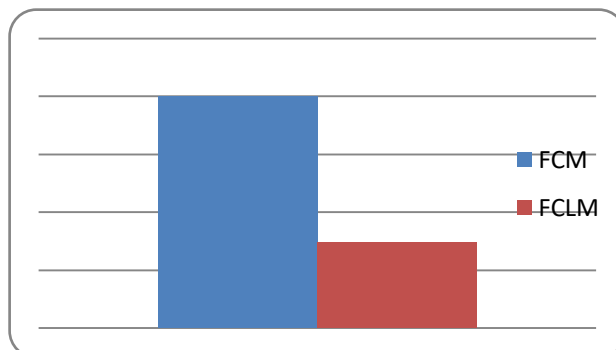
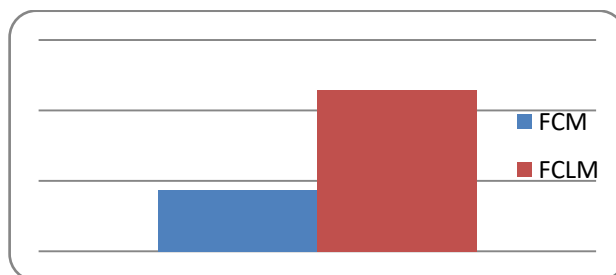
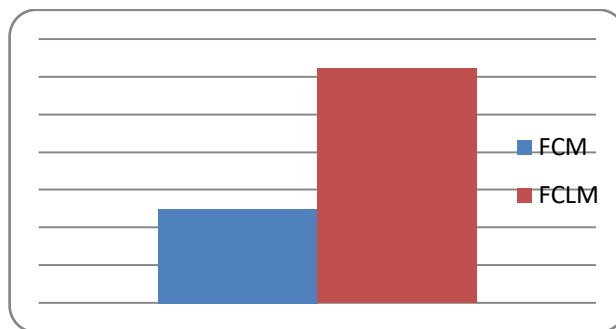
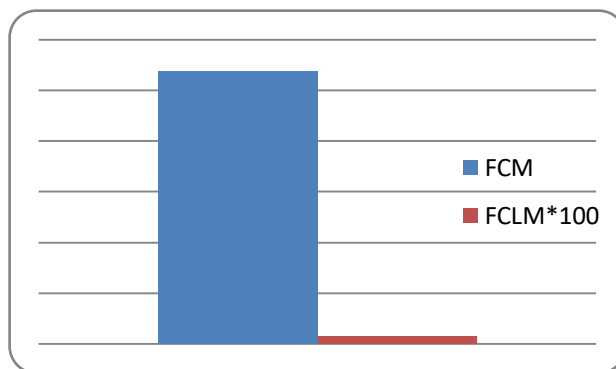
$$O_i = \sum_{j=1}^c (u_{ij} * d_{ij}(v_j - s_i)) \dots \dots \dots (6)$$

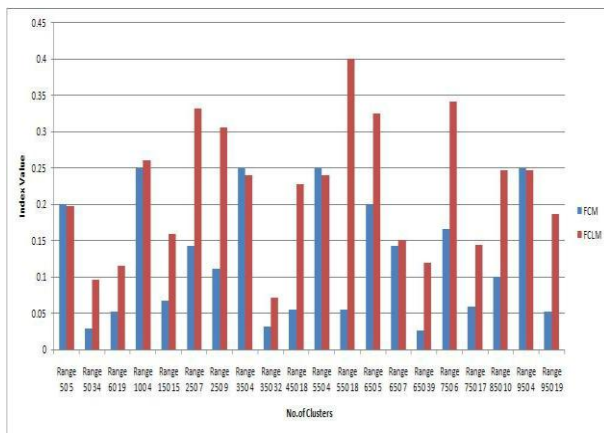
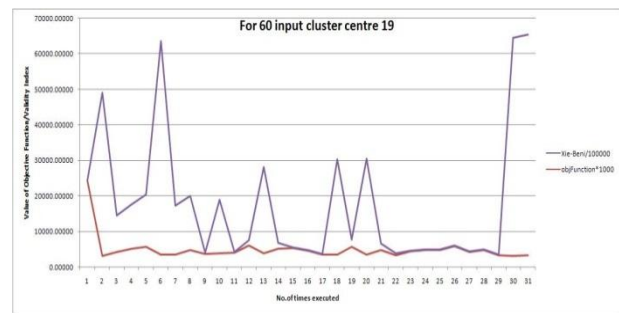
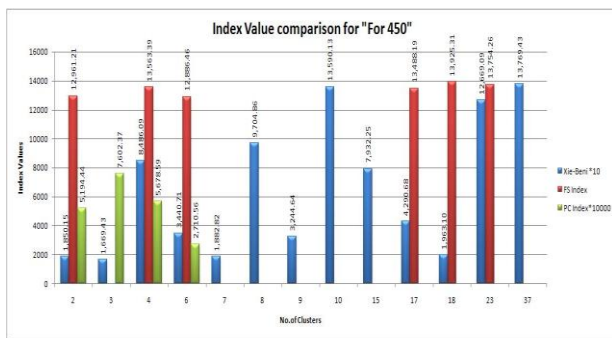
**3.9.4 Algorithm Termination**

The means in this areas will be proceeded till a predetermined number of steps or till we get the base incentive for the goal work. The relating worth of the group places will be taken as last.

**Results**

For both FCM and proposed algorithm(FCLM), we will give similar data information. That is, we will give a similar basic bunch habitat and ascertain Xie-Beni Index, Partition Coefficient, FS Index, Deviation, Compactness, Separation of group focuses overall. Likewise we will process the fluffy smallness and fluffy deviation of individual group habitats. After that we will look at file esteems obtained by both FCM and the proposed calculation. The calculation which is getting less regard for legitimacy record performs preferred other over Partition coefficient. For parcel coefficient the calculation which gets a higher worth performs better (It's most outrageous worth is "one").





**Conclusion and Future work**

The proposed fuzzy clustering algorithm further develops grouping. It decreases the impact of mean squared blunder and furthermore disposes of the impact of exceptions and consequently the clamor. So we are improving bunching arrangements than in fuzzy c-means algorithm. With better informational collections we can improve arrangements in our calculation.

Both FCM and proposed FCLM exhibitions are affected by starting group place decision. To get away from this adverse consequence we can apply the mountain thickness capacity to pick basic group habitats. So we will get fitting beginning group habitats. In preprocessing additionally we need to do a great deal of enhancements like applying new techniques to channel robot demands.

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## A STUDY ON GREEN PRODUCT AND GREEN MARKET PERCEPTION FOR THE YOUNG GENERATION

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### ABSTRACT

*The current scenario has highlighted the importance of green products as it has given a positive change in the mindset of the consumers. They are more conscious about the environment and are willing to adopt a green lifestyle.*

*The researcher will collect data from 16-25 years old age group for analyzing the potential growth of green products in India. This age group is also expected to have a favorable perception about these products. The researcher would like to explore various untouched areas in order to find a solution which can be adapted to the business sector.*

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**Keywords:** green marketing, green products, consumer buying behavior, marketing, etc

### Introduction

“Reducing our levels of consumption will not be a sacrifice but a bonus if we simply redefine the meaning of the word success.” – David Wann

Green marketing is becoming an integral part of the marketing mix, as it offers businesses various benefits such as increased transparency, better connectivity, and alertness regarding the environment. As a result, many businesses are now looking for ways to integrate green programming into their marketing strategies. According to a study conducted by PricewaterhouseCoopers, the economy is now becoming green, not adding green. This is because of the increasing number of people asking for green action and the combined marketing of green products and services.

The economy is gradually turning green, not adding green. This is the reason why businesses are integrating green action into their operations and marketing strategies. There is a growing demand for combining green action and marketing. Green marketing permits businesses to cut costs and increase profits by focusing on green strategies and practices. This discipline cuts through the waste that can be found within the supply chain.

In a city like Nagpur, Green business is becoming a flourishing trend in the business world. According to experts, the main reason why consumers are opting for non-chlorine-based products is that they are safer than those

that contain chlorine. Nagpur Green is a fast-growing feature of the business world. Its continuous growth is attributed to the increasing demand for safe and non-chlorine-based products. The key to success in green marketing lies in having the right product or service at the right time. By being the first to introduce a green substitute, marketers can capture the attention of the consumers and gain long-term consumer reliability.

By establishing a state for the responsibility, sustainability and awareness of the community will attract the ability of future thought, as well as to preserve them. A result of this is the formation of an ethnic group of the reliable employee base, which, finally, reduces the recruitment of general expenses.

Investors have observed and are ready to invest in the next wave of immense enterprises. Since the request for such products and services is growing. Entering the green market is surprising, as it illustrates respect for the environment and the public, the company is inside.

To consumers Environmental notice was a precondition for green purchase based on the hypothesis of a lot of green marketing literature. Both researchers and business researchers seem to be mistreated while following a green behavioral marketing that organic products are bought only if customers recognize products as higher than competitors' offers. The demand and the main emphasis are

in young people, that green is today's youth and precious participation in green marketing.

The millennial we call, since TechSavy generation has grown with computers and the Internet. They are hurriedly experiencing marketing practices that consider forging or misleading, skeptical of the government and authority. They are able to collect instant reactions of millions around the world with the ability to express their feelings through blogs, text messages and social networks. Late consumers have also been worried about environmental problems and have started asking organic products in advanced nations; meanwhile, many customers are aware of the influence of numerous substances in the environment.

Implementation and promote green marketing means, promote and solicit people to buy a respectful product of the environment, which describes the company as a company that highlights its social responsibility and promotes its activities as friends of the environment. Advance Green shopping through the operational promotional campaigns depends completely from the point of going to green. The green customer purchasing behavior is what the company must recognize to achieve this goal.

To increase green marketing and reduce waste and repair of energy efficiency, product, price, site and promotion are the key components that you need to offer some alteration of the elements of the marketing mixture. Modified environmental value and customer satisfaction are the two intentions that green marketing must meet. Since there is a demand for balancing products without a doubt, green marketing offers a perspective to companies to increase their market presenting ecofriendly products. With the times of alteration, the green color has become almost identical to the environment. The green term is completely ally with development and faith.

### **Literature review**

Green marketing is the marketing of products that is assumed to be safe.

That sustainability is increasing is the tip of the iceberg. Green companies are fast becoming industry pioneers; the population of conscientious citizens has been increasing

since our dire environmental condition has been carefully monitored.

The congregation's performance on sustainability and climate crisis is not going away anytime soon. According to some recent Gen Z party studies, many people who are currently 23 or younger are very concerned about these issues, with 68% of Gen Z recently reporting that they have made green purchases in recent years.

When the news gets this big, it will be revealed that 73% of millennials worldwide are kind enough to pay significantly more for organic products. If your brand's business practices aren't up to scratch, you can't benefit from this growing prospect. As long as the company is loyal to the environment, consumers are well aware of nasty marketing tactics and know exactly what to look for. When evaluating companies that challenge the market for sustainability, they can be content with serious public criticism when practices are consistently unsustainable. H&M found what it was looking for earlier this year when it announced its "conscious collection."

After publicly accusing them of burning 12 tons of fresh unsold clothing this year, it wasn't long before fashion bloggers and media called out H&M for greenwashing.

The concept of green marketing came to the fore in the late 1980s and early 1990s.

Two concrete milestones for the first wave of green marketing came in the form of books. Green Marketing by Ken Peattie (1992) in the United Kingdom and Green Marketing: Challenges and Opportunities for the New Era of Marketing by Jacquelyn Ottman (1993) in the United States. Yeow Kar Yan and Rashad Yazdanifard (2014) find that consumers are related to environmental protection, which has led to a diversification in purchases by consumers guided by ecological lifestyles, since environmental issues are increasingly small value techniques that are used by companies to increase their finances. compensation and have the opportunity to achieve customer satisfaction, to achieve the mission and vision of the company is green marketing and organic product development.

The hazardous substance in a product can influence consumer purchasing behavior; Therefore, manufacturers tend to produce green

commodities to convince green consumer demand. Approximately 30% of customers stated that organic products must be energy efficient during manufacturing, use and disposal, support water exchange and be safe for the environment. Mihaela Kardos, Manuroala Rozalia Gabor and Nicoleta Cristesho (2019)

The opening of new indications for the debate on the role and corporate responsibility in society, in recent decades the company has had more and more problems in the perception of problems of sustainable development. As a result, companies around the world have shifted their strengths to better meet the new challenge by incorporating various aspects of sustainability into their writing, using sustainable products in favorable circumstances, and also for stakeholders responsible for supporting sustainable development. Harendra Pal Singh Chauhan and Dr. Ramesh Chaturvedi (2015)

Ecologist has also started in India. Together, government and non-government organizations have flooded green campaigns to address the downsides and shortcomings of pollution and the rapid depletion of natural resources. Various environmental laws have been enacted in the country to prevent environmental damage. According to Nikhil Ampraval, Akhil Agrawal (2014), for companies to be successful in green marketing campaigns, young people who are the most responsible must have a comprehensive approach to nature and the environment. You must certify that consumers are truly aware of this concept. Your campaigns should be designed in such a way that young people are fascinated with buying products.

"Green" is the Cathastics phrase that is being recognized by the modern generation.

Various companies that directly ask private companies, such as Walmart, to promote the concept of organic food to public bodies, such as the allegation of obstruction by the London governments, all of which aim to promote the environment by promoting of products and "green" problems according to a study by (Jacob Cherian and Jolly Jacob). In several countries such as Canada, Brazil, China, France, Germany, India, the United Kingdom and the United States, 87% of the population

has shown interest in reducing their impact on the environment, according to a survey by several researches.

### Research Methodology

Explore and understand shopper perceptions of green products in Nagpur city. Secondary data was obtained from research, the Internet, and books. The data was used to collect basic information on the subject. To collect primary data, the researchers prepared a questionnaire. The questionnaire was developed in consultation with the faculty and the research expert. Data were collected on the 18-25 year-old age group. A total of data was collected from 200 respondents using the Google form.

### Objectives of Study

- 1) Research on the perception of green products by the young generation.
- 2) Know the relationship between their level of education and understanding of buying behavior towards environmentally friendly products
- 3) Try to understand the reason for buying environmentally friendly products

### Hypothesis

- H01: There is no correlation between green product awareness and user satisfaction  
 H11: There is a direct correlation between green product awareness and user satisfaction  
 H02: There is no correlation between the green product status symbol and the same consumption pattern  
 H12: There is a direct connection between green products as a status symbol and their consumption pattern.

### Case Processing Summary

		N	%
Cases	Valid	200	100.0
	Excluded <sup>a</sup>	0	.0
	Total	200	100.0

a. Listwise deletion based on all variables in the procedure.

### Reliability Statistics

Cronbach's Alpha	N of Items
.774	13

High value suggests that data is reliable and has medium internal consistency

**Multilayer Perceptron**

**Case Processing Summary**

		N	Percent
Sample	Training	142	71.0%
	Testing	58	29.0%
Valid		200	100.0%
Excluded		0	
Total		200	

**Network Information**

Input Layer	Factors	1	Price is the major concern for me to go for green products.
		2	I purchase green products because it is considered to be a status symbol.
		3	Though I like to buy green products but I cannot afford them.
	Covariates	1	From where did you get the awareness about green products
	Number of Units <sup>a</sup>	13	
	Rescaling Method for Covariates		Standardized
Hidden Layer(s)	Number of Hidden Layers	1	
	Number of Units in Hidden Layer 1 <sup>a</sup>	7	
	Activation Function		Hyperbolic tangent
Output Layer	Dependent Variables	1	Age
		2	Gender
		3	Education
	Number of Units	7	
	Activation Function		Softmax
	Error Function		Cross-entropy

a. Excluding the bias unit

**Model Summary**

Training	Cross Entropy Error			9.840
	Average Percent Incorrect Predictions			2.8%
	Percent Incorrect Predictions for	Age		3.2%
	Categorical Dependents		Gender	4.1%
			Education	2.0%
	Stopping Rule Used			1 consecutive step(s) with no decrease in error <sup>a</sup>
Training Time			0:00:00.16	
Testing	Cross Entropy Error			3.554
	Average Percent Incorrect Predictions			2.1%
	Percent Incorrect Predictions for	Age		3.2%
	Categorical Dependents		Gender	3.6%
			Education	2.3%

a. Error computations are based on the testing sample.



Overall Percent Correct

Sample	Overall Percent Correct
Training	93.6%
Testing	97.9%

The data calculation and high value suggests that data is true and gives useful output for understanding of multilayer perceptron mapping.

**ANOVA**

		Sum of Squares	df	Mean Square	F	Sig.
I have a deep knowledge of green products	Between Groups	20.611	1	20.611	40.101	.027
	Within Groups	101.769	198	.514		
	Total	122.380	199			
Price is my main concern when choosing eco-friendly products..	Between Groups	20.052	1	20.052	37.632	.045
	Within Groups	105.503	198	.533		
	Total	125.555	199			
I would buy green perceived products because they are a status symbol.	Between Groups	20.611	1	20.611	40.101	.047
	Within Groups	101.769	198	.514		
	Total	122.380	199			
Though I like to buy green products but I cannot afford them.	Between Groups	12.407	1	12.407	17.990	.033
	Within Groups	136.548	198	.690		
	Total	148.955	199			

From the above Anova Test the **Sign value = 0.027, 0.045, 0.047 & 0.033 which is less than 0.05, Thus, the null hypothesis H0 is rejected at 5% level of significance** and hence the

**alternate hypothesis is accepted.** The alternate hypothesis is H11: - There is a direct relation between green product awareness and user satisfaction level

**ANOVA**

		Sum of Squares	df	Mean Square	F	Sig.
Price is the major concern for me to go for green products.	Between Groups	121.165	3	40.388	113.111	.031
	Within Groups	4.390	196	.022		
	Total	125.555	199			
Quality is one of the most important factors what influences me for purchase of green products?	Between Groups	73.341	3	24.447	115.587	.043
	Within Groups	41.454	196	.212		
	Total	114.795	199			
I feel I can protect the environment by buying the environment friendly products.	Between Groups	71.797	3	23.932	117.910	.047
	Within Groups	39.783	196	.203		
	Total	111.580	199			

From the above Anova Test the **Sign value = 0.031, 0.043, & 0.047 which is less than 0.05, Thus, the null hypothesis H0 is rejected at 5% level of significance** and hence the **alternate hypothesis is accepted.** The alternate hypothesis is H12: - There is a direct relation between Green products being Status symbol and consumption pattern of the same

**Results**

Values / beliefs of consumers, attitudes towards organic products: No one thought that organic products are the order of the day. Educated and tech-savvy shoppers were relatively better informed about green products. In fact, they felt that by buying eco-friendly products, they could have a positive impact on

the entire environment. Green products are still a very young concept, so customers are still not sure how best to use them. Customers are often unsure whether they are specifically looking for green products. Products with a larger presence are more likely to sell in larger quantities. Environmentally friendly values tend to lead to more environmentally friendly behaviors if the values and beliefs are specific enough, the green campaign corresponds to the subjective interests of consumers, and the product attributes are perceived positively. The buyer's perception that this is in line with environmental protection is also seen as an additional boost.

It showed that customers were willing to pay a little more if they felt it could act as a status symbol. If companies establish themselves as a credible source for green products, they can

have a very young and dynamic customer base that truly believes they can make a difference through the use of green products.

### Business Implications

Research has clearly shown that with the new scenario people are now one day more inclined to buy green products to show greater differentiation. The trend changes in the purchase of organic products can be attributed to the level of consciousness and the change in consumption pattern. However, it became clear that consumers wanted a much wider range of options to compare between brands and products.

Business houses can take the hint and use it as an opportunity to grow in the market and unlock the potential.

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## HAS THE NEIGHBOURHOOD FOREIGN POLICY OF THE MODI GOVERNMENT CHANGED THE OUTCOME

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### ABSTRACT

*The following research paper discusses if Indian foreign policy has changed and continued since Narendra Modi took office. In assessing the degree of change, it describes the significant change as a substantial shift in a state's foreign policy's objectives and policies. It argues that shifts in the structural variables accompanied by changes in either the national or individual levels are the most frequent consequence of a significant foreign policy change. Indian foreign policy is under Modi's leadership and is experiencing a proactive turn. India's foreign policy goals have been redefined in the new Government, and the degree of external commitment has also increased. However, areas like the promotion of democracy did not maintain momentum. The Government's regional strategy struggled to take advantage of the possibilities at the beginning of its term of office. Foreign policy is therefore evolving. This study shows that while Modi departed significantly in some countries, his ties with others were mainly reinforced and expanded. So, because of India's spate of international travel and increased focus on foreign affairs, his regime has not fundamentally changed the course of foreign policy. In the past, however, he has gone beyond that work. The most critical of these was his insidious silence on a nonalignment.*

**Keywords:** Modi; Neighbourhood; Government; Policy; Political; Agreement; Established

### Introduction

In a 2015 book, *Modi's World: Expanding India's Sphere of Influence*, the well-noted C. Rajan Mohan, an Indian foreign policy analyst, argued that the conduct of Indian foreign policy was preceded by Prime Minister Narendra Modi in a "3rd Republic." His central point was that Modi had reinvigorated Indian foreign policy in theory and had gradually shed many of the shibboleths that had once obstructed the country's foreign policy choices. Of course, the high dedication to nonalignment and subsequent incarnation, 'strategic self-sufficiency' is among them. He also argued that India is now dispensing with the emotional, reflection anti-American line which characterized its foreign politics for a long time.<sup>156</sup>

Modi's tenure as Prime Minister has now ended more than half. Therefore, it may be an appropriate time to determine whether Mohan's foreign policy characterization as a completely new era is correct. There are few doubts about Modi's reinforcement of the Indian external policy sector since most Indian political observers were surprised by his considerable focus on foreign policy, as he had shown little

involvement in foreign policy issues during the election campaign. During his tenure as Chief Minister of Gujarat, he established his decision-making style. During that time, he took up the policy agenda, relied on several trustworthy aid workers and diligently led officials to carry it out. Since taking over the nation's leadership, he has pursued a similar strategy to a significant extent.<sup>157</sup>

While Modi is interested in changing several contours of India's foreign policy, it is not an easy task to bring about drastic changes. India has a very well-institutionalized decision-making apparatus for foreign policy, an increasing public attentiveness, and a political culture strongly inclined to gradual evolution. This study shows that while Modi made significant departures in some regions, he mainly strengthened and extended established relations in others. Thus, his regime has not radically altered the direction of India's foreign policy, despite its spate of foreign travel and increased focus on foreign affairs. That said, he has gone away from those activities in the past.

<sup>157</sup> Ashok Malik, "Modi the Risk-Taker: Is the PM's Foreign Policy Style Reckless and Unduly Personalized?" *The Times of India*, August 20, 2016, <http://blogs.timesofindia.indiatimes.com/toi-edit-page/modi-the-risk-taker-is-the-pms-foreign-policy-style-reckless-andunduly-personalised/>.

<sup>156</sup> C. Raja Mohan, *Modi's World: Extending India's Sphere of Influence* (New Delhi: HarperCollins, 2015).

His deafening silence about nonalignment was the most critical of these.

### The Inheritance

After independence, India's neighbourhood policy has been motivated mainly by its perceived security and strategic interests. India's concerns on the safety of its citizens have changed significantly because of three significant developments: one was the partition that established Pakistan as an adversarial neighbour; the second was the rise of communist China and its militant takeover of Tibet, which altered the security situation of the Himalayas. India was very concerned about maintaining its strategic space in its sensitive neighbourhood and establishing mutual safety understandings and arrangements bilaterally to deal with its neighbours. In India's neighbourhood commitments, the economic aspect played a secondary role in the early decades. India, an inwardly looking poor, developing nation, was seemingly inadequately to meet its neighbours' growing economic aspirations. In Bangladesh, India was originally viewed as a strategic step towards considering India's regional interests and position in 1980, which eventually led to the South Asian Association for Regional Cooperation (SAARC) back in 1985. The redefining of India's regional strategy was not feasible or lasting, as the Gujral Government had not lasted long. The strategic environment in the Indian region has not changed significantly. The GUJRAL Doctrine in 1997 proposed that the approach to neighbourhoods be unreciprocated. Even Pakistan has not been allowed to be included in the 'Gujral Doctrine.' The start of a sustainable transformation in India's neighbourhood's approach was at the end of the 1990s. This reflected greater economic and strategic self-confidence in the Indian State. The economic liberalization policies begun at the beginning of the 1990s produced positive results and developments such as the declaration of the State's nuclear arms status after the successful nuclear tests of May 1998, and Pakistan's derailment in Kargil in 1999 reassured the safety concerns of India. The Cold War's end and the US's efforts to pursue India's strategic cooperation have helped India relax more in dealing with its

neighbours. In addition to building morale and increasing economic ties with China, the 2003 ceasefire agreement with Pakistan and the opening of business and economic relations have been positive factors. As a result, India began inviting its neighbours to engage in their growth and development and create more excellent connectivity and multilateral cooperation. India then Prime Minister Atal Bihari Vajpayee proposed in December 2003 that the SAARC Summit should be held to establish a regional economic union. Foreign Minister Shyam Saran urged India's neighbours in 2005 to become involved in India's development and prosperity.<sup>158</sup>

The basis for the 10-year-old United Progressive Alliance (UPA) regime of Dr Manmohan Singh's Prime Ministership was to establish creative economic and strategic interaction with India's neighbours. A revival of democracy was a significant development in the region in the early years of the 21st century. Multiparty democracies took root from military monarchies, regimes, and one-party domination structures. In promoting this transition, India played an important role. This role was almost decisive in some cases, like Nepal and the Maldives. Securitarian cooperation between India and many of its neighbours, especially Bangladesh, Bhutan, the Maldives, Sri Lanka, and Myanmar, has also improved significantly. India is a significant development partner in Afghanistan. In 2007, Pakistani President General Musharraf and Indian Prime Minister Singh had a viable understanding about resolving Kashmir's worst issue. However, such a comprehension could not be combined. The neighbourhood policy of the UPA was affected by the chronic delivery deficit in India, by the gap between pledge and results, by the constraints imposed by UPA partners, particularly regarding Sri Lanka and Bangladesh, and by the priority given to Pakistan and significant powers such as the United States and China. The smaller neighbours thought India lacks the necessary economic and diplomatic tools for their political attention and investment. This was the

<sup>158</sup> This position was forcefully argued by then Foreign Secretary Shyam Saran at India International Centre on 14 February 2005, New Delhi.

'heritage' of Modi about the neighbours of India.

### Modi's Initiative and the Approach

SAARC+ participants included the neighbours protected by the initiative. Mauritius also was invited, but not Myanmar, to Modi's swearing-in ceremony. Here, China has not been included. But the most noteworthy aspect with China was that Mr Lobsang Sangay, leader of the political party of Tibet in exile in India, the prime minister (other than HH the Dalai Lama), was invited by the Bhartiya Janata Party, the ruling party of China (BJP). This has been noted attentively by the Chinese minister in New Delhi, and China has protested at his presence.<sup>159</sup> Chinese Prime Minister Li Keqiang called Modi to convince him of the enormous potential for cooperation between India and China within 72 hours of the swearing-in.<sup>160</sup>

The original and stated aim of Modi behind the neighbourhood first initiative was not to refine the current policy's fundamental structure but to enhance the implementation dynamism. Modi was clearly and adequately equipped for this purpose. Initially, he won the elections in 2014 with a thumping margin, with most of his party, BJP. As in many prior administrations, his coalitions partners had no constraints, particularly UPA I and II, about specific policy movements. Secondly, as opposed to its former Dr Singh, who had been depicted as an 'accidental' prime minister, Mr Modi was a prime minister by himself.<sup>161</sup> The President of the Congress Party's guidance and governance, Mrs Sonia Gandhi, was heavily influenced by Dr Singh. Almost by himself, Modi led the primary campaign of his party with a stunning majority. He was supposed to show dynamism in governance policy, including the "neighbourhood first plan," as part of the business community's entrepreneurship Gujarati. Later, we will return to the complexities and deviations that guided Modi's initiative in the legacy policy context.

In June 2014, India's Envoys were invited for a one-day conclave in South Asia, China, the Central Asian Republic, Iran, and Myanmar to devise wide-ranging criteria of its Neighborhood Strategy. There was some debate whether Iran and China's presence meant an expansion or acknowledgement of the neighbourhood's canvass as leading players. Foreign Minister Sushma Swaraj has drawn up a "3C Mantra" on trade, culture and connectivity in the neighbouring countries and the world after consultation of his envies.<sup>162</sup> Surprisingly, there was no place for protection in this mantra. Foreign Secretary S. Jaishankar said it "provides an increase in communications and cooperation to establish a new neighbourhood strategy. One that is both rational and firm where appropriate. China's security, economic and foreign policy triangulates."<sup>163</sup> A few months later, again, the main components of the strategy were articulated by saying: The word has a good sense of priority and does not imply a future without problems. The difficulties of diplomacy are always inverse to the scope. The argument is that it represents an overview of our broader neighbourhood that reflects increasing capacity and trust. It assumes that our objective should be to achieve shared prosperity regardless of our history. To do this, our cooperation and communication must not only be dramatically improved, but we must also introduce a new mindset. In the case of India, regional cooperation could be motivated by itself, not driven by it. Indeed, we should pursue our objectives intentionally without overly influencing our partners' weaknesses or diverting them from Today's difficulties.<sup>164</sup>

In other places, the Indian foreign secretary often used phrases such as 'positive unilateralism' to highlight the India initiative 'neighbourhood first.' As we can see, some of these statements represented a new aggressiveness in India's approach considering practical steps and behaviour. Although the

<sup>159</sup> Indrani Bagchi, "Tibetan Leader at Modi's swearing-in irks China", Times of India, 05 June 2014.

<sup>160</sup> Times of India, 30 May 2014

<sup>161</sup> Sanjay Baru, *An Accidental Prime Minister: The Making and Unmaking of Manmohan Singh*, Penguin India, 2014.

<sup>162</sup> Sushma Swaraj's foreword to a new MEA Publication entitled "Transformational Diplomacy: New Milestones, New Horizons", New Delhi, 2015

<sup>163</sup> See his speech at a book release function on 17 July 2015. Text is on MEA Website

<sup>164</sup> Foreign Secretary's speech at the inauguration of the India Centre of the Carnegie Endowment for International Peace, New Delhi on 06 April 2016

Minister of Foreign Affairs spoke of the '3C Mantra' for Modi's government's external policy, the Neighborhood Initiative could identify four significant dimensions. The first can be called the building of contacts and trust. Prime Minister Modi, Minister Sushma Swaraj, his foreign minister and senior officials have visited neighbouring countries extensively. Sushma has seen both SAARC neighbours. Prime Minister Modi, except the Maldives, addressed all the neighbouring countries. In December 2015, his visit to Pakistan to participate in Prime Minister Nawaz Sharif's family function was exceptional. In November 2016, the SAARC Summit in Islamabad was scheduled to be a formal visit to Pakistan. Modi's planned visit to the Maldives in March 2015 was stopped at the last minute to show India's disappointment at the autocratic way President Yameen dealt with the previous President of the Maldives, Nasheed.<sup>165</sup> Following Sushma Swaraj's visit to India in October (10 – 11), 2015, India has adjusted its position on this topic. However, the visit of Prime Minister Modi has not yet come true. But President Abdulla Yameen of Maldives visited India in April 2016 to demonstrate his appreciation of India's strong defence against the Commonwealth Ministerial Action Group Maldives (CMAG). We hope that India will continue to help Maldives in any unjust CMAG punitive action.<sup>166</sup>

Some of the trips to these neighbouring countries broke the long logjam of the Prime Minister's visits to India. The last Indian Prime Minister visited Sri Lanka, for example, 28 years ago. It's been 17 years for Nepal. During these visits, the Indian leaders and the host countries formed themselves at the highest political level. Both Modi and Swaraj also met a broad section of the political leaders in the

<sup>165</sup> Prime Minister Modi's visit was postponed, its details were worked when Maldives Foreign Minister Dunya Maumoon visited New Delhi and held discussions with her Indian counterpart Sushma Swaraj. *The Hindu*, 09 March 2015.

<sup>166</sup> The CMAG had taken a strong action to the treatment meted out to the former president Nasheed and was contemplating strong action. India's intervention on the issue softened the CMAG, which let Maldives off the hook by asking it to deal with Nasheed gently and create an "inclusive" country. *The Hindu*, 13 April 2016.

opposing nations, all of them promising Indian collaboration and growth with their governments. The meetings of Modi with the outgoing. Mahinda Rajapaksa, President of Sri Lanka, accusing India of its electoral failure, Begum Zia, of the Bangladesh Nationalist Party (BNP), in Dhaka, who criticized India's support for Sheik Hasina Wajid's Awami League (AL) administration and for the Maoist faction in Nepal which is considered an anti-India group, could be regarded as a prudent and mature gesture. Modi also attempted to meet significant parts of the national elites and ordinary citizens during his visits. He talked to national legislatures and held public hearings in those countries. In his addresses, Modi has assured Indian love for the interests and sensibilities of his smaller people through the speech and use of inventive catchphrases like "B4B" in Nepal, Highways, I-ways-Transways in Bhutan (meaning Bhutan in Bharat) and Highways in Nepal and was ready to contribute to its economic growth. The warmth and honesty of the speeches of Modi in these countries were widely praised. In Nepal, familiar people encouraged him to gain their hearts and minds as a hero.<sup>167</sup>

The second aspect of implementing the neighbourhood's initiative was to pursue the debate, i.e., to enable and extend bilateral cooperation and bridge India's persistent external policy gap. At the swearing-in ceremony, Modi gave assurances on the revival of the composite discussion at the foreign secretary-level through his conversations with Pakistani Premier Nawaz Sharif. However, as we can see later, this dialogue has gone through difficulties. After years of indifference and lethargy in foreign minister, Swaraj visits, bilateral Joint Commissions between India and some neighbours established to review all ties regularly. India extended soft lending to Nepal and Bangladesh for infrastructure growth of 1million dollars and 2million dollars, respectively, during Modi's visits. India has reviewed its progress on its development cooperation projects, and commitments to speed up their implementation have been made. Prime Minister Modi has encouraged Indians

<sup>167</sup> "Modi wins hearts and minds" was the widely circulated phrase in Indian and Nepali media, including social media.

to reactivate central, vital and stalled projects on various levels, incredibly bureaucratic and political. He made a significant effort to conclude a power exchange and grid connectivity agreement with Nepal and ratify the sensitive land boundary agreement between Bangladesh (LBA) and Sri Lanka.<sup>168</sup>

He succeeded in bringing the West Bengal Chief Secretary to Bangladesh, where his predecessors had struggled. However, the end of Bangladesh's much-desired Teesta waters agreement remains to be seen. In Sri Lanka, the improvement of bilateral development cooperation was also noticeable. Given Sri Lanka's concerns, it was revised as an Economic Cooperation and Technical Cooperation Agreement (ETCA), which could be signed sometime or not very short, the longstanding Comprehensive Economic Partnership Agreement (CEPA). India seems to be trying to regain its strategic space after an exchange of high-level visits with Afghanistan. Foreign Secretary Jaishankar stresses the benefits from India's new approach towards its neighbours: "Today's focus is probably without precedent... The increased chemistry represents quicker project completion, increased exchanges and more aggressive negotiated targets."<sup>169</sup>

For India's regional ties with its surroundings, the SAARC is an important forum. Prime Minister Modi made a powerful pitch under his 'neighbourhood first' initiative to advance SAARC regional cooperation. Just one month after he took up office, Modi asked the Indian Space Research Organisation (ISRO), in its address to the SAARC meeting in Kathmandu in November 2014, to create a communication and weather satellite for the use of all SAARC members and offered this gift to every neighbour. This was a step forward in networking from the physical to the 'spatial' stages. He stressed the importance of "sub-regional cooperation especially in trade, transit, networking and hydropower" during his visits to Bhutan and Nepal. In his Kathmandu SAARC speech, this idea was echoed. The free

movement proposal between Bhutan, Nepal, and India (BBIN) forms part of that movement.<sup>170</sup>

For India, our vision for this region lies in five pillars — trade, investment, support, cooperation in all areas, people interaction and connectivity. This is our time's call... There's a fresh awakening in South Asia, a new acknowledgement of the interlinked destinies. This connection is going to expand. By or without SAARC. Between all of us or some of us. We are all able to select our routes. However, if we join our hands and move on, it is easier to go faster and closer.<sup>171</sup> The message highlighted by "via or beyond the SAARC... all of us or some of us" might have been an answer to Pakistan's concerns on connectivity. It was essential for India to pursue sub-regional structures, as indicated by BBIN, should Pakistan or any other country not be prepared to participate in Regional Projects.

Modi's neighbourhood diplomacy has a third dimension in its deliberate and measured use of soft power. Cooperation with neighbours in the fields of health and education was given considerable importance. Even during the past UPA regime, it has been a flagship of India's soft power in the region to open the South Asian University. Cooperation in the field of education was part of many MOUs between India and Bangladesh. Modi vowed to improve the number of Indian scholarships to neighbouring countries to impart diverse qualifications and support higher education during his visits. In its SAARC summit address, Modi also pointed to the capacity of India to tackle disasters. In neighbouring countries, where disasters such as earthquakes and floods hit, Modi provided Indian help quickly and generously to meet the challenge. Pakistan has either not accepted these offers in September 2014 or during the October 2015 earthquake.<sup>172</sup> Nepal embraced happily. In Nepal's devastating earthquake, India has been

<sup>168</sup> Some of the details of such cooperation agreements have been listed in the MEA document "New Milestones  
<sup>169</sup> Paragraph 7, of the text of Foreign Secretary's Speech at the inauguration of Carnegie Centre in India on 06 April 2016. Text at MEA Website

<sup>170</sup> For details, see, Sharmistha Mukherjee, "New Economic Corridors: India on road to redefine trade ties with South Asian Neighbours", The Indian Express, 18 November 2015, p. 23

<sup>171</sup> Full text of speech at, <http://www.narendramodi.in/text-of-prime-ministers-speech-at2014-saarc-summit-in-nepal-694>

<sup>172</sup> The Dawn (Karachi), 07 September 2014; Times of India, (New Delhi) 26 October 2015.

the most important provider of assistance in April-May 2015. However, there are dissident voices against India's projected aid in the Indian media.<sup>173</sup> India gave a \$1 billion package to the Donors' Meeting to assist Nepalese tremors, not to mention this criticism. Since a quarter of the aid had to be granted, the remainder was a generous loan.<sup>174</sup> India responded promptly by flying water to Male in December 2014 in response to the Maldives drinking water crisis. In May 2016, India replied promptly in Sri Lanka to help combat the terrifying impact of the Roanu cyclone. One transport aircraft and two Navy ships were being hurried via relief supplies. India responded swiftly to the Maldives drinking-water crisis by flying water to Male in December 2014. In Sri Lanka, India replied promptly in May 2016 to help combat the devastating effects of the Roanu cyclone. One transport aircraft and two Navy ships hurried relief supplies.

Religion was a noteworthy feature of India's projection of soft power. As an original contribution of India to the civilizational identity of the region, Hinduism and Buddhism have taken a prominent position in the Modis approach. During his visit to Nepal, Bangladesh, and Sri Lanka, he visited Hindu and Buddhist temples. In Nepal, he made promotional discounts at the famous temple in Pashupatinath and ensured help to improve pilgrims and devotees' facilities. He also vowed to help establish the Buddha in Nepal's birthplace Lumbini. India organized an invitation for Foreign Ministers from Asian Buddhist Countries and Sri Lankan former President Chandrika Kumaratunga to discuss religion to resolve conflicts under the pretence of Vivekanand Foundation in New Delhi, and Mr Modi opened the conference.<sup>175</sup>

In disapproval of the Sino-Nepalese tries to usurp Buddha and Buddhism from India, India boycotted the Foreign Buddhist Conference in Lumbini that marked the 2560th anniversary of

the Buddha's birth.<sup>176</sup> In March 2016, the first International Sophistic Conference under the auspices of the WSF was opened in New Delhi. Modi himself avoided having Islam in his neighbouring countries' religious approach. Modi encouraged exchanges with other neighbouring nations and India and Pakistan in pilgrimages. The fact that India holds the world's second-largest population of Muslims and has made significant contributions to enrich Islamic philosophy and practice needs to be emphasized in the inclusion of Islam in Indian cultural diplomacy. All the world's major religions are part and parcel of India's cultural heritage, and India's cultural diplomacy will underline the richness of its artistic and liberal culture. In his opening statement at the Sufi International Conference, Modi effectively expressed this when he said: "Welcome to an early country which has received and nurtured the world's religions, an age-old source of traditions and faith"<sup>177</sup>

Finally, aspect was strengthening cooperation on security with neighbours, in all his speeches and discussions that was listed briefly. The emphasis was clearly on the war against terrorism, as this topic ultimately posed severe problems in relations with Pakistan and Modi's involvement with other major powers, such as the US and China. In June 2015, India's security forces were directed to engage in terrorist operations and counterinsurgency activities inside Myanmar, allegedly tacitly endorsed by the Myanmar Government. Such processes in the media were referred to as part of a Modi-Doval Doctrine. Ajit Doval, the national security adviser, had once proposed three options in dealing with the risks to India's security, namely "defensively, defensively and offensively."<sup>178</sup>

The bilateral agreement between the two countries concluded on 10 May 2014 provided for a system of operations. This meant

<sup>176</sup> Bharat Bhushan, "Buddha in a diplomatic jam: Nepal, China takes on India over Buddhist heritage", [www.catchnews.com](http://www.catchnews.com) 11 May 2016.

<sup>177</sup> Text of Modi's address at the Conference on 17 March 2016. <http://www.ndtv.com/indianews/full-text-of-pm-narendra-modis-speech-at-world-sufi-forum-1288303> Accessed on 18 May 2016

<sup>178</sup> "Myanmar operations product of Modi-Doval doctrine", *Business Standard*, (New Delhi), 11 June 2015.

<sup>173</sup> Wall Street Journal, 25 April 2015, Times of India, 29 April 2015. Sanjay Kumar, "The Indian Media's PR Disaster in Nepal", *The Diplomat*, 07 May 2014.

<sup>174</sup> *The Express Tribune*, 25 June 2015.

<sup>175</sup> C. Raja Mohan, "Raja-Mandala: Faith and diplomacy", *The Indian Express* (New Delhi), 01 September 2015.



"coordinated patrols" on international borders and information exchange. An "enhanced cooperation of security forces and border guard agencies in peace, security and stability in border areas" was decided at the meeting between the India-Myanmar Joint Consultative Commission held on 16 July 2015.<sup>179</sup> Bhutan India also cooperates with Nepal and Bangladesh on counterinsurgency/terrorism. In this respect, Pakistan is the biggest challenge.

Modi's first Neighborhood initiative emphasized maritime safety in the Indian Ocean region as a significant naval activity of China, and a more substantial presence in that region became apparent. Cooperation has been extended to include, in addition to Bangladesh, Myanmar, Sri Lanka and Maldives, Mauritius and Seychelles. Modi reiterated the importance of his new conception of security and growth for everybody in the region (SAGAR) in the Indian Ocean during his visit to Mauritius in March 2015. He clarified that India's aim in the area was "to pursue an atmosphere of trust and accountability, the observance by all countries of international maritime law and standards, the sense of mutual concern, peaceful settlement of maritime security problems, and increased maritime cooperation."<sup>180</sup> At the Maldives visit to India in April 2016, President Abdulla Yameen adopted an action plan to strengthen cooperation in defence between the countries that provided a defence secretariat-level institutional mechanism. Modi defined its critical components as "Port development, ongoing training, capability development, equipment supplies and maritime monitoring." He said, "We are aware of Maldives' security needs. President Yasmeeen decided that our political and security interests would be taken into consideration by the Maldives. Our common strategic, defence, economic and development priorities determine the contours of the relationship between India and Maldives."<sup>181</sup>

<sup>179</sup> Para 9, "Joint Statement by India and Myanmar on the First Meeting of the India- Myanmar Joint Consultative Commission", 16 July 2015. Ministry of External Affairs, Government of India.

<sup>180</sup> The Hindu, 17 March 2015

<sup>181</sup> "India, Maldives sign six pacts, resolve to expand defence cooperation", The Indian Express, 13 April 2016.

### Dealing with the Neighbourhood

Next to his home, after his opening as Prime Minister in 2014, the emphasis he places on the region's foreign policy was evident to Narendra Modi. (Singh did not comply with his reported commitment when his predecessor, Manmohan Singh, had shown a similar interest.) Modi's decision to invite all his counterparts from the South Asian Association for Regional Cooperation (SAARC) countries to the event could be attributed to this.

Just afterwards, he turned his attention to a long-held Indo-Bangladesh problem which included several border enclaves. These territorial odds were a legacy of subcontinent division and were not resolved even after Pakistan was broken up, and Bangladesh was founded in 1971. Previous governments tried but failed in their attempt to understand this nettle. Modi concluded a Land Boundary Agreement (LBA) successfully in late summer 2015 that resulted in the exchange of Bangladesh 111 Indian enclaves and Indian 51 Bangladeshi enclaves.<sup>182</sup> It should be somewhat noted that the Modi party achieved this goal primarily by having a parliamentary majority in the Lower House of Indian House Lok Sabha and not trying to hinder the Upper House of the main opposition party, the Indian National Congress. The solution of enclaves is, without a doubt, an essential step towards improving ties between Indo-Bangladesh. Parenthetically, the BJP undermined attempts by the previous regime to resolve the longstanding conflict. However, the party now agreed, as a BJP initiative, to present the policy. Therefore, although the administration welcomed that creation as a novel effort, it was also a previous attempt.

It should be noted that Modi has not entirely overlooked India's smaller neighbours, particularly Bhutan and Nepal, which had not been very interested in the past administrations. His approach towards these two nations, however, has proved unequal. Modi has undoubtedly strengthened Bhutan relations. He visited the Himalayan Kingdom almost

<sup>182</sup> AP, "India, Bangladesh Swap Border Enclaves, Settle Old Dispute," The Hindu, August 1, 2015, <http://www.thehindu.com/news/national/india-bangladesh-swap-border-enclaves-settle-old-dispute/article7488497>.

immediately after he took office. Bhutan has cooperated with the Indian counterinsurgency operations successfully in the troubled Northeast, and the visit is of great importance. More specifically, India, Bhutan's largest bilateral aid donor, aims to ensure that China does not enter the region. It is not surprising that Modi signed, during his visit to the area, taking advantage of their mountainous terrain, agreements to create joint enterprises to boost hydraulic power stations' production.

In the wake of the April 2015 major earthquake in Nepal, his regime also demonstrated a lot of enthusiasm. He helped organize relief and rescue operations to ease the victims' condition in coordination with the Border States' Chief Ministers. Modi's fast response in Nepal created significant goodwill. Unfortunately, he lost a substantial boost to his gesture in Indo-Nepalese relations in one year. Modi introduced himself into Nepal's domestic politics to gain some electoral advantages in Bihar in the northern Indian State, home to many Nepalese coethnics. It became clear in May/June 2015 that India was intervening in drafting a new constitution in Nepal not to ignore a specific ethnic community's interests, the "madhesis." Besides, India's government seemed to be funding its activities covertly when the adhesive used the protests and tried to stop India's supply of oil. Given the acute dependency on petroleum on India by Nepal, even this collaboration led to a powerful nationalistic backlash in Nepal.<sup>183</sup>

Any benefit India gained from its efforts to relieve the earthquake was rapidly wasted madness; in Modi's regime, relations with Pakistan took an unfavourable turn quite early. The episode, in some respects, indicated that he was able to be firm in dealing with India's nettlesome neighbour. In an alert from the Indian Ministry of Foreign Affairs that Kashmiri's separatist organization, All Party Hurriyat Conference, will be unable to meet the representatives of a separatist organization, the Pakistani Ambassador to India, Abdul Basit, on the eve of the resumption of talks with Pakistan in August 2014. (APHC). Previous

governments gave similar alerts, but they were largely ignored, and the proposed discussions had gone a long way. However, at this time, the Modi regime decided to annul the talks on the grounds of not tolerating intervention in "India's domestic affairs."<sup>184</sup> Despite the talks' cancellation, the Modi regime took at least two additional efforts to demonstrate its determination to restart its dialogue with Pakistan against much excitement from its anti-Pakistani prejudices.<sup>185</sup> The first was a sudden stopover in Pakistan in December 2014 following Prime Minister Nawaz Sharif's visit to Afghanistan. The political opposition in India criticized this sudden visit. But the study of lasting rivalries indicates that leaders will contribute to overcoming longstanding political blockades by unforeseen and unpredictable gestures.<sup>186</sup> Although there was no breakthrough, the two sides decided to resume talks with the foreign minister.

But Modi's sudden gesture wouldn't last much for the bonhomie. A series of frontier skirmishes led once again to mutual recrimination in Jammu and Kashmir's disputed State at the end of 2014. Consequently, the talks with the Foreign Secretary were not renewed until March 2015. Any progress that may have arisen from these discussions has been derailed again. In January 2015, a Pathankot Indian Air Force base in Punjab was targeted by terrorist operatives based in Pakistan. Surprisingly, the Modi regime approached its Pakistani counterparts for a joint inquiry as part of this assault. Known Indo-Pakistani journalists reported that the regime's ultimate attempt was to make public its desire to improve its ties with Pakistan. In this case, this effort did not come much. After a second terrorist attack in the Uri Indian Army camp in Jammu and Kashmir State in September 2016, a final breakthrough

<sup>184</sup> Niharika Mandhana, "India Cancels Planned Talks with Pakistan," *The Wall Street Journal*, August 18, 2014, <https://www.wsj.com/articles/india-cancels-planned-talks-with-pakistan-140837746>

<sup>185</sup> David J. Karl, "3 Reasons Why Modi is Misguided on Pakistan," *The Diplomat*, October 31, 2014. <http://thediplomat.com/2014/10/3-reasons-modi-is-misguided-on-pakistan/>.

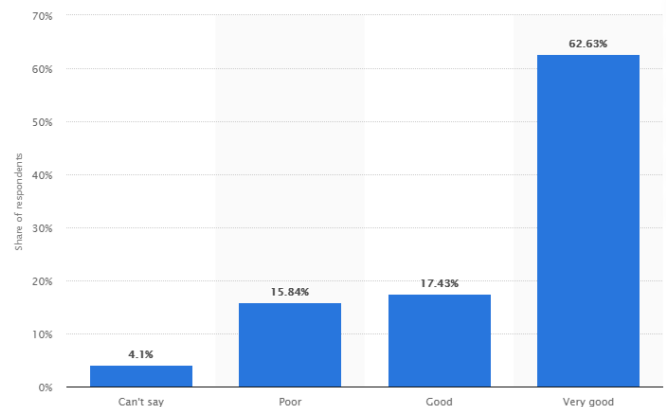
<sup>186</sup> Karen Rasler, William R. Thompson, and Sumit Ganguly, *How Rivalries End* (Philadelphia: University of Pennsylvania Press 2013).

<sup>183</sup> Sunil Raman, "Madhesi protest in Nepal: Why India needs to step back a little," *First Post*, November 9, 2015, <http://www.firstpost.com/world/madhesi-protest-in-nepal-why-india-needs-to-step-back-a-little-2>

in Pakistan's ties took place. Indians attributed the attack to the Jaish-e-Mohammad, a Pakistan-based organization. With the Indian government very inflamed, the Modi regime decided to launch several de-facto international border attacks in Kashmir on terrorist camps across the Line of Control at the end of September.<sup>187</sup> Similar attacks are suspected of having been carried out by previous regimes. However, shortly after these attacks took place on this opportunity, the government of Modi decided to make them public. Following these assaults, the regime has determined that the pursuit of a dialogue with Pakistan does not have much meaning. It is, in fact, clear in discussions with leading Indian foreign policy officials that the regime's favoured strategy is to strengthen relations with all South Asia, except Pakistan.<sup>188</sup> Only when Pakistan stops, continuing terror dependency will dialogue resume.

Meanwhile, because of India's strengthening links to Afghanistan, Pakistan's relationship is also fragmented. While well disposed of for India, former President Karzai (2004-2014) nevertheless tried to reconcile with Pakistan. After being rejected by Pakistan, the new Ashraf Ghani Government in Afghanistan turned more quickly to India, much to the Pakistani security institution's grief. Likewise, in seeking closer relations with Afghanistan and providing the country with military equipment, the government in Modi has shown fewer complications. It decided to deliver four Russian Mi-25 helicopter gunships in Afghanistan in late 2016. Although the extent of such transfers is limited, the Modi administration's willingness to proceed with them shows a subtle change in policy. Ironically, the United States now urge India to step up this assistance. For some time, India tried to stop offering material support to Afghanistan because of Pakistan's reported

concerns.<sup>189</sup> The policy changes introduced by the Modi regime are not simply cosmetic; they reflect significant policy shifts in many ways.



**Figure 1: Public opinion on the foreign policy of the Modi government in India.**

### The Outcome

Initially, all neighbours warmly accepted Modi's initiative 'neighbourhood first.' It has inspired the neighbours to hope that India will be easily accessible and friendlier, and more welcoming to its sensitivities and aspirations under Modi. Modi and his South Asian counterparts shown their bonhomie in May 2014 and indicated the start of a new period of cooperation and understanding in the region. It soon turned out, however, that this should not be the case. At most, Modi's initiative results are mixed, and the products with Pakistan and Nepal are the most misleading. The Indian Express wrote in its article on 3 November 2015 in solid criticism of the neighbourhood's policy:

Unfortunately, less than a year ago, Prime Minister Narendra Modi's first neighbourhood strategy was hailed as a bold breakthrough. Even to the most improper optimist, it is now clear that the product has not paid off... The Modi administration has demolished what it sees as PM Manmohan Singh's ineffective policies, but there is no significant push for financial links or strategic cooperation.<sup>190</sup>

<sup>187</sup> Ellen Barry and Salman Masood, "India Claims, 'Surgical Strikes' Across Line of Control in Kashmir," The New York Times, September 29, 2016, <https://www.nytimes.com/2016/09/30/world/asia/kashmir-india-pakistan.html>.

<sup>188</sup> Personal interview with senior Indian foreign policy official, Ministry of External Affairs, December 22, 2016.

<sup>189</sup> Josy Joseph, "US wants India to step up aid to Kabul," The Hindu, August 11, 2016, <http://www.thehindu.com/news/international/US-wants-India-to-step-up-aid-to-Kabul/article14562564.ece>.

<sup>190</sup> The Editorial was titled "Uneasy neighbours". Also see Archis Mohan, "Modi's foreign policy push trips in the neighbourhood", Business Standard, New Delhi, 01 November 2015.

The lesson here is straightforward. His international policy still lacks a script in all Modi's high-energy international performances. Mostly, the PM was happy to let foreign policy bureaucrats keep going down their predecessor's road. Simply put, the strategy of 'neighbourhood first' has not shocked India from the inertia of the government of UPA over the last years. Modi introduced fresh momentum without any dispute, even though it did not convert it into a real strategy. There appears to have been no real progress in India-Pakistan, although bilateral contacts continue at the highest levels. The Composite Bilateral Dialogue's resumption has accompanied several preparation and suspension and reprogramming periods, and the discussion itself has been called "Comprehensive Bilateral Dialogue." Informally, explicitly, and even via multilateral meetings, Foreign Secretaries, national defence advisors, foreign ministers and the Premier Ministry remained in contact. On 25 December 2015, Prime Minister Modi also visited Lahore in surprise, joining Premier Nawaz Sharif for one of his family duties, although such acts did not help. India insisted that Pakistan discuss cross-border terrorist attacks in the country after dropping its objections to talks between Pakistan and the separatist party, the Hurriyat Conference in Kashmir.<sup>191</sup> Pakistan has made India's attempts to restart dialogue, such as the Pathankot air force base in January 2016, complex by allowing fresh terrorist attacks to take place. Pakistan's slow movement on prosecuting 2008 (26/11) attacks against the Mumbai and Pathankot attacks (January 2016) makes India suspect the intention of Pakistan to deal with the issue of international terrorism.

The rock-bottom even impacted India's relations with Nepal. In addition to Nepal's cold reaction to the new constitution, India sponsored the Madhes and Janjati groups that were working against the new form. Such assistance resulted in an extreme destructive supply to Nepal, leading to unimaginable difficulties in getting cooking gas, petrol, medicinal items, and foodstuffs for ordinary Nepalis. In Kathmandu, therefore, Modi's effigies and the national flag of India were

<sup>191</sup> See for instance, the author's article in *Economic and Political Weekly* on "Ufa Fiasco", 05 September 2015.

burned. Nepal has tried and has reached unparalleled heights to internationalize its demonstrations against India's threat and its "intervention" in its internal affairs. India's goodwill during the visits of Modi and India's fast and generous response to the earthquake has evaporated for India in Nepal. In the February 2016 visit to India by Prime Minister Oli, attempts were made to monitor damage done to the constitution's question by Indian affirmative diplomacy. However, they seem to have done nothing to get China to counterbalance India; Nepal continues to hold India to account for its internal political disputes and governmental crises.<sup>192</sup>

Cooperation relations prevailed in most of the neighbouring countries without significant controversy. After Foreign Minister Sushma Swaraj visited the Maldives and President Yameen's visit to India, disagreements on Maldives' internal politics seemed to ease. It is, however, not entirely clear if India has dropped its concerns about the care of former President Nasheed's Yameen administration. Relations have remained smooth with Bhutan and Bangladesh, while Bangladesh awaits an agreement on the Teesta's waters. India and Afghanistan are looking after the change of Colombo's government and President Ghani's discontent with Pakistan about Afghanistan's peace process. In all these ties, however, no substantial progress has been made. They all cooperate strongly with the Chinese Road & Belt Initiative, which has not been favoured by India yet. India's hope for the Colombo Port City project, funded by China, was rejected, and the declaration of former President Chandrika Kumaratunga, in an event held in New Delhi, "China is an opportunity, not a threat," generated inevitable unrest in India's policy and strategic communities.<sup>193</sup>

SAARC maintains its slow speed at the regional level. In November 2016, Modi decided to visit Islamabad at the next summit, but there is no possibility of breaches of ties

<sup>192</sup> D. Muni "Nepal: Unfolding Internal Contradictions", ISAS Brief, No. 425, 11 May 2016. Institute of South Asian Studies, National University of Singapore, Singapore. Also see, S.D. Muni "No zero sums in this great game", *The Hindu*, 28 March 2016.

<sup>193</sup> Suhasini Haider, "India kicks off Raisina dialogue", *The Hindu*, 2 March 2016.

between India and Pakistan. There is no fair speed for regional connectivity projects. India's sub-regional initiatives also make no significant gains. In general, several of Modi's commitments to India's neighbours remain a matter for serious consideration. The 'neighbourhood first' campaign is dissipated in spirit and excitement. Whether and how it would be resurrected remains to be seen.

### Why Failures?

A variety of factors must be defined to fulfil the requirements of the initiative 'neighbourhood first.' The critical importance of five of them stands out. Second, serious homework, a cohesive plan and a realistic roadmap were missing in the initiative. It began as an idea and could develop its path. The Foreign Secretary-General, Sujata Singh, admitted that only three days were provided to organize visits by South Asian heads at an appointment ceremony for the Prime Minister. Only during two days of a discussion with the leaders of Indian missions established a holistic approach. As stated earlier, the '3C Mantra' of connectivity, culture and business took shape. This was not sufficient. It was essential to carefully identify and develop appropriate responses to radical political, socio-economic, and strategic changes in the neighbouring countries during the launch of a new policy initiative. Many responsible for implementing policies have taken a business as usual in dealing with Indian neighbours. This attitude of precedent and complacency dominated over a complex and sensitive approach. This led to ad hoc and reactive steps in the implementation of the policy. In several ways, this was obvious.

About Pakistan, it is necessary to look at the last-minute cancellation of the talks between foreign secretaries in August 2014 about Hurrian leaders visiting Pakistani diplomats. In India's official strategy, India's 'red line' against the Hurriyat was subsequently disappearing. Modi arranged a surprise visit to Lahore on a social occasion to welcome his counterpart Nawaz Sharif, but this proved little more than a dramatic gesture in broader policy terms. It proved to be a rather undiplomatic step to postpone the promulgation in Nepal of foreign secretary Dr Jaishankar's last rushing into Katmandu in September 2015 after it was

finally voted on Constituent Assembly. India's undeclared but knowingly designed limitations on the movement of vital goods from India to Nepal have exacerbated this situation. This aimed to oblige Kathmandu to comply with Madhes' demands for the new constitution in Nepal. But the undisclosed partial blockade was lifted before these requests were fulfilled. Prime Minister Modi's visit to the Maldives will also be cancelled at the last minute in the Knee jerk and ad hoc reactions group. These movements entailed high diplomatic costs and did not yield the desired results. In addition to alienating the interested neighbours, India had to resign from all these issues and endure humiliation. The second factor hindering smooth neighbourhood ties can be regarded as India's persistent foreign policy delivery deficit. Modi sought to simplify the processes of implementation and, in some ways, succeeded. But in many fields of commerce, investment and communication initiatives, the supply gap continues to suffer. Many sources cause the issue. India should invest in its neighbourhood policies, especially contrary to what China is prepared for and able to do since restrictions on economic capital. Different policy implementation bodies then discussed problems in teamwork. The most serious was the decision-making between the Prime Minister's Office and other ministers involved. At the time of the programme launch, the Ministry of Foreign Affairs was mainly on the fringes. After Dr Jaishankar was appointed Foreign Secretary, it has improved noticeably, but MEA, other Ministers, and Indian security agencies continue to have a problem of coordination. The most recent example of such a lack of communication in India was visas for Uighur rebel and Chinese dissidents given and cancelled for a meeting in Dharamsala in May 2016.<sup>194</sup> This lack of cooperation has further strengthened the role played in policy choices by intelligence services. Institutional arrangements have now been made in foreign policy fields to address the Federal States' position, particularly those neighbouring immediate neighbours. In India's approach to Bangladesh, for example, Western Bengal will continue to pose problems in practice with

<sup>194</sup> The Indian Express, 29 April 2016.

Teesta's water sharing issue and with Assam about illegal migration. Likewise, New Delhi cannot easily take in critical issues the new Tamil Nadu administration led by Jayalalitha. The political Agenda of BJP and its ruling organizations and many of its allies, particularly Rashtriya Sevak Sangh (RSS), its many allies and Maharashtra-based Shiv Sena, was Modi's 'neighbourhood first' initiative's third adverse factor. The explicit focus by the organizations on Hindu identity is not always consistent with the mentioned political objectives. It sends discomfort to those neighbours who have not primarily Hindu societies, both within the internal Indian political context and neighbouring countries. Opposition from the BJP to beef food and illegal migration specifically impacts Bangladesh. It has not done the parts of the establishment well except a Hindu nation in Nepal. In Pakistan's media and strategic culture, Shiv Sena has been firmly unwilling to oppose Pakistan's evaluation and the uncomfortable remarks of the BJP-leaders against Pakistan to deride Indian Muslims during electoral campaigns. In line with its political agenda, BJP delegations and messengers are periodically sent to the neighbouring countries. India's governing party's successful implementation of its political plan raised fears and anxieties among the neighbouring countries, making them suspect the real intention of the 'neighbourhood initiative' of Modi.

To suppose that India is the sole judge of its close ties would be unreasonable. These relations are formed by neighbours who are identical and conclusive. In nearly all the neighbouring countries, India has long been a crucial factor in the domestic shift, power struggles and political equations. India's position as an internally polarised and divisive factor has developed further during these countries' radical transformations. Thus, in those nations, the degree to which India's close ties are to be forged is not a sustainable national consensus. In the initiatives of Modi's 'neighbourhood first,' the implications of this internal divide fuelled by India in the neighbouring nations were very evident. Pakistan's civil-military division has not only blocked any significant progress in putting

cross-border terrorist guilty parties on record against India, but it has also vitiated India's efforts to revive dialogue and encourage regional connectivity projects. Domestic political divisions in Nepal on Madhes' and oppressed groups' Constitutional Account and the structures to share power have made India simple for the unfortunate governing elites and the stakeholders concerned. Even the new Sirisena government of Sri Lanka was not able, owing to the discarded opposition of the Rajapaksha party and the unresolved Tamil issue, to speed up the consolidation of cooperation with India. The rivalry between the Yameen regime and former President Nasheed has previously been noted about India. In Afghanistan, he had a very uneasy view of India, as President Ghani first viewed India as a supporter of Abdullah. That changed after that. The deepening polarization between the ruling Awami League, the Bangladesh Nationalist Party and the Islamist Jamat-e-Islami opposition, also in Bangladesh, is perhaps not a good long-term development for India.

Finally, the rivalry from China is one factor that affected Modi's 'neighbourhood first' initiative. China is pushing South Asia strongly for its own political and economic reasons.<sup>195</sup> This is how it has manipulated the degrees of alienation between India and its neighbours through its support for India's independence and sovereignty, and through its Belt and Road Initiative (BRI) initiatives, generous economic and infra-structure support. China has also worked systematically for support and understanding among the different political groups of each of these countries in ensuring that its increasing presence in the region continues to be supported. South Asia has generally been optimistic in its view of a growing China.<sup>196</sup> They all want active Chinese involvement in SAARC, except India. They all also decided to join China's BRI without the need to align their projects with China's goals. China's economic and political support for

<sup>195</sup> For a brief discussion of the drivers of India's South Asia policy, see S.D. Muni, "China and South Asia", THE SARCist, Online magazine, Centre for Policy Research, New Delhi, 14 March 2016.

<sup>196</sup> D. Muni and Tan Tai Yong, Resurgent China: South Asian Perspectives, Routledge India, New Delhi 2012.

India's neighbouring countries in South Asia has strengthened the confidence of all these countries in negotiating with India in the interests of their political and economic interests. Recall the use of the "China card" in Nepal by the Oli regime against India's financial troubles and constitutional pressures. Nepal has been celebrated as a significant nationalist achievement in securing an alternative transport route through a railroad connection to China in March 2016.<sup>197</sup> In the disputed and occupied area of Kashmir, under China's Pakistan Economic Corridor (BRI projects linked to more than \$40 billion), Pakistan enabled China to undertake projects. In the light of China's refusal to either stop the program or even dramatically redefine its core parameters, Sri Lanka has not wholly addressed India's concerns about the "Colombo port city" project. The Indian government in the Maldives had to negotiate with the Yameen government to ensure that unfavourable terms of the land rental were not given to China to construct the several Maldives' islands. But Chinese financial presence and military cooperation with Bangladesh are increasing. Bangladesh refrained from committing itself to expanding its Sonadia port.<sup>198</sup> China is also Afghanistan's political partner and the leading partner in its quest to resolve the Taliban's mediated internal conflict. It seems unmistakable that India finds it difficult to deal with this 'pressure' from China in the region. The Chinese "pressure" certainly took away the sight of Modi's "neighbourhood first" initiative.

### Previous related research

**Priya Chacko(2014)** In, India's foreign policy debate, the Indo-Pacific notion started to emerge. This article argues that the way Indo-Pacific was perceived by the Indian leadership rather than signalling radical shifts in Indian

foreign policy indicates considerable stability and transition that is counter to the aims of the most fervent proponents of the Indian idea. The article aims at creating a structure for understanding change of ideas and foreign policy continuity by theorizing the interaction between thoughts, political and financial flows and social expectations relating to effective and legitimate state-building. It is argued that, because of rising flows and trade and production and export linkages, the Indo-Pacific definition has provided new importance to regional construction to handle the continuing regionalization between the Indian and Pacific Oceans. However, the Indo-Pacific definition has been expressed in ways that also consistent with long-standing ideas – such as non-alignment – concerning the proper foreign behaviour, such as the new regional engagement ideas that preceded it—the East-Look and the 'enlarged neighbourhood.' This reflects the essence of a larger state project since 1990, which continues to prioritize old ideas as to what constitutes successful and legitimate state-building and includes a new emphasis on economic development and competitiveness, which is central to a compelling government building.<sup>199</sup>

**Pawan Mathur (2014)** The latest election results have seen an unparalleled win by the National Democratic Alliance, Narendra Modi's leading Bhartiya Janata Party (BJP). It is now time to reflect upon the new government's goals with all the euphoria of the victorious celebrations. One of Modi's outgoing UPA's significant complaints during his vigorous electoral campaign is that he is pursuing a timid foreign policy<sup>1</sup> and that neighbouring country, including Pakistan and China, continue to behave in terror infiltration and land capture. The institutional and ideological basis for Indian foreign policy and the continuing bureaucracy means continuity in many areas. Still, changes to a few fronts by the government of Modi should be made. A complete intolerance of Pakistan's militants and a warm partnership with smaller neighbours,

<sup>197</sup> D. Muni "No zero sums in this great game", The Hindu, 28 March 2016. Also see, Shannon Tiezzi, "In China Nepal's PM Seeks Alternatives to India", The Diplomat, 23 March 2016. <http://thediplomat.com/2016/03/in-china-nepals-pm-seeks-alternative-toindia/> Accessed on 15 April 2016

<sup>198</sup> "India 'watching' Chinese defence minister's Dhaka visit closely", bdnews24.com, <http://bdnews24.com/bangladesh/2016/05/24/india-watching-chinese-defence-minister-sdhaka-visit-closely> Accessed on 24 May 2016.

<sup>199</sup> Chacko, P. (2014). The rise of the Indo-Pacific: understanding ideational change and continuity in India's foreign policy. *Australian Journal of International Affairs*, 68(4), 433-452.

such as Bangladesh, Nepal, and Sri Lanka, should be accorded prime priority.<sup>200</sup>

**Pinak Ranjan Chakravarty (2014)** After the early economic reforms of 1991, India's foreign policy has begun to draw renewed global interest. With strong growth rates over the last two decades – on average almost 7.5 per cent, but in the last two years, Indian foreign trade has dropped to 5 per cent. More than 50% of its GDP now contributes, as opposed to roughly 3% Before that, India is the third-largest economy in the world after the PPP. The United States of America and China. The rising international profile of India has, of course led to questions on the position of India in regional activities and globally. The world expects India to play a more significant role, Compatible with its increasing size and power. The query therefore India's view and foreign evaluation have emerged. The position and essence of its global involvement. This has contributed to a phase. Changing consensus and nuancing the thought and thinking of India in foreign policy Targets.<sup>201</sup>

**Amitendu Palit (2015)** The critical drivers of Modi's foreign policy, as this paper points out, are incorporated into the goals of domestic economic growth and Indian economic expansion. These drivers' primary purpose is to promote India's economic turnaround and improve its competitive advantages for expanding India's share of global production over time in many vital industries. The paper highlights the value of Modi's Make in India's flagship initiative to turn the Indian industry into a global hub. Modi's efforts to rectify India's supply – aside from shortcomings, especially its limited access to electricity, are also analyzed. It also argued that building nuclear power capacity was a significant target for Modi's external expansion.

The Diaspora is another primary driver of Modi's external involvement. The BJP's close connections to the Indian community in overseas countries and its political and financial benefits are a "natural" engagement.

The paper shows the Diaspora's multiple meaning, which includes strengthening India's global reputation and drawing more strategic advantages from bilateral ties with the host countries in the Diaspora. Modi's strategy for making India an active member of major regional and economic groups is a final engine described in the paper. Taking APEC as an example, it argues that formal entry into the APECs should make it possible for India not to be left outside of the region's development history but to become a significant shift in its trade and economic structure.<sup>202</sup>

**Angana Das (2016)** The paper analyses India's neighbourhood policy and seeks to draw essential conclusions from India's recent attempts to achieve peace in South Asia. The immediate vicinity of India refers to this analysis. Prime Minister Narendra Modi and the SAARC Member States Policy stressed the priority policy 'neighbourhood first.' Reinforcement of ties between India and its immediate neighbours. This paper follows developments in Indian Neighbourhood Policy. Years and studies various leaders' methods. The renovation the impetus for India's Narendra area neighbourhood the government headed by Modi has been thoroughly discussed. India is said to be Neighbourhood recent practises such as bilateral relations strengthening, diplomatic ties. Commitments, sub-regionalism, continuity, and transition components and there to maintain peace in the region, applicability made a significant impact. Area. Region. The complex regional dynamics that India must deal with Nepal and Pakistan are roadblocks for coherent implementation. Politics of neighbourhood teased out. The paper presents new perspectives. integration and provides a set of guidelines for sustainable participation to establish peace in the area between India and its neighbours.<sup>203</sup>

**Tobias Schumacher (2016)** Ties between the EU and its southern and eastern neighbours have never received as much attention as they have in recent years. The outbreak of what was prematurely dubbed the "Arab Spring" in early

<sup>200</sup>Mathur, P. (2014). What Should the New Indian Government's Foreign Policy towards Neighbours look like?

<sup>201</sup>Chakravarty, P. R. (2014). India's Foreign Policy in the Neighbourhood. *Indian Foreign Affairs Journal*, 9(2), 142

<sup>202</sup>Palit, A. (2015). Mega-RTAs and LDCs: Trade is not for the poor. *Geoforum*, 58, 23-26.

<sup>203</sup>Das, A. (2016). India's neighbourhood policy: Challenges and prospects. *Jindal Journal of International Affairs*, 4(1), 1837.



2011, the fall of supposedly consolidated autocratic regimes in Tunisia, Egypt, and Libya, the eruption and continuation of Syria's civil war, the emergence of the Islamic State of Iraq and the Levant (ISIL/Daesh), the military coup of 3 July 2013 in Egypt, which resulted in the ousting of Egypt's first democratically elected civilian government, Together with the continuing effects of the financial and economic crisis, which have impacted both EU countries and European Neighbourhood Policy (ENP) partner countries in the EU's neighbourhood, and the persistence and re-emergence of "stubborn authoritarianism," these developments had exposed the EU's ENP to problems that were unprecedented when it was first introduced in 2003. Parallel to this, the accession of Central and Eastern European countries to the EU in 2004 and 2007, Croatia's accession to the EU in 2013, the entry into force of the Lisbon Treaty, and thus the establishment of the European Foreign Action Service (EEAS), have altered the EU and EU foreign policymaking towards the neighbourhood from within.<sup>204</sup>

**S D Muni (2017)** With the 'neighbourhood first' plan, Premier Modi introduced his foreign policy. On 26 May 2014, he invited all the neighbouring countries' leaders to his ceremony of swearing-in the environment was built for regional cooperation and harmony with Modi's one-on-one discussion with other leaders in South Asia Promises geographic and cooperative synergies. Before we look at the "neighbourhood" of Modi first the initiative would be helpful to outline the neighbourhood of India briefly Politics.<sup>205</sup>

**Bibek Chand (2017)** Indian Premier Narendra Modi has begun to redirect Indian foreign policy after the 2014 general elections. Titled the neighbourhood's First strategy, Modi tried to establish closer relations with its neighbours in South Asia. Given China's growing interest in the region, Modi's focus on the neighbourhood highlights India's attempt to

secure itself as South Asia's main force. In the sense of IndoNepalese ties, this paper aims to examine this strategy. The will of both States to expand their influence in material aid and rebuilding aid have been seen since the 2015 earthquake that destroyed significant areas in central Nepal, India, and China. The launch in 2015 of Nepal's new constitution, which India considered not including minority groupings who share substantial socio-cultural links with India, recently undermined Indo-Nepalese ties. While recent Nepal openings have caused primary links to be brokered, China still plays a significant role in Indo-Nepalese relations. The paper has used Indian and Chinese relief data after the Earthquake in Nepal, investments in Nepal, and the Beijing and New Delhi rhetoric about Kathmandu since 2015. It will examine how China plays a vital role in India's first neighbourhood policy in Nepal, particularly during critical junctures such as the 2015 Nepal Earthquake, its lull relations in Indo-Nepalese countries the same year, and Nepal's accession to the One Belt, the One Road Initiative in China.<sup>206</sup>

**Thorsten Wojczewski (2019)** Today, a worldwide upsurge of populism is rising. Leaders and parties of the right-wing populist parties claim to serve the people and condemn a "corrupt" elite and "dangerous" other. Global, however, Populism dimensions are still largely unknown and the literature on foreign affairs (IR). Through evaluating the link this article aims to demonstrate how the between foreign policy and populism. Populism phenomena can be incorporated into IR and IR theory. Scientific studies can inform populism debates. The article says the post-structuralist IR, based on the border drawing of foreign policy activity that distinguishes the Self from the Other enables us to study how Conservative actors may use an international policy to replicate. Their claim to be people's representatives. The article describes this to explain various discursive tactics that the antagonism between citizens and elite Can be designed and communicate with other antagonisms like the inside/ External nationalism divide. He reveals his points in one

<sup>204</sup>Schumacher, T. (2016). *Back to the Future: The New ENP towards the Southern Neighbourhood and the End of Ambition*. Bruges: College of Europe.

<sup>205</sup>Muni, S. D. (2017). Modi's 'Neighbourhood First' Initiative. In *MODI AND THE WORLD: (RE) CONSTRUCTING INDIAN FOREIGN POLICY* (pp. 117-137).

<sup>206</sup>Chand, B. (2017). Paper Title: Assessing Modi's Neighborhood First Policy: The China Factor in Indo-Nepalese Relations.

case. Analysis of India's Hindu nationalist foreign policy discourse Narendra Modi, who vowed that the corrupt elite would purify India and follow the strategy of "India first."<sup>207</sup>

**Karun Kishor Karki (2020)** Taking the historical narratives of the whole relation between Nepal and India as a basis of shared respect for each other's sovereignty as a starting point, we consider the weaknesses of a single uncritical expression, which not only risks stereotyping but leaves it unfinished and misleading. While the roots of the modern nation-state have pre-empted several aspects of Nepal-India relations, any historical discourse, which in these relations downplays realpolitik, leaves unknown the story about India being a hegemon that interferes in Nepal's internal affairs and obstructs Nepal's social, economic, and political development. We give a neo-colonial snapshot of how India has violated Nepal's sovereignty and freedom and how it has violated it.<sup>208</sup>

### Conclusion

Modi's project 'first neighbourhood' is a little over two years old. Writing your obituary would be cruel and premature. However, a significantly lower degree of power and dynamism than planned initially is more likely to function. Their impetus can only be restored by providing them with sufficient economic tools and policy preparation that fully respond to shifting political and strategic conditions in each of their neighbours. Modi needs to ensure that the plan does not conflict with his political agenda and its various influential constituencies. Serious efforts are also required to dramatically reduce India's foreign policy "delivery gap," which can be easier said than done. Modi's job cannot be made more accessible with the return of unique and better governments headed by non-BJP parties under influential leaders in border states such as Bihar, West Bengal, and Tamil Nadu. India's diplomatic institutions will need to show greater sensibility and resilience towards the

increasing ambitions and identities of neighbourhood power structures and greater resolve and ingenuity in tackling the challenge faced by China to succeed in this neighbourhood first initiative.

The 2014 General Elections saw a shift in leadership as well as some state-level factors such as governing elite ideology. However, most state-level factors stayed unchanged. In the same way, there was no significant change in the systemic factors. In the absence of significant changes in state and systemic factors, Modi's leadership style distinguishes the Modi government's foreign policy. India's foreign policy has shifted from being reactive to proactive under his leadership. As per Rajiv Bhatia, a former diplomat, proactive foreign policy is marked by "re-prioritization, focus, and subtlety, sharper communication, strategic daring, verve, and activity." He brought India and the United States closer together. In terms of soft power, he has placed a strong emphasis on culture and direct ties to the diaspora. These changes are significant, but not significant enough to be considered a big shift. On the other hand, democracy promotion has barely made any progress. The issue continues in India's reaction to the worldwide power transfer, as it did previously. In terms of the neighbourhood, the Act East Policy and the Neighbourhood First Policy have yet to provide any significant results. The development of Indian foreign policy demonstrates how changes in the international system led to changes in strategy. In the 1990s, India chose 'strategic autonomy' as its chosen approach in reaction to the unipolar world order. By the end of the 20th century, as various power centres began to develop (at least India's policymakers realised this), a consensus arose on the necessity for a new approach. Thus, the transition in the international order from unipolarity to an era of power decentralisation has paved way for 'strategic partnership.' Strategic autonomy. Following the strategic partnership line and the multiple alignment of the Vajpayee Government, the Manmohan Singh administration has brought the strategic partnerships of India to a new level, with over fifteen of the first twenty-seven agreements inked. According to the tradition, new strategic cooperation agreements with Mongolia,

<sup>207</sup>Wojczewski, T. (2019). Identity and world order in India's post-Cold War foreign policy discourse. *Third World Quarterly*, 40(1), 180-198.

<sup>208</sup>Karki, K. K., & Hari, K. C. (2020). Nepal-India Relations: Beyond Realist and Liberal Theoretical Prisms. *Journal of International Affairs*, 3(1), 84-102.

Singapore, the UAE, and Rwanda have been inked by the Modi Government. No change,

actual or perceived, in systemic factors has taken place since Modi took power.

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**BIOMEDICAL SENSOR AND ITS IMPLICATION TO PHYSICS AND ITS SUBDOMAIN****Dr. S V G V A Prasad**

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**ABSTRACT**

Sensors are being used more and more in the world to improve human lives by delivering information and innovative techniques in medical science for diagnostics and healthcare. Because of their admirable operation capability, Physical sensors devices have been effectively shown admirable operation capability in the field of biomedical sensing technologies. Sensors are the device which is used in physical sensors for sensing physical properties like mass & energy, light, magnetic field, flow, heat, pressure, etc. and turn them into signals for quantification. Bio-sensor discipline has evolved into a multidisciplinary research area that connects basic science concepts & theories of physics for developing biomedical sensors. To understand the structural and functional properties of particles and their effect on the body, physics-based tools and approaches are enormously helpful. For example, Electromagnetic radiation is used in X-ray crystallography to generate wavelengths that can create 3D detailed viral structures. This paper discusses the subdomain of physics and its use in biosensors applied in medical technologies.

**Keywords:** Electromagnetic radiation, 3D, X-ray crystallography

**Introduction**

The living organism's body parts function in a certain way to understand this function accurately Physics tools and theories have been used. . This domain is named biophysics. This paper aims to discuss the role of physics in the biomedical sensor. At present time the biomedical field has made a lot of progress in quantification and revealing the Nanoscale structure. It has been possible because of bio-sensing technologies. A physical domain like mechanical magnetic electrical mechanical thermal is connected with biomedical technologies for monitoring and sensing. Torsion, temperature, pressure, and humidity are the elements of natural physics which is used as the principal for the physical sensor. [1]

Sensors play a significant role in all devices and measuring systems. They've been employed in a variety of sectors, including science, health, automated production, and environmental monitoring. Some inexpensive sensors are making their way into a wide range of consumer devices, including children's toys, dishwashers, and automobiles. Sensors are multidisciplinary in certain ways.[2]

There has been a growing effort to build sensing devices with enduring stability, high optical translucency, and enhanced sensitivity, mostly with platforms that are suited for certain sensing platforms. The use of materials such as

superconductors, Nanophase materials, optical fibres, and semiconductor microfabrication technology has ensured the success of the project. Sensors have been devised and implemented for biomedical applications using a variety of flexible materials and substrates that give a good surface for a variety of topologies and geometries. Flexible physical sensors are particularly appealing because of their exceptional capacity of reshaped, optical translucence, ductility, and compliance.[3]

Biological sensors are electronic devices that can convert biomedical signals into electrical signals that may be monitored. Biomedical sensors are used in a variety of medical diagnostic devices and equipment. Biomedical sensing technology research is mostly focused on how to better biological processes and technology for medical diagnosis and treatment.

**Materials and Methods****Characteristic of Sensor**

Sensors are a device that transforms the variation (quantity or a parameter) into an information signal. The signal's nature can be: electrical, optical, mechanical. Sensors are usually categorized based on the quantity being measured:

- **Mechanical quantities:** It can be position, force, acceleration flow rate, displacement, rpm, pressure, acoustic waves, etc.

- **Radiation intensity:** It could be electromagnetic, nuclear, etc.
- **Chemical quantities:** concentration of humidity, gas components, ions, etc.
- **Thermal quantities:** temperature, flow, heat, etc.
- **Biological quantities:** concentration of enzyme substrates, antigens, antibodies, etc.

### Technologies in the sensor.

- Optical fibre technologies
- Ceramics
- Thin-Film and thick-film technologies
- Monolithic semiconductor processing
- Polymer film techniques

### Optical fibre technologies

A light source, optical fibre, external and photodetector are all components of optical fibre sensors. They detect changes in one or more of the effects of light that are channelled internally in the fibre, such as intensity, wavelength, or polarization. An external displacement created by the physical parameter to be monitored causes the modulation in a direct and reproducible manner. Changes in the light attribute are used to infer the measure of interest.

Fibre-optic sensors may be internal or external. The light never leaves the fibre in an internal sensor, and the parameter of concentration influences the quality of light by moving through the fibre by acting directly on it. The disturbance works on transduction in an external sensor, and the optical fibre merely transports light to and from the sensing point.

The temperature of the body, BP, and displacement in muscles are just a few of the physiological data measured by physical sensors. Imaging sensors include devices for internal observation and imaging, also more modern techniques like OCT (optical coherence tomography) and photoacoustic imaging, which allow for noninvasive internal scanning and visualization. Biological sensors are more complicated, relying on biologic recognition reactions to discover and monitor specific biochemical substances of concern, such as enzymatic, antibodies, or ligand-receptor.[4]

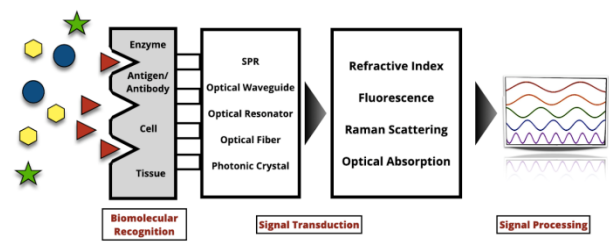


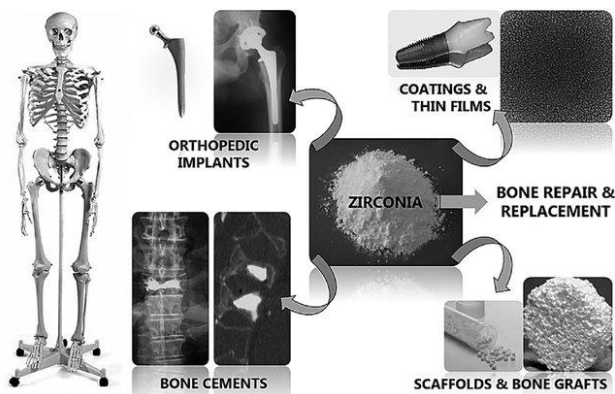
Fig 1: Optical fibre technologies [5]

### Ceramics

Ceramic materials are non-metallic, inorganic materials formed from metal and non-metal combinations. Ceramics are extremely durable, capable of resisting tremendous pressures, temperatures, nuclear radiation, and extremely toxic substances. Polycrystalline ceramics typically have a complicated microstructure. The presence of grain boundaries distinguishes it from a single crystal. Additionally, the presence of pores and flaws, as well as the multiphase composition, allow for the creation of a wide range of properties. A fusing technique is used to make ceramics from powdered basic materials. This method produces polycrystalline ceramics, which are an aggregation of fine crystalline grains with grain boundaries. The fusion process has a significant impact on chemical and physical properties.

“Ceramics are used in hip and knee replacements, as well as dental restorations, according to Roger Narayan, professor at the University Of North Carolina Department Of Biomedical Engineering”. Advantage of Ceramics in manufacture in sensors:

- Discrete, low-cost parts can be mass-produced in large batches.
- It is possible to process a wide range of materials.
- There's no need for complicated procedures.



**Fig 2: Use of Ceramic in the human body[6]**

### Thin-film and Thick-film technologies

These technologies are used for integrated circuit and micro-sensor processing methods. The notable differences among these two technologies are in the layer thickness, applied materials, and manufacturing procedure. Physical deposition methods & chemical methods are used for preparing Fabrication technologies of thin films. Screen printing and high-temperature firing/curing are the most common methods for producing thick films. The thin film functions as a physicochemical-optical, magnetic, electrical, and mechanical converting the signal generated by the biological component into another measurable signal.

The thick film technique is well-known for its widespread application in the manufacture of electrical circuits. It's usually done by screen-printing and firing different types of pastes having various compositions and electrical properties at various temperatures. Planar solid-state biosensors can be mass-produced because of the use of thick-film technology. Because of the huge surface area generated by the microporous structure, the devices have good reliability and strong electrochemical activity. There are an extensive variety of techniques for the deposition of materials, including casting, dipping, dropping, spinning, fluidized-bed coating, roller coating spray-coating brushing, and ink-jet printing.[7][8]

### Monolithic semiconductor processing:

Microcircuit manufacture is formulated on compound semiconductors & silicon, mainly Gas. The monolithic micro fabricating procedure involves materials like silicon probes, PEDOT which are used for revealing neural activity. Measurement of voltammetry

in glucose and oxygen concentration can be done through the monolithic smart sensor.

In semiconductor microsensors, silicon material is dominant. The diamond structure of single-crystal silicon possesses a cubic shape. Three indications are used to represent the various directions in the structure. The arrangement of silicon can be affected by its properties they are: electrical, chemical, & mechanical. The distinguishing feature of silicon sensors is that they have a higher reaction to frequency changes. The substrates for these semiconducting sensors are made of single-crystal silicon. The silicon sensors have been used for human bio-signals like heartbeats blood flow, stem cell research, and pulse rate. [9]

### Polymer structure

Scientists have been particularly interested in polymeric materials because they can modify them physically or chemically, such as by changing pH, modifying biologically active compounds, or adding functional groups. Controlled synthesis and recent advancements in these polymeric materials enable the fabrication of new chemical and rational designs of bio-sensor systems. The most frequent method for producing thin polymer films is polymerization precisely on sensor surfaces. Because the synthesis and shaping processes take place on the sensor surface, technologies that work with inorganic sensor parts are required. For photolithography, polymers like photosensitive are broadly used in integrated circuits as photo-resists. For shaping sensor polymer films, photolithography can be used.

Photosensitive polymers have a distinct processing advantage: under UV light, polymerization & shaping can both take place simultaneously. Photosensitive polymers have the advantage of being simple to use on an integrated circuit or micro-sensor fabrication. Polymers are generally found in form of self-assembled Nano-particle solutions, gels, films, or solids so that they can be utilized for drug and gene delivery, catalysis, detection, and imaging & self-repairing.

## Literature Survey

[1] The study is done on the various physical sensors utilization in the biomedical field. The researcher mentioned in his study Blood pressure, muscle displacement, blood flow, core/external body temperature, bone development, and cerebrospinal fluid pressure measurements as examples of physical sensors utilized in biomedical applications. Optical sensors are the most common kind of physical sensors utilized in biomedical applications. The researcher also mentions the future of development in the same field. [10].

[2] This article discusses the role of physics methods and tools in fighting covid 19. Discusses the four technologies they are: X-Ray Crystallography, Cryo-Electron Microscopy, CT-Scans. The article discusses the X-Ray Crystallography method used to be slow but with the application of automation, fast computing, and X-rays .structure may now be obtained quickly. Cryo-Electron Microscopy is used to understand the structure of SARS-CoV-2. This electron microscopy technique uses materials that have been cooled to extremely low temperatures. CT Scans employ a narrow beam of x-rays that revolve around the patient to generate sectional images of the living organism, generate a 3D representation, and provide every tiny detail of the patient. [11].

[3] This article reviews the modern technologies in the field of medical science which includes the latest development in laser and Nanotechnology (disciplines of physics). This paper discusses the LIBS technology which is very powerful in detecting microorganisms and human body specimens. It was used in the diagnosis and classification of liver cancer. The article mentioned In LLNM, new short-wavelength laser lines have been discovered, which are crucial for the development of X-ray lasers that will have a significant influence on medical sciences and applications. [12]

## Observations/Results

### Impact of physics in bio-medical filed.

Physics principles & theories application in medicine or health care is known as medical physics. In this filed physics knowledge and method is used for the development of

instruments and techniques that will help medical filed to grow further. Radiation oncology, diagnostic radiology, medical imaging, and nuclear medicine are few branches of medical physics. Although they overlap each other repeatedly.

### Radiation oncology or Radiation physics

A physicist in a radiation oncology program gives a unique perspective to the clinical team: a scientist who is trained in physics, as well as in radiological physics, fundamental medical, and radiobiological sciences. The Radiation Physics department seeks to provide an arena for medical physics research and radiation oncology applications. This incorporates breakthroughs in the use of physical sciences in radiation oncology, covering a wide range of topics such as enhanced beam delivery and imaging, dosimetry, computation, and data processing.[12]

### Diagnostic Radiology

Understanding the physics of medical imaging and radiation protection requires an understanding of the atom structure, nuclear physics, the nature of electromagnetic radiation, and the creation of x rays. Radiology is the practice of using images to create and evaluate circumstances within the human body. An image is a physical object with defined physical properties that are based on physics. It is the point where the fields of physics and clinical medicine collide.[12][13]

### Nuclear medicine & Medical imaging

Medical imaging is concerned with Creating images of the internal structure or condition of living beings inside the body, diagnose structural and biological problems using intra-operative ways Techniques used for medical imaging are Radiography, MRI, Ultrasound. Nuclear medicine research and development-including the types of radiopharmaceuticals employed for creating, image acquisition and analysis methods, and the potential to treat disease with radio-nuclides, resulting in important advancements for the profession. Nuclear Medicine arose as a result of developments in physics, bringing the subject of medicine as a specialization based on

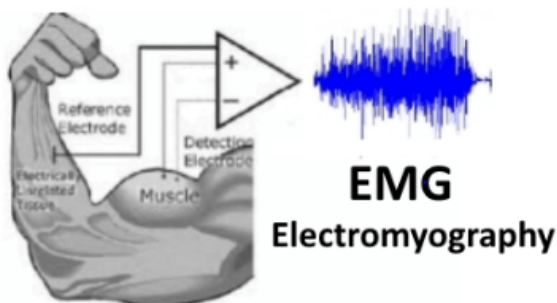
physical science and technological innovation.[14][15]

**Type of Biomedical sensor and their function**

Biomedical sensors detect certain biological, chemical, or physical processes and then report the data. These sensors can also be found in systems that handle clinical samples, such as lab-on-a-chip devices, which are becoming increasingly popular. During the design, production, and usage of some biomedical sensors, the packaging is a crucial factor. Because biomedical sensors frequently touch the human skin or interior organs of patients, they must be safe, gentle, and trustworthy.[16]

**EMG Sensor Electromyography (EMG)**

This sensor is an electrodiagnostic medicine technology for measuring and recording skeletal muscle electrical impulses. Many clinical and biological applications rely on EMG signals. When muscle cells are electrically or neurologically active, electromyography monitors the electric potential created by these cells.



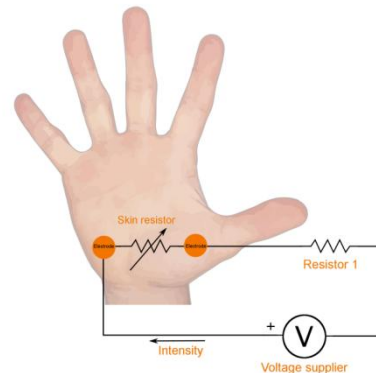
**Fig 3: EMG Sensor Electromyography[16]**

**Function:** The function start from the brain, Neural activity pass signals to the spinal cord, then that signal passes on to muscular parts of the body through motor neurons, these neurons stimulate the muscles directly because of the release of the calcium in muscles which creates mechanical change in the body and this change involves an electromechanical rise in the body which is detected by EMG

**GSR Sensor**

GSR acronym for galvanic skin response which reacts to variations in sweat gland action

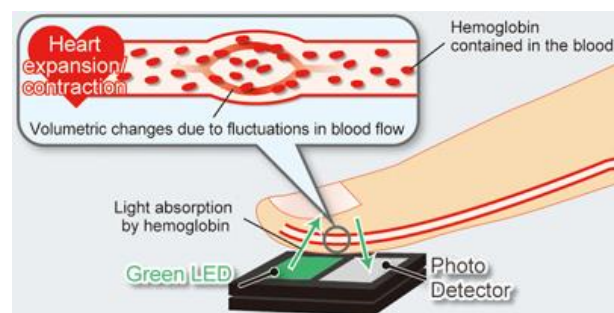
that reflect the intensity of our emotional status, also known as emotional arousal. Because sensitivity is not under our conscious control, it provides full observations into autonomous emotional regulation.



**Fig 4: GSR sensor [17]**

**Function:**GSR sensor is used for tracking sweat gland activity, which is correlated with emotional stimulation. The electrical properties of the skin are used to determine through GSR. In particular, how skin resistance fluctuates with sweat gland activity, the higher the sweat gland activity, the more moisture in the skin thus lower the skin resistance.

**Heart Rate Sensors:** Pulse waves, or changes in the volume of a blood artery caused by the heart pumping blood, are measured by an optical heart rate sensor. An optical sensor and a green LED are used to detect pulse waves by monitoring volume changes.



**Fig 5: [18] Heart rate sensor**

**Function:** The heart rate sensor uses an optical LED sensor to determine your heart rate in BPM. The light passes through the skin, and the sensor detects how much is reflected. As blood beats underneath your skin and passes through the light, the reflections will change. Heartbeats are seen as fluctuations in light reflections.



### Conclusion

Science plays a very substantial role in the development of technologies. Branches of physics are employed in the development or application of sensors in the biomedical field. Sensors are used in X-rays, ultrasonography, MRI, etc. but due to advancement in every field reduction in the size of the sensor is in demand. The fundamental benefit of

constructing microelectronics is their tiny size, which allows multiple sensors on a single chip to be combined with microfluidic systems. By doing analytical study it can be said that Methods of physics have been used to see every minute element of live organisms without the need for anatomical dissection, which is a great support in the field of medical science for treating living beings.

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## SUSTAINABILITY OF SCHOOL IMPROVEMENT PLAN AND THE SCHOOL-BASED MANAGEMENT PRACTICES OF PUBLIC ELEMENTARY SCHOOL ADMINISTRATORS IN CENTRAL MINDANAO

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### ABSTRACT

*This study was conducted to determine the sustainability of the school improvement plan (SIP) and the influence of school-based management practices of school administrators of public elementary schools in Central Mindanao.*

*The study also used qualitative and quantitative types of research. There were two hundred (200) school administrators who participated in this study. The gathered data had been analyzed using the SPSS version 7.1. Statistical tools were utilized to analyze the mean, grand mean, and regression.*

*The result revealed that school administrators had demonstrated highly school-based management practices in public elementary schools with highly sustained school improvement plans (SIP).*

*SIP's sustainability has been linked to strong management practices in leadership and governance, curriculum and instruction, accountability, and resource management. The school-based management practices substantially contributed and were the best predictors of the School Improvement Plan's sustainability (SIP).*

*Therefore, it is recommended that the school administrators sustain the good display of such School-Based Management (SBM) Practices for the sustainability of School Improvement Plan (SIP) to achieve the VMGO of the public elementary schools. A monitoring strategy should also be employed to strengthen and improve the quality of education that covers ways and means of management practices of school administrators in Central Mindanao.*

**Keywords:** *School Improvement Plan, Sustainability, School Administrators, Management Practices, Public Elementary*

### Introduction

Education is critical for improving human life quality and ensuring social, economic prosperity. It cultivates human capital and strengthens individual and national capability and the awareness necessary for a meaningful and productive individual and social existence (Todaro and Smith, 2007). It implies that education can have beneficial effects and influences and should thus be given priority at all times.

In addition, education has undergone paradigm shifts and innovations to address the accumulating educational difficulties at various levels of education about educational relevance and quality. According to Burke (2005), as referenced by Salendab (2014), the educational system has experienced numerous paradigm modifications to successfully adapt to the requirements of students, particularly those in the global market.

In order to improve educational quality, the Philippines' most recent educational system has prioritized restructuring the educational system, changing the curriculum to make education more relevant to society's problems, revamping teacher training, and improving

educational management, with a special focus on school administrators (DepEd, 2007).

This appeals to educators, particularly school administrators, to enhance their educational tactics and approaches to meet their institution's goals. Additionally, school administrators should be knowledgeable about the school improvement program to meet the demands of stakeholders. Thus, school administrators are essential.

On the other hand, the school improvement plan focuses on enhancing the school's capacity to provide a high-quality education by putting a premium on student learning. Reynolds (2010) defines a school improvement plan as a collection of controlled processes aimed at both student accomplishment and the school's ability to manage change.

In the Philippines, school improvement plans fall under the umbrella of School-Based-Management, whose principal objective is to adopt decision-making processes from the central level to individual schools to build effective schools by equipping school heads with administrative experience. Glickman (2010), on the other hand, asserts that certain school heads lack managerial abilities; hence, they must emphasize their managerial abilities

through seminars and training. A school or educational institution's performance is contingent upon a school head who can focus the school on ongoing improvement. This indicates that the school's performance is highly dependent on the administrators' skills. Thus, it is vital to evaluate management strategies to contribute to the school development plan's sustainability (SIP).

Further, the school improvement plan seeks to strengthen community partnerships. According to the Ministry of Education (2010), the SIP increases community engagement in resource allocation decisions and resource development and improves the learning environment by giving adequate resources to schools. Lontayo (2007), on the other hand, emphasizes that the effectiveness of a school improvement plan is highly dependent on how school administrators manage finances and other school resources contained in the SIP. It implies that a closer examination of this subject is necessary, as it may contribute to the effective and sustainable implementation of a school reform plan (SIP).

In addition, the school improvement plan transforms the school into a more conducive learning environment by implementing improvements at both the level and with the classroom expectations of children and their parents. Abrugar (2001) stated that school administrators, instructors, and parents should foster students' greatness. On the other hand, Epstein and Salinas (2004) noted that they did not build a true community partner for learners. These issues, as well as the issue of whether such school-based management practices contribute to the sustainability of the school improvement plan, are addressed through research and discussion of management practices only when a commitment to the sustainability of the school improvement plan is demonstrated, or an educational issue arises. The researcher considers this work to be relevant and worthwhile in this context.

### Theoretical Framework

This study was founded on the notion of School-Based Management Practices. SBM is a leadership and governance network. It directs the educational system toward accomplishing its shared vision, mission, and goals through a curriculum system linked to the community

and learner's circumstances and aspirations and being collaboratively designed and updated. It also comes with a distinct vision, mission, and objectives (DepEd, Manual on the Assessment of SBM, 2009).

The idea was to make School Improvement Plans (SIPs) and School-Based Management Practices of School Administrators more sustainable by incorporating the National Competency-Based Standards for School Heads (NCBSSH) and 21st Century Skills. It was based on the Basic Education Sector Reform Agenda (BESRA), a comprehensive set of reforms initiated in 2006 to sustain and grow the gains of the School's First Initiative (SFI) through School-Based Management (SBM). SBM became the integrated framework for institutional adjustments targeted at improving the learning of elementary and secondary school students through SBM. The following ideas guide the School-Based Management philosophy: Leadership and Governance, Curriculum and Learning, Accountability and Continuous Improvement, and Resource Management.

### The Research Problem

The main purpose of this study was to determine the Sustainability of School Improvement Plan (SIP) and School-Based Management Practices of School Administrators of Public Elementary Schools in Central Mindanao.

Specifically, this study attempted to answer the following questions:

1. What is the extent is the school-based management practices manifested by the school administrators in terms of:
  - 1.1 Leadership and Governance;
  - 1.2 Curriculum and Learning;
  - 1.3 Accountability and Continuous Improvement; and
  - 1.4 Resource Management?
2. What extent is the sustainability of the school improvement plan (SIP) in terms of:
  - 2.1 School Leadership;
  - 2.2 Instructional Leadership;
  - 2.3 Student-Learning Climate;
  - 2.4 Human Resource Management and Professional Development;
  - 2.5 Parent Involvement and Community Partnership;

2.6 School Management and Daily Operations; and

2.7 Personal and Professional Attributes?

3. Is there a significant relationship between school-based management and the sustainability of school improvement plans (SIP) of public school administrators?

4. Does the School-Based Management influence the Sustainability of School Improvement Plan (SIP) of Public Schools Administrators?

### **The Hypothesis of the Study**

Based on the statement of the problem, the hypotheses were stated as follows:

Ho1: There is no significant relationship between school-based management practices of school administrators and the sustainability of school improvement plans of public elementary schools.

Ho2: There is no significant influence between school-based management and the sustainability of the school improvement plan of public elementary schools.

### **Literature Review**

#### The School-Based-Management

According to Myres and Stonehill (2007), school-based management improves education by moving important decision-making authority from state district offices to individual schools. By delegating budget, personnel, and curriculum decisions to administrators, teachers, students, and parents, SBM gives them a bigger voice in the educational process. By incorporating teachers, parents, and other community members in these essential decisions, SBM may improve children's learning environments.

According to the American Association of School Administrators (AASA) and the National Association of Secondary School Principals (NASSP), SBM can help teachers and students make better decisions in the classroom and give the entire school community a voice in important decisions. It increases program development creativity while focusing accountability for decisions.

The superintendent and his or her district office staff encourage school-level decision-making and provide technical assistance to schools with problems converting the district's vision

into high-quality programming. The district staff is also in charge of creating and reviewing school performance criteria for students and staff.

According to Wohlstetter (2004), school-based management has generally been viewed as a political reform aimed at devolving authority (authority) over budget, people, and curriculum to individual schools. Empowering school locations to exercise control over information, professional development (knowledge), and payment systems have received little attention (rewards). Furthermore, research on SBM programs reveals that decision-making authority delegated to site teachers and administrators is limited.

Planning is a fundamental component of SBM, according to Coomb (2004). He demonstrates that educational planning is based on the past and is concerned with the future. It acts as a roadmap for future decisions and operations, but it is more than just a blueprint. Planning is a continuous process that analyzes where to go and how to get there and how to do it in the most effective way possible. Its work does not end with the creation and approval of a plan. To be effective, planning must consider execution, progress made or not made, and potential stumbling blocks and how to overcome them. Plans are not meant to be set in stone; they are meant to be changed and revised as circumstances change. As one period's plans are implemented, the next period's preparations must begin, aided by input from the prior. Planning is not the author of policies and decisions in and of itself; rather, it serves as a handmaiden to those who do so at both high and low levels.

While maintaining within the restrictions of available resources, planning can assist in achieving larger and more favorable aggregate results. Hughes et al. (2015) believe that instructional planning is essential if schools are to achieve organizational excellence. It guides the administration, board of education, teachers, students, and community members in determining where the school should go and how to get there.

It helps with the identification process in the short term. The operational and functional performance of the school district or division will be substandard, and the district's objectives

and goals will be difficult, if not impossible, to fulfill without planning.

SBM is done under collegial and subsidiary principles. Problems should be solved and choices made at the lowest organizational level possible, according to the former. Because they are most familiar with the school's life, activities, and problems, the school's head, instructors, students, parents, local government units, and community members are best qualified to manage challenges.

The latter, on the other hand, necessitates collaboration among stakeholders in order to improve the school. The school head exemplifies collegiality by allowing teachers, parents, community leaders, and students to participate in decision-making on what is best for the school, in which they all have a stake.

The Basic Education Sector Reform Agenda (BESRA) includes principles to follow, according to Lopus and Suan (2008). These include school-based management, which is a concept that requires incorporating the community in order to guarantee that innovations implemented in schools are relevant and sustainable. This notion relates to the reforming principle that the best people to enhance school quality are the most directly impacted by school operations, such as school leaders, teachers, students, parents, and others in the community.

Implementing a school improvement plan, maintaining and other operational costs (MOOE), and competency-based teaching standards that define how instructors might contribute more effectively to improving learning outcomes are all examples of this activity. All aspects of teacher preparation, from licensure to retirement and remuneration and benefits, are covered. It refers to teachers' vital role as the driving force behind student learning and educational quality in primary schools, and it is also known as improved teaching effectiveness and teacher development. Teachers who are actively employed, in training, or attend seminars and other courses may be affected.

Lontayo (2007) emphasized the need for budgeted funds in guaranteeing SBM's success. The public education system requires all available resources to bridge current gaps in educational resources like high-quality

textbooks, well-equipped classrooms, and competent teachers. On the other hand, private schools meet these expectations within the restrictions of their financial resources and budget allocation.

Fiscal autonomy over school funds implies duty and accountability for the lawful and efficient use of such funds to achieve specified outputs and objectives, in addition to the freedom to make financial resource allocation decisions. As a result, it is vital to give the school principal a solid understanding of the principles, processes, and procedures that underpin a streamlined management system.

Decentralizing decision-making authority away from central, regional, and division offices and toward individual schools is referred to as school-based management. This initiative aims to bring together school administrators, principals, teachers, students, local governments, non-governmental organizations, and the commercial sector to improve the quality of early formal education in Philippine public schools (DepEd, 2006b). As part of the SBM, the School Improvement Plan (SIP) was created. The fields of the School Improvement Plan are distinctive, and they serve as a guide for school managers. Each field is arranged around the tasks that school administrators must complete; within each area, there are competency features or procedures split down into various performance indicators. The ability, attitude, and underlying knowledge that contribute to effective performance are performance indicators.

#### The School Improvement Program

It is unreasonable for schools to ignore approaches that result in a change in today's environment. School improvement is now widely recognized as a key activity, and it has established itself as the dominant approach to educational reform, assisting in enhancing the quality of students' learning and strengthening schools' capacity for change (Hopkins, 2002). School improvement is a term used to describe improving a school's ability to provide a high-quality education while focusing on the kids' learning.

According to Zijian and Williams (2006), school improvement is the process of better organizing, promoting, and supporting learning

in schools. Shifting aims, expectations, organizational structure (and even personnel), learning and teaching techniques, and organizational culture are all part of it. There is literature that identifies school improvement as a focus on improving the quality of teaching and learning in classrooms and the management structures that support it to increase student achievement. In connection with this, School improvement, according to Fullan (2001), is an educational transformation strategy that focuses on boosting student achievement inside the school to promote teaching and learning or strengthen the school's capacity for improvement.

It indicates that school improvement is a technique of promoting educational change that focuses on both school operations and student outcomes and increasing teaching and learning and the environments that support them. School improvement may also be characterized as a concept that focuses on improving students' academic accomplishment by self-evaluating various school domains with their current state and improving inputs and teaching processes.

### Methods

This study utilized both qualitative and quantitative research designs. Particularly, the study used the survey and Stepwise Regression Analysis Design to determine the extent to which the administrators manage the school-based in demonstrating leadership and governance, curriculum and learning, accountability, and resource management. It also determined the extent of sustainability of school improvement plan (SIP) in school leadership, instructional leadership, student learning climate, Human Resource management and professional development, parent involvement and community partnership, management on daily operation, including personal and professional attributes. According to Good and Scates, as cited by de la Cruz (2005), the word survey signifies gathering data regarding the present condition. Stepwise regression statistical measurement is used to identify significant relationships to know the best predictors in which school-based management practices affect the sustainability

of school improvement plans of public school administrators or principals.

Stratified Random Sampling was used to select samples for this study. Strata are produced in stratified random sampling based on shared attributes or characteristics between individuals.

The strata were created by the Division of the Department of Education in Region 12, and regardless of gender or age, they serve the same purpose as the respondents' common features. These samples have the following distributions: According to 200 respondents in nine (9) divisions, Cotabato City Division has three public elementary schools, General Santos City Division has eight public elementary schools, Kidapawan Division has seven public elementary schools, Koronadal Division has five public elementary schools, North Cotabato Division has 73 public schools, Sarangani Division has 29 public elementary schools, South Cotabato Division has 34 public elementary schools, Sultan Kudarat Division has 38 public elementary schools, and Tacurong City Division has three public elementary schools. The names of public elementary schools were not specified because they were chosen at random.

The respondents of this research were the two hundred (200) principals or school heads as administrators in the public elementary schools of nine divisions (9) in Central Mindanao. The respondents were randomly selected in the different public elementary schools of nine divisions regardless of their age and gender as long as they are heads of their schools; they have the same functions, practices, and share responsibilities in their respective public elementary schools. The researcher uses the 200 principals and school heads because the total number of schools in Central Mindanao is big. To make it lessen the cost, 200 respondents from 1,746 are ideal for this study. The researcher modified, added, and arranged the research instrument based on the National Competency-Based Standards for School Heads (NCBSSH) and the 21st Century provided by the DepEd. It was a survey questionnaire with items used to collect quantitative and qualitative data from selected public elementary school administrators in their respective areas to avoid biases regarding

school-based managerial practices of school administrators.

This is because the questionnaire made it easy to conduct surveys and collect data from many study participants in a short amount of time. Additionally, it allows for time and cost savings and a high proportion of useable answers (Best & Kahn, 2003).

The instrument had been validated, and the reliability applied was extremely reliable, with a Cronbach's Alpha value of 0.991, which was also greater than 0.600, the basic decision-making threshold for testing reliability, indicating that the questionnaire items were reliable.

Using the split-half method, the Spearman-Brown Coefficient of 0.930 also had been applied, which indicated that the questionnaire had been highly reliable.

All data gathered had been analyzed through descriptive analysis to answer the statement of the problem, including Stepwise Regression Analysis Design. This design had been appropriate to identify the relationship between the sustainability of school improvement plans and the school-based management practices of public elementary school administrators significantly.

### Results and Discussion

School-based management practices are defined as the practices of school administrators to sustain the implementation of the school improvement plan. This school-based management would contribute to the effective and sustainable implementation of the school improvement plan.

**Table 1: Extent of the School-Based Management Practices Manifested by the School Administrators**

<b>N=200</b>		
Items	Mean	Description
Leadership and Governance	3.59	Highly Sustainable
Curriculum and Learning	3.53	Highly Sustainable
Accountability and Continuous Improvement	3.52	Highly Sustainable
Resource Management	3.49	Highly Sustainable
<b>Overall Mean</b>	3.53	Highly Sustainable

*Legend:*

1.00 – 1.49	Poorly Sustainable
1.50 – 2.49	Fairly Sustainable
2.50 - 3.4	Moderately Sustainable
3.50 – 4.00	Highly Sustainable

Table 1 reflects the extent of the school-based management practices manifested by the school administrators. As reflected, leadership and governance got a mean score of 3.69, described as highly sustainable, while the curriculum and learning got a mean score of 3.53, described as highly sustainable. The succeeding item is accountability and continuous improvement, with a mean score of 3.52, described as highly sustainable, while resource management got a mean score of 3.49, described as highly sustainable.

The overall mean of 3.53, described as highly sustainable, suggests that the school administrators highly manifested the identified management practices to make decisions for the improvement of the teaching-learning process. Also, the figure suggests that management practices of the school administrators provide a sound-based judgment and increase the development and administration.

It is confirmed by Myres and Stonehill (2007), who said that SBM is a method for enhancing education by transferring key decision-making authority from state district offices to individual schools. School-based management can empower competent individuals in schools to make decisions that improve learning, provide a voice for the entire school community in critical decisions, focus accountability for decisions, and increase creativity in program development.



**Table 2: Extent of the Sustainability of School Improvement Plan (SIP)**

N=200		
Items	Mean	Description
School Leadership	3.58	Highly Sustainable
Instructional Leadership	3.61	Highly Sustainable
Student-Learning Climate	3.61	Highly Sustainable
Human Resource Management and Professional Development	3.57	Highly Sustainable
Parent Involvement and Community Partnership	3.62	Highly Sustainable
School Management and Daily Operations	3.56	Highly Sustainable
Personal and Professional Attributes	3.66	Highly Sustainable
Overall Mean	3.60	Highly Sustainable

**Legend:**

- 1.00 – 1.49      Poorly Sustainable
- 1.50 – 2.49      Fairly Sustainable
- 2.50 - 3.4        Moderately Sustainable
- 3.50 – 4.00      Highly Sustainable

Table 2 displays the extent of the sustainability of the school improvement plan. As displayed in this table, the school improvement plan has seven (7) items. The school leadership as the item of school improvement has a mean score of 3.58, described as highly sustainable; instructional leadership (3.61), described as highly sustainable; student-learning climate with a mean score of 3.61, described as highly sustainable.

Human resource management and professional development (3.57), parent involvement and community partnership (3.62), school management and daily operations (3.56), and personal and professional attributes (3.66). These items received a mean score which was described as highly sustainable.

In general, the overall mean score is 3.60, described as highly sustainable. This mean score implies that the school improvement plan has a great impact on the development of schools. The school improvement plan promotes the overall improvement, such as the teaching-learning process, professional development, and organizational structure, which all aim to achieve the learning institutions' vision, mission, and goals. Items in the school improvement plan promote a better organizational culture.

This statement affirms the idea of Zijian and Williams (2006), who said that a school improvement plan is the process of better organizing, promoting, and supporting learning in schools. Shifting aims, expectations, organizational structure (and even personnel), learning and teaching techniques, and organizational culture are all part of it.

**Table 3: Stepwise Regression of Sustainability of School Leadership and School-Based Management of School Administrators**

Items	B	Std. Error	t	Sig.	Interpretation
Management of Resources	.373	.058	6.391	.000	Highly Significant
Leadership and Governance	.323	.064	5.053	.000	Highly Significant
Accountability and Continuous Improvement	.277	0.69	4.024	.000	Highly Significant

Dependent Variable: Sustainability of School Leadership

Excluded Variable: Curriculum and Instruction  
Adj. R square = .756

The stepwise regression analysis was utilized to examine the relationship between the sustainability of school leadership and the potential predictors such as leadership and governance, accountability and continuous improvement, curriculum and instruction, including management of resources. Table 3 summarizes the analyses results.

As revealed in this table, management practices such as management of resources, leadership and governance, and accountability and continuous improvement significantly influenced the sustainability of school improvement plan in terms of school leadership.

The stepwise regression analysis shows that three out of four predictors produced adjusted R2 =.756 The stepwise model suggests a highly significant relationship between the management practices such as management of resources, leadership and governance, accountability and continuous improvement of school administrators, and the sustainability of SIP in terms of school leadership.

As reflected in table 3, the extent of management practices of school administrators in management of resources, leadership and

governance, accountability, and continuous improvement has significant positive regression weights, indicating that school administrators practicing at all times and have a high manifestation of practices particularly on the management of resources, leadership, and governance, and accountability and continuous improvement were expected to have a high level of sustainability in terms of school leadership. In contrast, the curriculum and instruction did not significantly contribute to the sustainability of SIP in terms of school leadership. The beta coefficient for management of resources (.373), leadership and governance (.323), and accountability and continuous improvement (.277) are significant at .001. The .001 level of significance indicates that the school administrators' extent of management practices in the management of resources, leadership, and governance, including accountability and continuous improvement, formed a highly significant set of predictors for the sustainability of school improvement plan in terms of school leadership.

**Table 4: Stepwise Regression of Sustainability of Instructional Leadership and School-Based Management of School Administrators**

Items	B	Std. Error	t	Sig.	Interpretation
Accountability and Continuous Improvement	.340	0.67	5.098	.000	Highly Significant
Leadership and Governance	.333	.062	5.368	.000	Highly Significant
Management of Resources	.166	0.57	2.936	.004	Highly Significant

Dependent Variable: Sustainability of Instructional Leadership  
 Excluded Variable: Curriculum and Instruction  
 Adj. R square = .700

Another stepwise regression model had been utilized to examine the relationship of SIP in terms of instructional leadership and the management practices of school administrators, such as accountability and continuous improvement, leadership and governance, and management of resources as potential predictors. Table 4 summarizes the descriptive statistics and analyses results. As revealed in table 4, the extent of management practices of school administrators in accountability and continuous improvement, leadership and

governance, management of resources when taken in combination significantly influenced the sustainability of SIP in terms of instructional leadership.

The stepwise regression shows that three out of four variables on instructional leadership and school-based management had been produced adjusted R2 =.700. It suggests a highly significant relationship between the management practices of school administrators and the sustainability of school improvement plan in terms of instructional leadership.

As also revealed in table 4, the extent of management practices of school administrators such as accountability and continuous improvement, leadership and governance, and management of resources have significant positive regression weights, indicating that school administrators who have a positive manifestation of such management practices were expected to have a high level of sustainability in terms of instructional leadership. The curriculum and instruction do not significantly contribute to the sustainability of SIP in terms of instructional leadership.

The beta coefficient for accountability and continuous improvement (.340), leadership and governance (.333), and management of resources (.166) is significant at 0.001. This level of high significance explains that the school administrators' management practices in accountability and continuous improvement, leadership and governance, and management of resources formed a significant set of predictors for the sustainability of school improvement plan in terms of instructional leadership.

**Table 4: Stepwise Regression of Sustainability of Student Learning Climate and School-Based Management of School Administrators**

Items	B	Std. Error	t	Sig.	Interpretation
Accountability and Continuous Improvement	.471	0.63	7.517	.000	Highly Significant
Leadership and Governance	.414	.064	6.473	.000	Highly Significant

Dependent Variable: Sustainability of Student Learning Climate  
 Excluded Variable: Curriculum and Instruction, Management of Resources  
 Adj. R square = .681

To examine the relationship of a school improvement plan in terms of student-learning climate and the management practices of school administrators, such as accountability and continuous improvement and leadership and governance as potential predictors, stepwise regression was utilized. Table 4 summarizes the analyses results.

As revealed in table 4, the management practices of school administrators, such as accountability and continuous improvement and leadership and governance, when taken in combination, significantly affect the sustainability of SIP in terms of student-learning climate.

The stepwise regression model with all four predictors produced Adjusted R2 = .681.

The stepwise regression suggests a highly significant relationship between the management practices of school administrators, such as accountability and continuous improvement and leadership and governance, and the school improvement plan in terms of student-learning climate.

Also, the extent of management practices of school administrators in terms of accountability and continuous improvement and leadership and governance have significant positive regression weights, indicating that school administrators who have a positive manifestation of such management practices were expected to have a high level of sustainability of SIP in terms of student-learning climate.

The higher the accountability and continuous improvement and leadership and governance, the higher the possibility of SIP's sustainability in terms of student-learning climate.

The curriculum, instruction, and management of resources do not contribute to the school improvement plan regarding the student-learning climate.

The beta coefficient for accountability and continuous improvement (.471), leadership, and governance (.414) had significance at 0.001.

This level of significance suggests that the management practices of school administrators, such as accountability and continuous improvement and leadership and governance, when taken in combination, formed a significant set of predictors for the

sustainability of SIP in terms of student-learning climate.

**Table 5: Stepwise Regression of Sustainability of Human Resource Management and Professional Development and School-Based Management of School Administrators**

Items	B	Std. Error	t	Sig.	Interpretation
Curriculum and Instruction	.404	.085	4.760	.000	Highly Significant
Accountability and Continuous Improvement	.343	.076	4.487	.000	Highly Significant
Leadership and Governance	.169	.080	2.112	.036	Significant

Dependent Variable: Sustainability of HR management and professional development  
Excluded Variable: Management of Resources  
Adj. R square = .661

A stepwise regression model was used to examine the relationship of a school improvement plan in terms of Human Resource Management and Professional development and the management practices of school administrators such as curriculum and instruction, accountability and continuous improvement, and leadership and governance as the potential predictors. Table 5 summarizes the analyses results and descriptive statistics.

As reflected in table 5, the extent of management practices of school administrators in curriculum and instruction, accountability and continuous improvement, and leadership and governance, when taken in combination, significantly influenced the sustainability of school improvement plan in terms of Human Resource management and professional development.

The stepwise regression displayed that three out of four predictors produced the adjusted R2 = .661.

This suggests that there has been a highly significant relationship between the management practices of school administrators (Curriculum and instructions, accountability and continuous improvement, leadership and governance) and the school improvement plan in terms of Human Resource management and professional development.

As also reflected in table 5, the extent of management practices of school administrators (Curriculum and instructions, accountability and continuous improvement, leadership and governance) three out of four predictors has significant positive regression weights, explaining that school administrators who have a positive manifestation of such management practices were expected to have a high level of sustainability of school improvement plan in terms of Human Resource management and professional development. The management of resources does not contribute significantly to the sustainability of school improvement plan in terms of Human Resource Management and professional development.

The beta coefficient for curriculum and instruction (.404), accountability and continuous improvement (.343), and leadership and governance (.169) was significant at 0.005.

**Table 6: Stepwise Regression of Sustainability of Parent Involvement and Community Partnership and School-Based Management of School Administrators**

Items	B	Std. Error	t	Sig.	Interpretation
Accountability and Continuous Improvement	.317	.075	4.204	.000	Highly Significant
Management of Resources	.278	.064	4.337	.000	Highly Significant
Curriculum and Instruction	.235	.075	3.155	.002	Significant

Dependent Variable: Sustainability of Parent Involvement and Community Partnership

Excluded Variable: Leadership and Governance

Adj. R square = .665

Stepwise regression had been conducted to examine the relationship between the school improvement plan in terms of parent involvement and community partnership and the management practices of school administrators such as accountability and continuous improvement, management of resources, and curriculum and instruction as the potential predictors. Table 6 summarizes the analyses results.

As gleaned in this table, the extent of management practices of school administrators in accountability and continuous improvement, management of resources, and curriculum and instruction, when taken in combination,

significantly influenced the sustainability of school improvement plan in terms of parent involvement and community partnership.

The stepwise regression with all four predictors had the adjusted  $R^2 = .665$ . The beta coefficient for accountability and continuous improvement .317, management of resources .278, curriculum and instruction .235 indicates a positive relationship among these predictors.

The stepwise regression suggested that there has been a highly significant relationship between the management practices of school administrators (accountability and continuous improvement, management of resources, curriculum, and instruction) and the sustainability of school improvement plan in terms of parent involvement and community partnership.

As also gleaned in table 6, the extent of management practices of school administrators (accountability and continuous improvement, management of resources, curriculum, and instruction) has been a significant positive regression weight, indicating that school administrators who have a positive manifestation of such management practices were expected to have a high level of sustainability of school improvement plan in terms of parent involvement and community partnership. Leadership and governance do not contribute to the sustainability of SIP in terms of parent involvement and community partnership.

Moreover, the 0.001 level of significance suggested that management practices of school administrators (accountability and continuous improvement, management of resources, curriculum, and instruction) formed a highly significant set of predictors for the sustainability of SIP in terms of parent involvement and community partnership.

**Table 7: Stepwise Regression of Sustainability of Management and Daily Operations of School Administrators**

Items	B	Std. Error	t	Sig.	Interpretation
Curriculum and Instruction	.309	.091	3.407	.001	Highly Significant
Management of Resources	.261	.071	3.663	.000	Highly Significant
Leadership and Governance	.210	.083	2.513	.013	Significant
Accountability and Continuous Improvement	.193	.085	2.268	.024	Significant

Dependent Variable: Sustainability of Management and Daily Operations  
 Adj. R square = .682

Table 7 displayed the stepwise regression analysis of the sustainability of school management and daily operation and the management practices of school administrators. As embedded, the extent of management practices of school administrators such as curriculum and instruction, management of resources, leadership and governance, accountability, and continuous improvement significantly influenced the school management and daily operation.

The stepwise regression with all four predictors produced adjusted R2 = .682, which suggests a significant relationship between the management practices of school administrators when taken in combination with school management and daily operation.

As also shown in table 7, the extent of management practices of school administrators in curriculum and instruction had a beta coefficient of .309, management of resources had.261, leadership and governance had.210, accountability and continuous improvement had.193 showed significant positive regression indicating that school administrators who have a positive manifestation of such practices had been expected to have a high level of sustainability of school management and daily operation.

The 0.001 level of significance suggests that the school administrators' management practices are the predictors and positively affect school management and daily operation.

**Table 8: Stepwise Regression of Sustainability of Personal and Professional Attributes and School-Based Management of School Administrators**

Items	B	Std. Error	t	Sig.	Interpretation
Curriculum and Instruction	.257	.085	3.017	.003	Highly Significant
Management of Resources	.239	.065	3.678	.000	Highly Significant
Leadership and Governance	.208	.080	2.599	.010	Highly Significant

Dependent Variable: Sustainability of Personal and Professional Attributes

Excluded Variable: Accountability and Continuous Improvement

Adj. R square = .542

Table 8 reveals the analysis results of the relationship between the personal and professional attributes and the management practices of school administrators, such as curriculum and instruction, management of resources, and leadership and governance as the potential predictors.

As revealed, the extent of management practices of school administrators in curriculum and instruction, management of resources, and leadership and governance significantly affect the personal and professional attributes.

The adjusted R2 = .542 suggests a highly significant relationship between the management practices (Curriculum and instruction, management of resources, and leadership and governance) when taken in combination and the personal and professional attributes.

As also revealed in table 8, the management practices of school administrators (Curriculum and instruction, management of resources, and leadership and governance) have significant positive regression with the beta coefficient for curriculum and instruction .257, management resources .239, leadership and governance .208 indicating that school administrators who have a positive manifestation of such practices were expected to have a high level of sustainability of personal and professional attributes. Accountability and continuous improvement do not contribute significantly to personal and professional attributes.

**Table 9: Regression Analysis of School-Based Management of School Administrators and the Sustainability of School Improvement Plan**

Items	B	Std. Error	t	Sig.	Interpretation
Leadership and Governance	.237	.057	4.163	.003	Highly Significant
Curriculum and Learning	.176	.062	2.837	.005	Highly Significant
Accountability	.265	.058	4.569	.000	Highly Significant
Resource Management	.203	.049	4.188	.000	Highly Significant

Dependent Variable: Sustainability of School Improvement Plan

Predictors: Leadership and Governance, Curriculum and Learning, Accountability, and Resource Management

Table 9 reflects the regression analysis of management practices of school administrators and the sustainability of the school improvement plan.

As reflected, management practices of school administrators such as leadership and governance, curriculum and learning, accountability, and resource management are the potential predictors and have influenced the sustainability of school improvement plans.

The regression analysis suggests a highly significant relationship between the management practices such as leadership and governance, accountability and resource management, and the sustainability of school improvement plan; in addition, curriculum and instruction moderately contribute to the sustainability of SIP as indicated by its interpretation as significant.

As also reflected in table 9, the beta coefficient for leadership and governance .237, curriculum and learning .176, accountability .265 and resource and management .203 it has been indicated that the management practices, when taken in combination, have significant positive regression weights indicating that school administrators who have a high manifestation of such management practices had been expected to have a high level of sustainability of school improvement plan.

The .005 level of significance indicates that the management practices of school administrators, when taken in combination, formed a highly significant set of predictors for the

sustainability of school improvement plans (SIP).

### Conclusion and Recommendations

Based on the findings of this study, School administrators are practicing the school-based management practices guided by the school improvement plan to achieve the VMGO to produce quality education. They show a clear display of their school-based management practices, which indicate high sustainability and that the practices contribute much to the school improvement plan (SIP). Concerning the sustainability of school improvement plans and the school-based management practices of school administrators, the following are the best predictors: (a) Management of resources, (b) leadership and governance, (c) accountability, and continuous improvement are good predictors for the sustainability of school leadership.

The curriculum and learning have no significant involvement in the sustainability of school improvement plan in terms of school leadership because they do not have direct contact with the students or pupils, teaching strategies, and the teaching-learning process had been coming from their subject teachers and adviser.

Accountability and continuous improvement, leadership and governance, and resource management are good predictors for the sustainability of instructional leadership.

Accountability, continuous improvement, and leadership and governance are good predictors for the sustainability of the student-learning climate.

Curriculum and instruction, accountability and continuous improvement, and leadership and governance are good predictors for HR management and professional development sustainability.

Accountability and continuous improvement, management of resources, and curriculum and instruction are good predictors for the sustainability of parent involvement and community partnership.

Curriculum and instruction, management of resources, leadership and governance, accountability, and continuous improvement are all good predictors for the sustainability of school management and daily operations.

Curriculum and instruction, resources management, leadership, and governance are good predictors for the sustainability of personal and professional attributes.

It observed that school-based management practices of school administrators in the sustainability of school improvement plans revealed the manifestation of management practices was highly influenced the sustainability of school improvement plans.

Therefore, the above results and statements that School-Based Management practices such as leadership and governance, curriculum and instruction, accountability and continuous improvement, and resource management are the significant predictors for the sustainability of school improvement plan (SIP).

It is recommended that School administrators should sustain the good display of school-

based management practices to provide quality education. School administrators should maintain faculty development and training in order to continue to improve the program. Additionally, school administrators should get adequate instructional resources and materials and upgrade buildings and equipment. He or she should provide administrative assistance and increase collaboration among stakeholders while allowing teachers to adapt instructional approaches and strategies to the quick speed of information technology development. A monitoring strategy should also be employed to strengthen and improve the quality of education that covers ways and means of management practices of school administrators in Central Mindanao.

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## HARVESTING AND APPLICATION IN FISHERY MANAGEMENT USING SECOND-ORDER DELAY DIFFERENTIAL EQUATION

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### ABSTRACT

The study refers to the diversity and period of asset quantity due to its general development and collection. We also refer to specific models, where the goods were expected to be strategically developed and harvested by the active Runga Kutta model, considered a Schaefer operation. Of these types, it is generally accepted that the number of firm's changes as it indicates the difference between the gain and the cost of the current abuse  $t$ . In the event of a lease, many firms come in and double the asset of the asset again and again. In this paper, we will accept that a piece of the harvested material is already considered regarding delay differential equation.

**Keywords:** Delay Differential equation, second-order, Fishery management, Harvesting and Equation Model

### Introduction

The bio-financial aspects focus on the properties of non-combustible assets in terms of controlling the hypothesis that enters the presence of the fishery management yields. Many types look at two-state objects and property weighing in kilograms or weight per unit, and the amount of power involved in property exploitation. As for the fishery management and harvesting, the features are differential equation size and effort. We are talking about a previous commitment to introducing opposing models as a time of change in the fishery management. These types of numbers consider two situations. The first scenario refers to the diversity and period of asset quantity due to its general development and collection. We also refer to specific models, where the goods were expected to be strategically developed and harvested by the active Runga Kutta model, considered a Schaefer operation (Li & Rogovchenko, 2015). Of these types, it is generally accepted that the number of firms changes as it indicates the difference between the gain and the cost of the current abuse  $t$ . In the event of a lease, many firms come in and double the asset of the asset again and again. In this paper, we will accept that a piece of the harvested material is already considered regarding delay differential equation. As a result, we will add a third

dimension to the traditional model that looks at the timing of stock volatility.

### Aim and Objective of the Study

The point of the study is to examine impacts of the applications and harvesting on fishery management by using differential delay equation (second order). As we will see, from the point of view, this encourages the reversal of diversity. This paper is compiled as follows. There is a demonstration of the price division model presented about the sheriff. There are indications of a sound and separate model of the model (Sylla, 2019).

### Delay Differential Equation Model

The first phase of our demonstration of basic models. These species consider two state factors: material density  $n(t)$  and  $E(t)$  density. Such models are read as -  

$$\frac{dn}{dt} = rn(1 - n) - \phi(n, E)$$

$$\frac{dE}{dt} = p\phi(n, E) - cE$$

Property  $n$  is planned to be strategically developed in this area. The transfer capacity was effectively set to one. The catch per unit of time is defined by the volume  $(n, E)$ . It usually has the form  $(n, E) = q * nE$ , with the fixed cost  $p$  as the border.  $P(n, E)$  denotes a gain that occurs right away. The word  $c * E$  refers to the costs of money, such as compensation, fuel, and other expenses. The costs incurred in each effort unit and time unit. In this way, the



following scenario expects that hard work will increase when the job does something else. In this basic approach, it is accepted that all catches are sold quickly and add to a vital E. As a result, we summarise the prior basic model by incorporating certain stock variables, which are represented by S. A new phase of fish capture [0, 1] will enter the stock chamber. In contrast, another part  $1 - \eta$  will be given immediately to add a little effort (Sylla, 2019). Under these actions, we are currently considering a new corresponding model:

$$\frac{dn}{dt} = r \cdot n(1 - n) - \phi(n, E)$$

$$\frac{dE}{dt} = p((1 - \eta)\phi(n, E) + \delta \cdot S) - c \cdot E$$

and,

$$\frac{dS}{dt} = \eta\phi(n, E) - \delta \cdot S.$$

The limit  $> 0$  refers to the rate at which the stock fish returns to the fish market and makes a significant attempt to contribute the value p. We predict the cost to be quite similar to the ashes swiftly sold if we work hard enough, and the equation emerges from the stock. By linking the third condition, we can disregard the S variable under certain reasonable criteria for the underlying condition. As a result, the above order of ODEs can be reduced, delaying the two components related with these retrospective conditions:

$$\frac{dn}{dt} = rn(1 - n) - \phi(n, E),$$

and;

$$\frac{dE}{dt} = (1 - \eta)p\phi(n, E) + \eta pq \int w(\Theta)n(\Theta)E(\Theta)d\Theta - c \cdot E.$$

This framework can consist of three planned provinces.  $(n, E) = (0, 0)$  and  $(n, E) = (1, 0)$  are both present at all times. The first is in constant motion, whereas the second is stable if and only if  $c / p \cdot q > 1$ . Point  $(n, E) = (1, 0)$  exceeds the basic dividing when  $u \cdot c / p \cdot q$  crosses 1 base value, resulting in the presence of another fixed point that becomes stable when  $c / p \cdot q < 1$ .

### Application and harvesting in fishery management

#### Lemma 3.1

In each case, for a limited and endless introduction  $n_0$  and  $E_0$  satisfying condition,  $0 \leq n_0 \leq 1, E_0 \geq 0$ , meanwhile, subtract the given equation,

$$\frac{dn}{dt} = r \cdot n(1 - n) - q \cdot n \cdot E \tag{3.1}$$

In addition,

$\frac{dE}{dt} = (1 - \eta) p \cdot q(n \cdot E) + \eta(p \cdot q)$ , has a global  $(n) t, E(t)$  solution such as  $(0), E(t) \geq 0; \forall t > 0$ . Confirmation of this effect is an old style. Right now, we have a desire for the outrageous behavior of this model. Releases (3.1) can have up to three concentrations. The status marks set (3.1) are given for the purpose of the frame  $r \cdot n(1 - n) - q(n \cdot E) = 0, p \cdot q(n \cdot E) - c \cdot E = 0$  and  $0 \leq n \leq 1, E \geq 0$ . The presence of this constant fixed concentration is summarized in the corresponding language (Lamine, 2019).

#### Lemma 3.2.

At the point where  $c / p \cdot q \geq 1$  system, it has two accessible settings  $(n_1, E_1) = (0, 0)$  and  $(n_2, E_2) = (1, 0)$ .

At the point where  $c / p \cdot q < 1$ , then, at the same time, the framework has three fixed settings, two fixed parameters  $(n_1, E_1)$  and  $(n_2, E_2)$  corresponding internal layouts:  $(n_3, E_3) = c/p \cdot q, r/q(1 - c/p \cdot q)$ .

We are currently investigating the validity of these focus points. The appropriate application setting can be created according to the strategy. It is indicated that the status of its given trademark indicates the test of a fixed point  $(n^*, E^*)$

$$\Delta(\lambda) = \det(r(1 - 2n^*) - qE^* - \lambda)$$

$$= p \cdot q \cdot E^* \cdot (1 - \eta + \eta \cdot \omega(\lambda)) - p \cdot q \cdot n^* \cdot (1 - \eta) - c + \eta \cdot (pq) \cdot n^* \cdot \omega(\lambda) - \lambda$$

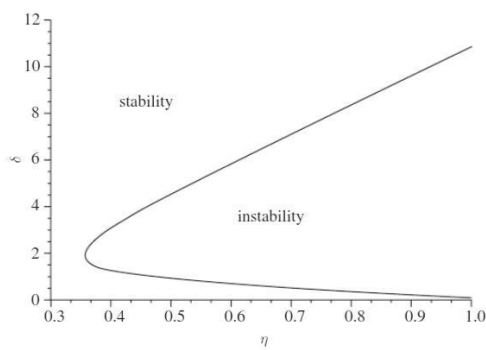
Where we placed,

$$\omega(\lambda) = \int_0^{\theta} e(\lambda\theta) d\theta.$$

We first gave a few results about the security of the restrictions. We have a similar effect.

### Methodology

The repetition of figures for subtraction is the focus of this section (3.1). Figure 1 illustrates that the fishery remains consistent with a minor amount of volume, 0.35. Earthquakes can occur at a specific border if the limit is exceeded. Let's go above this limit and find 1 to demonstrate that the fishery is stable at low prices, at least if it small enough (Muslim, 2018).



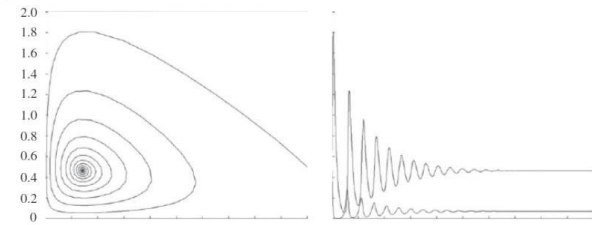
**Figure 1: Model of the fishery (Muslim, 2018)**

The volume appears to always be in stock, protecting the market or to a lesser extent, and there is no natural effect on the stock that remains constant in these ways. If the is large enough, the fishery returns to the market rapidly following a stock exchange, which has a significant impact on the meeting. These latter cases are almost identical to not being in custody. Amid road prices, instability occurred. Indeed, let us consider a time when the size of fish is minor, in these lines, the quick catch is much smaller, and as a result, as there is no stock, the effort will decrease faster because the difference between profit due to real catch and cost will be more significant. In any case, because of the stock, the money collected in the past returns to a stable level  $\delta$  in the market, which raises a lot of hard work. We recognise that this could encourage the state's foundations to be shattered, because all things considered hard labour are kept at a very high level in terms of the actual tiny number of battles. This, in turn, will result in a significant decrease in the size of the fish, the transmitted transmission you have used, and this impedes progress.

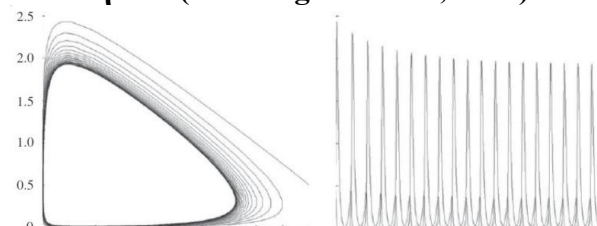
**Results of Study**

A comparison and speaking cycle can occur when the size of the fish is large. We are currently investigating the model material by showing the framework indicators. Levels 2 and 3 display the results. We measure the height of the borders in step 2 and then reverse the reversal. Figure 1 shows how to find the normal values. Naturally, the setting maintains in the appropriate balance with a modest reversal (figure 2a); as the reversal rises, the direction deviates; as the delay increases, the direction re-balances. In Figure 3,  $x$  is a boundary set and is different in scale  $\eta$ . True to

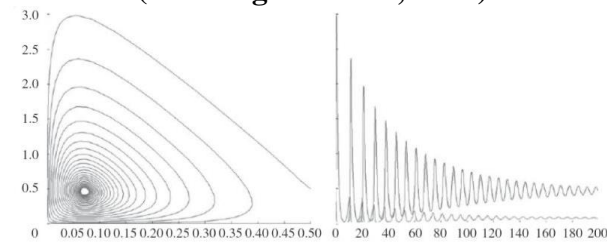
the formation of the dividing chart, we see that the expansion of  $\eta$  induces a few movements in the elements. We can similarly see the amplitudes of moving increases about  $\eta$ . On finding 3c, we get about 0.75 of the maximum size of fish. When  $c = 1, r = 1, q = 2$  and  $p = 7$ :



**Figure 2(a): Stabilization when  $\delta=0.5$  and  $\eta=0.5$  (Li & Rogovchenko, 2015)**

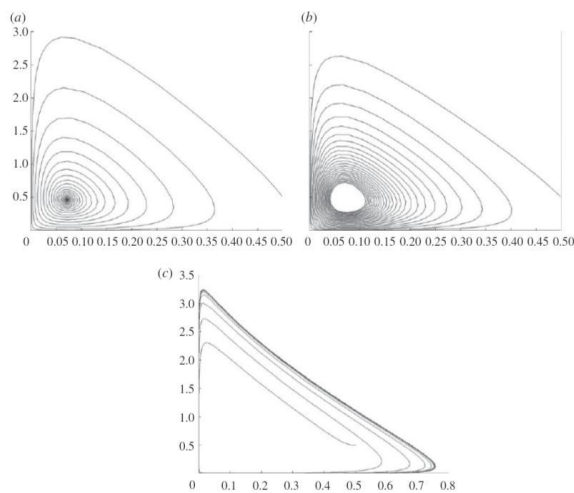


**Figure 2(b): Oscillation when  $\delta=2$  and  $\eta=0.5$  (Li & Rogovchenko, 2015)**



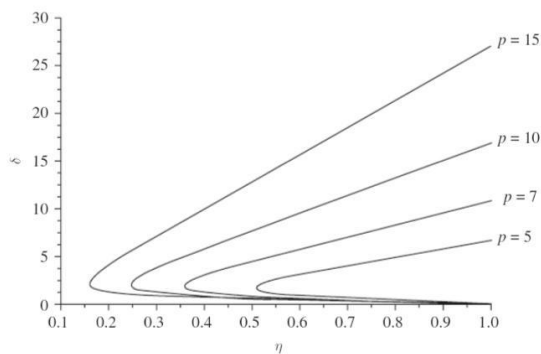
**Figure 2(c): Stabilization when  $\delta=10$  and  $\eta=0.5$  (Li & Rogovchenko, 2015)**

We finish up this mathematical analysis of the concurrence balance's vulnerability by looking at the influence of the value variable. Figure 4 summarises the findings. We can see that increasing the cost leads to an increase in the unsteadiness zone. We can understand this since fixed fishery costs mean that while the cost of the fish is high, the benefit of the fishery is also huge (Yang & Meng, 2021).



**Figure 3: Model of fishery with variable  $\eta$  with  $\delta=10$ , (a)  $\eta=0.1$ , (b)  $\eta= 0.3$ , (c)  $\eta= 0.9$ (Yang & Meng, 2021)**

Because the difference between the benefit and the expenses determines the diversity of the fishing activity, an excessive cost retains the fishing activity at a higher level than it should be in the case of a lower cost. As a result, exorbitant expenses lead to overexploitation of the asset in the case of fisheries with low market costs. Overexploitation promotes flimsiness, which explains why, as seen in figure 4, the space of precariousness expands as market costs rise (Nyamoradi, 2015)



**Figure 4: Bifurcation diagram along with  $r = 1$ ,  $c = 1$  and  $q = 2$  (Beck & Jentzen, 2019)**

These improvements will be considered in other upcoming activities. The first development we can think of contains a related framework:

$$dn/dt = r*n (1 - n) - \phi (n, E),$$

$$dE/dt = p ((1 - \eta) \phi (n, E) + \delta S) - c*E - c'*S$$

what else,

$$dS/dt = \eta*\phi (n, E) - \delta S.$$

In this model, add the word  $- c'*S$  in the second case to process energy costs.

We, too, can revisit this issue as conditions for a different reversal. This type of release raises some difficult questions. Of course, the dynamics of the dynamics are not always good. In this way, we incorporate the theme of the excellent performance of the fishery model. There are many questions identified on this issue, in particular, to highlight a clip of eligibility. These types of questions will be directed to the forthcoming activity (Beck & Jentzen, 2019).

### Conclusion

In this commitment, we have limited our review to the more direct position of the stocked king. Right now, the most basic model reveals intriguing results. However, there are a few revisions to this study that could be considered in later research. A few species of animals for sale, for example, may appear small; their size is controlled at inadequate levels, putting them at risk of extinction. In this approach, the overused species would benefit from assuming that the fish stock is currently logistically unaffected by Allee's effect (Nyamoradi, 2015). Then again, instead of considering the estimated market value, one might similarly assume that the cost of an asset is not proportional but fluctuates as a result of inventory and a special interest rate based on profitable market costs. We can also evaluate the consequences of investment on stock management, which can be stored when the catch is large but not when it is little. The purpose of the stock is to keep it at a constant level in order to keep track on market costs. In a later analysis, we intend to look into the effects of these varied adjustments on fisheries factors.

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**INTELLIGENT TRANSPORTATION SYSTEM DURING PANDEMICS****Anvesh Mannepalli**

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**ABSTRACT**

*Rapid Vehicular Growth, increasing population, rural to urban migration and economic upsurge, has put a great amount of pressure on transportation, especially on the traffic systems in urban India transporting around 8.225 billion passengers annually in 2019. As we need temporary restrictions during pandemic situations, we need to adapt transportation systems with the current restrictions as early as possible after the lockdown is completely lifted up. As you cannot have crowded places and crowded transports which are more common in Urban cities, we need some intelligent systems like the real time passenger information to know how many passengers have boarded a particular mode of transport, as to when people can use, wait or leave for that particular mode of transport. Some other practices like Social Distancing, E-Payments and Informative Passenger Communication are few other practices which can be implemented during such times.*

*Many people depend on public transport for transiting from their workplace and home along with the rising oil prices in India. ITS and its components are discussed like the Variable Message Signs (VMS) and Real Time Passenger Information, followed by best practices of ITS employed round the world.*

*Along with regular components, this paper tries to focus on how such a technology can help during pandemic times. Further, a critically brief discourse has been addressed about issues and challenges of ITS in India.*

**Keywords:** *Pandemic, Transportation, Healthcare, Infection, Transmission, Virus, ITS*

**Introduction**

A fundamental part of present day urban life is the public transportation system. Huge wastage of non-renewable fossil fuels, degradation in quality of life, safety for vehicles, safety for pedestrians, high pollution is all caused by inefficiencies in the traffic system. To provide knowledge to vehicles by jointly managing traffic and safety by introducing few new technologies is the main scope of this research. As there has been an increase in demand for vehicles almost to 51000

vehicles being bought each month, there is going to be an increase in the traffic as well. Getting beforehand information with the help of Intelligent Transportation System by judging the conditions of the place they are travelling to and diverting the riders accordingly so that there is a reduction in traffic and which indirectly reduces pollution.

Mornings between 8 to 11am and Evenings during 5 to 9pm are the usual peak traffic hours which every city has. Providing advanced information to riders going through a route which are the busiest areas primarily which could have a change in the city traffic pattern. This can be done by connecting around with the infrastructure and also connecting with the riders who are also travelling around you. This is what Intelligent Transportation is about.

Not only does intelligent transportation system is about the traffic details that is incoming, but also emergency conditions like earthquakes, tornadoes etc. along with the weather conditions around. You can call it as the vital information system working along with the network system on board.

An Ethernet change may be incorporated to permit network arrangements in Intelligent Transportation System for a normally controlled walled-in area. For gauging activity levels Inductive circle recognition framework is installed. For screening conditions on other roads controllers for variable message signs movement cameras are installed for travel times to be advised to the drivers. Also if there are any roadblocks or and repairs along the roads.

Without these ITS prediction and analysis gets difficult to implement and also for the ITS to respond.

**Literature review:**

According to an editorial, *Covid-19 pandemic and transport engineering* submitted by

*Chris Hendrickson, Ph.D., NAE, Dist.M.ASCE,*

This editorial was mainly written to discuss some important lessons for problems related to transport engineering profession which might help us to prepare for the future by considering learning lessons from the current situation. There has been an immense disruption in the social impacts, economic and environments throughout the world. Transportation unrelated topics like treatment development, vaccines and tests etc. are not added in this editorial. This editorial mainly focuses that freight transportation and public transportation are mainly derived demand. Which means demand is

directly proportional to other activities related to the economy like shopping, work etc. Because of individual choices like staying at home, social distancing travel volumes have come down drastically throughout the world to avoid being infected with the virus.

The idea of writing this paper is to make create an idea among the people that such initiatives need to be implemented urgently before things get worse. Boarding a public transport is very much a need and dire for Indian people since many cannot afford the luxury of travelling in their own vehicle daily. Indian systems need to gear up and things cannot wait until situation gets worse. Bus crowd status and Google maps are just small examples that we Indians need, as a country. The most effected people by this are the gig workers and the people who depend on public transport to get to work daily have to now use their own vehicles to move which might burn holes in their pockets along with the increasing oil prices. So understanding the complexity in these relationships on how such decisions have overall affected the transportation company will take many years of study.

It is visible like how freight and passenger transports have already been affected. Since January 2020, there was a disruption in supply chains starting with closing of factories. Shortage of essentials in supermarkets and medical facilities started to show up. However, essentials started to move but the production of these essentials soared. Since most of the logistics practice JIT approach this has disrupted the entire logistics industry. Though there has been a reduction in the usage of public transport, essential workers have still been on the move since. Protection of riders while transiting is vital along with maintaining social distancing. Adding to this, systems which are vital to maintain life like food, water etc. freight and logistics systems have to be maintained properly.

Though transportation has helped essential services to be delivered, it has also helped in the spreading of the virus. Over the past 50 years, researches related to improving emergency preparedness has increased the co-operation between the medical emergency team and transportation engineers.

According to a report published by *New Mobility Covid-19 Taskforce made up by global new mobility coalition* to identify the lessons and opportunities for mobility during the pandemic times. The report is an insight to Key thematic areas of work, Proposed activities and outputs and initial reflection and next steps. Their goals were mainly to create a more sustainable and inclusive mobility systems in the world by bringing out learnings and best practices from COVID-19 responses and also create a global action around critical themes of innovation to recover from COVID-19.

Their focus areas were:

- increasing mobility throughout by digitizing usage

- Re-establishing use of public transport and shared mobility service in a redundancy and complimentary system
- Retrofitting existing and installing new infrastructure
- Private-Public mobility services designing and testing
- Autonomous vehicle deliveries
- Re-designing of Supply Chain
- Rapid information exchanges between cities, businesses and communities

According to the article provided in *THE CONVERSATION* by Yale Wong, has stated that since public transport is the life blood of our cities, we need to keep it moving since that is the most affordable transport that one can achieve. He also stated a few examples from Australia, Hong Kong and China on the practices that they have implemented to ensure the safety of passengers and the drivers of public transport in containing the disease. American Public Transportation Association (APTA) and International Association of Public Transport (UITP) such industry associations helped different countries by developing responses.

*Developing a contagious virus response plan*, a paper written by the *American Public Transportation Association*, was written for the public transport worldwide as an aid to transit agencies in the wake of CVRP. This paper highlights elements that might be covered by the plan and might provide implementation and format suggestion examples. Transit agencies should consider determining the applicability of the various elements in this Standard with respect to the requirements, plans and policies of their local health departments. Once the CVRP is drafted, the transit agency should share it with the local health department for review and comment before getting issued it as a final document.

According to the *Guidelines for Public Transport Operator to Manage COVID-19* issued by the *Advanced Public Transport*, has issued that it is important planning is not a stand-alone project, but should be linked with existing crisis management structures and procedures in order to be effective. The key processes that needed to be looked after are the Essential functions within the organization along with the backup for critical positions in the administration. Essential Protection and cleaning equipment and supplies with stock and all the supply chains keeping in mind with the staff's information. Communication of the responsible authorities need to be informed by the country or region.

In the article issued by the *INTELLIGENT TRANSPORT HUB*, on 10 June, 2020, mentioned in their statement that Google Maps is introducing a new feature to ensure safety for its riders. Google Maps will now show relevant alerts from public transport companies to those looking for public transport directions for a trip where restrictions are

implemented because of the corona virus. The alerts can help users better prepare for journeys, for example, telling them if wearing a mask in public transportation is important as a government mandate. The alerts will initially roll out in U.S, United Kingdom, Thailand, Spain, Netherlands, Mexico, India, France, Colombia, Brazil, Belgium, Australia and the Argentina. The app has also been updated with better information for drivers around COVID-

19, too, with notification alerts to drivers about restrictions and checkpoints about Coronavirus, while crossing the national borders first of such being implemented in US, Mexico and Canada.

WBUR news has listed an article in its page stating *Massachusetts Bus Transport Association (MBTA)* has initiated a crowd checking in the bus system where a passenger who wants to board a bus can look in the app or the website before boarding about how crowded the bus is and then decide whether to board the bus or not. They say travellers can make better-informed decisions about maintaining social distancing by having a knowledge what conditions are like on buses. Crowds are going to be categorized in 3 sub categories: "crowded," "some crowding" or "not crowded," implemented in the pandemic and all categories taking the lowest count into consideration.

In an article related to why COVID-19 has not spread much in Japan, an interesting little mystery is why haven't cases in Japan have increased during the corona virus pandemic. Comparing to the nationwide testing like south Korea or widespread lockdown like China the country has not witnessed any such thing. The epidemic has still spread slowly after all this has been happening. Though the country has a very dense population with cases less than those of population of a 20<sup>th</sup> less than that of Denmark with not even 1000 cases. Many say that Japan has still not tested a large number of population, but if this was right given the country's majority population of having elderly people the hospitals must have been flooded by now. The possibility is that Japan is simply very good at social distancing, avoiding groups of people, and keeping physical distance from unknown people. Despite densely urban areas, Japan has been the signature for social isolation or social distancing. Only a few young people live with a roommate. Maintain a personal space whenever possible is one of the country's culture; people greet each other not by shaking hands but, they bow down and greet each other. So is their culture.

### A. World economic forum

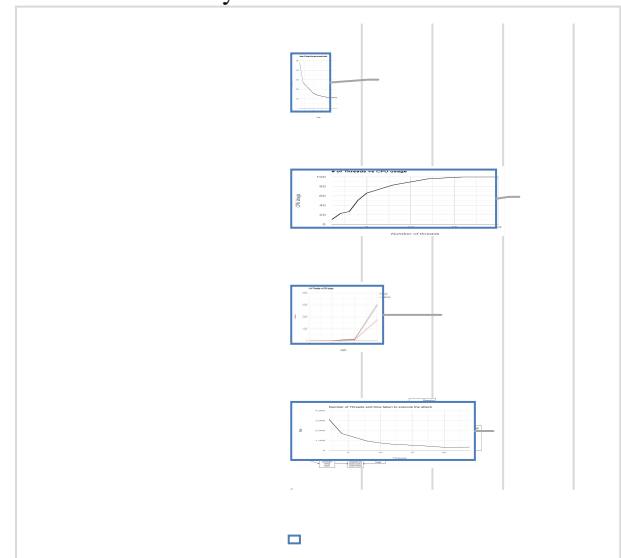
A survey was conducted by the world Economic forum to find out how people preferred the use of public transport during pandemic times. A Global Kick-off virtual meeting was held on 7th of July,

2020, with objectives such as introducing a task force approach and mission, broaden proposed themes by sharing case studies and ideas, and to scope potential factors and identify taskforce activities.

The meeting's Agenda was to:

- Introduce a new Mobility COVID-19 Task Force
- Increasing Mobility By Digitising and Intelligent means
- Re-establishing Public transport and sharing mobility services
- Installing new Infrastructure and Retrofitting Old Infrastructure

Surveys were conducted to find out opinions of people. These surveys were mainly conducted on three themes namely –



THEME 1: Increasing mobility throughout as well as multimodality by digitizing usage

THEME 2: Re-establishing use of public transport and shared mobility services

THEME 3: Installing new Infrastructure and Retrofitting old infrastructure.

### THEME 1:

People were asked in the survey if they would like to explore any new practices in their city during the virus season.

They were given 4 options namely Integrated and dynamic multi-modal route planning tools, Notification of transport schedule changes, Digital tools to reserve transport/ on-demand mobility and others.

A majority of people 58% of them preferred to have an integrated and dynamic multi modal route planning tools. Next, a 52% of them preferred to have digital tools to reserve transport, then a 26% of them wanted a notification of transport schedule changes and a mere 11% of them preferred others.

The Proposed Task Force actions were as follows-

1. Digitize reservations for public transports, on-demand transports and public-private partnerships.
2. On-demand and shared solutions to be established during covid-19 to support vulnerable communities and also accessible to the healthcare workers for their abrupt commuting patterns in longer term.
3. Ensuring digitizing improves mobility for vulnerable communities must be practiced.
4. PROTOCOLS must be developed to prioritize healthcare supplies according to societal needs.
5. Frameworks must be provided for the integration of modes of mobility to optimize route planning.
6. Blueprints need to be developed to connect with the infrastructure with dynamic and updated transport information.

**THEME 2:**

A survey was conducted in this theme asking people their challenges to re-establishing mobility services and rides with high occupancy. In this they were given options as if they wanted access and design issues similar to pre-crisis, increased cost of services, poor sanitization practices, commuter fears and others

As we can see the results, a large group of people, 78% of them have commuter fears which are quite obvious during such times, next a 41% of them wanted access and design issues similar to pre-crisis. Then a 33% of people voted for poor sanitisation practices and 22% of them had a challenge with increased cost of service. Last 6% people had other challenges.

Proposed actions were:

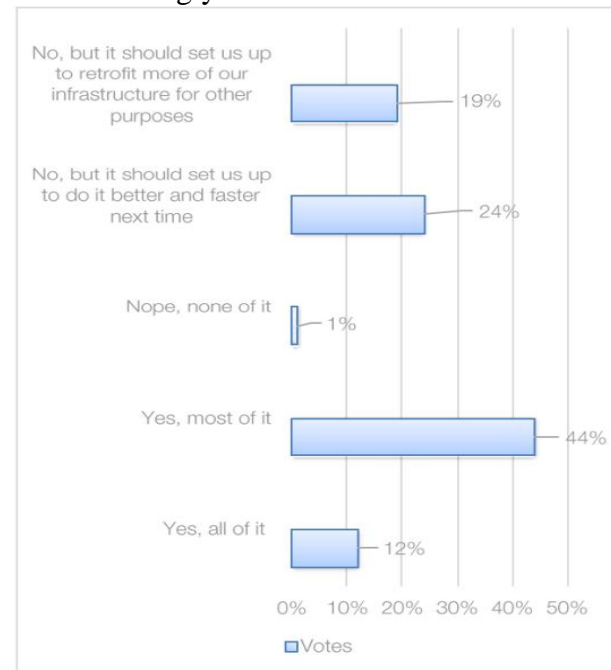
- 1 Need in enhancing multimodality by keeping financial barriers in mind
- 2 Show portraits of mobility workers to showcase the impact of covid 19, and share successful preparations and recommendations to improve systems.
- 3 Showcase and amplify first and last mile connectivity by facilitating the usage of public transit and high occupancy solutions

4 Business-model development for more resilient public-private financing

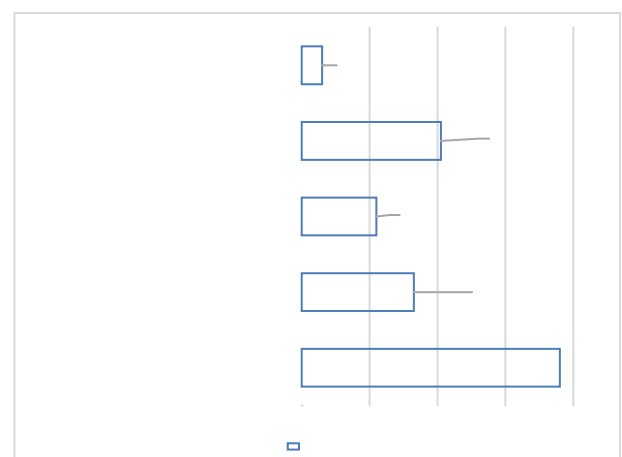
5 Build models for redeployment, protecting health, safety and economic stability of vulnerable populations.

**THEME 3**

Retrofitting existing infrastructure and designing new infrastructure surveys were floated asking yes or no.



So as we can see, there were 5 options that were given with a majority 44% people wanted all retrofitted infrastructure to last in the city



even after COVID-19. A 24% of them voted for that the infrastructure should set us up to do it better and faster next time. A 19% also said no, but it should set us up to retrofit more of our infrastructure to other purposes. 12% wanted all of it to be retrofitted and just 1% wanted it to change.



### Proposed Actions

1. Opportunity to learn and leverage all learnings from COVID-19, as a test to transform the mobility future.
2. There is a need in accommodating for shifting transport patterns, aggregate scarce transportation options and also informing users about the schedules that should be forged beyond the crisis responses.
3. Overcoming fears while commute and shifting of travel behaviours for a positive mobility transformation as we shift to a new normal
4. Many Solutions will not work, now or in the new normal, unless rapid communication about shifting of transit availabilities, changing traffic patterns, schedule changes, mode availability etc.
5. Investments from social workers and people of high profile express a willingness in investing funds with demand driven transport management.
6. Redefining possibilities and responsibilities around public-private partnerships to address the socioeconomic inequities, public health and barriers sustainability.

The surveys above were taken from over 10 countries with over 120 stakeholders covering a wide spectrum of mobility services including private, public and third sector participants. The next step which the forum is planning is to increase the reach by expanding communities. There were more than 10 case studies that were discussed more additional case studies are being collected to inform both immediate and long term taskforce actions. These themes which were shared during the kick-off are test practices and case studies as we transition to a new normal mobility. This forum has done it before and will keep working to ensure mid and long term solutions through actions over the next years.

### B. Practices by other Countries



Berlin and Malta have quickly adapted themselves to existing on-demand transit services to meet the needs of their communities in the midst of the COVID-19 epidemic.

In Berlin, the transportation authority, the BVG — which partnered with ViaVan changes its existing on-demand BerlKönig service to meet the needs of essential workers. The BVG expanded the BerlKönig's service zones to cover over 10 additional hospitals and a limited ridership to pre-approved healthcare workers. Using the available resources and technology, they've reduced vehicle capacities to support physical distancing, adapting quickly within one week to get the service up and running.

Similarly, in Malta, "Cool" extended its on-demand service zone to the entire island in just two days, and adapted in two critical ways: first, rides, typically shared, are now private-only to support physical distancing; and second, grocery stores and other small businesses can now use the Cool app to dispatch food and other essential goods for delivery. Cool drivers can see whether their dispatched trip is for a delivery or a private ride within their app. While all passenger trips are now private, the service's technology allows all deliveries to be shared to increase efficiency.

### Objective

The idea of writing this paper is to make create an idea among the people that such initiatives need to be implemented urgently before things get worse. Boarding a public transport is very much a need and dire for Indian people since many cannot afford the luxury of travelling in their own vehicle daily. Indian systems need to gear up and things cannot wait until situation gets worse. Bus crowd status and Google maps are just small examples that we Indians need, as a country.

### Research Methodology

The methodology for this project is purely on how different countries are tackling public transport restrictions and how these processes can be implemented in India. Many countries have started operations on their public transports and in India we are still clueless on how to have an efficient transportation system. Many countries have updated Google Maps that show containment zones so that a rider can avoid such routes and other public transport apps that show the crowd standing in the bus.

The data and required information was collected through secondary sources like the internet, news articles, automotive portals etc.

### Analysis

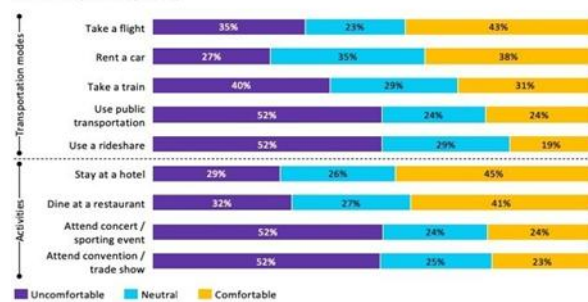
Public Transport Systems, be it Buses or Metro Rails where transmission of COVID-19 is very risky since these are the areas of confined spaces with heavy passenger volumes and multiple surfaces. Installation of hand sanitizers in metro coaches, buses, bus stops and railway station premises, following mandatory norms for wearing of masks and strict action must be taken against non-compliance. Paintings on the ground at bus shelters which mark a suitable distance which must be maintained between each passenger ensuring social distancing norms are maintained. Installation of contactless card reading machines in buses as this is the perfect opportunity to test such technologies,

so people can just tap their cards and move ahead instead of exchanging cash. Installation of face shields to protect driver and the conductor – such benefits of online payments and face shields will also be helpful in the post COVID era as a promotion of online payments and to prevent of assaults from rogue passengers.

Extra care against the virus is still the utmost priority since it is less likely that the novel COVID-19 will be completely eradicated in the coming future, though businesses have eventually resumed their operations. Attention of utmost importance will be given to lessen the impact to the novel corona virus by keeping social distancing norms. There is a high possibility of

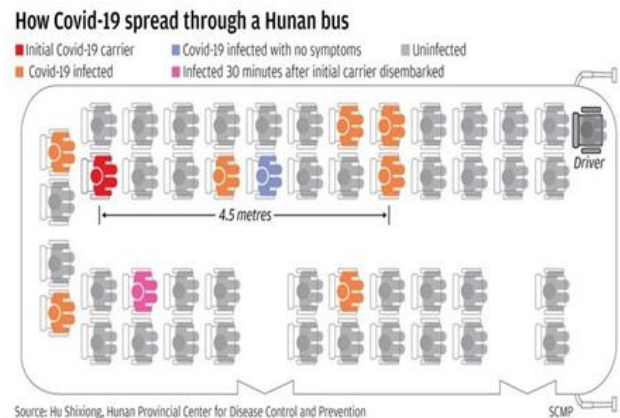
#### COVID-19 CONTINUES TO MAKE CONSUMERS WARY OF SOME ACTIVITIES

After the COVID-19 outbreak ends and travel restrictions are lifted, how comfortable will you feel doing each of these activities?<sup>1</sup>  
Percent of respondents, (n=4,594)



Source: Google Images

introducing legislations by the government by implementing proactive disease prevention measures.



Source: Google Images

There will be a change in life after this and there is no doubt about it. Authorities had to act quickly to protect our society since the pandemic started very quickly. Similarly, Shenzhen bus Group report and UITP factsheet have developed important assets to help public transport operators to handle the impact. Guidance and preparedness while using public transport are offered by them.

To lessen the risks heavy emphasis like personal hygiene, sanitizing fleets along with social distancing norms to reduce contact among people have been put on personal hygiene. If you have right technology such recommendations can easily be implemented very quickly.

These are general precautions that one who is travelling or one who is arranging the travel needs to take care of. We need something more efficient and worthy which everyone will think of using like Real Time Passenger Information Systems, Updated Google Maps, Billboards.

#### a. Social Distancing



Though it doesn't come under the ITS, it is still very important for everyone to practice social distancing not just in public transport, but also at any crowded place which at first you shouldn't be at, but if there is something which maybe important to go to, practicing social distancing is mandatory. Practicing social distancing not only is beneficial during pandemic times, but is also a good thing to do during normal times.

Also one of the better practices is putting on masks if you have a cold or the flu so that you don't infect others. Many people put on surgical masks. A person exhaling infectious droplets can be stopped by wearing masks.

**b. Time Passenger Information**

The main role of the RTPI-Real-Time Passenger Information System is to show the arrival of a bus at your bus stop, to let you plan your travel accordingly. To minimize delays Traffic Light Priority (TLP) is provided with the help of the RTPI system on your bus journey, also for buses which are running late. India’s private bus sector operated around 160,000 buses that transport more than 60 million travelers a day. While functional metro rail passengers of 4.6 million people with more than 500 stations located in 10 cities having a daily ridership and a range of about 701 km. Bus movements located by the intelligent ticket machining systems which are synchronized to the RTPI server use this information to provide the location of the bus at the display in the busstop.

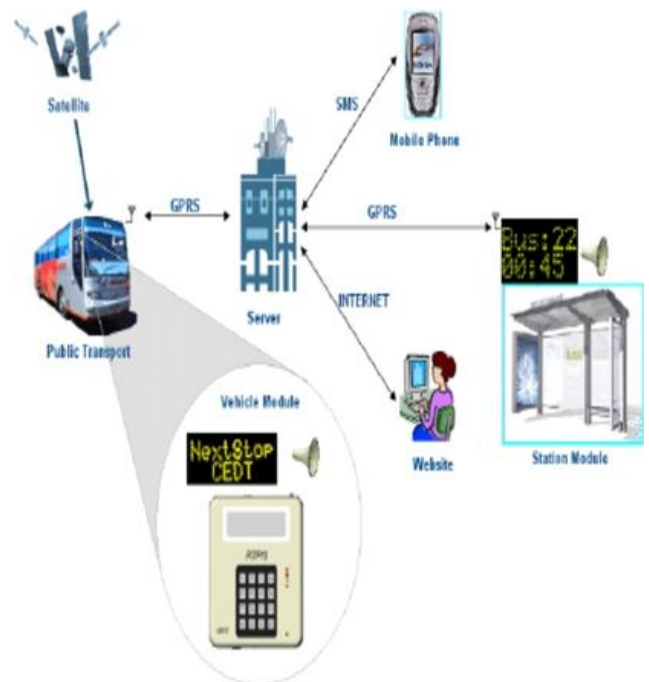
Real time passenger information system gives you the countdown of live predictions of the bus arrival expectation. It is displayed in the format of “XX mins” and shows a countdown displaying “DUE” about the bus arrival at the stop, which allows you to plan your travel confidently.



Since many people depend on public transports for their daily transit to their workplaces, it is natural that they will be troubled to use their own vehicles in such situations where oil prices are rising and daily essential commodities are getting costlier. Even a single penny they earn is of hard work and they need it to keep their houses running. But public transport in India is very crowded and is an easy way for the virus to transmit. So we need an efficient way to keep public as well as the workers in the public transport safe and secure.

This is when Real Time Passenger Information comes in. When a person is about to board a public transport, data will be uploaded in the website or the app stating how crowded the bus or the train is and how many more people can the bus accommodate. This information is very useful especially in cities like India.

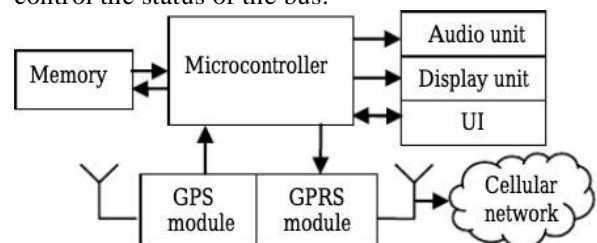
It is also difficult to maintain a track of people who boarded the bus or train which later was known was infected by a person who has been diagnosed with COVID-19. Such details can be uploaded in the app or the website later stating such bus or train has been used by a patient having the virus and making others who travelled by the same bus or train to quarantine themselves immediately



The main parts of Real Time Information are a **central data processing server**, a **station unit** at the stop and a **vehicle unit**.

**c. Vehicle unit:**

The vehicle unit is used in calculating the speed of the bus, directions and computing the current location. This information is used by the central server unit to transmit the computed information using GPRS. This is used to display the upcoming stops and also if the bus is crowded or not. Also providing a user interface where the bus driver can control the status of the bus.



**d. Station Unit**

This unit is used to transfer data and calculate an estimated time of arrival of a bus. This unit can also be controlled by the bus driver showing the availability of free space for passengers to enter. Micro controller application is used for controlling and sequencing and for communication with server, Python scripts are used.

Table name	Contents
Bus	Bus ID, type and route
Bus Position	Bus ID, current coordinates, speed, average speed, direction, current link, link entry time, estimated end time, status
Bus Position Log	Log of changes made to bus position table
Node	Node ID, coordinates, name
Link	Link ID, node pair, travel time
Route	Route number, sequence of links
Stop	Stop name, node ID, route number, ETA

**e. Central Data Processing Server**

This is a database which is the main element of the Real Time Passenger Information. This is used to maintain a database of all the buses which ply on a route and also to maintain database of all routes. The database table is made which contains bus details, position, bus position log, node, link route and stop. Because of these databases, it continuously receives location of the bus in longitude and latitude. It is also used in calculating ETA for the upcoming stops. It also sends notification to the passenger waiting for the bus with the help of a GSM modem that helps to transfer queries to the server which solves the query and sends it to the user. With the help of a server the user can always track his or her bus also in checking the route map of abus.

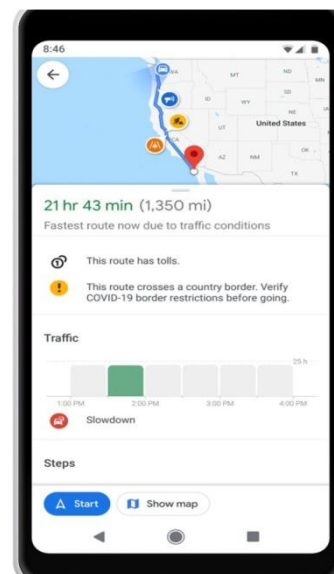
**f. Google Maps**

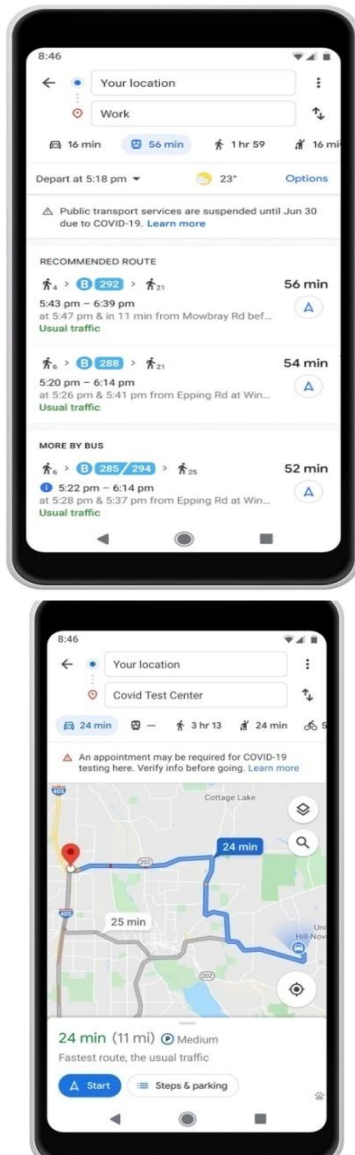
The latest update of Google Maps for iOS and Android has introduced a number of new features to help public transport passengers in staying safe from the threat of the novel virus. The global pandemic has disturbed public transport services over the world, but technologies offering up-to-date information for passengers serve a route towards the new normal. Google Maps will now be showing relevant alerts from public transport companies to those seeking for public transport with areas being affected by restrictions from COVID- 19 and show directions accordingly.

The transit alert will grant users to check where there is a high possibility of crown in a train/bus station if limited schedule is being implemented. In the updated app, when you click through to check Transit directions when looking up a route, you can scroll to check crowdedness predictions and add your own inputs, like very crowded or not too crowded, or other terms. This feature is available in countries like United States, United Kingdom,

Thailand, Spain, Netherlands, Mexico, India, France, Colombia, Brazil, Belgium, Australia and the Argentina. The app can check show the facilities limitations and show the eligibility if a user is driving to a medicalfacility.

In several countries, Google stated it will now provide transit alerts from local agencies that will make users be ready for any government mandates that impact your ability to take a public transit. For example, if services are closed or if you're required to wear a mask, the alerts will include this information.





The alerts can be used by users to be prepared for journeys, for example, telling them if there is a mandate put up on public transportation by the government which may require them to put on a mask or which might jot services.

### g. Managing Operations And Controlling Demand

Bus operations have to match when demand changes or are being used to cut down travels which are unnecessary complying with directives from the government accordingly. This can be by departures controlling and reduction in bus dispatch frequencies, also by branch adjusting, routes in the evening, peak, and suspension of bus services complying to inter-city routes. Challenges can be faced with limited workforce due to unavailability causing a suspension in providing services.

This is when the real-time monitoring becomes important in management of the public transport fleet operations. Citywide clarity of the fleet and the authority of your operations is given by the Automatic vehicle location (AVL) with a transit management system. Resource organization can be

done along with fleet organization, route scheduling, and also adjustments in schedules, then any changes are quickly implemented. With transit management integration and passenger information system, any modifications in service can be updated automatically in journey planner apps and information displays.

Increase in performance and operational efficiency can be done by these systems, enabling transport providers in delivering services in a better way along with fewer resources.

### h. Managing Passenger Flow And Decreasing Waiting Times

Social distancing measures can be backed by Operators by not getting into crowd gathering at stops, terminals and bus stations. Real-time passenger's accurate information will enable travellers in organizing their journeys in advance and keep a track in their arrival time so that they do not receive any risks.

While providing times for to-the-minute service, it's critical that an ETA forecast engine will be used for real-time GTFS feeds for truly accurate arrivals with corrective algorithms. Your journey planning app will immediately transfer the data from your mobile phone on-the-go, with a variety ranges of other information related to services.

Usage of mobile apps to regulate passenger flow, showing notifications, or introduction of regulations in ridership staggering. Devices that count passengers and installation of cameras in automobiles that can integrate with the transit management system, so that you may keep a note if passenger restrictions of 50% have implemented in cities.

### i. Informative Passenger Communication

Passenger communication during pandemic times is important public confidence is maintained in the transport sector and situation handling with total clarity. All potentially valuable information and news along with standards of conduct in risk reduction associated with travel must be shared by the Authorities who have a duty of care.

Service changes and restrictions will also be there. Real time or advance communication must take place for this whichever possible.

Passengers must be fully learnt by the operators, frequently and simultaneously by a wide possible range of channels with the help of a passenger information system.

Website and mobile apps can be used to inform prior to travel. Screens at stations and solar powered bus stops while the journey begins. And display on the buses during the journey

### j. E-Payments And No Cash Handling

Quick secondary research on handling cash and the virus gives us the picture as to why workers in the transport industry have shown concerns in handling

cash, and also why a lot of operators made online payments compulsory, where possible.

Though online ticketing has its own benefits along with automatic fare payment systems, it instantly takes out the need for cash exchanging by hands. It also removes out any contact between ticket kiosks and passengers, ticket inspectors or drivers.

Contactless ticketing are as follows:

- 1) Online Tickets
- 2) Online Payments through Apps like phonepe etc.
- 3) Travel Cards/SmartCards

Similarly, the government has mandated the implementation of FastTag's for all vehicles for collection of tolls to make sure no cash is exchanged from hands and there is a faster movement of vehicles at the toll plaza.

### k. Real Time Crowding Information

So, what's on transit riders' minds these days? It's simple: Just how full is that bus or subway car? They want to protect themselves from catching COVID-19, and they are thinking about whether they should hop on or wait for the next vehicle.

The pandemic has made people more aware of the health risk of being in public places – especially enclosed spaces like transit. With cautions on movement and many people working from home, ridership around the globe has dropped anywhere from 60% to 90% with commuter services taking the heaviest toll.

Riders want assurances they can physically distance themselves from other riders. Wearing a mask will help, but the science on this virus and how to keep safe continues to change.

**Survey: Before COVID-19, 60% of Riders Would Board a Packed Car.** Transit app company Transit, surveyed more than 6,000 app users in June to find out how they feel about the risks of COVID-19, crowding on public transit, and what type of info would make them most likely to start riding transit again. They looked at six cities in North America, some with agencies that already provide real-time crowding info. People who have access to a car are twice as likely to avoid public transit, while 31% without a car are using transit. Before the pandemic, more than 60% of riders said they'd board a tightly-packed car. Now 30% of people say they would use transit if they had capacity info and if agencies are enforcing rider limits.

How to Get Real-Time Info to Passengers?

The real-time capacity information using automatic passenger counters (APCS) which are installed on vehicles. There are two main styles: beam sensors on either side of vehicle doors that count passengers going on and off, and the overhead infrared sensor. The beam sensors require a clear

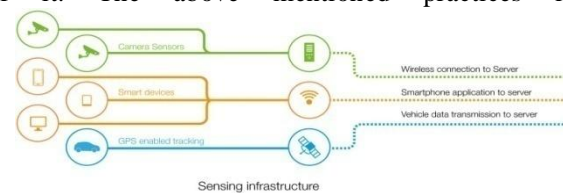
line of sight, so if there's doorway crowding or a bag in the way, there can be miss-counting. The overhead infrared sensor is more expensive but more accurate and can handle these anomalies in counting because of the bird's-eye overhead view. Data captured in real-time goes to passenger information systems. Developers can customize a mobile app for agencies to give passengers trip-planning capabilities on their iOS and Android devices, including vehicle capacity. Riders can see exactly how full a vehicle is before they board, along with the crowding info of the next vehicle coming. The web version of the product lets passengers access scheduled and real-time transit information and notifications online.

Accuracy is variable in real-time and may drift throughout the day. It doesn't have the benefits of hindsight that we have with historical data that uses the statistical averages that the post-processing tools are able to use." So agencies need to make sure the real-time data is as good as it can possibly be.

### Findings And Recommendations

Based on the analysis above, we found out that countries in the Europe, USA have already adapted themselves with the ITS to help reduce the transmission of virus while using public transport. They offer us an effective benchmark which can easily and efficiently be implemented in India. Desired results are being produced in the market due to its effective approach. Indian Government should take up urgent action for implementing the ITS. Indian Government still has not stepped up their approach in opening up of public transport systems. Policymakers and private stakeholders can act proactively in the long run which is evident. Suggestions are as follows:

- a. **Create awareness among people to use public transport.** As oil prices increasing day by day, it is very hard for the sole breadwinner of a family who has to work hard for every single penny to take his own vehicle daily. Since COVID-19 is the new normal, we need to plan our work and life accordingly. Similarly, public transport must be accessible not only for the people working in health care industry but also the citizens who are in dire need of it. The above mentioned practices like



**Crowdcontrol, GoogleMaps, SocialDistancing, Smartcards** can be implemented so that public transport is safe and hygienic to be used. Making public transit available will not only be helpful for the people but also boosts the economy of the state.

- b. **Identify containment zones through apps.**

By doing this, riders will know which routes to avoid and choose any other available alternatives to take. European countries like France and Spain have already implemented these in their Updated Google maps which divides an area by the colour. Like Red is a containment zone, Orange is a little restricted but can pass through and Green is a non-containment zone and people can go around following there strict norms. By doing this, riders will know where they can head to and where they don't want to. They can plan their ride accordingly.

**c. Innovative Financing and Investments schemes.** Overcoming financial barriers to ensure support is very important if any privatizing concept is being introduced. Experience from European countries like France and Spain are also introducing private players in upgradation of ITS. As we have seen above where a survey was conducted by the world economic forum, governments are planning to ease regulations to introduce public players who are ready to invest and finance such schemes at such pandemic times which not only help to share burdens but also share all the finances where the economy is at a low.

Countries tend to enhance their policies and regulatory frameworks in transforming their approach in fighting this pandemic, it is a unique opportunity to address sustainable and innovative approach which not only helps during pandemic time but also post pandemic such ideologies are definitely useful. Going forward, holistic, adaptable frameworks capturing and measuring multiple impacts of such innovations can help in balance in favour of a well organized and a helpful policy worldwide.

**d. Connecting with the Infrastructure around.** There are few private companies that are working on this concept of connecting with the Infrastructure around. This so works supposing if there is traffic nearby the ITS connects with other cars and prevents you getting stuck in traffic and take an alternative route. This same technology also lessens your chances of getting involved in an accident. The main purpose of this system during pandemic times is when an ambulance/paramedic is in a hurry to reach a hospital, the ITS acts in such a way that it reacts to the nearby signals and opens up everything which lessens the chances of the ambulance in being stuck in traffic. This is very useful especially in situations like India having especially heavy volumes of traffic and also a very huge possibility of community transmission during the pandemic. Such technologies are already in use in few of the European countries and will be very useful if implemented in Indian conditions.

### Limitations

**a. Costly Parts,** most of these technologies listed above are a little futuristic and will be placed at a higher side on costs. Since most of the technologies are still in the initiation phase, the technologies implied on a public transport tend to also increase the

costs of daily travel by at least 20% than what is charged now. Coming to private vehicles such technologies will increase the cost of a car making it safer but considering India's poverty line, affording such cars isn't an easy task for everyone.

**b. Lane to Lane discipline.** For most of the components of a technology to work properly as they do in western countries in because they follow lane to lane technology. Such a thing is difficult in a country like India because of obviously the lane to lane indiscipline which is hard for the software to follow and might end up getting confused and may cause accidents.

**c. Malware or Hacking.** Since hacking and malware are big threats in the online world, hackers can hack the systems and may cause serious repercussions to the proper movement of vehicles. So more research is being done on this to make such software's safer and user friendly and can help in saving more lives.

**d. Training of people.** In a country like India where the literacy rate is still not on top but coming up, most of the people who drive luxury vehicles have chauffeur's driving them around in such cars and most of them being uneducated, gets difficult for them to teach the basic usage and educate them on learning any new thing. Also old people above the age of 60 have difficulty in grasping few things. So that brings a major problem. enforcement, citations, Variable Message Signs. Because of this Initiative there was an Improved traffic regulation and Reduction in road accidents.

**e. Operational Infrastructure** was very much voted in the surveys conducted. New and old retrofitted public transit infrastructure with new technologies need to be implemented in the societies as they give a clear cut idea about the current mode of public transport. Such things need to be implemented soon as outbreak is reaching peaks and we as citizens need to support. Such infrastructure not only helps now but according to the survey it is learnt that such infrastructure will create a new normal and will be useful Post COVID which is necessary in countries like India.

**f. Intelligent Transport System** plays a major role be it a virus outbreak or a normal sunny day. It's a life saver as well as a life changer. It's a technology that not only is available in high end automobiles but also in lower segment vehicles and can bring in a lot of faith in public transport in such times. Public transport cannot be opened anytime soon in India based on the crowded nature. If there was ITS connected with IOT available on your mobile phones or any other device around you, could be a life changer.

### Conclusion

It is essential that we identify and address the key barriers so that we are ready for future

hurdles, in order to achieve an efficient, ITS in India. With the right strategies and enabling frameworks in place, the integration of ITS in the lives of a common man will ease his travel and also will help the country to boost the economy by utilizing this.

The Asia Pacific intelligent transportation system (ITS) market is set to hold the second largest share over the forecast period as major economies in the region, such as China, Japan, and India, are investing significantly in creating megacities and modernizing their transportation networks to facilitate enhanced trade exchanges.

Roadways held a majority share of the ITS market due to the extensive amount of consistent traffic movement on roadways /highways demanding innovative traffic management methodologies. An exponential rise in the number of road accidents around the world is a growing concern for government agencies. Operation and collision avoidance application is projected to hold a dominant share of over 30% in the railway intelligent transportation system market by 2025. **In the airways ITS market, communication and networking systems are projected to exhibit excellent growth between 2019 and 2025 at a CAGR of over 7%.** With increasing air traffic levels and rising demand from passengers for in-flight communication systems such as Wi-Fi access, airlines are exploring innovative methodologies for improving communication and the network infrastructure.

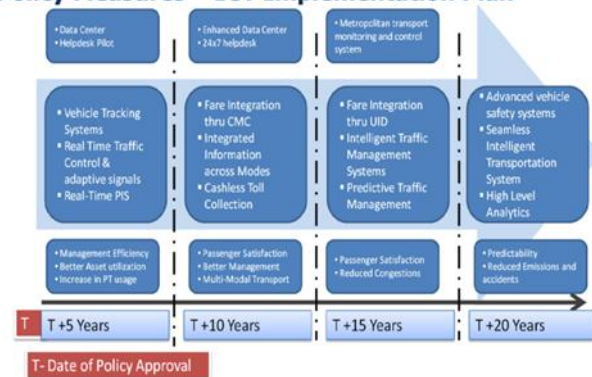
Coming to the **Regulatory Framework**, it is necessary that few regulations are put up for the ITS to become successful and also ease for private-public partnerships for investing in the development of the ITS. Laying down of such regulations will not only help players but also maintain a decorum for the upcoming future generations. A new regulatory committee has to be formed by the government as stated by the smart grid forum, which helps to in creating a committee within few days as the outbreak is sudden and we as a country need to act fast on it. So a Strong Regulatory Framework is necessarily required.

Few new regulations that can be added are having a Partnership model for ITS development along with central command centre to monitor and managing systems,

Mandatory Training for drivers to use the new technology, – Internet hotspots and kiosks at bus and train stations; Surveillance and security systems, Contact less smart card system for payment and to provide service related updates through electronic means.

Coming to **Finance** part, laying down a collective compliance scheme based on a combination of pay as you use and several liability principles will help it grow in a feasible way. As we say in the survey, people wanted both new infrastructure and also retrofitting the old infrastructure. As the economy slowing down and a trade war with china calling for boycotting Chinese products, high finances are required which is possible only by implying public-private partnerships.

#### Policy Measures – ICT Implementation Plan



(Source: Final Report, Working Group on Urban Transport, NTDP, MoUD March 2012)

The Indian Government has already started investments in the 12<sup>th</sup> Five year plan from 2012-2017, in the Public Transport Sector especially in the ITS.

Total Investment was about 2,30,000 crores in ITS, Vehicle Technologies like the EV's, Hybrids, Fuel Technologies etc. The application of those technologies were implemented in all modes of transport like Roads, Public Transport, Freight, Waterways and Aviation. The Technologies which the government were working on are Telecommunication Systems, Automatic Identification Systems, Automatic vehicle location systems, Traffic Data collection and automatic classification system, Electronic Data interchange, Cartographic databases and Geographic Information Systems (GIS).



Component	Investment (€ Million)
New Roads Infra	15,563
Road Upgrade	10,163
ITS/Pkg	1,615
Misc	1,231
<b>Public Transport</b>	
Buses	2,117
BRTS	4,554
Metro Rail	20,112
Commuter/Regional Rail	3,043
Bus Infrastructure	1,348

Citywide ITS was first implemented in Mysore, which was planned in Naya Raipur. ITS masterplan for Hyderabad in three phases spread over 10 years, at a cost of 1200 crores which include Automatic Traffic Counter-cum-Classifiers (ATCC), CCTVs, Variable Messaging System, Traffic Signals, Pedestrian Signals, Flood Sensors, Weather Stations, Pollution Sensors. B-TRAC – Bangalore was initiated by the Bangalore traffic police. Components of B-TRAC include, Centrally controlled traffic signalling system, Camera enforcement, Speed Interceptors, Mobile enforcement, citations, Variable Message Signs.

Because of this Initiative there was an Improved traffic regulation and Reduction in road accidents.

**a. Operational Infrastructure** was very much voted in the surveys conducted. New and old retrofitted public transit infrastructure with new technologies need to be implemented in the societies as they give a clear cut idea about the current mode of public transport. Such things need to be implemented soon as outbreak is reaching peaks and we as citizens

need to support. Such infrastructure not only helps now but according to the survey it is learnt that such infrastructure will create a new normal and will be useful Post COVID which is necessary in countries like India.

**EU-India ITS Technologies**

(Source: EBTC Clean Tech Mapping)

ITS Area	Insights	Technology Deployed	Presence EU	Presence in India
Traffic Signal Control	Manage Traffic Speeds, Vehicle merging & corridor crossage	<ul style="list-style-type: none"> <li>Updated traffic signal control equipment used in conjunction with signal timing</li> <li>Adaptive signal systems (Sensors)</li> </ul>		
Ramp Metering	Safety space vehicles merging onto a highway, while minimizing speed disruption to existing flows	<ul style="list-style-type: none"> <li>Ramp metering Signal &amp; Controller</li> <li>Check-in Detector</li> <li>Check-out Detector</li> <li>Merge Detector</li> <li>Queue Detector</li> </ul>		
Automated Speed Enforcement	Photographs of vehicles and/or drivers taken at the time of the violation, along with data from the radar device	<ul style="list-style-type: none"> <li>Speed Detecting radar</li> <li>Light detection &amp; ranging (LIDAR) units with image capturing technologies</li> </ul>		
Incident Management	Address 3 key areas: traffic surveillance, clearance & traveler information	Video Image Processing System		
Electronic Toll Collection	Electronic payment of highway & bridge tolls as vehicles pass through a toll station	Vehicle-to-roadside communication technologies include roadside antennas & pocket-sized tags containing radio transponders		
Traveler Information	Providing the public with information regarding available modes, optimal routes, and costs in real-time either pre-trip or en-route via in-vehicle information	In-vehicle guidance: CMSs and PDAs to distribute user information		
Bus Rapid Transit	Encompasses the use of a series of ITS technologies, resulting in increase in bus riding	<ul style="list-style-type: none"> <li>Route planning</li> <li>Right-of-way</li> </ul>		
Weight-in-motion technologies	Enable the weighing and cataloging of trucks without causing vehicles to stop and queue in line	WIM scale imbedded in the pavement triggering the camera		
Vehicle control technologies	Aim to improve vehicle safety, efficiency, and comfort	<ul style="list-style-type: none"> <li>Intelligent cruise control</li> <li>Specie alert</li> <li>Anti-lock brakes</li> <li>Electronic system malfunction indicators</li> </ul>		

**Intelligent Transport System** plays a major role be it a virus outbreak or a normal sunny day. It's a life saver as well as a life changer. It's a technology that not only is available in high end automobiles but also in lower segment vehicles and can bring in a lot of faith in public transport in such times. Public transport cannot be opened anytime soon in India based on the crowded nature. If there was ITS connected with IOT available on your mobile phones or any other device around you, could be a life changer.

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**THE IMPACT OF COVID-19 ON FINANCIAL MARKETS AND BANKING SYSTEM****Yadu Krishna<sup>1</sup>, Dr. K. P. Yadav<sup>2</sup>, Dr. Sunil Kumar<sup>3</sup>**<sup>1</sup>Student, B.A.(Hons.) Economics, Shri Guru Tegh Bahadur Khalsa collage, University of Delhi, Delhi<sup>2,3</sup>Vice Chancellor, Mats University, Raipur<sup>2,3</sup>Professor,CSE, Mats University, Raipur**ABSTRACT**

*The outbreak of the Covid-19 pandemic has wreaked havoc on India's economy on a scale never seen before. The economy was already in a perilous position before Covid-19 struck. The economy is projected to enter a prolonged period of recession in the next months as a result of the lengthy country-wide lockdown, the global economic crisis, and the ensuing disruption of demand and supply networks. We describe the Indian financial markets prior to the implementation of COVID-19, evaluate the shock's likely impact on various segments of the economy, and present an impact on specific sectors throughout this article.*

*The goal of this research is to look at data from emerging sectors to see how COVID-19 affects financial markets. The study also includes empirical data on the impact of Covid19 and lockdown measures on financial markets, as well as COVID-19's influence on financial sectors when the lockdown restrictions are lifted.*

**Keywords:** COVID-19, Financial markets, Lockdown, banking System

**Introduction**

India's already vulnerable financial state was intensified by the pandemic. The ongoing Covid-19 pandemic has cast a long shadow over the global economy, which was already hurting from the effects of the trade conflict between the United States and China. Covid-19 appears to have dealt the global economy a triple-whammy: massive supply-chain related disruptions across a range of industries as a result of containment efforts in China and other economies; amplification of demand-side shocks as a result of domestic uncertainties and other containment measures; and propagation of financial illiquidity. This global shock comes at a particularly inconvenient time for India, whose economy was already struggling. Addressing the downward trend that has been seen from the start of the fiscal year 2018-19 According to the World Bank, India's quarterly growth rate decreased from around 8% in Q4 FY18 to a new low of 4.5 percent in Q2 FY20. According to a recent study conducted by **Liu(2012)**, uncertainty is an unavoidable part of life. In most cases, it refers to one-of-a-kind circumstances that can't be predicted ahead of time, and the global pandemic COVID-19 is undeniably unexpected. COVID-19 has had a substantial economic impact, with its global presence having a visible impact (Zhang et al., 2020). This unforeseen illness, known as corona virus, emerged in late 2019 in the

Chinese province of Wuhan and has wreaked havoc on individuals all over the world in a short period of time. This economic downturn is far worse than the one that happened during the 2008 financial crisis, and it has the potential to be the worst in the US since the Great Depression (**Barrafrem et al., 2020**). To avoid the spread of this fatal disease, all countries, including India, have been placed on lockdown and are enforcing a policy of social isolation while restricting economic activity. India was the first country to report a case of the disease on January 30, 2020.

The shock is playing out practically the same way in every country in the world in terms of Product demand and their supply interruptions, as the consequence of financial slowdown. However, given the state of the Indian economy prior to the adoption of Covid-19, the situation in that country may be more serious and long-lasting. The Indian economy had deteriorated considerably by the time the first case of Covid-19 was recorded in the country, following several years of poor performance.

**Review of Literature:**

Experts used current research to determine the economic effects of COVID-19, which suggests that extraordinary events in the past can have a significant impact on the world stock markets (**Papakyriakou et al., 2019**). Speculative occurrences like infectious illness outbreaks can produce negative mood swings

among investors, affecting their investing decisions and, as a result, the stock market's performance (**Liu et al., 2020**).

The Indian financial market saw tremendous volatility in March 2020, something that had not happened in the preceding 12 years. Since the breakout of COVID-19 has been confirmed in the country, the stock market looks to have witnessed a panic sell-off in response to the news. We may simply conclude, based on the facts offered above, that the market is extremely reactive and that the new piece of information has an impact on it.

According to **Richard Baldwin (2020)**, Covid-19 will be both a supply and demand shock, causing a crash in global commodity and service trade. According to the report, business reactions and policy have the potential to cause irreversible harm to the trade system. Covid-19 has a major impact on the stock market, according to **Scott R. Baker (2020)**, for a multitude of reasons, including the fact that it affects public health and the economy, as well as the interconnectedness of economies. The primary impact of the Covid-19 outbreak, according to **Shlolo Maital et al. (2020)**, will be on the supply side of the market, whereas the current solutions are primarily focused on the demand side.

Furthermore, the study's conclusions indicate that a global recession is highly likely to occur under present realistic situations. Covid-19 would have a 0.1 to 0.4 percent impact on global GDP, or \$77 billion to \$347 billion in lost revenue, according to the **Abiad., A. et al.(2020)** study. According to **Mahendra Dev., S. (2020)**, measures such as a lockdown, limits on global trade, the shutdown of non-essential services, and restrictions on migration will have a severe influence on the nation's financial health and well-being. **Mishra (2020)** analysis and anticipated that the Covid-19 will have an impact on all sectors, including international business, financial markets, unemployment, income, poverty, and global trade.

## Research Methodology

The approach of this research is predominantly descriptive and analytical. The influence of Covid-19 on the Indian Financial Markets and a specific segment of the Indian economy have been investigated in this article. Secondary sources were used to gather information in accordance with the study's requirements. A review and study of various literatures, credible publications such as peer-reviewed journals and working papers, as well as pieces in newspapers and on the internet, is undertaken in order to obtain information.

### 4.1. Impact of Covid-19 on Financial Markets and sectors analysis

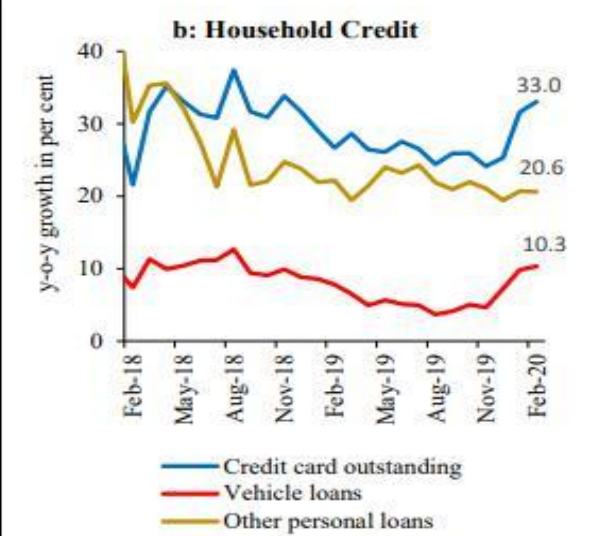
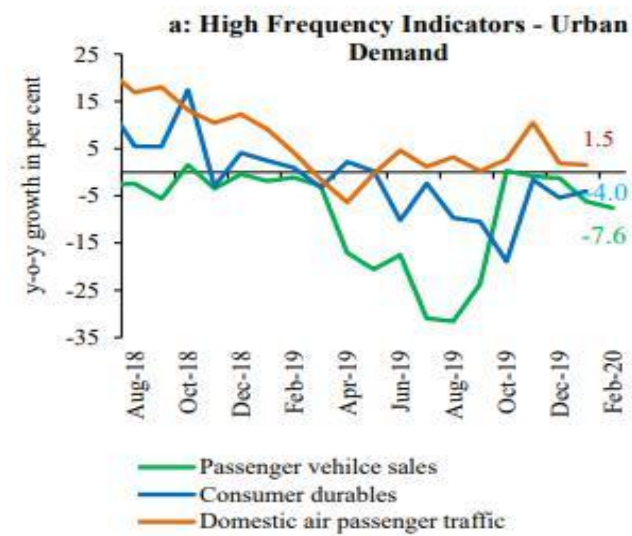
The rate of growth in GDP (gross domestic product) has been slowing since 2015-16. GDP growth fell to 4.2 percent in 2019-20, the lowest rate since 2002-2003, according to government estimates. In the fourth quarter of 2019-20, the industrial sector, this accounts for 30% of GDP, decreased by 0.58 percent. Unemployment hasn't been this high in 45 years. In any country, private corporate investment is a crucial engine of economic growth. Since the start of the Covid19 period, the nominal value of private sector investment has been declining. According to CMIE data, the overall number of outstanding investment projects declined by 2.4 percent between 2015-16 and 2019-20, while the number of new projects announced decreased by 4%. (Centre for Monitoring Indian Economy). Consumer expenditure was also on the decline, for the first time in recent decades.

### 4.2. Impact on Urban consumption and demand

When examining at high frequency indicators (figure 1) of urban consumption demand, it is clear that passenger vehicle sales and consumer durables growth both fell in February 2020. In general, it appears that urban consumption slowed in the fourth quarter. In February 2020, motorcycle sales and consumer non-durables sales both fell, showing a lack of demand in the rural sector. The lock-down would have made it much more difficult for consumer demand and private investment to revive.

This information comes from the Reserve Bank

of India (RBI) (2020)



**Figure 1: Indicators with a high occurrence rate: consumer demand**

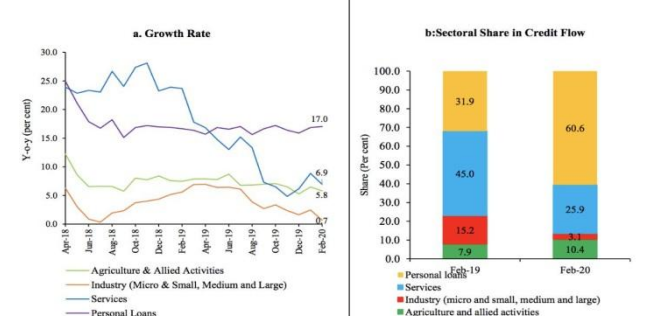
India's position is particularly delicate when it comes to dealing with the present economic crisis for a variety of reasons.

**4.3. Impact on The financial, banking and corporate sectors**

The financial sector must play a crucial role in lowering strains on the actual economy during times of crisis, and it is one of the sectors of the economy that must stand up to the plate. The growing losses produced by non-performing assets on bank balance sheets have been a source of concern for many years for financial institutions, particularly those in the public sector. The banking sector's woes have had a severe impact on credit enlargement, and by the time the virulent disease hit in India, these troubles had moved to the debt marketplaces, which are equally essential in the context of financial intermediation and, as a result, require attention as well. This could quickly create a big bottleneck in the system as the Indian economy responds to this one-of-a-kind shock to the system.

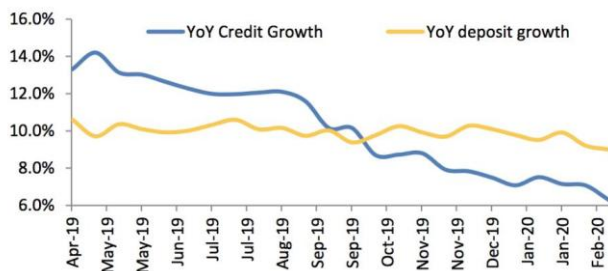
When IL&FS (Infrastructure Leasing and Financial Services), a large non-banking financing organization (NBFC), declared bankruptcy in September 2018, the financial sector was dealt another blow at a time when the non-performing assets (NPA) problem was beginning to stabilize. Narrow-band financial companies (NBFCs) get a large amount of cash through the banking system and debt markets, which are the two most important funding

sources for the firm. As a result of the RBI's and the government's encouragement, banks were able to continue lending; nevertheless, they did so only to a small number of highly rated nonbank financial companies.



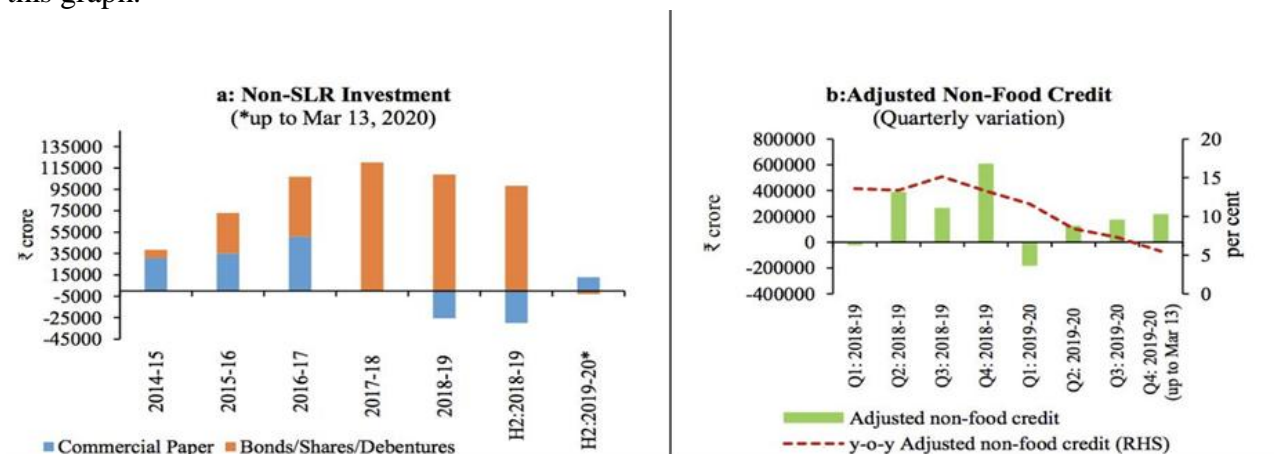
**Figure 2: Sectors deployment of credit, this information comes from the Reserve Bank of India (RBI) (2020)**

Commercial credit declined by about 90% in the first half of fiscal year 2020. The near-death of Yes Bank, a large private sector bank, in February and March 2020 highlighted the threat of a deposit shortage for private sector banks, limiting loan growth further. This has resulted in lower credit off-take in 2019-20 (up to March 13, 2020), with non-food credit growth of 6.1 percent, less than half of the 14.4 percent witnessed in the previous year's similar time (figure 3). According to the Federal Reserve, this was also the slowest growth rate in non-food bank credit in six decades.



**Figure 3: Credit and deposit growth in the banking business year over year**

The data is taken from an ICRA report. The total growth in non-food credit is depicted in this graph.



**Figure 4: Inflation-adjusted non-SLR investment and non-food credit. (RBI) (2020)**

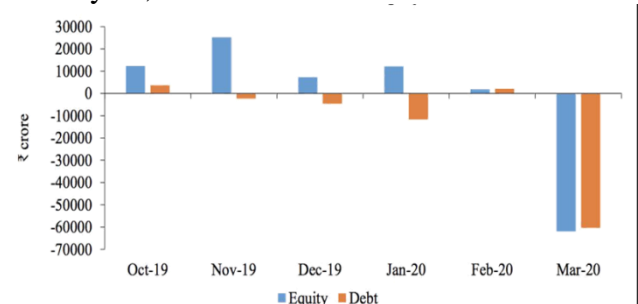
The debt market was shocked by the events surrounding the Yes Bank bankruptcy just as it was starting to recover its appetite for commercial debt securities following the NBFC crisis of 2018-19. As part of the company's reformation, Yes Bank Ltd other tier 1 (AT1) bonds were totally written down. 14 These AT1 bonds make up a large part of a bank's capital structure. Around Rs 89,000 crore in bonds were still outstanding across the banking sector as of the date of this write-down. A considerable amount of these securities were held by mutual funds, pension funds, and even individual investors.

**4.4. Impact on Financial markets**

The current turmoil in the debt market is the result of several forces colliding at the same time. The interest rate gap between the United States and India, as well as the rupee's relatively steady value, have motivated foreign institutional investors (FIIs) to make continuous investments in Indian debt during the last few years. As the Covid-19 outbreak grew over the world, notably in the United States, increasing risk aversion and a desire for protection pushed many of these investors to

As a result of this trend, the debt markets have begun to experience the effects of rising risk aversion in the banking sector. Bank holdings of non-SLR bonds have fallen dramatically, as seen in figures 4 showing that they are less concerned about credit risk. Instead, banks are holding more G-Secs than the SLR requirements, and the excess SLR of all banks – public, private, and international – has increased dramatically, demonstrating widespread credit risk aversion.

sell massive amounts of Indian debt paper in addition to stocks (figure 5). Outflows of foreign direct investment (FDI) totaled over USD 7.1 billion in 2019-20. (up to March 31, 2020). In addition, the month of March in India is usually a time of low liquidity. The demand for cash during this time period is exacerbated by advance tax payments, the conclusion of the fiscal year, and other circumstances.



**Figure 5: FPI investment in Equity and Debt, This information comes from the Reserve Bank of India (RBI) (2020).**

**Discussion**

We can illustrate the COVID-19 contagion effect on the Indian financial markets based on this research. It shows that COVID-19 has a negative impact on daily market returns, as

well as the impact on individual industries. It has been observed that a country's strategic reserve is critical during a crisis, and as a result, the government must focus on building a long-term health and safety infrastructure for its citizens. The banking sector has been significantly damaged by this crisis, as a result of the prolonged halt in economic activity, more loans and EMIs (equivalent monthly payments) have been halted. If investors and fund managers had done their homework, they may have benefited from the irregularity in the trends as well as some favorable peaks that had been recorded over this time period. Moving forward, the financial markets have shown a positive trend since the lockdown was lifted, underscoring the importance of organic activity that has commenced in several industrial sectors since the country's lockdown was lifted.

## Conclusion

The current research looks at the impact of a pandemic on financial markets over a short period of time, specifically nine months. Furthermore, because India has removed restrictions on economic activity, and COVID-19 cases are increasing at an exponential rate, definitive judgments about the amount of the harm caused by this contagious illness in the country are impossible to draw. Although the markets have improved since then, the economic system has been severely harmed by the pandemic, which can only be healed through long-term, sustainable measures. Additional data can be gathered during a longer study period, which can then be compared to the final results..

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## ANALYSIS OF COMPETENCY FRAMEWORK FOR MANAGERIAL POSITIONS IN A LARGE CONGLOMERATE

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### ABSTRACT

*The purpose of this study is to examine the structure of competencies for employees in a large conglomerate. This research enables one to explore more on the technical/functional competencies than the behavioural framework, and analyze its effect on an organization's competitiveness and the business impact of incorporation of functional competencies. There exists two approaches to this study. One, the study, implementation and impact for the behavioural and second, the similar of the functional competences. The methodology followed for this research is through various steps. Namely, assessment centers, critical incident technique, personal interviews etc. According to the benchmarking and literature reviews, we can see that the implementation of the competency structure has not practiced by the Indian organizations because of which the workers are unaware of their KSA and about its application. This study should establish the need to concentrate and stress on the fact that large conglomerates need to adapt and match their human resources management to a structure based on competencies.*

**Keywords:** *Competencies, Conglomerates, Human Resource Management*

### Introduction

Competencies are necessary for enterprise to gain competitive advantage, and there is a need for a competency strategy to encourage workers to improve their skill sets that can be applied and trained for organizational transition in different job scenarios [29]. At the higher level, a combination of academic, techno-managerial and interactional skills is necessary. In addition to a standardized output, literature shows that general, managerial and functional skills are also vital in career progression of any employee and indicated that people with the right skills can execute the finest work; the factors that account for these differences were elusive in research literature.

The key aim of this segment is to explain how the company's competencies can be the source of strategic advantage for the organization and how different analysts have undertaken analysis in the past to see how competency has benefited the organization and what the studies have been done so far in this way [1]. Any firm's distinctive abilities derive from two factors, which are its assets (man, machine, equipment, property, state of the art, methods) and capabilities. A differentiating capability is the capacity that enables one business to attain superior performance, quality, and creativity or

consumer sensitivity and achieve a competitive edge. [6] Any company's primary goal is to preserve its strategic edge by sustaining a good growth rate and high profitability.

The current concept paper reviews competency mapping critically as a powerful tool for organizational efficiency enhancement. Competencies play the most important role in conducting job tasks that are essential to streamlining an organization's progress. Competencies are of a long-lasting and persistent nature compared to job duties; therefore, the companies have become highly stringent about the need for skilled workers [23]. Competencies show the people's most distinctive abilities and qualities, but they are not essential to the work. The line managers involved in studying and assessing success are expected to play a significant role in defining the competencies. In the modern context of globalization, and rigorous competition, there exists new opportunities for companies to retain competitive advantage. [50] Towards this aim, the organizations need to respect their human resources by recognizing effectiveness-enhancing traits and attitudes that contribute to improved profitability. This paper aims to dig further into the idea of competency and explore the visualization of competencies as an effective method in organizations for

increasing productivity and accelerating growth. [9].

In the dynamic industrial world, marked by finite capital, it has become the key focus of any businessperson to use the tools available effectively and in the best possible way. The various resources are people, equipment, machinery, and money. All these resources must be integrated effectively to achieve maximum performance and minimize inefficiency [45]. The most valuable resource of any company is manpower, both technical and managerial. Except manpower, no other element can be used effectively. Therefore, its mismatch with either of the variables would result in wasting time, resources and energy causing the loss of performance. Therefore, it is very important to make good use of such resources.

The most significant resource, however, is also the hardest to manage. The reason for that difficulty is that there are no two similar persons. [53]. Every single person has different attributes, skill sets, personalities, motivations, same kind of information. Those variables do have an important effect on their efficiency.

Competency can be described as a person's ability to do the job implemented correctly. Competency mapping is a method of recognizing the difference in the competence or job-related abilities of any person to address such gaps by means of appropriate development. [10].

Competency was used in numerous ways in the following areas. Psychologists occupied themselves with the definition as a metric of capacity and whether a person's measurable success matched the intrinsic characteristics or capacities. [8]. Theorists of management applied a behavioral approach to determine how to better accomplish corporate goals by increased employee results [31]. Human resources managers viewed the concept as a technical tool for implementing strategic direction through recruitment, placement, training, assessment, promotion, reward systems and personnel planning tactics.

### Literature Review

The research focuses on competence-based approach in the human resource development along with planning & involvement of

automation process[34].

It intends to explore on the creation of an automated & adaptive human resource development planning system that will be aligned with the usage of competence-based HRM approach.

A major issue that has been stated is the inability of the organizations to map the competencies of the employees with the development strategy. [49]. As pointed out that one of the disadvantage being "biased human factors" that comes as an obstacle in an employee's individual development, which is considered as a fact no matter how hard an organization tries to keep technology based checks.

All of the companies involved in the research are from the field of information and communication technologies, and have been operating in the Latvian market for more than ten years. The analysis consists of in depth-interviews by the SME's and the various practices conducted in the organizations. [5].

As a result, all the experts present in the process of analysis collectively summarized that the research is of importance and that it will allow us to find out more about the patterns and practices of HR growth in Latvian companies. Its merger with an IT based programs would further lead to the development of IDP's of the employees that leads to the business succession. [37].

The research states that competency is a blend of strategic and precise information, actions and abilities that allows anyone the capability for growth in job efficiency and Competency model is a systematic summary of the knowledge, skill and ability for a specific job category, occupational community, division, department or other unit of analysis [41].

The objective is to evaluate the consolidation of the competency models with human resource development. [52].

The author has divided the study into 4 parts. Namely, the introduction, reviewing the competency concept in various other sections depicts the applications of competency models to HRM functions and finally in section 4, we express the benefits of competency-based HR system.

In the first section, we gauge that sustainable competitive advantage in current dynamic

market world is the key element in accomplishing the organizational & operational strategies. [20]. Several companies have considered their workforce flexibility to be a salient feature to achieving competitive advantage. [17]. Modern organizations are distressed about their employee skills base, their growth; therefore, competence studies have gained increased value and attention.

In the second section, the author specifies the different type of competencies and its concepts by development a models by defining the research based, value based and strategy based approach by explaining its effectiveness on the area sales manager of the organization. [54].

The conclusion of this study has been elucidated in the last two sections, which clearly states the application of competency model in large organizations and its advantages leading to profit making business because of the productivity of employees [57].

This research aims at creating a conceptual & methodological framework for measuring the appropriate knowledge required at an organization. The focus of the study is to observe and map the competencies required at the targeted organization. Here, the authors have considered a sample of 17 hospitals and firms.

First, organizational awareness is implemented within a corporation from the viewpoint of several 'knowers.' It is also problematic to quantify organizational knowledge without understanding and assessing the qualities of those who try to provide the information [22].

Second, understanding of organization includes scope and meaning. Organizational awareness may be very loosely (e.g., marketing) or very precisely scoped. Work on the acquisition of information helps to distinguish reach that is likely to identify essential knowledge in organizations. [11].

Thirdly, in the calculation of information capital the selection of 'knowers' is key. Organizational knowledge is embedded in a firm in the members 'everyday activities. Managers are regularly expected to turn procedural knowledge into declarative knowledge when negotiating organizational goals and making strategic decisions. [12].

A four-step methodology for measuring organizational knowledge had been tested in

two industries with 17 firms in it. This methodology comprises of defining the scope, protocol design and data collection by interviewing and surveying the SME's [16]. Post analysis it is observed that the protocol encourages efforts by managers to identify and concentrate on important strategic assumptions [26]. This mechanism will provide a springboard for big decisions about a firm's technical resources, such as allocations for R&D and strategic hiring decisions, which are the application of competency frameworks and models. [27].

This paper reviews the usage of the competency-based management as a mechanism for the growth of the organization and its use in the Indian organizational sector [33]. It defines the competency-based management, its driving force and its future prospects pertaining to Indian organization context. [15].

Globalization, digitalization, individuality and the rising competition are the new face of the industry. The goal is to achieve top-notch performance in the long term by developing the knowledge and competencies of the employees on a continuous basis. [28]. Be it the Indian or international sector, the organization are putting their best foot forward in terms of improving their employees performance by various assessment for competencies recognition and IDP's. [43].

Study states that there are many organizations that have adopted the behavioral competency framework but lack in the implementation and application of the technical/functional competency framework that actually defines the job role with their proficiency levels [44].

The driving force in the Indian organizations are namely, organizational performance, increase the ability to be competitive, reduce turnover, clarify managerial roles and specialist roles, increase emphasis on business objectives, aid in career and succession planning, analyze skills and able to identify the current and projected deficiencies in skills and many more [19].

Competency practice has been around for many for the management of every organization's human resources for the past 30 years; it demonstrates that it is not anything new. In the Indian Context, however, this definition was

not much explored. Competency model alignment with the HR feature has improved employee as well as organizational efficiency. The purpose of this paper is that the modern organizational effectiveness primarily requires the ability to enable, distribute and turn the company's intellectual property into a competitive advantage that is both durable and challenging to imitate[35]. This paper intends to build a conceptual framework of competencies that incorporates previous concepts and frameworks from the literature and to suggest a strategy to define competencies to assist in the transformation from a task-based to a competency-based paradigm for managing human resources. The design this paper uses is through a framework and describes the results of the implementation of a capability model in two case companies that facilitates crucial organizational change from a task-based approach to a competency-based one.

The findings state that it recognizes vital enablers that will lead to effective execution, while also offering information about the predicaments that need to be tackled.

It acts as the basis for explaining the key measures, as well as the essential success factors characterizing these initiatives, by evaluating the application of the competency system in two case companies. Finally, it shows the benefits of incorporating the existing skills system and provides strategic perspectives and recommendations for similar implementations.

[23] Understanding the characteristics of competences: McClelland (1973) is credited with the beginning of a revolution in competencies with the publishing in his Paper "Competence assessment rather than knowledge assessment" Sun & shin (2008) asserts that 'McClelland's concept of skill was the key driver of skills management.' McClelland stated that a traditional competence is "a personal trait or set of habits that leads to more efficient or superior job performance: an ability that adds clear economic values to people's efforts at the job." According to BOYATZIS,[7] , 'Competence is a person's intrinsic nature, such that it may be an attribute of self-worth, trait or ability, appearance or social position or body of

information'.

The "Iceberg Model" explicitly shows that certain components are commonly present and can be measured over the surface whereas there are several more difficult to detect and although they are more important and significant in many other cases.

Correspondingly, there are six types of competency characteristics as follows:

1) Motives- Applies to the implicit thoughts and desires that motivate 'direct or select' behavior regarding particular actions or purposes that are a source of gratification.

2) Traits- Are an individual's fundamental trait, are the repetitive habits that identify the person by. Self-image- It is the impression people have of themselves. It is an attitude, values or self-concept for a person.

3) Social position- The identity a person shows in the public is the one.

4) Knowledge- This is the information an individual possesses in a given field.

5) Skill - The ability to perform a specific task. Distinguishing and understanding different ability levels is really critical. The surface knowledge and skill competencies are relatively easy to develop and retain whereas hidden, deeply rooted, core "motives and traits" competencies at the base of the Iceberg, are harder to analyze and improve.

Competencies can thus be defined as the knowledge, abilities and skills that distinguish the star performers.

The competencies can be split into two groups- Firstly, Threshold competencies- These are the basic qualities that every individual must possess to perform the job effectively, but that does not differentiate between superior and mediocre performers. Secondly, Differentiating competencies – These are the skills which separates superiors from average performers.

As GOLEMAN [21] also discussed two levels of job abilities, and so two kinds of job competence models. One examines the threshold competencies, these are the skill and abilities that employees use to get a job completed. These are minimum skills needed to execute the tasks related to a given job role. Many types of organizational competency fall into this group. The other category of role expertise model explains differentiating competencies. These are the competencies and

qualities that differentiate good performers from the mediocre ones. Those are the qualities people now possess to succeed superbly in their career.

Competence modeling is an essential part of Handling Competitive Human Resource. The idea of SHRM is designed to encourage high performing environments and the utilization of human resources. This connects HR with the corporate priorities and strategies of organizations in order to enhance market success and build an organizational culture that nurtures creativity, efficiency and competitive advantage. Competency management is the emerging HR strategy and management methodology that offers a holistic approach to defining and developing the most basic and appropriate capabilities to streamline an organization towards achieving individual and job-related competence and parameter-deciding target.

Justification for the use of skill-based strategy. The skills-based strategy offers the basis for defining the abilities of the best performers in the job. Organizations may enhance their efficiency by recruiting applicants with these capabilities, which achieve comparative advantage. They can also design and implement highly targeted programs to develop the differentiating skills that will assist the average performers to reach the next higher level.

The effect of the decision to pick incorrectly may be significant. Among the complicated costs inherent with the recruitment process (advertising, setting up an interview team, hiring, accompanying the applicant, etc.), there are negative long-term consequences of hiring the wrong person, including the following. Resources wasted in training and development programs, low efficiency and quality as a poor performer is in the job, lost opportunity, poor morale as others struggle to fill the gap in the performance, dissatisfied customers, loss of competitive advantage, poor strategies and plans.

A skill-based screening approach thus lets businesses reduce these risks by offering a hiring, creating, encouraging and maintaining outstanding performers' frame of reference [42]. This is escalates an individual and team success and organizations develop large and

flexible workplace capable of solving challenges and problems, is resilient and successfully and reliably fulfills corporate goals. More or less, a solid, advanced and well-documented selection processes based on competence helps the organization follow fair work practices regulations.

Competency thus makes one work adeptly under complicated and unpredicted conditions [32]. Performed a gap study in ability of mapping and found out that the higher-level managers lacked in functional competencies, middle-level managerial skills and first-level human resources skills are expected in the higher-level managers and these gaps can be strengthened. Such skill gap analysis can be bridged by providing them with the correct training and development modules that will improve operational performance and promote efficient operation of the company and its goals.

### Research Methodology

The research methodology used in the analysis of competency framework for managerial positions in this case is based on qualitative analysis. Qualitative analysis is aimed at acquiring a deeper understanding of a single entity or occurrence, rather than a surface summary of a broad population sample. It aims to provide an explicit representation of a group of participants' structure, order, and specific trends observed [24].

It generates data in social settings about the human groups. In addition, this research consists of three various methods of qualitative research as it involves rigorous discussion based on the behavioral as well as the functional competencies at various organizations. Qualitative research involves observation as the method for gathering data.

Observation is the compilation and documenting of people's actions within their environment. Observation is useful for producing in-depth explanations of entities or activities, for collecting otherwise unavailable knowledge, and for conducting analysis in situations where other approaches are ineffective [36].

The below mentioned methods provides with valuable information by considering multiple views on a competency-based structure. The

three methods used are as follows:

1) Focused Group Discussions - Focus group discussion is often used as a qualitative approach to acquiring a thorough understanding of social issues. The method is aimed at obtaining data from a purposefully selected group of individuals rather than from a statistically representative sample of a wider population. For this research, a group of employees from different business units were brought together on a single for discussion on the concept of utilization of competencies. Setting up KRA's for their respective departments and giving the discussion a meaningful conclusion by setting up a mechanism for the assessment centers with well-defined proficiency levels for a specific job role in the organization. The process involved multiple webinar sessions that included the senior managers and SME's.

2) Personal Interviews - The career interview gives first-hand insight into employee behaviors and is a valuable way for potential employers to gain detailed information and insights. The interview record can be compared with the skill map produced for the job to decide which applicant provides the best fit for the company's needs. For this research, the line managers from various businesses belonging to various organizations were interviewed. As an outcome, six to seven themes were designed on basis of which a questionnaire was prepared. The SME's were then interviewed anonymously as per the questionnaire and presenting their views on the concept of competencies.

## Results & Analysis

### (A) Focused Group Discussion –

The analysis of the focused group discussion had been conducted through various online modes. Digital focus groups are not a new form of focus group interaction per se, but one focused on the Internet's implementation as an extension to existing approaches. This is done online, using conference calling, chat rooms or other online means considering the situation around us in the pandemic times.

In this case, we gathered a group of people from an organization to carry out a detailed discussion about the current scenario with regards to the application of the competencies

and its business impact in terms of the cost-effectiveness & on the employees.

The online session of multiple focused group discussion were conducted via webinar sessions, wherein there were six to seven participants present along with an observer. The purpose of the sessions were well defined and pre-emailed to the required members coming on-board.

Let us consider one of the focus group discussion that was conducted in the pharmaceutical sector. The members included managerial positioned employees from three departments. Considering the qualitative analysis approach, there were three parameters to be defined basis the discussion for a productive outcome.

### (B) Benchmarking –

Fifty years ago, major corporations were reluctant to quantify 'positive' or 'negative' when it came to patterns in their own workforce. The absence of a structured framework for any organization kept them questioned about the parameters for the advancement or the retention rate [4].

As the technology and employees began to compete in the business world knowledge, skill and ability played a critical parameter in the job roles of any organization.

Disruption is highly linked in the VUCA world and as Deloitte's experts say, "effective companies need to be structured for speed, agility and adaptability to allow them to succeed and thrive in the competitive market world of today."

In this research as we analyze the competencies at managerial position in various organization, we consider to learn about the positive effects of the introduction of the competency model. Also, to understand through different themes that the adoption of competency based job roles are directly linked to the revenue and profit of any organization.

### 1) Data Collection

This parameter is self-explanatory the discussion requires dimensions & data.

It comprises of two sub steps. Namely, the pre-session preparations, facilitation during the meetings.

(i) Pre-session preparations include the analysis of the focus group requires a group of professional facilitators and assistants. In

addition to maintaining current interactions, the facilitator is vital to the conversation by establishing a safe and supportive atmosphere for new participants. Likewise, the task of the assistant involves observing non-verbal behaviors and the influence of group dynamics and recording the overall content of the conversation, thereby contributing.

As a part of this research, numerous focused group discussions were conducted across selected departments in various conglomerates amongst the employees at managerial positions. As mentioned earlier we consider various departments from a pharmaceutical sector for this research.

To begin with, for the pre-session preparation a series of invites were sent to a group of professional facilitators and assistants for focused group discussions. The assistant's task is to observe non-verbal behaviors and the influence of group dynamics, and to record the overall conversation content and thus contribute to the data.

Prior to the actual focused group discussion, it is important to define the topic of discussion, the purpose of the meeting, outline of expected outcomes at the end the discussion.

In this case, the topic for discussion aimed at the analysis of the competencies in this particular organization. To discuss about the study that helps one to examine more on the technical / functional skills than the behavioral framework, and evaluate their influence on the performance of an enterprise and the market effects of integrating functional skills. There are two approaches to this analysis the behavioral analysis, application and impact, and the functional competencies related.

The discussions in focus revolved around the concept of the competencies, its structure and their practices in the current scenario at the organization. A walk through the current competency framework in practice and its impact in terms of employees and organizational benefits were defined in the pre-session of the focused group discussion. The further discussion was channelized towards the impact of the adoption of the functional competency framework along with the behavioral competency framework which is aligned to the organizational mission and values.

Furthermore, there were multiple opinions along with several facts and figures aligned to the organizations benefits in term of cost-effectiveness.

(ii) Facilitation during the meetings includes the following:

(a) Introduction of various aspects such as self-introduction of employees of the four departments considered so that the member in the FGD's are well aware about their peers. Ensuring the consent and confidentiality of the discussion is of extreme importance at this stage as number of dependable factors could be revealed in the discussions. Setting up of a certain ground rules is always helpful to avoid any conflicts and negotiation amongst the member present for the discussion.

This research comprises of four main departments of one of the organizations where the focused group discussions were conducted. The audience here consisted to two employees from the managerial position from each department of this organization. A well self-introductory task was planned out before the discussion so that all the employees present are well aware about one another. Strict instructions about the confidentiality of the discussion to be maintained was made clear to the managers present for the discussions.

(b) Keeping up the continuous discussion is a key aspect of FGD's. As an assistant of the focused group discussion, it is important to record and observe the discussion being conducted. One must also probe, pause, reflect, observe and question the non-verbal cues. Non-verbal data are based on the behavior and actions of the pre-focus group discussion, during and after focus group discussion of the respondent. Non-verbal data offer "thicker" explanations and perspectives relative to using verbal data only.

As the pre-session of this discussion has already been conducted wherein the discussion about the concept of competencies, its existing structure in the organization and its benefits with respect to cost-effectiveness and employees are to be discussed and observed by the assistant.

As the second segment of the data collection parameter in terms of qualitative data, the discussion gyrates around the behavioral competency framework and the analysis of its

impact on specific job roles in the managerial positions. Next discussion took place with respect to the introduction of the functional competency framework. The objective was to discuss the methodology that will be beneficial to define the existing job role with the specific KSA and KRA's. A suggestion for the involvement of a few consultants for the purpose of benchmarking was mentioned. Due to the strict confidentiality guidelines, the names of the same cannot be revealed. After a multiple focused group discussion, it was observed that personal interviews with the line managers and SME's of those four departments in picture needs to be considered because SME's are expected to have the best of experience and abundance amount of KSA's for the managerial job roles. The outcome of these multiple focused group discussion had two major conclusions. Namely, conducting personal interviews with the SME's and chalking out the functional competencies for structured job roles in the four departments of the particular organization.

(c) The last step of data collection is of utmost importance. This step concentrates on tracking of the questions and touch-points that were discussed and marked at a high importance as a part of the conclusion of the multiple discussion. Meanwhile, also chalking out the outline of the themes for the competencies wraps up the focus group discussion. Lastly, acknowledging the members that had joined the focused group discussion takes place.

As the last step into the data collection parameter of this research, there are numerous questions and touch-points to be considered in terms of the introduction of the functional competency framework. A collective opinion of all the managerial employees states that there are benefits of introduction of the functional competency framework with respect to defining the KSA and KRA of different job roles, employee career development plans and a far off goal that aims in building a ladder of the succession planning.

For the implementation of the above, it has been observed that there is a requirement of conducting personal interviews with the SME's of the four departments in same organization, which will then provide us with the themes for building the functional competency framework.

Personal interviews in terms of benchmarking will also be required to as to maintain the organizational standards considering the market competitiveness. As a conclusion, content analysis for chalking out the themes, constructing a competency dictionary and benchmarking are of utmost importance according to the members belonging to the managerial position of the multiple focused group discussions.

## 2) Analysis

Textual analysis is a testing technique used to assess the existence, within such contextual evidence (i.e. text), of certain words, patterns or principles. Researchers may measure and analyze the effect, definitions and associations of certain terms, themes, or ideas through content analysis. Researchers will then draw inferences through the texts mentioned by the writer(s), the recipient, and even the context and time around the text.

Collected data sources can be from interviews, open-ended questions, field study observations, meetings, or practically any communicative language event (for example, novels, articles, debates, newspaper reports, presentations, television, historical papers). Throughout its research, a single study can examine various types of text.

The analysis followed post multiple focused group discussions can be diagrammatically represented in a way of mind-map. The outline beneath is a flowchart of the competency composing process. A detailed step-wise approach will be introduced later. The motive for this flowchart is to show how the various advances fit together to create the competencies that underlie successful job roles. Following the above mentioned sequential flowchart that eventually defines the KSA's in terms of the competencies required for specific job roles present in the four department of the organization in consideration.

This process involves multiple personal interviews, consultants review, benchmarking to ensure the best and updated definition of the functional competencies for the job roles in focus.

Functional competencies comprises of three parts: a label, essential job assignments, and the requisite expertise, talents, abilities, and personal characteristics for productive work



performance.

A set of defined themes of competencies were discussed in the final FGD and a complete outline the competency dictionary was introduced for the four departments.

The competency dictionary and the analysis concerning the specific job roles in the organization is as shown below.

### Results

Competency	Descriptor
Process Development	Plan the completion of development activity, deliver it timely and maximize production by optimizing the process
Analytical Skills	N/A
Quality Management	Aware of the GXP compliances, follow the SOPs and apply that in work. Grading the work against set quality standards
Technical Acumen for operating equipments	Ability to handle and work on technical instruments like HPLC, Gas Chromatography, sifters, granulators, IR Spectroscopy etc.
Market Intelligence	N/A
Domain Knowledge	Having sound knowledge of project management as well as of all departments within IPD i.e. API, Formulations and knowledge of manufacturing department so as to address any issues while the project is being driven
Project Risk Management	To figure out the risks associated with the project & design risk mitigation plan as well as decision log so as to take timely actions against it
Business Understanding (API/Formulations)	N/A

Competency	Descriptor
Planning & Administration	Create the project plan and execute it by coordinating with cross-functional teams and optimizing the whole flow of project
Technical Writing	To extract the relevant test data, summarize reports and update it on internal DQA software's (e.g. ELN)
Ability to use specialized Literature Search softwares	Ability to operate literature search software's in order to extract relevant data. Software's include SciFinder, DEREK, etc.
Strategy Development & Application for Transfer of Technology	Design process in order to deliver a process that can easily be manufactured
Ability to apply engineering & tech transfer knowledge	Apply technology transfer knowledge to scale up or scale down batches and engineering solutions for smooth process
Cost optimization	Deliver the results by optimizing the process and minimizing the cost associated with it
Interpersonal Skills	Take sound and quick decisions pertaining to the project, Being able to share information verbally, in writing and make presentations. Maintain continuous communication with cross-functional teams, Ability to make the work done by other teams within least amount of time and crack deals with vendors at least possible cost

ANALYTICAL JOB FAMILY															
		API ADL							F ADL						
Competencies	Sub-Competencies	Job Roles													
		Analyst (BII-CI)	GL MD&V (DI-DII)	GL SSC (DI-DII)	TL MD&V (EI-EII)	TL SSC (EI-EII)	TL ROC (EI-EII)	HOD (FII)	Analyst (BII-CI)	NDDS Analyst (BII-CI)	Group Leader (DI-DII)	Group Leader ROC (DI-DII)	Team Leader (EI-EII)	HOD (FII)	
Analytical Skills	Applying analysis procedure, accurately and consistently which will deliver a reliable compounded preparation	B	I	I	E	E	N/A	E	B	I	I	N/A	E	E	
	Interpretation of data of the tests run on several instruments	B	I	I	E	E	N/A	E	B	I	I	N/A	E	E	
Technical Writing	N/A	B	I	I	E	E	N/A	E	N/A	N/A	N/A	N/A	N/A	N/A	
Technical Acumen for operating equipments	N/A	B	I	I	E	E	N/A	I	B	E	I	N/A	E	E	
Quality Management	N/A	B	I	I	E	E	E	E	B	I	I	E	E	E	
Business Understanding (API/Formulations)	Having knowledge of IP related to API/Formulations and develop the process accordingly	B	I	I	E	I	I	E	B	I	I	I	E	E	
	Regulatory knowledge related to API/Formulations and API/Formulation analytical development	B	I	I	E	I	I	E	B	I	I	I	E	E	
Process Development	N/A	B	I	I	E	I	I	E	B	B	I	I	I	E	
Market Knowledge	Understanding of market to analyse alternate vendors for development activities	B	I	I	E	I	N/A	E	B	I	I	N/A	I	E	

(B= basic, I= intermediate, E= expert, N/A= not applicable)

As the outcome of these multiple focused group discussions and the benchmarking process and the primary and secondary approach to the introduction of the functional competency framework, we can see that one of the department in the target organization now has well-defined set of competencies at various proficiency levels.

Many other researches have stated the benefits of an integrated talent management system of which the competency-based structure for job roles is a part.

A similar study conducted by Deloitte states that the following organizational benefits post the adoption of the functional competency framework along with the existing behavioral framework:

- 1) 26 percent increased higher revenue per employee
- 2) 40 percent lower turnover among high performers
- 3) 87 percent greater ability to hire the best people
- 4) 156 percent greater ability to develop great leaders

### Discussions

Managing human resources is a method of getting together individuals and organizations so that each other's interests are achieved.

Having visualization between highly qualified and knowledge-based workers has been improved by proper competency [38,39]. Human resource development aims at constantly assessing the skill requirements of different individuals to effectively perform the job assigned to them and to provide opportunities to develop these skills to prepare them for future roles in the organization. Therefore, an effort was made to examine the relation between the organization's mapping of competencies and human practice [2].

In fact, there are findings that show the impact on human job performance of certain competencies. For example, WANG [56] claim team building, communication; teamwork, implementation, and continuing learning are essential skills for middle managers' performance. Likewise, there is scientific data suggesting the association between competences such as HRM, leadership [4, 25]. It also notes the relationship between human competences and business performance. Nevertheless, this topic includes few empirical evidence [30].

### Conclusion & Recommendations

The conclusion and recommendations made are based on 15 personal interview conducted and various organizations with the target audience

belonging to the managerial position with an experience of minimum 3 years.

Competency is a combination of expertise, skills and behavior required to perform a job quickly and accurately, and explain what needs to be achieved. It can be inferred from the fore-mentioned analysis that competency mapping is certainly a new development in the field of HR. It promises the most important resource, human capital, to be used economically by ensuring the person has the best-suited job. This also promotes growth and prosperity for individuals. Simply put, it means not only that the right person is selected and positioned in the best position for the individual, but also training and assessment makes the less competent and skilled employee more competent with respect to his/her job role.

Companies achieve and retain competitive edge due to their willingness to improve, adapt and develop their current competencies, allowing the organization to turn resources into product services that can support the success of a business. In fact, with growing competition, firms need enhanced capabilities to define, create and deliver superior customer value than competing brands, and respond directly to customer demands and provide the consumer with a highly interactive, personalized experience that allows businesses to develop, grow and sustain long-term customer relationships more than ever before.

The adoption of a functional competency based structure is recommended rather than just the behavioral one through this research. Studies have shown that less than 60% of the Indian organizations are currently experiencing the benefits of the functional competency based model in terms of its applications.

Therefore, below mentioned are the benefits of the adaption to the functional competency framework:-

1) A competence model based on an individual's holistic evaluation assesses the abilities an employee holds and determines the one's a task or business may require.

2) Human resources department can then use the information in different applications. It further contributes to the advancement of the

competency-based recruiting, appraisal and training and growth activities in any organization possessing the correct structure.

3) During hiring and PMS, matching employee skills and job requirements improves employee and organizational performance, which leads to increased satisfaction. Abilities assessment will recognize the difference in required skills and these skills will form the basis of preparation and learning.

4) Competence-based compensation allows employers to assess benefits by assessing the particular skills demonstrated by workers when doing their roles based on success standards. Competency-based program also helps develop an equal and egalitarian framework through an unbiased evaluation of capabilities that leads to the success of a person.

### Limitations

Competency models are exclusive of technical competencies. Too often organizations exclude technical skills from the functional portion of their competency model. Technical skills are prevalent among many critical job roles including engineers, IT specialists, medical professionals, and others. However, in many organizations, their competency models are, unfortunately, void of technical competencies.

The methodology became common among researchers working under tight deadlines and providing a simple and resource-efficient way to collect information on complex relationships.

On the other hand, there is still some uncertainty and doubt about the relationship between expertise and success given the rising propensity to use competency models [14].

Those are largely due to the competency appraisal challenges and the dynamic and lengthy process needed to determine the correct success competency relationship [55]. Among the several aspects of organizational success, it is not straightforward to relate individual competencies to organizational performance [47].

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## EFFECTIVE DIGITAL LEARNING STRATEGIES FOR ORGANISATIONS: UNDERSTANDING MOTIVATIONS AND CHALLENGES AROUND DIGITAL LEARNING

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### ABSTRACT

*The purpose of this paper is to understand the motivations, challenges and learning preferences of working people when it comes to learning digitally. The concept of corporate learning today is being catered to by Digital Learning. Although Digital Learning has revolutionised organisational learning and development, its implementation and adaptation is not as easy as it seems. For establishing effective and sustainable digital learning practices in an organisation, it is first necessary to understand the mindset of employees towards this change. This paper explores various elements and insights which can make the digital learning initiatives more effective in organisations.*

*This research is an exploratory research conducted by involving working population and talent development leaders across industries to get their understandings, motivations, challenges, preferences and best practices around digital learning.*

*The generational gap plays a big factor in the ease of adaptation to digital learning and motivation towards it. As organisations are equipping themselves with personalised LMS, MOOCs etc. for their employees, an understanding of employees' preferences, motivations and challenges while learning digitally will help them establish effective and sustainable digital learning practices. Understanding of the employees' mindset regarding digital learning shall help organisations to develop competitive learning and development strategies.*

**Keywords:** *Digital Learning, Multigenerational Workforce, Learning & Development, MOOCs, Talent Development*

### Introduction

The world of talent development has been revolutionised by the enhancements in technology. The increase in number of remote workers along with a younger workforce that values career development more, has made learning and growth a necessity for companies. Organisations equipped with Learning Management Systems is much higher than before. With the introduction of Massive Open Online Courses, platforms for learning experience and adaptive learning, microlearning, nano-learning and all other media platforms, businesses have been able to save money, make people at work more engaged and effective. In situations like the pandemics, integration of learning with technology has not only ensured constant learning but kept people connected and engaged. However, there are many organisations which are still highly invested in traditional approach toward training.

Today the next big challenge for the Talent

Developers is to promote learning and helping the employees in the organisation grow inquisitive towards learning and development through ways which involve technology. It is often that the talent developers aren't even able to figure out where they are failing in their learning interventions [5]. In a chain of public training sessions and programs across South East Asia, managers across different industries were asked about what was that one thing that they didn't like about Learning and Development opportunities in their company. Their answers ranged in variety of grievances but a few of the top grievances were that they didn't find the content delivery and representation engaging or interesting at all, the content delivery often took too long and could be finished or wrapped up in a short period, a lot of programs took them away from work and which in turn built their absence from work and they have no control over the content being delivered. Their choice of learning is

often restricted.

The point of focus here is that even though the companies feel that they are trying their level best to provide their employees with the best learning opportunities they can, the problem lies in the delivery and the way it is presented to its employees.

As the world today is progressing and looking towards technological advancements, Learning and Development has evolved too and so should its delivery. Why is it that heavy investments are made in developing new products and services, updating advertisements and promotions but a little in learning opportunities? Professional development activities need to be regularly refreshed and shaken up too; they can stimulate the creativity that spawns innovation [5].

### Literature Review

Digital learning in the workplace, is focused on learning backed by digital technology to serve the purpose of enhancing job performance and learning [9]. Digital learning changes learning in the workplace by introducing innovative ways to present information and give instruction, by making learning resources easily accessible and creating flexible learning environments [6]. Digital learning can prove to be cost effective and reusable while providing consistency for a diverse workforce [2].

To focus on an organisation's capability to innovate and develop orientation in general, continuous learning is the most important precondition [10]. To achieve a successful digital transaction, first the most important thing is to understand the behaviour of the digital consumer, his/her preferences and choices. According to Klaus Schwab of the World Economic Forum, the current speed, structure and magnitude of technological change is the "Fourth Industrial Revolution". We are the beginning of a revolution that is fundamentally changing the way we live, work, relate to one another [17]. The world is entering a new digital industry economy where everyone will be a technology company [18]. It is important for companies to help their employees adapt to digital learning faster if they want to progress in the

learning and development of their employees. Still, there is little research done in this area. There are fewer studies which provide insights on what might turn out to be effective in order to make digital learning more fun and engaging. From the little literature reviewed, a few strategies that can be used to provide employees with a voice and respect their time as well are creating learning catalogues, bite sized learning modules, online interactive platforms etc.

Companies aren't fully aware of all the skills, certifications and talents an employee possesses. Many a times these skills can prove to be the most useful to the organisation and other employees [5]. Talent developers can organize and collect data from the employees regarding their qualifications, certifications and talents they haven't declared. This data can then be uploaded and easily accessed by all the employees. This learning catalogue can have names of the skill holders and their contact details making it easier for employees to reach out to people to learn and update themselves regarding something [5]. Companies can also break up all the existing training modules and courses into bite sized content. According to a study done by Microsoft in 2018, the average attention span of humans is 8 seconds only [3]. What is surprising is that it used to be 12 seconds in the year 2012. Considering the fact that the average human attention span has come so close one of a goldfish is shocking. This means that there is an extreme need of presenting short and minute sized content to individuals if you want them to register it in their brains [3]. Freedom to learn whatever a person wishes to in his/her own time should be established. This also creates a focused learning of specific skills or areas of knowledge [5].

Managers who avoid professional training and developmental programs can be engaged and challenged to develop themselves by letting them take control of their own learning [4]. Companies should then enable employees to share their learnings with their peers through interactive online platforms or even through group discussions [5].

The older roles and jobs are becoming

obsolete too fast and there is hardly any time to train and prepare the workforce for the next and upcoming role they are going to have to play in the organisation. Digital learning comes handy at this time and helps in preparing the employees for the future of the company as well as technology. Rather than having your entire workforce go through a manual training session on how to cope with coming job related changes, it is much easier to cater to all the employees through a digital platform where everyone can easily access whatever they are supposed to learn to deal with the upcoming changes and be updated about the changes in the industry.

An example of how digital learning is being implemented and integrated as a prime learning system is Ford Motor Company and Mitacs [22].

In order to improve and increase assembly line safety, Ford Motor Company partnered with University of Windsor. They together have taken help of video game technology to increase assembly line safety. By using computer simulations and video game technology, they map how Ford workers move while working in the factories. After the completion of the analysis of the technology, the workers at the factory will be outfitted with suits that capture motion. As the workers move around, the suit will capture their movement and create data which can be rapidly transferred into a simulation software which is game-like and human.

This can be termed as the future of the workforce learning and development. This is how all the companies will eventually impart learning to its employees.

All the businesses share one thing in common which is the need to transmit information in real time to the employees and also in a manner which allows all the employees to be able to access these resources on their demand, wherever and whenever they need them [23]. Due to this need, adoption of mobile learning by companies has seen an increase. According to a survey conducted by eLearning Guild in 2012, 65.7 percent of the respondents stated that they intend to use Mobile Learning at

their workplace. In one another survey, amongst the respondents, 34 percent of mobile users stated that eLearning was one of the factors that contributed to the organisational productivity [20].

One such example of implementation of Mobile Learning can be seen within the company Jaguar Land Rover [23]. A global automotive manufacturer needed a way to deliver training material and resources across the globe in a way which was sophisticated and enabled the content to be accessed in different languages. Due to a franchised nature of their dealer network, the capability to deliver content in a mobile fashion was a prerequisite.

If Jaguar Land Rover decides to go ahead with Mobile Learning, it would find its own benefits. For instance, learning and resources on demand for all the employees. If a mechanic ever wanted to access the resource sheet from his mobile device while carrying out a repair in the car, he would be able to do so easily. It would also become easier to track objectives and content interaction through both new mobile applications and traditional eLearning by integrating with their existing Learning Management System. Users could access content remotely and latest version of information would always be available to them. Content could also be assigned to them according to their roles which would in turn create a personalised learning library for them [23].

Over 65 percent organisations who are considering learning through mobile and internet as their primary mode of learning in the workplace. Organisations are still trying to figure out ways to deliver interactive programs which are attractive to the users [23].

### **Moocs**

In the recent years, MOOCs – Massive Open Online Courses have shown the fastest rate of adoption by organisations in order to impart right skills and knowledge to their employees. Today integration of technology into every aspect of life is thoroughly changing business and labour [14]. For an organisation to gain competencies relevant in the twenty first



century, it is extremely important that the learning for work is a highly individualised process [7]. In the workplace now, self-regulated learning is taking the front seat and gaining more and more importance. For workplaces in the contemporary world, a new perspective is called for on learning and learning environments and not to forget a special focus on informal settings and learning with technology [12].

Today, MOOCs are one of the highest used for learning digitally in workplaces. Coursera today is by far one of the largest knowledge imparters with estimated 24-25 million users. The concept of MOOCs fits in perfectly for workplace digital learning as it provides various features.

For MOOCs for corporates, a different approach is followed. In order to offer their services to the corporates, MOOC platforms allow a no direct relationship with academia for workplace digital learning. The organisations themselves operate and control the content on the MOOC platforms. This approach is similar to the idea of corporate university which had become quite famous in the 1990s [1]. Even though MOOCs offer a wide variety of content, they are not highly appreciated when it comes to changing employee's skill development even though HR professionals are actively exploring MOOCs for professional development [15]. However, it is found that once the employees are well aware about the MOOCs, a better rate of acceptance is seen. MOOCs were then significantly seen as a positive factor for professional development, recruiting purposes and hiring decisions [6]. Another study revealed the positive attitude of professionals towards MOOCs especially for professional development [13]. It is surprising what a survey found was that roughly 72 percent of the employees learn through MOOCs without their employers being aware about it. However, amongst those employers who were aware about this, 80 percent encouraged their employees learning through MOOCs [11]. In a large survey conducted on people who have taken Coursera courses and completed them it was found that for 87 percent of them most common and top reason to take the course

was to gain a career benefit of some kind [23].

### Research Methodology

This research is an exploratory research which includes Gen X, Y and millennial working population including talent development leaders across the industries in order to get their insights on digital learning and best practices around it. For collecting data for the working population, a survey form was circulated to multigenerational people working in various organisations with work experience ranging from 1-2 years to more than 3-5 years. For collecting insights on digital learning practices conducted in different organisations, a survey form was circulated to talent development leaders in various companies. This will help in gaining a better understanding of the current position of digital learning in the corporate world and how are the companies leveraging technology to improve learning and development opportunities in their organisation. Both the survey forms consisted of open-ended questions in order to expand the understanding of the population. These open-ended questions did not provide statistically measurable responses but gave a richer quality of information that can lead to discovery of unexplored elements that stand as motivations or challenges for digital learning, which can further be researched upon. These responses have been analysed to acquire foundation for basing recommendations for effective digital learning strategies for organisations. This methodological approach provides an in-depth view into the perception of digital learning that people carry. It will also allow an insight into how far are people into accepting digital learning as their preferred learning method.

A. *Questions in the working population's survey were based on following areas:*

- Current digital learning practices carried out in the organisation
- Barriers to Digital Learning
- Motivations of employees surrounding digital learning
- How to encourage employees to adapt to digital learning

- How to make digital learning engaging for employees
- What can be done further to increase the scope of digital learning in the organisation and create learning opportunities in the workplace through it

*B. Questions in the talent developer's survey were based on following areas:*

- Learning preferences of the individuals
- Learning styles of the individuals
- Learning goals of the individuals
- Individual's perceptions on digital learning
- Motivating factors surround digital learning
- Barriers faced while learning digitally

After receiving 57 responses from the working population and 12 responses from leaders of various organisations, with the help of excel, this data was sorted and analysed for findings on major trends and discoveries.

In order to understand the learning preferences of people better, 2 Learner Personas were created. These personas provided a deeper understanding of the learning preferences of people and created a distinction between their learning goals, styles and nature.

### **Results and Analysis**

The insights on digital learning practices were gathered from talent developers in various organisations like Mahindra, Flipkart, Amadeus etc. In order to promote digital learning practices in their workplaces and help their employees gain benefits of learning digitally, a few practices were observed.

#### **A. Findings from the survey of Talent Developers:**

1. Focus on personalising learning for different learning styles. Content prepared for employees is based on Neil Fleming's VARK Model. According to Neil Fleming's VARK Model the learning styles are categorised into Visual, Auditory, Reading-Writing and Kinesthetic.
2. Ensuring that after successful completion of a digital training program, employees are given a business problem or assigned a project related to their learning. This helps in settling the context of their learning right and also helps in assessing the success rate of the training session.

3. Making use of the competitive spirit between peers and creating a healthy competition amongst employees in order to encourage learning. When employees see their peers performing well in a competition which has a reward towards the end, they develop this sense of competition and want to perform better. A few companies have converted this concept into a digital one by creating peer groups and assigning digital projects.

4. Social Media is one of the easiest and most accessible sources if one wants to gather information about specific things online. Platforms like LinkedIn also offer learning courses and programs online. A few companies have created such platforms for their employees where they can post about their learnings from a particular project for their peers to view and implement. If a business problem is solved by a team and shared with the entire organisation, it creates a positive impact as this can help other employees learn from it and implement the same solution for a business problem that they have been facing.

5. Allowing live environments to practice learnings in. This point mainly focuses on tech companies who are heavy with coding skills. This allows the coder to first learn and then practice their skills in real environments.

6. Letting employees communicate and share their learnings. This creates a two-way effect: One, where the employees learn and keep learning in order to gain more self-esteem as they keep learning and sharing. Second, where employees look at their peers learning and sharing and get motivated to do the same. This also helps in gaining better solutions for business problems as employees can take inspirations from their peers' projects. One of the common platforms used for enabling discussions is Teachable.

7. Having a culture where leaders are the influencers. Companies take help of their senior leaders in order to influence their employees to explore the digital learning world. The leaders are required to share their learnings and their journey of learning anything digitally. This helps in motivating other employees towards digital learning.

8. Sharing success stories of employees

learning digitally. If an employee achieves a skill or qualification online or takes part in any digital learning activity, the organisation makes sure that they give recognition to those employees. This increases the employees' morale and confidence. Also motivates other employees to do something similar.

9. Ensuring that there are learning sessions for the employees by the employees. For example, when a team learns something new, they are required to create a micro or mini representation of it like a small infographic or something similar and share it with their peers to help share their ideas and learnings throughout the organisation.

10. Focus on implementing digital learning only in those areas of business which are of great importance to them. For example, Swiggy focuses on using digital technology and video game-based learning for their delivery channel personnel. They gamify the entire delivery process and help their employees learn better.

11. Following nudge theory and believing that constantly nudging the employees in the direction of digital learning might help in them adapting to it. The companies send out emails to their employees regarding what courses they should go for and guiding them where to start their digital learning journey from.

12. One of the most surprising observations here was that very few companies take their employees' recommendations on the content they create and make available on their learning platforms. Asking for employees' recommendations gives a fair idea to the companies about what the employees are seeking to learn and what is lacking in the current learning system.

13. Allowing employees to rate the course they took and letting them know the quality of it. Ratings not only help the talent developers understand what kind and quality of content are employees looking out for but also helps everyone to choose and pick which courses they want to go ahead with.

14. Companies with platforms where employees can share and communicate use those platforms as content distributors. Talent developers make sure that they maintain continuous supply of bite sized learning materials on these platforms. Long drawn

courses are converted into short clippings and small content for quick and on the go consumption of employees. The content keeps floating in the employees' profile feed and they can view it as and when they want from wherever they are.

15. The internal communications and sharing platforms are also used by different Business Units and Teams to share their success stories and what helped them solve a great business problem for the company. This helps in distributing a novel idea throughout the organisation and makes the best practices of those business units viewable to the entire organisation.

16. Many organisations have realised that, later an employee starts adapting to digital learning in their work life, more difficult it gets. Employees once used to the traditional ways of learning and training themselves have a bit of a rough start with the way of learning digitally. Many employees find this as a demotivator to learn itself. Digital learning is more of a self-driven activity whereas those employees who are used to learning by the way of training sessions and camps where modules are set out and scheduled for them, find it difficult to adapt to learning on their own. They feel lost. In order to solve this problem, companies today are making sure that the employees are made to come in contact with digital learning as soon as they join. Companies make sure that the employees are well settled with the digital technology from day one by conducting Virtual Onboardings. This sets a comfort level for the employees and they then don't happen to find it difficult to adjust with technology later in their work life.

17. Encouraging managerial staff to be the facilitators of digital learning in their organisation. Managers are expected to guide their subordinates' learning journeys in ways that involve extensive learning and research online. They are expected to encourage and support them in taking up relevant courses for their job role and deliver their learnings in the projects undertaken.

18. One observation was regarding the communication of success stories of employees learning digitally but one more was where a few companies communicate the

success rate of their digital learning portal or system. These statistics are displayed around the organisation in a creative and an interactive manner where employees can see those and get motivated to start using the learning portals. This data is generally about how many new users have registered on the portal, how many regular users have increased, increase in the number of people taking up courses, course completion rate etc.

19. Special committees to create content and design it in ways that can be consumed by all types of learners in the organisation. These committees keep a check on the quality of content offered to the employees and maintain timely delivery of the content on the learning platforms. These committees also take care of the employees' recommendations on what kind of content they wish to consume and try to make that available for them. They take constant feedback from the employees regarding the quality of the content.

These were a few digital learning practices observed across different companies in different industries.

#### B. Findings from the survey of the working population:

1. 91 percent of the respondents which is, 53 of them stated that they only want to do work related learning and are not interested in learning anything beyond that. This can lead to an assumption that people are not interested in learning unless and until it helps them achieve some kind of professional or career goal. Out of these 53 respondents, 50 stated that they want their learning to be strictly on the need basis only. They wish to learn only those skills which are needed at the moment and nothing beyond that. This observation leads us to think that learning is relative to the goals of a person.

2. 100 percent respondents agreed that they found it extremely difficult to find time to learn their preferred skills on a regular basis. Most of their time is often occupied by work and household chores. If they wish to take up a course, they have to actively seek out time and make room in the schedules for completing the course in its due time period. This means that in order to achieve a successful digital learning strategy in an organisation, first thing is to make sure that you are enabling your

employees to learn. Enabling employees to learn here refers to making it easier for employees to find time for their designated learning courses and making the learning content accessible to them whenever and wherever they need it at any point of time.

3. A very interesting observation came to light through this survey, that people choose watching informative videos over courses and modules. 55 of the respondents agreed to watching videos over taking courses. Out of these 55 respondents, 54 stated that their primary source of gaining knowledge or learning something on the go through videos was YouTube. This can lead to the assumption that people look out for quick bite sized learnings and even something as detailed as a course might bore them eventually. When asked about why the choice of YouTube, 42 respondents stated that it was because it gave them instant gratification and a sense of achievement which they would have to wait for days to feel had they taken up a course. People find long drawn courses to be less appealing due to the time associated with it.

4. One of the most surprising things found from this survey was that people when learning online seek for constant help and they aren't able to find help on the go. 42 respondents stated that while learning online they often feel stuck or have doubts regarding a concept that they are trying to understand. This mostly happens when they are learning through courses and have questions in relation to it. A few respondents also suggested if there could be a way through which they could receive instant help when they require it. It was also observed that when these respondents don't get their queries solved on the go, they feel demotivated to continue with the course and are likely to drop the course if they continuously face this problem.

5. 50 respondents stated that they find it difficult to choose relevant sources and find credible courses. With a vast source of information and knowledge out there and even in the learning systems, it is difficult to know which source to choose and opt for. People don't want to take up courses and realise mid-way that the course isn't as relevant as they thought or not that up to the mark or informative.

6. 49 respondents stated in the survey that they sought companionship while learning online. Learning digitally as we know is more of a self-driven process where people are responsible for their own learning. What people look out for and miss here is the feeling of companionship, togetherness and team work which they are used to. Out of the 49 respondents, a few also stated that it would be great if they could have someone along them to share their digital journey with. This might make it easier for employees to adapt to digital learning.

7. It was also observed that people look out for excitement and activity while learning online. Training sessions and programs are full of interaction and it is easier to express your views and discuss when sitting physically in a space along with others. When it comes to learning digitally, one is not able to do so and misses the interaction. This makes digital learning a bit dull and unappealing to the people.

8. One of the most interesting observations made while virtually observing the respondents learn through video calls was that people don't understand how to go about learning digitally. They struggle to find the right resources and even if they do, they struggle to choose one of them. It can be assumed through this that people look out to learn how to learn digitally.

Looking at the above observations, it is found that there are a few major things that act as a demotivating factor towards learning digitally. They can be summarised as difficulty to find time to learn, unavailability of instant help and credible sources to learn from, lack of companionship, lack of interaction and lack of know-how about how to learn digitally.

### C. Learners Persona

From the above findings, 2 distinct Learners Persona have been created. Persona 1 is of respondents with work experience less than or up to 1-2 years. Persona 2 is of respondents with work experience more than 3-5 years of work experience.

For Persona 1, it was majorly observed that their learning goals consisted of being updated with the current industry trends and preparing to take up another role in the organisation. Whereas when it comes to respondents in Persona 2 with work

experience more than 3-5 years, their learning goals are to stay updated with the current industry trends and constantly upskill themselves to become successful. When asked about their learning purpose, Persona 1 seeks excitement and wants to be engaged while Persona 2 wished to gain extensive knowledge in their profession. Persona 1's nature is avid and curious. They are extremely enthusiastic, competitive and actively seek content online. Hence, prefer to learn digitally. When it comes to Persona 2, they are avid but interactive and like to learn by exploring, observing and experimenting. They are not proactive and require constant nudges and space in order to learn digitally. Persona 1 again prefers to learn using YouTube, Blogs, Articles, Podcasts and Courses only for technical learning. They mostly prefer to consume and learn most through bite sized content. Whereas Persona 2 respondents prefer to learn on the job through experience and observation. They are bite sized learners and lay significant emphasis on learning through their peers.

### Discussions

Digital Learning truly revolutionises the entire learning experience of the employees. It does take several trial and error methods for organisations to come up with practices that help employees find digital learning engaging. In sync with what the researchers have already explored, it is true that in order to set the context of digital learning right, talent developers focus upon providing employees with all the opportunities they can to learn digitally. Majorly the competitive spirit of the employees is used to encourage them to collectively learn online. Not only that, but it is of value when it is found that in order to facilitate digital learning, managers' and leaders' help is taken. They are the major facilitators when it comes to helping employees adapt to digital learning. Taking inspiration from the concept of group learning, digital projects are also assigned in groups so that learning digitally becomes easier and engaging. Along with this, most

effective practices involve constant communication and intense personalisation. Personalisation is the way to sell anything and everything today but here personalising a digital learning experience is a tough task. This is one of the reasons why in-depth research about the user's preferences is required. Apart from this, as we have been taught since childhood, the traditional way of learning in classrooms through live discussions and interactions, just like that employees also look for such environment when they are learning digitally. This is the challenge for the talent developers, to provide employees in the organisation with those elements which provide a traditional learning experience while learning digitally.

### Recommendations

Based on the research conducted above and the results of the survey and multiple interactions with L&D leaders and working professionals as well, a few strategies that can be adopted by companies for encouraging and implementing an effective digital learning system for its employees, are as follows:

1. **Formation of Learning Teams:** Organisations should enable formation of peer and similar interest learning teams where people with similar interests can come together and learn together by taking any digital course together. This will help solve the problems like lack of interaction and companionship.
2. **Online Community for Instant Help:** Organisations should have their own online communities to provide instant help to those who require it. For example, how on Reddit, Quora, Yahoo Answers etc. people post their queries and receive instant help and suggestions from people around the world. A similar concept can be adopted in a secure space which is accessible by the trusted members and employees only. This space can be used by people to post their queries and difficulties which can then be responded to anyone who knows how to solve it or help further.
3. Employees should often and as and when time permits should be assigned mini **virtual group projects** wherein; they are able to work

with a close-knit group digitally. This increases connectivity within the organisation and helps solve the problem of lack of companionship and interaction. It also provides the employees with some refreshing activity and helps them adapt to digital learning better.

4. **Creation of a Learning Trend:** A learning trend can be created by encouraging the leaders to share their digital learning journeys. This will help motivate the employees to follow their leaders digital learning journeys and adapt to digital learning. The leaders can start a digital learning challenge by nominating 3 of their peers to learn something digitally and share with their peers and nominate 3 more peers as well. This will create a digital learning chain throughout the organisation and will help everyone to adapt to digital learning.

5. **Constant Nudges:** Companies should draw their employees' attention towards existing learning modules on their learning systems and encourage them to go and check out the digital content available. This can be done by constantly nudging and sending emails with descriptions and links of interesting that content that can be consumed.

6. **Learn from each other:** Companies should enable a learning culture by encouraging teams and business units to share their success stories and learnings with their peers and employees through their learning platforms and in the forms of bite sized multimedia content.

These recommendations are not conclusive but address the needs mentioned by the respondents

and found in the survey through analysis and observation.

### Conclusion

To answer the question "What are the effective digital learning strategies for organisations?" we can say that Digital Learning is a vast area and a lot needs to be worked and researched upon here. Talent developers are trying to help people adapt to digital learning through strategies which are constructed on the basis of ongoing research. There are less than few organisations who have been able to successfully implement and digitalise their learning and development activities. Adapting to digital learning takes time as generations of

employees adapt to it. The rate and ease of switching over to digital learning varies with age and only becomes difficult with age and experience. Although adaptation becomes a bit rough with work experience but the learning curve just gets steeper which is the silver lining here. We have seen the demotivating

factors for digital learning and our solutions can go so far but as long as people are enthusiastic to learn, they can be guided towards how to learn digitally successfully.

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## MSME SECTOR AND EMPLOYMENT GENERATION: A PERSPECTIVE OF INDIAN ECONOMY

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### ABSTRACT

*Increasing the job creation rate is a remarkable macroeconomic approach of any country. The examination is an endeavor to examine the specific employment creation of individuals by small businesses ventures. The sense of this assessment is to legitimize if MSMEs are satisfactorily fulfilling the job creation in India through innovative technological amendments. It is critical for understanding the fundamental situation of the MSME sector in India's business age so that the policymakers put the supplement on the turn of events and improvement of the field. The assessment used secondary data to show the current situation of the MSME sector to the extent of the business era. The examination proposed some healing steps to address the MSME sector's reasonability and advancement challenges in India*

**Keywords:** MSMEs, Sustainable Development, Job Creation, Technological improvement, Training and development.

### Introduction

At present, unemployment is a big problem in any country in the world. Especially the Covid-19 pandemic is creating undue pressure on employment and creating opportunities for using innovative technologies in business transactions. MSME sector has been playing a significant role in the employment generation of any country. MSMEs need comparatively low investment to start new ventures. It is acknowledged as the engine of the progress and development of a nation. The result of the SME sector is getting popularity among the government, policymakers, entrepreneurs, financial institutes, and private sector organizations.

In India, the MSME sector has a significant influence on employment generation. Around 630.52 lakh micro-enterprise employed 1076.19 lakh persons. Besides, the small industry with 3.31 lakh and medium sector with 0.05 lakh MSME estimated units engaged 31.95 lakh and 1.75 lakh persons respectively of total employment in MSME sector. But the Covid situation has been slowing down the trends of MSMEs' growth and development. At the same time, unemployment is showing increasing trends day by day. So the government and private companies must take the initiative to rescue and help the sector develop sustainably. Moreover, adaption with

modern technology can help the industry to conduct its business sustainably.

### Literature Reviews:

Several authors dealt with the topic regarding the economic contribution of MSMEs and adaption with the technological innovation in India. Some of the writings are reviewed in the following:

Sharmah A. et al. (2021) authored a research paper entitled "Can unemployment be answered by Micro Small and Medium Enterprises? Evidence from Assam". The examination is an endeavor to examine the general commitment of MSMEs in employment creation in Assam. Another generous justification of the analysis is to review the example of male and female personnel in the study region. The examination showed that the business age and MSME areas are directly related. Other fundamental revelations of the investigation uncovered that the male-had MSMEs have a higher number of people used than female-asserted MSMEs.

Chaturvedi P. et al. (2021) had a research paper on "Technological Innovation: a Necessity for Sustainable MSME Sector in India." The study explores the innovation in the MSME sector to improve productivity. The researcher found that the personnel engaged in MSMEs' industrial job capabilities heavily affect the industry's productivity performance. Finally,

the researcher suggested that the technical institutions create high-tech innovations in the MSME sector to improve productivity and make them sustainable in the competitive market.

Waseem Khan (2020) wrote an article entitled "Understanding the Dynamics of Small Scale Industries: A Case Study of Indian Context." The study was conducted to determine the performance of MSME related to units' establishment, production, employment generation, and exports. The researcher tracked down that the MSME area impacts Industrialization in India. He likewise saw that MSMEs contributed fundamentally to the development and improvement of Industrialization during the investigation time frame.

Olufemi Aladejebi (2019) wrote an article on "The Impact of Microfinance Banks on the Growth of Small and Medium Enterprises in Lagos Metropolis." The study aimed at examining the effect of Microfinance Banks (MFBs) on the progression of SMEs. The study found that SMEs with MFB products are growing faster than those without MFB products. Moreover, the MFB savings rate is higher than that of other commercial banks. MFBs loan disbursement duration is also faster than other commercial banks. Besides, SMEs having MFBs training showed better performance in their growth. Finally, the study concluded that MFBs are influencing the progress of SMEs significantly.

Singh D. (2019) authored an article titled "Implementation of technology innovation in MSMEs in India: A case study in selected firms from Northern region." The researcher examines the obstacles faced by MSMEs and studies technological innovation and their implementation in this sector. The research explored the superior understanding of the problems that resist the MSMEs from a successful implementation of technological innovation. Besides, the paper provides valuable insights into technical adjustment by the MSMEs to enhance their performance.

Davinder Singh, J.S. Khamba, and Tarun Nanda (2019) composed an exploration paper on "[Justification of technology innovation implementation in Indian MSMEs using AHP.](#)" The examination investigates the significance of different elements affecting the assembling execution improvement of small and medium ventures utilizing the scientific order measure. The analysts found that, for the most part, small firms contribute altogether to work age in immature nations. So the public authority of those nations underscores the improvement of SMEs' efficiency and execution through innovation execution.

A. Sathish and S. Rajamohan (2020) directed exploration on "An Impact of Re-Engineering on Entrepreneurship and Employment in Indian MSMEs." The researchers analyzed the effect of reengineering practices on MSMEs. The examination tracked down that the two significant reengineering practices like globalization and MSMED Act, 2006 affected the exhibition of business and work of MSMEs in India. The MSMED Act, 2006, fostered a legitimate plan and design that is a reasonable answer for unemployment in India.

Hendro Gunawan, Benyamin Langgu Sinaga, and Sigit Purnomo WP examine the usefulness of electronic money (e-money) technology in MSME sector. They found that innovation in the business transaction using new technology is affecting business performance significantly. Moreover, the use of E-Money technology is convenient to the MSME owner-manager. So, the MSME sector can easily adapt to the technology without any anxiety to boost their performance.

### **Objectives of the Study:**

The study will seek to:

1. Portray the current scenario of employment generation by MSME sector in Indian economy.
2. Identify the obstacles faced by Indian MSMEs regarding smooth business operations.
3. Recommend certain remedial actions for the resolution of the problems experienced by the MSMEs.

### **Methodology of the Study:**

The investigation is descriptive intrinsically. An empirical study was conducted by

examining specific articles on the query of the researcher. It uses only secondary data. Secondary data sources are magazine documents, annual reports, journals, and publications on the Internet.

**Conceptual Model:**

The conceptual model builds on a literature-based research that contributes to the development and growth of any country's economy based on job creation.

Figure 1 shows the relationship between MSMEs development and growth and employment generation.

**Figure1:**



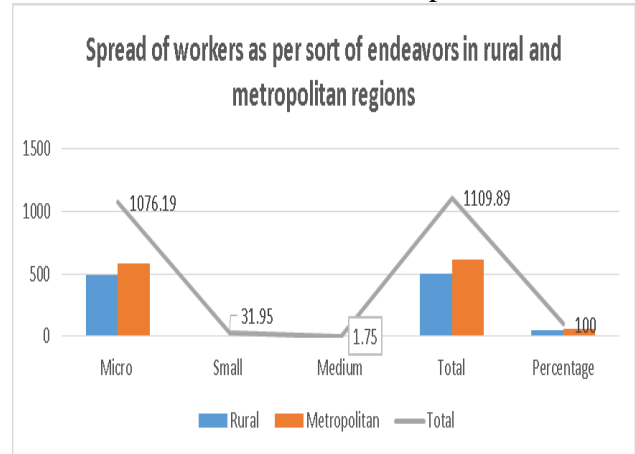
**Statutory Organizations of MSME sector in India:**

Six legal associations are working under the MSME-Ministry, Indian Government. Among these, Khadi and Village Industries Corporation (KVIC) is occupied with advancing openwork doors in rural regions, Coir Board is set up for the general advancement in coir industry, the National Small Industries Corporation (NSIC) is associated with cultivating the development of the MSME area by offering incorporated help administrations, Mahatma Gandhi Institute of Rural Industrialization (MGIRI) is working for country industrialization by giving elective innovation utilizing nearby assets, and Public Establishment for Micro, Small, and Medium Endeavors. National Institute of MSME manages the development through technical innovation, skill up-gradation, and other maintenance facilities.

**6.1 Spread of workers as per sort of endeavors in rural and metropolitan regions (Numbers in lakh)**

Types	Micr o	Sma ll	Mediu m	Total	Percent age
Rural	489.30	7.88	0.60	497.78	45
Metropoli tan	586.88	24.06	1.16	612.10	55
Total	1076.19	31.95	1.75	1109.89	100

**Source:** Annual Report 2020-21, Ministry of Micro, Small and Medium Enterprises



MSME sector help to create equitable employment creation in the economy. The above chart and table shows the picture of equitable development of urban and rural areas. We notice that MSMEs created 45% and 55% jobs for rural and urban people, respectively.

**6.2 Spreading of personnel by gender orientation in rural and metropolitan regions (Numbers in lakh)**

Types	Rura l	Metropolit an	Total	Percenta ge
Female	137.50	127.42	264.92	24
Male	360.15	484.54	844.68	76
Total	497.78	612.10	1109.89	100
Percenta ge	45	55	100	

**Source:** Annual Report 2020-21, Ministry of Micro, Small and Medium Enterprises

The above chart displays the gender equitability in MSMEs personnel. The male and female workers of the sector are 76% and 24% respectively.

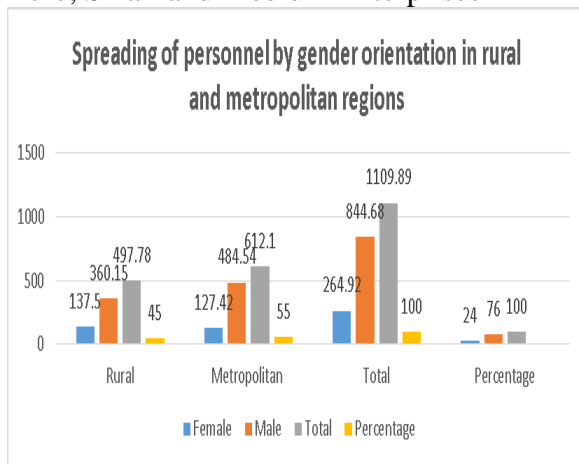
**6.3 Job creation under Khadi and Village Industries (Artisan in Lakhs)**

Year	Khadi sector	Village industries
2016-17 @	4.56	131.84
2017-18 #	4.65	135.71
2018-19 #	4.96	142.03
2019-20	4.97	147.76
2020-21 (Up to 31.12.2020) #	4.97	150.31
2020-21 (Projected up to	5.00	154.12

31.03.2021) #

**N.B:** @ Including Polyvastra # Including Polyvastra&Solarvastra

**Source:** Annual Report 2020-21, Ministry of Micro, Small and Medium Enterprises



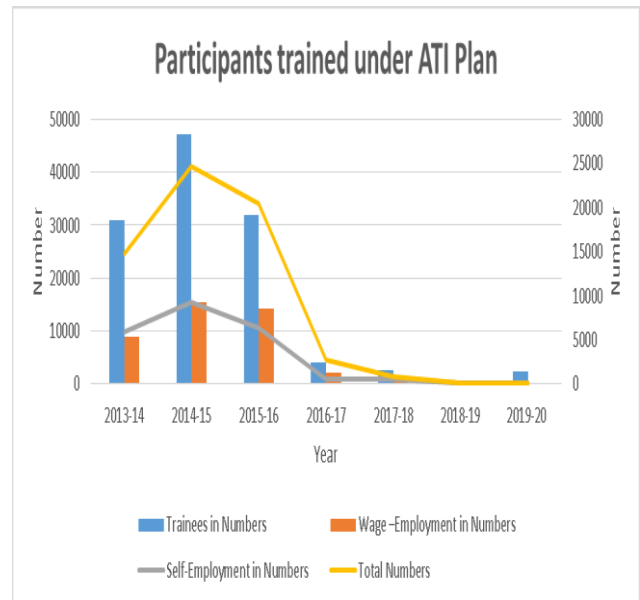
KVIC has a substantial part in the job creation of marginal people in India. The above chart shows the consistent and increasing trends of employment under the khadi sector and village industries.

**6.4 Participants trained under ATI Plan**

A few quantities of projects directed, the members prepared and the number of participants who accomplished independent work or figured out how to discover wage-work since 2013-14 to 2019-20, are given in the ensuing table:

Year	Trainees in Numbers	Wage – Employment in Numbers	Self-Employment in Numbers	Total Numbers
2013-14	30910	8843	5905	14748
2014-15	47092	15419	9236	24655
2015-16	31874	14130	6313	20443
2016-17	4050	2159	615	2774
2017-18	2610	328	498	826
2018-19	750	54	53	107
2019-20	2290	67	88	155

**Source:** Annual Report 2020-21, Ministry of Micro, Small and Medium Enterprises



**6.5. Skill Development Programs:**

The progress of skill development programs undertaken by Ministry of MSME:

Year	NSIC	NI-MSME	KVIC	Coir Board	Total
2014-15	21860	990	94522	20648	138020
2015-16	27455	1740	79286	6819	115300
2016-17	31958	47136	93041	4779	176914
2017-18	37459	31874	78841	2481	150655
2018-19	41201	4051	81906	4253	131411
2019-20	54624	2608	74938	4325	136495

**Source:** Annual Report 2020-21, Ministry of Micro, Small and Medium Enterprises

The above chart depicts that the advancement of skill development program was maximum in the financial year 2016-17 and it showed the lowest involvement in the financial year 2015-16.

**Findings:**

After examining a few main articles on the role of technology in employment generation by MSMEs, the investigation found the following aspects:

- The innovation and technological adjustment can ensure the defensible progress of the MSME sector.
- The pandemic situation leads to significant problems before micro-enterprises: lack of working capital, decreased product requirements, disruption of labor accessibility,

lack of material supply, and restriction on moving goods.

➤ Indian Government has taken some crucial steps to implement innovative technology in this sector. The current creative technical arrangement, such as MSME Data Bank, MyMSME mobile application, and online job portal for the industry (MSME SAMPARK), plays an influential role in employment generation and growth of the sector.

➤ Unskilled labor force might be treated as a burden for ensuring sustainable development in the MSME sector.

➤ Female entrepreneurs are in a backward position. Because they face many obstacles in conducting their business, such as Banks and Non-banking financial institutions, they don't feel secure to lend funds to female entrepreneurs. Besides, our society is male-dominated; women are involved in household activities, etc.

➤ MSMEs create great opportunities to produce and market products such as masks, hand sanitizers, medical equipment, online equipment, and IT equipment.

➤ Number of training under the ATI scheme showed decreasing trends over the years.

➤ Progress of Skill Development Programs also showing decreasing trends after the financial year 2016-17.

### Recommendations:

The study proposes the succeeding actions to solve the difficulties of the Indian MSMEs and to make sure the viable improvement of the sector:

✓ Government and private organization need to take initiatives to retain the progression and improvement trends of Indian MSMEs.

✓ Financial institutions should offer good financial packages to the MSMEs to overwhelm the problems.

✓ The government can also provide credit facilities for MSMEs.

✓ Free collateral loans could be sanctioned to MSMEs in the situation of the pandemic.

✓ MSMEs should develop strategies to address the pandemic environment that has changed.

✓ Enterprises should adapt themselves when doing business using e-commerce and other innovative technologies like e-money, MyMSME, MSME SAMPARK, Direct Benefit Transfer, etc.

✓ To confirm the smooth operation of MSMEs' business, the Government must take actions to improve its businesses' blocking, including transport and power, etc.

✓ MSMEs' owners/managers should keep a record of their business transactions using upgraded software.

✓ The introduction of more training and skill development programs can help MSMEs to enhance their performance.

✓ Administrative processes should be computer-generated to start new MSMEs.

### Conclusion:

Micro, Small, and Medium Enterprises are getting superior priorities to attain the development goals of any economy. Innovative technology implementation can speed up the progression of the sector and help to reach the goals. The MSME-Ministry of the Indian Government has been taken necessary measures to introduce innovative technology enactment in the trade transactions of MSMEs. For example, online registration, MyMSME mobile Application, Shortest Benefit Transfer for faster fund flows, etc. that can increase the sector's efficiency. But then again, the business is encountered numerous problems, including transportation, power, admittance to fund, lack of skilled workers, inadequate market demand, disruption in the supply of materials, etc. So the public authority and the private organizations need to join hands to overcome the obstacles faced by the MSME sector that will jointly affect the country's economic development..

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## IMPACT OF TELECOMMUTING PRACTICES DUE TO COVID-19 PANDEMIC IN WORKPLACE

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### ABSTRACT

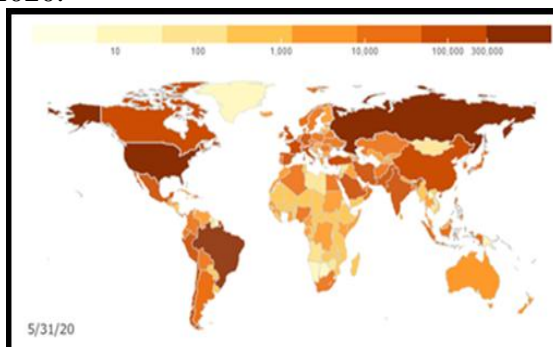
The recently emerged COVID-19 pandemic has forced employees of various industries into telecommuting or practice work from home to carry out their daily roles & responsibilities. The change has been strictly enforced by both the government as well private enterprises for their business continuity as well as employee safety across industries. Although telecommuting or work from home as a concept has existed for a while, it is only now that companies as well as individuals are starting to see both the gains & losses to be had through its forceful albeit necessary adaptation. As a lot of employees across various industries have suddenly been thrust into this situation, this paper attempts to explore the experience of such employees with sudden shift in work environments as well study their willingness to carry on with it when the situation normalizes.

Owing to the shift of employers & employees to an increased reliance on digital technologies, there has been an effect on the mental health & well-being of the employees. The primary focus of this research is to examine the effects related to adaptation & acceptance of teleworking by employees..

**Keywords:** Telecommuting, Decision Making, Business Insight, Teleworking, Pandemic Impact

### Introduction

The COVID-19 pandemic, which emerged in late 2019 in parts of China, has spread potentially to every major country in the world, leading to massive health and humanitarian crisis on an unprecedented scale [1]. According to data published by John Hopkins University, as on May 31st, 2020, approximately 5.8 million people have been infected worldwide. “Figure 1” shows the spread on coronavirus as on 31-May-2020.



**Figure 1**

The strain over the administrative, medical & financial systems of various countries has been severe. To combat the spread of the virus, several countries have put travel restrictions, both of domestic & international nature, and put multiple lockdowns into place to try and reduce the spread of the

virus & also the number of cases being observed, that otherwise might lead to failure or collapse of their healthcare infrastructure eventually. As a repercussion of the lockdown, the movement of people & goods has been ceased, along with several industries brought to a halt causing disruptions on supply chains and economic losses to various industries.

The financial markets across the G20 countries have been severely impacted. The Dow Jones Industrial recorded its second-largest single-day loss – falling 2997.10 points (12.93%) on 16-March-2020 [2]. The Indian Sensex also fell 3934 points, ending the day at 25981 points, at a loss of 13.15% on 23-March-2020 [3]. This has led to an economic recession whose effect can be felt across the globe as in “Figure 2”.

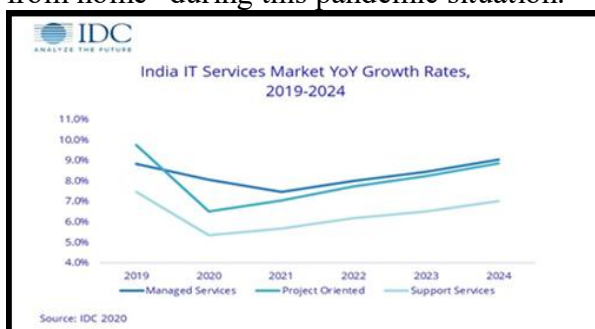


**Figure 2**

On March 24th 2020, India went under a

complete lockdown mode for 21 days under the direction of the Government of India to limit movement of the roughly 1.3 billion population. This was ideated as a preventive step to combat the step of the COVID-19 pandemic. The lockdown was further extended to May 17th and then to May 31st 2020. A large impact of these restrictions was felt on the Indian Information Technology sector, which had an aggregated revenue of USD 177 billion in 2019 and witnessed a growth of 6.1% YoY. India's IT sector accounted for roughly 38.6 lakh directly employed & 1.2 crore indirectly employed the people [4]. The contribution to GDP of the Indian Information Technology sector has increased from its 1.2% contribution to Gross Domestic Product back in 1998 to a massive 7.7% of Gross Domestic Product contribution in 2017 [5]. According to a forecast by the International Data Corporation (IDC), the Indian IT & Business Services market is expected to reach USD 14 billion by the end of 2020, growing annually 6.5% [6]. "Figure 3" shows the growth rate of India IT Services Market.

Given the severity of the situation, the Indian IT industry has been relatively quick to adapt to the pandemic with major IT giants and software companies announcing teleworking options for their employees. Tata Consultancy Services – part of the Tata conglomerate, which has more than 450 thousand employees [7], TCS has announced on May 27th 2020 that the company would be implementing changes to its "work from home" policies which would enable them to function with only 25% of their existing workforce being present in their offices by 2025. Infosys, another IT giant, has asked 33% of their existing workforce to "work from home" during this pandemic situation.



**Figure 3**

This has led to a tremendous increase in teleworking among employees, which in turn has increased dependence on virtual or software-based solutions for essential virtual conferencing & meetings. There has also been a shift in the working habits of employees due to present uncertainties. There has been a change in the dynamics of team members in terms of allocation of work and coordination, which is being embraced by the companies. But this journey of digital transformation has been difficult for various companies due to the increased dependency on digital technologies as compared to earlier.

According to Salesforce [8], which is a leading CRM & Enterprise Application software provider: "Digital transformation is the process of using digital technologies to create new — or modify existing — business processes, culture, and customer experiences to meet changing business and market requirements. This reimagining of business in the digital age is digital transformation."

According to McKinsey Digital, 70% of surveyed executives from Germany, Austria & Switzerland said that the current pandemic is highly likely to accelerate the pace of the digital transformation of their organization. The report also mentions that businesses must now scale their digital strategy & initiatives in a matter of days or weeks compared to the one- to three-year phases as was in practice earlier [9]. But as the companies go digital and are seemingly adopting newer technologies like cloud, AI, IoT, etc., at a rapid pace, the security of such data in data driven organisations becomes a paramount importance. Proper security frameworks and protocols need to be put into place to prevent any breaches. Proper & timely training and upskilling of employees needs to happen to prevent compromises on such massive amounts of data.

With increased telecommuting practices, accessibility of such data from anywhere becomes a requirement which can be quite risky if the personnel are not properly trained or the protocols are not properly followed. As such, with telecommuting or WFH practices, which take place away from the



secure boundaries of most offices, access to confidential data can pose as a severe security risk to the organisation.

As the Indian government declared lockdowns to combat the spread of the virus, organisations & industries had sudden exodus of employees in the unorganized as well as the organized sectors, suddenly being in a situation with limited work opportunities as well as being stuck or stranded owing to closure of transit facilities. This also gave a rise to technical challenges as in not everyone was equipped to carry out their work or duties from a remote location due to non-availability or lack of resources available to them. Also, employees with limited or no exposure to technologies such as video-conferencing software had to suddenly adapt to the situation to carry out their regular work or duties. The sudden agglomeration of both professional & personal environments gave rise to obstacles in adapting to the new normalcy situation. And compounding the situation with social-distancing guidelines during the pandemic, there were several challenges that suddenly had to be understood, dealt with & be adapted to in a very short span of time.

### Literature Review

This research study includes reviews of various existing literature in the form of research papers, articles, books & electronic sources.

The process of teleworking or homeworking is not a permanent solution or a remedy for any ongoing crisis. Working from home is not favorable to everyone and is highly dependent on the personality, aspirations & skillset of the individual. Also, people who tend to work longer or longer than average hours might find that their family life or personal life will be affected & marginalized by work-life [10]. As the current pandemic situation has forced a large chunk of the working population into suddenly adapting to the process of telecommuting, it remains to be seen how it would impact the employee psyche in the long term.

Another interesting read by Gajendran & Harrison [11], revealed that according to their study it is difficult to monitor an employees

work & effort at a remote environment or when they are working from home. It is especially more difficult when the employees are occasionally being interrupted to carry out private responsibilities or attend to their family members. Like in a competitive market, the workers' wage is dependent on such productivity measures, gauging the right pay in such cases would also be a challenge.

Reference [12] had also investigated that depending on the interactions of person between their work & personal lives, the process of telecommuting or working from home can be favorable to the overall satisfaction in life. But this leads to a paradox where there is a decline in female happiness. But this might change depending on the interactions around them and by the different parental status and genders. Similar challenges are faced by workers today and the experience of telecommuting might vary with the different genders having different personal responsibilities at home.

Reference Amabile & Kramer [13], found that the success of teams or people working remotely depends largely on the nature of the work that is being carried out by them. The study observed that the people working from home were more productive and it was owed to the fact that the work they were performing was independent and repetitive with very less need for collaboration & thinking proactively. It also emphasized that forcing employees under a single roof is important if the nature of work they do requires them to exchange novel ideas among themselves at work. It also showed that although employees are more productive when working from home, the process is best only when it is in moderation. Another thing pointed out was that work from home can help the employees balance and differentiate their office work with their routine work.

Basis of this information, as the pandemic continues, long term effects on the productivity of employees engaged in telecommuting needs to be seen.

Go [14] stated that there are drawbacks to working from home for a long term as this it poses challenges including lack of proper communication, low retention & reliability, issues with accountability and ownership of the

work and problems related to navigating various legal issues, payments & logistics owing the nature of the spread-out workforce for an employer.

A study by Beaugard, Basile & Canonico [15], highlighted in their study that mobile workers and partial homeworkers perform better to a certain extent than other workers. Also, these mobile or partial home workers tend to be highly satisfied and greatly engaged within their jobs than any of their co-workers. This study also revealed that good work-life balance leads to better performance of the employees and when the employees are less stressed. But a point of concern was noted that it mobile or telecommuting workers miss informal interactions & required emotional support or guidance from their co-workers more than partial mobile or home workers. Another point to note that is people in the early stages of their careers are unlikely to benefit from telecommuting as there is no such support available.

Similar inference can be drawn from [16] who have also opined that work from home is an inevitable confluence arising from improvements in modern technology, which has resulted in increased dependence on the internet for all basic process. For instance, usage of web-based video conferencing, VoIP services have made life simpler and reduced the need to be physically present in many cases. A positive side for telecommuting is that it enables employees to start and proceed with their work at their convenience. But he also added that this might result in lack of ownership, delay in submissions and other issues as time passes by.

According to Kaushik [17], the best practices as well as the evolution of roles by employers and their HR managers can bring about relief as well as a sense of safety for the employees when dealing with such adversities. The paper also highlights the importance of adoption of various skills required by the employees to keep them prepared for such eventualities in the future. Emphasis has also to be given to adoption of newer technologies as well as a shift in how organisations operate to prepare and help their workforce become more competent & help them enhance their skill sets.

Based on the literature reviewed above and through other journals & sources, it is clear that although the telecommuting or work-from-home is a viable option for dealing with the current crisis, with increased employee productivity in the short term, it does not represent a complete and total solution for the future for companies to fully and completely shift into it. Also, there are pieces of evidence of it affecting the employees negatively in the long run with the need to be studied further. Coupled with uncertainties in measuring the productivity of such employees, the matter of how much the employees should be paid also poses a serious threat to some industries, as, without a geographically bound workforce, the companies would be able to hire cheaper workforce elsewhere, forgoing their existing workforces.

### **Research methodology**

The study considers the current perspectives of various employees working in Indian businesses about their shift to teleworking and its effect on them. The population for this research would be all employees working in full-time or part-time jobs in an established company in India. However, owing to constraints, convenience sampling was used to gather the primary data.

This research involves collection of primary data through questionnaires, surveys and secondary data through various other existing papers, websites & reports.

There were three main stages in the study. The first stage comprised of reviewing various existing literature available which highlighted or showcased the effect of such a global pandemic on the workers employed in various industries. This literature included research papers, case studies, articles, and electronic publications. This served as a source of secondary data for the research.

Once the initial literature review was completed, the second stage deals with collecting the primary data for the research. The primary data was collected through observational data capture using a detailed survey. The questionnaire for the survey was created to understand the opinion of people who are currently employed full-time/part-time in various industries across India. The

responses from the candidates were collected and care was taken not to capture any personally identifiable information in the survey to prevent any bias to one candidate over the other. Information related to the age, gender & sector of their employment was captured to better understand the impact across the industries. The questionnaire was floated using multiple social networking accounts and messaging applications to respondents and the response to the forms have been voluntary without any financial incentives. The questions were a mix of multiple-choice questions with pre-defined selections. A 5-point Likert scale was used for some questions to better enable respondents to agree or disagree with the statement provided. Also, a 5-star rating system was used in some questions to allow the respondents to rate the statement provided.

The last stage of the research involved conducting an exploratory data analysis on the primary data collected and using statistical as well as data visualization techniques to identify possible patterns and draw insights between various factors in data. The analysis was done using Microsoft Excel.

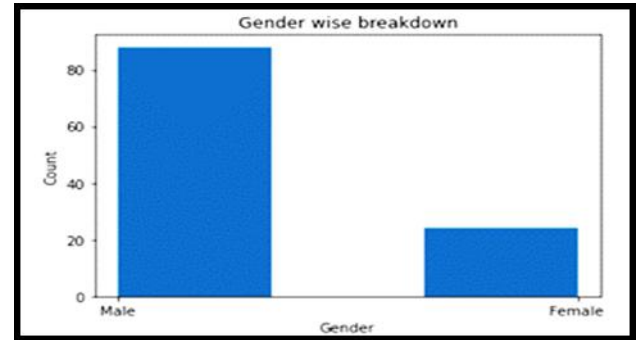
### Empirical analysis and results

A survey questionnaire was created containing several questions pertaining to working habits and experiences of employees related to telecommute and its effect on them.

The survey questionnaire was sent to recipients through email & also shared on social media channels. The responses were collected through the web-link and only complete responses i.e. cases with no missing values were considered for this study. These included responses from those people who were either full-time or part-time employed or were entrepreneurs who owned a business. The intent of such a survey was to obtain as many data points as possible from people working in different sectors or industries primarily based in India.

No personally identifiable information other than the email ID of respondents was collected with their consent to check &

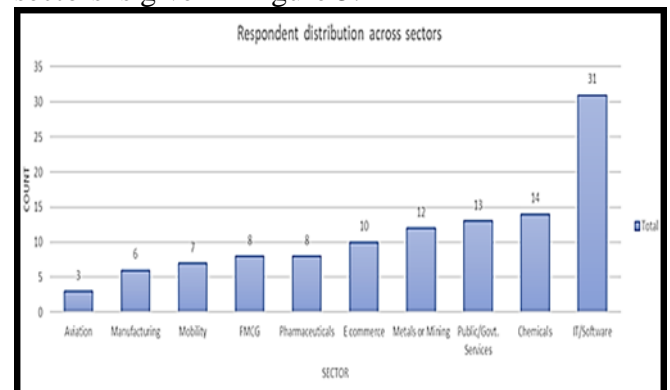
maintain sanity of the data collected through the online collection method.



**Figure 4 - Responses by Gender**

Of the people who filled the survey, 78.57% respondents were male and 21.42% respondents were female. “Figure 4” shows the count of the male & female respondents in the survey.

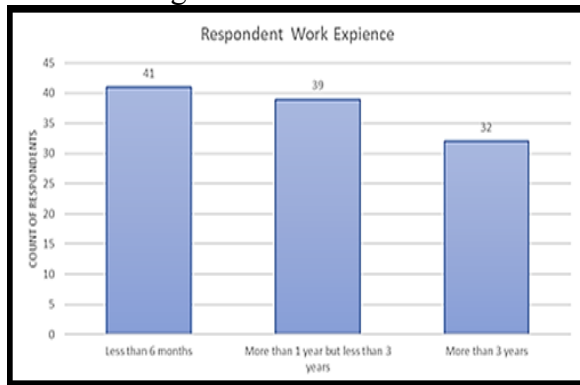
Of the people who filled the survey, the maximum number of the respondents – with a majority of 27.68% responses belonged to or are currently working or have worked in the Information Technology sector. The lowest number of respondents belonged to the Aviation sector with a response of 2.68% of the total responses received. Breakdown of respondents based on different sectors is given in figure 5.



**Figure 5 - Respondents by sector**

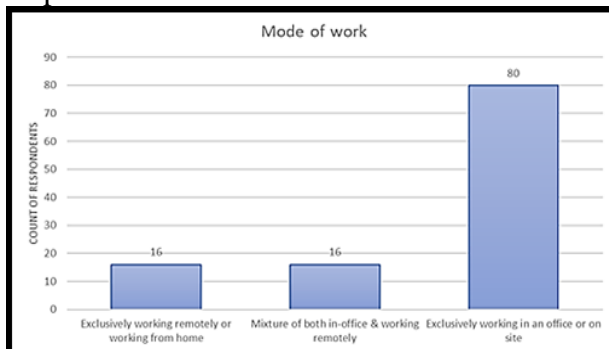
The respondents were asked to rate their work experience duration into three buckets as shown in the figure for their current jobs. Of the total responses received, 36.6% of the respondents had less than 6 months of work experience at their current jobs. Also, 34.8% of the respondents had more than one year but less than 3 years of work experience at their current organizations and 28.5% of total respondents have had work experience exceeding three years within their current organizations. The total work experience of the respondents based on the responses in

shown in “Figure 6”.



**Figure 6 - Respondents by work experience**

The next figure showcases the responses of the respondents about their current mode or method of working owing to the conditions prevalent at the time of collection of these responses. Of the total responses received from the respondents, 71.4% of respondents were exclusively working from their office or on-site locations away from home at the time of responding to this survey. Also about 14.2% of respondents were working exclusively from within their home or a location away from their regular place of work or remotely. And the remaining 14.2% of respondents were working through a mixture of both in-office or on-site location & remote or home-based locations. The “Figure 7” shows the breakdown of the responses received.

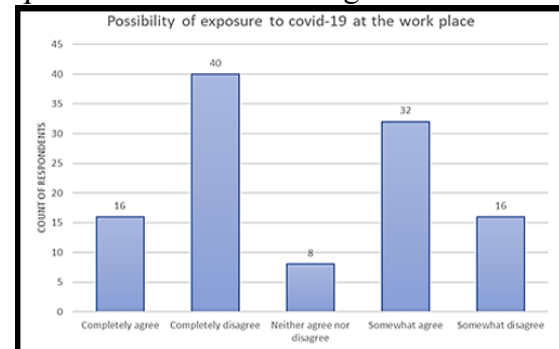


**Figure 7 - Responses by mode of work**

In the next section of the survey, the respondents were asked about the various factors related to their habits or opinions about working from their offices.

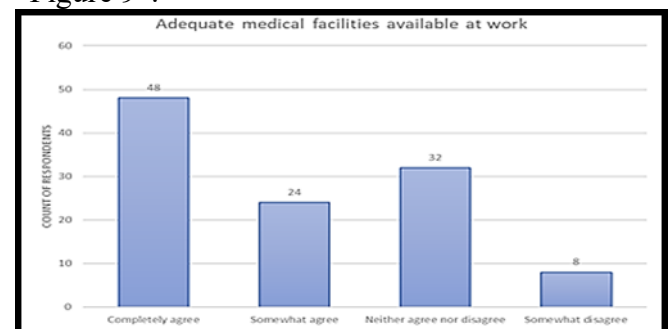
The respondents were asked about the possibility of contraction or exposure to COVID-19 at the place of their work and asked to rate the responses. Of the total responses received, 14.2% of total respondents “Completely agree” with the

possibility of exposure to COVID-19 at their workplace versus 35.7% of respondents who “Completely disagree” with the possibility of such contraction or exposure. The breakdown of responses received for this question are shown in “Figure 8” below.



**Figure 8 - Possibility of exposure to COVID-19**

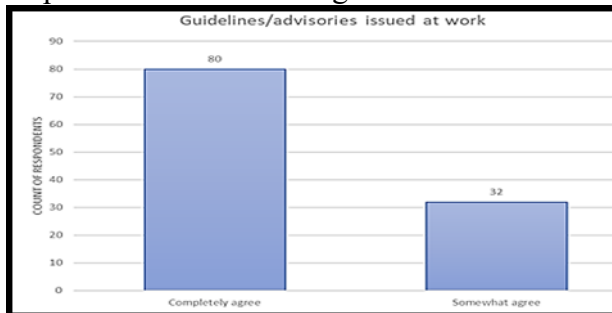
The respondents were also asked to rate their workplaces on basis of what they believed to be the presence of adequate medical facilities being accessible to them. Out of the responses received, 42.8% of the total respondents “Completely agree” with presence of adequate medical facilities being available to them at their workplace. And, 7.1% of total respondents replied with “Somewhat disagree” to the presence of adequate medical facilities being available to them at their workplaces. There were no respondents who completely disagreed. The breakdown of responses received is given in “Figure 9”.



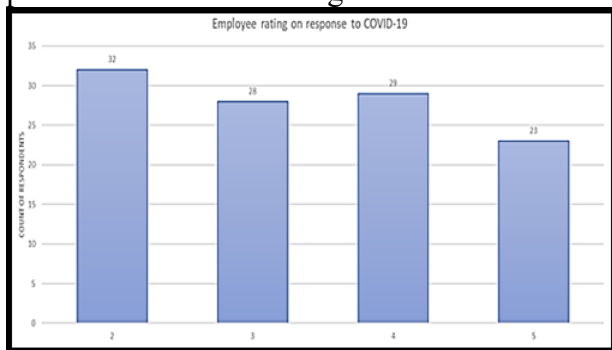
**Figure 9 – Adequate medical facilities available at work**

The respondents were also asked to rate the quality of guidelines or advisories issued at their workplace regarding their safety & prevention from exposure to the pandemic. Of the responses received, 71.4% of total respondents “Completely agree” with adequate guidelines and advisories being issued at work. And, 28.6% of respondents only “Somewhat agree” with the guidelines

or advisories issued. There were no respondents who “neither agreed nor disagreed”, “somewhat disagreed” or “completely disagreed” with the guidelines or advisories issued. The breakdown of responses is shown in “Figure 10”.



**Figure 10 – Guidelines/advisories at work**  
The respondents were asked to rate their employers immediate response to COVID-19, considering the safety, wellbeing of employees & business continuity plans on a scale of 1 to 5 with 1 being the lowest level (or least prepared) and 5 being the highest level (or the best prepared) of preparedness. Of the responses received, only 20.5% of respondents rated their employers with a “5” rating and 28.6% of respondents rated their employers with the second lowest rating possible i.e. of 2. See “Figure 11” for details.

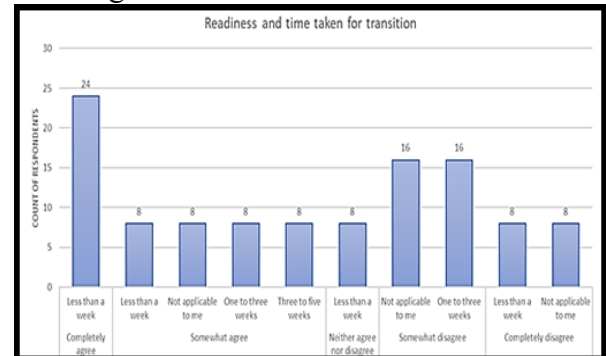


**Figure 11 – Employee rating to COVID-19 response**

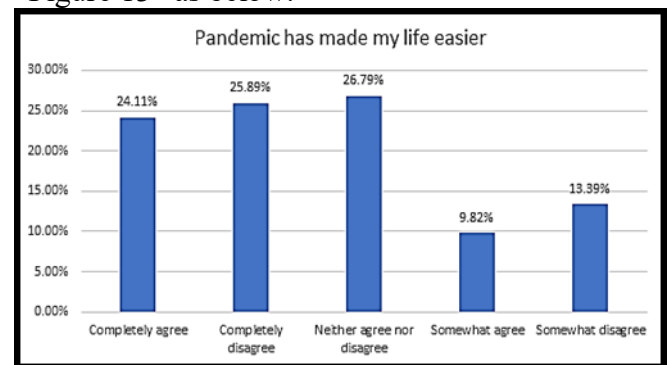
In the next section of the survey, the respondents were also asked about how the pandemic has affected their work and personal lives. The participants were asked if they had the right resources to start working from home and also how long would it take them to transition to telecommuting.

Of the total responses received from respondents, 21.4% of respondents completely agreed to the statement that that they had the right resources available to them and the transition time would be less than one week. 28.5% of respondents somewhat

agreed to the statement and provided a transition time ranging from less than a week to up to five weeks. 14.2% of respondents completely disagreed with the statement that they had the right resources for the job but 50% of them (8 respondents) stated it would take them less than a week for the transition. See “Figure 12”.



**Figure 12**  
And, the respondents were asked if the ongoing pandemic had made their lives easier and were asked their experience. Of the total responses received, 24.11% of respondents responded with “Completely agree” while 25.89% of respondents responded with “Completely disagree”. The responses of other respondents are shown in “Figure 13” as below.



**Figure 13 – Pandemic has made my life easier**

The majority of respondents responded with “Neither agree nor disagree” when asked about the pandemic making their lives easier. This showcases an inclination, or rather a lack of, the effects of the pandemic on the working habits of the respondents. This might be due to the nature of the work done or the practices & policies followed by the employers & employees at their workplaces. About a quarter of the respondents expressed displeasure in the sense that the pandemic has made their lives more difficult and this might have severe consequences in the immediate

future.

The adaption of the telecommuting or "work-from-home" practices can lead to or result in unfavorable conditions for the employees. This process also requires the employee to work from their existing setup at home or in an environment that might not have been properly setup for such activities. Addition of existing burdens or duties while performing work related activities that an employee may face during such setups might result in adverse or deterioration of their health condition.

### Conclusion and recommendations

The current situation demands adoption of telecommuting practices by employees across various sectors and industries for business continuity as well as their survival. The pandemic has helped organizations realize telecommute as an important & viable option within their business continuity plans. Although, availability of having a WFH option for work is better than being not able to work in most cases, it however, is not the solution to all problems. The effects of increased telecommuting practices seem to have had both a positive as well as a negative impact on the employees. Having the flexibility to work from the safe confines of one's home can be encouraging. However, increased responsibilities on the side of the employees in dealing with both personal & professional issues at the same time coupled with a lack of proper infrastructure to

support such practices can be a hindrance to its permanent adoption. Moreover, proper motivation & training need to be done to prevent degradation effects of such practices on the employees.

### Limitations

This focuses primarily focuses on the effect of the pandemic on employees in the Indian context and hence may not apply to a population of other countries. Also, the sample for the primary data has been collated through convenience sampling and as such may not be representative of the entire population mentioned here.

Another limiting factor of this paper can be its relative novelty to the current COVID-19 pandemic, which coupled with a limited timeframe for research, during which the pandemic continues to evolve in very unpredictable ways, might lead to conclusions which may prove to be counterproductive later as time passes by. The data for this research was collected from the various respondents during the second quarter of 2020 which might still have been too early to be able to present a complete picture of the long lasting effects of the pandemic on the various organizational decisions being taken. Moreover, additional studies on a large scale might need to be carried out to understand the actual effect of the pandemic of the evolving behavior of employers & employees and its effects on related policies.

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**BRAND MARKETING THROUGH THE CORONAVIRUS CRISIS****Mohit Tewary**

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**ABSTRACT**

*COVID-19 has brought about a drastic change in how brands go about their marketing strategies and forced them to think on their feet in order to stay relevant. The purpose of this paper is to research how brands should communicate with current/potential audiences in these tough times and what are the strategies that they can adopt in order to build long term sustainability. This is an exploratory study which is conducted using secondary research gleaned from different trusted sources. We found that Brands should change the way in which they communicate with their audiences during a crisis which should be in line with the situation at hand. The results imply that brands should be empathetic, educative, listening and communicating without being tone-deaf. The study also identifies the fact that consumers are ready to engage more with those brands that stand in solidarity with them during crises.*

**Keywords:** Brands, marketing, coronavirus, COVID-19, social-distancing, social-media, influencers

**Introduction**

Marketers may find it difficult to know where to start in times of a crisis. People have gone into defensive mode in just a few short weeks, concentrating on themselves, their friends, their workers, their customers and their communities. This is expressed in social media, with calls to obey government protection guidelines for fellow people. People crossed partisan lines to build bridges within their communities to fight against this invisible force.

Many of such changes in actions may be temporary, but others may not be so short-lived. As people step outside the current mode of survival, it is unlikely that the momentum behind digital-experience adoption will change as circumstances cause people to try new things. The initiatives that brands take right now to underpin and broaden their customer base will reduce the risk and take care of their stakeholders during such rapid change in this tough period. In this study we would try to:

- To research how brands should communicate with current/potential audiences in these tough times
- What are the strategies that they can adopt in order to build long term sustainability for their audiences and themselves both.
- How will they plan for the next and beyond

- How will they bounce back once the health concerns regarding the pandemic are eliminated

**Literature review**

With the arrival of the pandemic, people have crossed political lines to create bridges and unify against an unseen force within their neighborhoods and communities. We are also seeing big changes in behavioral patterns with social distancing holding many people at home. Audiences have resorted to broadcast television and other premium media outlets for trustworthy information. They are also increasingly trying their hands on different ways of escape and entertainment — online gaming, social media, movies/shows, and scripted programming. In a predominantly pre-5G era, people are switching between virtual lectures for students, remote working for professionals, indoor workouts and household chores, all this while keeping their spirits high. Demand for e-commerce is rising to new heights despite the need for physical goods placing pressure on new offline sources. Supply is incoherent given that food and convenience stores are the source for essentials for those who venture out. Health, hygiene and safety issues are forcing more consumers to adopt frictionless payment methods, such as using mobiles to pay at check-out time, without making any contact. Presented in reaction to the COVID-19 pandemic with the possibility of potentially significant market changes,



companies need to relook their strategies and the way they spend. Those that are more agile are now investing in the right moves — when many of their rivals don't or can't — will reap immediate and lasting benefits. The arrival of high-speed internet at the beginning of this century and a later of smartphones led to an explosion in media sharing and e-commerce that brought about a revolution in the retail and media landscape. In the last decade, a 10 percent growth in retail e-commerce penetration was witnessed in the UK and the USA and in France by 7 percentage points. (Euromonitor International, 2020). The usage of streaming video and digital content has risen from practically zilch to thirty percent during the same period in the United States. But apart from how much advertisers invest, they have to remember what they are saying, where they are saying it, and to with realism in tonality with their younger customers whom they are saying it. The lesson that came from 2008 was to concentrate maniacally on digital. Domino's and Nike are two businesses that reflect those teachings. In the midst of the financial downturn, both brands made bold strategic moves, focussing on their product and branding strategies to reach millennials. During the global financial crisis, both tried to strike a chord geared towards values.

Domino's launched a shockingly frank commercial for its new pizza recipe, effecting a change in its marketing and Nike bolstered its spending in sustainability-led innovation across key product categories. These two brands have pushed relevant messages in new ways, leveraging the advent of social media networks to the fullest and starting new digital customer interactions such as "Domino's Pizza Tracker" and "Nike+" in order to establish better communication with millennials and Gen Z audiences. These efforts and the subsequent investments paid off when they helped them gain disproportionate market share. Meanwhile, Uber and Warby Parker who were early digital brands, emerged and challenged more conservative counterparts, making the most of the ongoing digital and mobile boom, and attending to customer needs worsened by the crisis. To increasingly digitally savvy and cash-strapped young customers, these brands offered comfort and value. While previous

crises provide a host of useful lessons, the current situation is special in several ways. Like other recent economic downturns, the pandemic of COVID-19 isn't just a global crisis. It is also a health issue with significant societal consequences, such as business closures and social distancing. And it marks its introduction at a time when, in reaction to the technological developments of recent years, there have already been significant shifts in buying and media consumption habits. Hence a greater effect on customer behaviour could be seen vis-à-vis prior crisis events, in turn amplifying response efforts made by marketers and encouraging even greater spending.

In this case, determining a winning marketing strategy for the Generation Z and millennial target groups is the ultimate challenge and chance for brands. Given their growing purchasing power in the times to come and their potential to influence the decisions of older generations, these generational cohorts are of particular interest, with or without a crisis. Baby boomers have now been overtaken as the largest chunk of the population by millennials and these millennials are at the prime time of their buying years and will ramp up their per capita spending in the next five years by more than ten percent. The shift in consumer behaviour and patterns of spending that have taken place since the outbreak of COVID-19 started are considerable. Customers around the world have very proactively found out how to meet their desires, such as socializing, dining or having a nice time in general, through a combination of modern technology-enabled strategies and conventional methods. We will witness a ramp up of per capita spending by a quantum of more than 70 percent when it comes to Gen Z consumers, while both baby boomers and Generation X will turn back on their spending. As more than 80 percent of Gen Z teenage parents say their children play a critical role in household expenditure patterns, these young influencers will continue to exercise significant control over cash flows.

Market spending represented these behavioural seismic changes. Over the past quarter, e-commerce has risen more sharply vis-a-vis in the previous decade, rising from sixteen to twenty-seven percent of the total retail volume

in the United States and from eighteen to thirty percent in the United Kingdom. Some hit the rock bottom while others made a surge. The travel and tourism sector fell by a staggering ninety percent in the US with regards to sales revenues, moreover the departmental stores have reported collapses upwards of 50 percent, while food supply shot up by 90 percent during March and April. (Earnest Research, 2020, BCG GAMMA). The millennial and generation Z consumers have changed their perceptions and buying habits more dramatically in many respects than older generations have. And very hopefully, considering the impressionable minds of these younger customers, they intend to stick to many of these newly formed trends beyond the disruption caused by COVID 19. Generation Z and millennial customers have considerably increased the amount of time they devote to loved ones and household chores. What separates them is how much of that time they allocate to different types of interactive digital media from the comfort of their homes to entertain and socialise: sixty-two percent of their time spent on social media versus up from forty-two percent for older generations, seventy percent of their time spent on video streaming versus sixty-one percent for older generations and fifty-nine percent of their time spent on gaming versus thirty-five percent for older generations have increased. A huge transition to e-commerce has been seen by Gen Z and millennials with regards to how they invest their dollars. A staggering thirty-three percent of these consumers have ramped-up their online expenditure since the commencement of the pandemic, for a net increase of six percent versus one percent for older generations. This e-commerce growth happens on two fronts: The move to online of established goods, services and retailers and the rise of services and retailers who are digital-only or digital-first items. The first and most important step is for marketers to radically update their perception of their company's customer and advertisement sides. This will serve as the foundation for the subsequent marketing plan suggestions. Marketers must dig into the micro and macro shifts and gain an exhaustive and comprehensive understanding of the dynamics of demand-supply. This will give them the

flexibility to channel their resources on specific SKUs and distribution networks that have witnessed a demand increase, albeit not exceeding supply, and provide the best return on investment. Marketers need to cope correctly with the media world, which is witnessing huge eyeballs and advertisement upheavals. Marketers need to take a thorough re-look at their pre-COVID marketing strategies and take a fresh approach to budget allocation, making a Gen Z and millennials the center of focus as it has become relatively easy to pique their interest now. They should also take into consideration the fact that consumption has gone up across media, far in new-age digital versus the conventional television, including the internet. And, given the restrictions on movies and films, fresh content and broader headwinds that were already present when the pandemic began, the short to long term outlook remains obscure

Direct-response advertisements on digital should be given special consideration, keeping in mind the rapid increase in e-commerce usage that younger customers are driving, where there may be an immediate jump from advertising exposure to purchase. 60 per cent of Gen-Z and millennials claim that a social media advertisement affected their buying decision during COVID-19, vis-à-vis 25% of the older generation. In addition, the lockdown has enhanced the willingness of customers to try new goods and brands, without seeing them in the real world beforehand. For the very first time, sixty-nine percent of the total Gen Z and millennial population made a new product purchase across product categories surveyed, compared to forty-three percent for older generations, during the COVID crisis.

Marketers need to streamline and hasten their executions and make the best of what digital has to offer to capitalize efficiently, such as augmented-reality marketing to boost the experience of trying out a product/service virtually and increasing conversion. It is as imperative to aim for a greater pie of attention and loyalty from Gen Z and millennial audiences as immediate sales right now. As observed, the action plans of Dominos and Nike during past crises set strong instances of how the two goals of driving immediate sales and capturing youth attention can work in

tandem well. Nike with its outstanding "Play for the World" campaign during COVID-19 stood out very well in addition to free access to its Training Club app on a temporary basis. Marketers should effectively communicate their brand's ideals and value proposition to customers by effectively revamping their marketing and communications strategy, keeping a 360 degree view of the entire situation at hand. The intense emotions felt by young consumers can both be recognised by successful brands and contribute to new consumption occasions. Our focus groups say that on each of these elements digital-native brands are doing especially good job. The digital world provides countless opportunities to extend touch points on their own turf with young customers, digitize additional elements of the customer experience and create creative brand experiences. Marketers should use their own branded platforms and software to deliver on those. But those, by themselves, wouldn't be enough. Marketers should tap into digital and social channels for young millennials that provide with a good scope for storytelling, brand experiences and two-way interactions in an organic fashion through influencers or friends.

In order to vet every dollar spent, marketers have been trying to foster new capabilities and competencies. Some important ones, such as "waste management" (frequency capping, visibility, etc.). But marketers would need more ammunition in terms of advanced capabilities in order to represent the shortcomings in what they have been doing so far together with increased flexibility and agility in the pandemic. To cater to market-wide fluctuations in a crisis, namely regulations and consumer attitudes, the creation of high sensitivity and high-frequency capabilities to sense demand fluctuations and a marketing strategy which is hyperlocal will be key. In an era where the past does not decide the future, and where a myriad of factors determine the essence of the digital journey, incremental marketing effectiveness evaluation techniques and creativity will be at the forefront of change. In particular, marketers need to broaden their creative capabilities when targeting Gen Z and millennials, building a network of partners to comprehend how to

extract the most out of these novel formats and what resonates best with these generations of people.

These capabilities though very crucial in the short-term, will continue to be a perennial source of competitive edge even way beyond the crisis at hand.

The consequences of COVID-19 will reverberate for many years to come as it has changed our lifestyles drastically. The greatest shifts in buying patterns have been seen by Gen Z and millennials and as these trends cut across different realms of the society and they will lead the charge. Marketers have this once in a lifetime opportunity to target those generations and adapt to this modern paradigm or risk missing out on it .

Go-to-market after the pandemic:

The coronavirus pandemic has disrupted the go-to-market strategies of businesses everywhere, but the impact is nowhere more serious than in emerging markets. Even in good times, selling can be challenging in many markets in Africa, Asia , and Latin America — and those are not good times. Social distance standards have created a new complexity in markets which already had limited visibility (due to data limitations), fragmented front-end and last mile issues. Emerging markets will undergo a reset in demand once the recession has receded enough for companies to start bouncing backward. Nevertheless, in our opinion, the demand type on the front line would also be drastically altered. COVID-19 has already greatly disrupted the traditional activities of the sales teams. There are many unknowns ahead, but one certainty is that strategies to the go-to-market have to fundamentally change.

We suggest that businesses follow a two-phase approach to rethinking their go-to-market strategies in emerging markets. The first concerns the immediate answer – what to do now, with lockdowns in several cases persisting. The second is what to do when the new reality begins to set in and businesses begin to rebound. Many B2C and B2B businesses that sell to retailers have already set up commercial war rooms as part of their immediate response, with dedicated cross-functional teams led by senior leadership. They have also taken steps to help their channel

partners rebound fast. Yet in offering such assistance, companies had to make some difficult decisions based on their own liquidity levels, risk appetites and competitive positions. Companies have also produced minimally viable goods that make their underlying processes more functional and competitive using digital technologies.

Preparing for the rebound takes a different attitude. In the rebound phase, we observe five imperatives : Reimagine the sales and distribution process, Pivot to win in ecommerce, Optimize front-end sales spending, Prepare for an uncertain future.

Results and Analysis:

Brands are going to play a crucial role in the fight against the pandemic by working in tandem with the governments and synergizing the results. It has become all the more imperative for brands to step up and do what's right, working for the welfare of each and every stakeholder. Consumers and employees have become highly sensitive to how brands are going to react and might even punish those who don't adhere to their expectations. They expect brands to be reliable and keep them informed of the measures that can be taken to protect them against the pandemic by being an educator not a seller, connecting people and keeping them emotionally close, using social media responsibly, holding the public aware in what way is the brand supporting and safeguarding their employees and clients, issue public statements of empathy and solidarity for those most affected by the pandemic, emphasizing on how goods and services can help people cope with life threats related to pandemic, use traditional media adequately to convey response and most importantly, walking the talk.

People are turning to brands they can absolutely trust and brands that are gaining new customers are the ones that are responding to the virus outbreak in an or innovative and compassionate way. Brands that place profits before people are likely to lose trust forever.

Edelman Intelligence, a global insights consultancy, has released a special report on brand trust and coronavirus in the 2020 Edelman Trust Barometer, which reveals that more than three out of four consumers (73 percent) want brands to speak about their

products only in ways that suggest they are aware of the crisis, with 37 percent suggesting that brands have to do this to win or retain their faith. Almost two out of three respondents (62 percent worldwide and 65 percent in India) do not believe that their nation can storm through the crisis without brands playing one of the most significant roles in resolving challenges concerning the pandemic and its after-effects. Ninety percent want brands to work to tackle the crisis with government and relief agencies, while 59 percent claim that brands need to do that to gain or retain their confidence. A majority (69 percent) want brands to avoid any humorous or too lighthearted ads or marketing in tone. Advertising featuring people grouped together using goods and having a nice time is equally gross, with 34% of Indian respondents agreeing that it should be avoided.

Consumers look to brands to secure their workers at all costs. 90 percent of respondents want brands to do whatever they can to secure their staff and suppliers' well-being and financial stability, even if it translates to withstanding significant financial losses before the end of the pandemic. 55 percent say brands are obliged to do so if they want to win or retain their confidence. Nearly three-quarters of Indian respondents (73 per cent) said that brands and firms that put their profits before people during this crisis would forever lose their confidence.

Consumers would also like to see brands as innovative problem solvers. Nearly nine out of 10 respondents in India (88 percent) want brands to turn to creating new goods that help individuals solve the specific challenges of life during a pandemic, with 57 percent saying that brands need to do this to win or retain their trust. 67 percent said they are not paying attention right now to new products and services unless they are intended to deal with life problems associated with pandemic. Nearly nine out of 10 (87 per cent) want brands to give health workers and high-risk people free or lower-priced goods and services, with another 57 per cent saying brands need to do this to win or retain their confidence.

Consumers want to be cognizant of what brands are doing in order to adapt to the pandemic. Nearly nine out of 10 respondents in India (88 percent) claim they want to be fully

informed about how a brand protects employees and consumers, and almost a comparable number (86 percent) want brands to keep the public fully informed about improvements in how the brand works and how to access its goods and services.

87 percent want brands to serve as a credible source of news about the virus and the progression of the fight against it, with 54 percent saying brands need to do this to win or retain their trust. 86 percent want brands to act as educators with instructional details on the virus and how people can protect themselves, while 55 percent want brands to do this to win or maintain their trust. Consumers are turning to brands to bring people together. 84% want brands to link customers and help them remain emotionally connected, with more than half (45%) saying that brands need to do this to win or retain their trust. 86% Want the brands use social media platforms to build community and provide social support to people who are no longer able to gather in person.

Consumers agree that brands should concentrate their conversation on pandemic remedies and not selling also avoiding humour. More than three out of four consumers (73 percent) want brands to talk about their products only in ways that show that they are conscious of the crisis and the effects it has on the lives of people, with 37 percent saying that brands need to do this to gain or retain their trust. 85 percent want marketers to concentrate their ads on how their goods and services can help individuals deal with life challenges associated with pandemic, with more than half (49 percent) saying that marketers need to do this to win or retain their trust.

Consumers depend on conventional media for knowledge about the virus and a brand's response and find seasoned spokespeople most reliable. Email channels and traditional media out-perform significantly outperform social media. Before brand ads, brand social media, product feedback, influencers and social media, the national media, local media and proprietary media are most readily believed. Doctors and health authorities (84 percent), followed closely by brand CEOs at 71 percent, are the most trustworthy spokespeople. Brand responses already affect buying behaviour. 60 percent of respondents in India said they have

recently started using a new brand, including 82 percent in China, because of the innovative or compassionate way they have responded to the virus outbreak.

And a comparable amount (60 percent) also persuaded other individuals to avoid using a brand that in reaction to the pandemic, they felt, was not behaving properly. 79 percent said how well a brand reacts to the crisis would significantly affect their probability of purchasing that brand in the future.

### **Recommendations and Conclusion:**

Transparency and empathy are critical: Empathy has become all the more important as people are nervous. One can take a cue from banks who have waived overdraft fees, easing the lives of their customers. SAP has made its Qualtrics Remote Work Pulse platform available for companies switching into work from home setup. These instances reflect modesty in the face of such an overwhelming force of the pandemic. The importance of sensitivity has increased several fold. Brands cannot seem to exploit their customers in any which way. We could look at what Guinness did post St. Patrick's Day, by diverting its attention away from pubs and party events and instead focusing on health and wellbeing. We don't have answers to all questions When you make vows, even during hard times, you must be able to deliver on what you say.

Agility in media : Marketers would want to create more rapid-response operating models for agencies and internally to pivot creative communications rapidly as conditions shift. Remote access to production and innovative capabilities will become increasingly important as the crisis moves into its advanced stages. For example, Nike quickly went on to embrace a new message: "Play inside, play for the world." And Chiquita Brands removed Miss Chiquita from their logo to promote social distancing and demonstrate a dedication to the safety of the public. As the number of different media outlets used by customers increasingly shifts beyond innovative ones, marketers should consider changing their media mix. Marketers may want to step up their use of ad-supported premium video streaming and mobile gaming, for instance, with digital content spiking. Similarly,

advertisers should not be afraid of the adjacency, considering the degree of engagement and relevance, as news consumption peaks as consumers jostle to keep informed. In order to avoid over-exposure to groundbreaking goods, which can damage brand value, news can simply be an environment that requires more careful monitoring of how often advertisements appear.

Association with the good : People out there are definitely going to remember brands for their good deeds and cooperation during a time of crisis, particularly if they do so with compassion. In ways like helping medical personnel in all ways possible, donating food supplies to the needy, or not letting employees face salary cuts when the business is down. For instance, one could also take a cue from Adobe, which immediately provided Innovative Cloud solutions to K-12 schools, conscious of this moment to be adding value and being philanthropic rather than salesy. Ford, 3M and GE are going to have a place in people's mind for a long time because of how they worked to modify and adjust their factories and put people back to work to manufacture respirators and ventilators, standing in unity in the fight against coronavirus. And people appreciate that many adult beverage businesses, ranging from Diageo to AB InBev, have reused their alcohol processing capabilities to manufacture hand sanitizers, filling their "It's in our hands to make a difference" message with short supplies. Feel-good content that relieves anxiety and facilitates positive reinforcement will go a long way towards enhancing the brand. However, companies should prove that their donations are significant and not purely for commercial benefit. Honesty and true purpose are recognised by customers.

Social listening : Frequent analysis of human behavioural trends may allow

advertisers to gain stronger insights in real time. Marketers may want to keep a tap on sentiments flowing online by monitoring social media conversations and adapting their strategies accordingly on a regular basis. With this type of data, companies will quickly start building dashboards to drive the correct decisions. In order to provide feedback to executives who are increasingly involved in marketing decisions, marketers may also want to consider establishing deeper relations with their colleagues in the C-suite. The marketing team should work closely with finance and operations to forecast various situations and potential performance on the basis of how long the situation lasts.

### Planning for the road ahead:

We are in the Covid-19 pandemic's recognising-and-adapting phase. Yet, after the crisis, we do have to plan for life. Marketing executives will work outside to keep their products and customer interactions as complete as possible while we handle what we hear, while attempting to do three things internally:

- Understand the lingering effect of the disruption of business and try to work out the unexpected and adapt accordingly.
- Depend on new forms like digital to operate and communicate with consumers realizing this would also have lasting effects.
- Mitigate risks to customer experience by thinking from outside to inside in a realistic way.

Undoubtedly, the digital transformation strategy is forced to intensify as we realize how rapidly consumers and employees have embraced journeys and experiences that have been digitally activated.

Brands will have lead the way in these unprecedented and unforeseen times, and we will all have to learn with modesty and faith in each other..

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## THE IMPACT OF LEADERSHIP ON HUMAN RESOURCES IN SMALL FIRMS

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### ABSTRACT

*Leadership, its contribution in achieving organisation goals and the approach to business ethics has been the focus of study for decades. Limited empirical study has been conducted to study the role of leaders in managing human resources in small firms employing not more than 50 people. The entrepreneur of a small firm has to additionally perform the role of a HR champion to ensure sustenance and growth of the firm. Paternalistic approach to managing staff is commonly seen. However, in small firms employing highly skilled workforce, visionary leadership takes precedence. Distributed leadership too was seen in some firms. The style of leadership is seen to affect the three output criteria's of a small firm; a) Presence of formal HRM b) Presence of multiple HR practices c) Impact on selected business outcome..*

**Keywords:** — Leadership, Small firms, HRM in small firms, Formal HRM

### Introduction

Governments worldwide are trying to create employment for the youth. Employment alleviates poverty and strengthens the social fabric of society. Small firms have an important role to play in a nation's economic development as enablers of mass employment [1]. Crisis in the external environment triggered by a financial system collapse or a pandemic creates innovative opportunities to maintain focus on human resources [2]. Despite their contribution to wide scale employment, studies mention the limited research on small firms [3], [4].

Businesses across industry verticals need talented resources. The intellectual capital system mentions that intangible asset like leadership, form an essential element of human capital [5]; ensuring acquisition, stability, sustenance and growth. Evidence linking deliverables of the leader and the organisational output is firmly established [6]. The presence of a strong leader is imperative for an organisation to perform and sustain in a competitive and unpredictable market [7]. The intellectual capability of a leader results in creation of a strong culture, values, ethics and a set of competitive advantages leading to sustainability through multiple economic cycles [4].

Access to technology, presence of a robust

strategy and access to highly skilled resources are considered important for an entrepreneur to establish business success. External uncertain scenarios and economic disruptions can upset the survival of a small firm [8].

The competitive gain is secured from the ability to judiciously use these varied resources. Innovation and increase in organisational learning leads to enhanced performance [9]. Individual feature like leadership style and collective capability which is organisational learning, have a positive influence on high organisational delivery [10]. The 'system resource view' studies the relationship between and organisation and its environment [11]. The organisation is expected to have a collaborative approach to meet the set parameters with a focus on increasing profitability and reducing workforce turnover [12], [13].

Small firms also face the stigma of corruption. Business ethics put in practice by the leaders is critical to establishing the internal operating mechanism and external compliance [14], [15]. Entrepreneurs heading small firms should adhere to business ethics to ensure financial prudence and win the trust of stakeholders. Academic internal business governance models and its practical implementation form the base of sustainable growth [16].

Small firms are omnipresent across multiple industry verticals and are present in many



sizes. They operate on a crisis mode at most times [2]. Resources constraints with respect to environmental prediction, financial and managerial bandwidth, access to technology and efficient processes create hurdles in sustenance and growth. That has not prevented some from implementing strategic HRM and high performing work practices [17]. Small firms should not be viewed as a homogeneous group. One of the differentiating factors besides their varying size is the variation in the leadership style. Most small firms are started by family members as micro firms and may run without the aid of any professional management layer. They operate in the presence of a dominant leader [18]. Some small firms are also initiated as partnership firms; where-in friends or colleagues contribute resources to start an organisation. Distributed leadership in such scenario, play an important role in decision making [19], [13]. Successful small firms are known to possess multiple organisational capabilities including sustained stake holder management and a shared vision [20]. Leadership in small firms needs to be researched further to understand their impact on people and profitability [21]. In tough external conditions, the leadership of a small firm is tested and its approach to managing human resources; which is a cost to business needs to be investigated [8]. This study attempts to understand leadership in small firms; their focus on human resource intensity and thereby its impact on organisational performance.

### Literature Review

Focussed secondary research has been conducted with an intention to arrive at a theoretical model that can be empirically tested. This section, in a phased manner, attempts to propose the model for understanding the impact of leadership on human resources in small firms.

#### Definition of a small firm

There exists a lot of disparity in defining small firms. Some studies define small firms as those having an employee count of 20 to 99 employees [22], [23], while other studies have considered firms with employees up to 250 and 500 in number [24]. In 1995, SSIB – Small Scale Industries board of India defined small

scale industry as one that employs less than 50 people, The Indian central government revised these norms and in 2006 introduced the (MSMED) Micro Small and Medium Enterprises Development Act, 2006 leading to consolidation and standardisation of multiple legal clauses under a single act. A small enterprise is defined as one where the amount of capital invested is more than Rs.10 lakh but does not exceed the sum of Rs. 2 crore.

The criteria used to define a small firm for this study are; firms having an employee base of 10 to 50 employees and a capital investment of Rs 1 million to 20 million.

The importance of small firms can be realistically understood by getting to understand the employment challenge and the opportunity. National Sample Survey Offices (NSSO) job survey for the year 2017-18 mentions un-employment rate in India at over 5%. This translates into 18.6 million unemployed youths. A young population which is un-skilled contributes to the India's largest economic problem. The latest report published by the Ministry of Statistics and Programme implementation in India, mentions MSME contributing to 28% of Indian GDP in financial year 15-16. The last census by the ministry in 2013 highlights the presence of 63.8 million MSMEs. 99% of such firms are micro firms and about 0.78% of firms are small. The percentage of small firms might appear small as percentage; however the number of small firms is 4.8 million and is significantly larger than the medium sized firms. In addition; the informal sector forms a very large part of the small MSME ecosystem. 94% of the MSME sector was unorganised in 2005. Worldwide, informal small firm segment contributes to 32% of employment and 22% growth in the last decade [25]. Millions of such labour intensive small firms serve as an employment engine for any country [26], [4].

#### HRM in small firms

Small firms as a family of firms are heterogeneous. Despite the heterogeneity one sees them to display certain common characteristics. Focus on continuity of day to day tasks, a healthy work environment and ensuring total control by the leader are seen to be common characteristics [1]. Two terminologies are often associated with

working in small firms. ‘Small is beautiful’ and ‘small is brutal’ exemplify contrasting emotions of working in small firms. The importance of hard HRM and soft HRM cannot be ignored [8]. HRM comprises of interrelated activities aimed at identifying, on-boarding, developing, and maintaining a firm's human assets [27]. The intention of any department including the human resource function is to achieve organisational goals. Resource based theory identifies human resource as an important resource to achieve goals. Important stakeholders of the firm, their interaction basis their attitude and values; their informal way of workforce engagement are key to influence human resources [4], [28].

The importance of strategic HRM has also been well established. High performance work teams and self managed work groups are amongst the numerous achievements in human resources that aid in creating successful organisations [29]. High commitment HR practices like information sharing, role based training are directly associated with business gains [30], [31]. They lead to higher retention, lower absenteeism and fewer people related issues leading to higher team productivity [32], [33], [34].

Studies mention practices that are employed in large firms do not have the same impact on small firms. Small firms possess lower levels of expertise and resources and hence do not need to focus on human resources [24], [35]. However other studies mention small firms having adapted HRM practices. Table I [31], [36], attempts to capture how practices are different in small and large firms.

**Table I: HR practices in small firms versus large firms**

	Small firm HR practices		Large firm HR practices
Informal practices	Induction program, Performance Appraisals and Training	Formal practice	Manpower Forecasting and allocation
Less Frequent	External recruitment process,	Continuous	Planning and assessments are

	Reviews and assessments are irregular		continuous. Multiple external and internal sources of recruitment
Employee Benefit	Aimed at fixed salary and incentive and adherence to laws	Total Rewards	Aimed at increasing employee satisfaction
Work Environment	Informal	Structured practice	Focus on improving internal communication and ensure team cohesiveness

Research indicates that leaders of small firms are inclined to focus on business aspects. Transactional issues like HRM come to the forefront significantly when the problems become a cause of concern [37]. The presence of an HR champion in an organisation is likely to bring more attention to human resources and in many cases the owner of the firm plays the role of an HR leader [24]. Small firms are known to have adapted formal HRM in the quest for sustained business growth and employee performance. Focus has been on using scientific HR practices in selection and training [38], [39].

**Small firms – Leadership Style, the focus on human resources and business performance**

Leadership style of entrepreneurs is seen to have a large impact on innovation, collective performance and sustenance during uncertain times [40], [41]. Lack of managerial skills is one of the largest constraints faced by a small firm in their survival. Decision making by the owner-manager is important for day to day functioning. There is a lack of consensus on a single clear definition of leadership in small firms, partly due to the diversity of such firms [42]. Previous studies have shown that most small firms are run by leaders who are paternalistic [43]. The same study mentions that small firms need strong and dynamic leaders to survive and grow rapidly. Uncertain external environment can be managed easily by

small firms. Homogenous workforce and proximity to a small team enable faster adaptation to changing scenarios [40]. However studies also mention 'dependency theory' having cast numerous limitations on entrepreneurs of small firms [44]. Most leaders seen in small firms are transactional in nature limiting them to exception management and using contingent rewards to increase performance [5]. Small in this case is not beautiful but brutal and entrepreneurs in this case take short term measures leading to decrease in cost but erosion of trust [44]. Transformation leadership is seen in some small firms and the leaders are known to create a vision for their team. Visionary thoughts and inspirational messages are used to motivate and achieve higher order business results [45]. Transactional and Transformational styles of leadership are seen to be the most common style of leadership which rely on their human resources to achieve business goals [46].

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A few contextual factors also influence the focus of the organisation towards human resources and business goals:

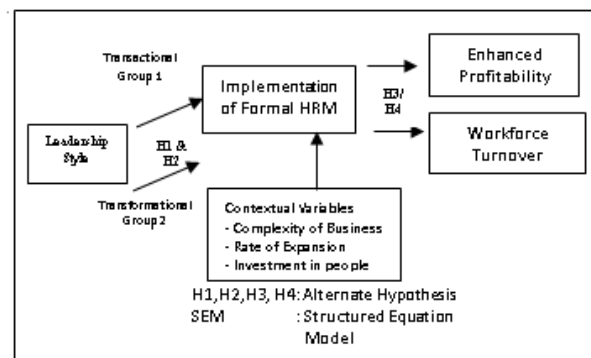
*Complexity of business:* Firms involved in higher end supply chain are seen to invest in human resources. Hiring skilled workforce and investing in them is often seen to translate into staying competitive specifically during uncertain times [5]. Both policy makers and policy implementers in firms have to identify HR practices to engage the workforce towards measureable outcomes [47], [48]. The presence of coherent HR practices might not be visible in many small firms; however an informal set of initiatives leads to desired results [29].

*Rate of expansion:* As firms grow and with addition of employees from diverse backgrounds the need for standardised

management practices becomes a necessity. Over the last decade especially in years post a recession; firms rely on HR practices like informal training of the workers to get back to increased production [29], [26]. These practices are sustainable during changing and unpredictable external scenarios [44], [5].

*Investment in people:* A small number of small firms have made investments in people and HRM practices. Firms have invested in creating assessments and defining selection criteria to hire staff. Evidence of documented job descriptions, application blank, and HR handbook reaffirm the view that small firms continue to invest in their staff [22], [31].

Figure I, shows a theoretical framework which this study attempts to investigate; thereby understanding the impact of leadership on human resources in small firms.



**Figure I: Proposed Theoretical Framework**

### Objective Of Study

Economic volatility along with aspiration of the millennial generation is seeing resurgence in entrepreneurship. Small firms have a very large presence in India. They employ millions across multiple sectors. A dichotomy exists. Some studies find presence of only informal HR practices in small firms, while other studies confirm the presence of formal and strategic human resource practices. The role of the leader in a small firm has an impact on how human resource is managed. There exists a limited study of the role of leadership in small firms. This study has been conducted in India keeping multiple objectives in mind (reference: Figure I). One, the impact of transactional and transformational leadership on human resource in small firms. Second, understand HR practices implemented in small firms. Third,

attempt to interpret the impact of formal HRM on business outcomes. Fourth, this study investigates HR practices in small firms led by the two different kinds of leaders; transactional and transformation leaders and its impact on business.

### Research Methodology

#### Questionnaire Design and Administration

Review of existing literature was used to identify the variables for the study. Questions were designed to collect data for these variables. The questionnaire was checked for reliability, validity and the rating scales were refined. The following four steps were taken to increase validity of the questionnaire. First, the draft questionnaire was shared with two academicians having relevant functional expertise in the field of human resources. Second, the amended questionnaire was run past three functional consultants who consult small firms in the area of operations, financial growth and people practices. This ensures high content and criteria validity. Third, the revised questionnaire was discussed with 3 entrepreneurs of small firms to improve the comprehension of the instrument. Lastly, a pilot test was conducted to check for reliability score and assess impact of multi-co linearity between the independent variables.

This study is aimed at understanding the HR practices in small firms. Small firms were approached individually and the authors were able to interact with the leaders. The protocols followed involved briefing the owner about the study, administer the questionnaire and have a discussion on variables mentioned in Table II. In most cases, the leaders seemed engrossed in their day to day task and discussions lasted for less than 15 minutes with numerous distractions. Only a handful gave adequate time to have a rich discussion and also present evidence to substantiate their views. In some cases, we were directed by the leaders to meet the HR leader in charge. This initial observation gave us enough confidence to understand the importance given to human resources by these firms. Small firms amidst the resource constraints faced had taken a large step by investing in an HR department.

### Sample

Small firms are present across the city of Pune. No centralised data base of small firms was available and the primary reason for this could be the dynamic nature of the business and its informality.

A database of SME – small and medium enterprises is found. This database does not segregate to show firms in the small category. Small firms operate from private co-tenanted buildings and state allocated industrial parks like MIDC – Maharashtra Industrial Development Corporation. The constituents of the sample were randomly chosen keeping in mind ease of access and proximity. 112 firms were approached. 6 of these firms did not meet the definition of small firm. Three of the respondents were occupied with operational issues and were unable to allocate time for discussion. 103 respondents spoke to us and answered our questions. The response rate was high since all respondents were approached individually by the researchers. To ensure homogeneity of data collected which will logically lead to higher validity of findings, we ensured analysis of responses that adhered to both eligibility criteria; number of people and limit of capital invested.

Most studies involving human resources source their information from meeting the HR manager, in this case data was obtained from the owner of the firm or the senior most production head. In many firms the HR function was managed by the owner and they acted as the HR champion. Small firms possess a very simple organisational structure and the respondents had a comprehensive knowledge of the functioning of the firm. Accuracy of the financial performance of the firm was limited to the information provided by the respondent. In some cases, respondents were keen to know the reason for this data gathering exercise. There could be possibility of firms not being transparent while reporting data officially.

**Table II: Key dependent and independent variables**

HR practices implemented	1- None 2- 1 HR Practice 3- 2 HR Practices 4 - More than 2 HR Practices
Presence of	1- No documented plans

documented business plan	2 - Plans are documented
Presence of the Vision document	1- No documented vision statement 2- Vision is documented
Percentage of profit to be diverted towards building HR systems	1- 0 to 3% 2- 4 to 6% 3- >6%
Type of training	1- Induction Training 2-Soft Skill Training 3-Technical Training 4 – Any of the two 5 – All of the above
Recruitment Sources	1- Reference 2-Advertisement Boards 3- Consultants 4-Job Portals 5-Social Media 6- Any other
Selection Process	1-Interview 2-Written functional test 3- Aptitude test 4-Psychometric Assessment 5-Simulation 6- Any other
Formal Levels of HRM in the Organisation	1 – HR processes not documented 2 – Some processes are documented 3 – All HR policies documented and implemented 4 – HR Professional manages implementation of documented policies
Annual Profitability	1- <10% 2- 10-20% 3- 21-30% 4- >30%
Workforce Turnover	1 – Less than 20% 2 – 20% to 40% 3 – Greater than 40%

### Analysis And Findings

In this section we discuss the measure of data, qualitative findings based on the data collected and the interactions with the leaders of small firms.

The data collected from visits to 103 firms was analysed using SPSS. Cronbach alpha cumulative score for the variables were identified was 0.692 & 0.712. Skewness gave us an understanding of the symmetry of the dataset. Kurtosis helped us understand the spread of the data [49]. Both the values were found to be within the range specified (acceptable limits of  $\pm 2$  and  $\pm 7$  respectively). The theoretical model proposed consists of reflective constructs. Validity tests were conducted as per procedures [50], [51]. A lot of the face and construct theory were derived from past literature and consultation with functional consultants

### Informality forms the foundation of small firms

Interactions with leaders of small firms show multiple common characteristic amongst the family of small firms. Presence of a patriarchal family culture persists. Team members are addressed in a manner which is found commonly when addressing young family members. Absence of first name while addressing the owner is evident. One sees traces of a culture of subservience. The owner of the family is the only dominant leader in the organisation. The impactful role of the leader in ensuring small firms innovate and adopt high performance work process has been established in studies [52], [24]. Short term profit maximisation was important for the survival of the firm. This seemed as a potent solution to manage the external environment [44]. A lot of the owners were not using any formal long term planning process and were relying on their personal business acumen. These observations point towards the informality of this sector [33]. Documentation was minimal and in most cases involved adherence to government regulations. In an Indian context where adherence to large number of labour regulation can be complex and challenging, it is not uncommon to see owners of small firm engaged in accounting and human resources related transactional tasks [32]. Most small firms reported profits and the owners seemed to have a very good understanding of their business. Clearly, owners of small firms were completely in control of their enterprise [38]. Few of the firms were seen to be making contribution

towards corporate social responsibility initiatives. All of the firms were seen to be supplying their products to larger institution as a part of the supply and value chain. Hence, there exists a motive to adhere to business ethics to ensure compliance to stakeholder guidelines. Similar observations are seen in other studies across regions [15], [53]. Since there was no documented evidence of a code of ethics in this study sample, it indicated the need for formally training leaders in business ethics [54]. No significant instances of employee theft or breach were highlighted by the owners as a part of our semi-structured discussions. Loyalty of the staff was of paramount importance to the owner. This was perceived to be a deterrent towards unlawful behaviour. Scientifically, studies mention the impactful way to increase ethical behaviour amongst employees is primarily through self efficacy and training [54], [55]. While this is seen in large firms as a systematic activity, no trace of it was seen in this study of small firms. People formed a key element in the business and it was evident in all the discussions with the owners. This seemed logical since small firms need loyal employees to survive through the initial phase of sustenance. Cultural orientation to the organisation was considered as the most regarded fitment [10], [19]. With limited members in the team, the owner preferred a homogeneous and compliant team [22]. Focus on people however did not translate to investments in HR practices [24]. The owners seemed confident of handling their people related issues. Hiring trained resources in addition to the right attitude formed a predominant part of their objectives. This was a common characteristic seen in firms with limited resources [24]. Most of the owners did not indicate of having undergone any formal training in the field of people management or having sent any of their staff for gaining professional HR skills. This gives the writers an indication that the owner and the management may not possess adequate knowledge about scientific HR practices and confirms to earlier findings [56].

It is important to note, informality does not indicate non-implementation of HR practices [25], [57]. Evidence of basic functions which form the foundation of people

engagement is seen. Recruitment, training, rewards and compensation are practiced by small firms which is evident in our observation and highlighted by earlier studies [32], [26]. More than 69% (71 out of 103) of the firms mentioned using at least 2 HR practices. The most common practices were of recruitment and training. Some of them have also employed professional managers to implement HR practices. These were seen to be limited to firms where business was dependent on highly skilled manpower [26], [59].

#### **Recruitment – the crucial HR practice**

□ □ □ □ □ Recruitment as a practice was the most visible HR practice and was present in all the firms and is evident in most literature about small firms [24]. Sourcing skilled manpower had a direct impact on business. Even in uncertain times, minimal client orders had to be fulfilled to sustain business relationships. Availability of manpower ensured seamless operations which cannot afford even minor disruptions [26]. Multiple sources were used to attract talent. Referrals and advertisement in “job boards” in the neighbouring commercial zones were the most popular source of obtaining prospects (48 of the 103 firms). A few firms were seen to engage with external agencies to identify people along with the use of social media and job portals (18 of the 103 firms). Such firms were also seen to be in need of people with relatively complex skills. No use of job portal was seen in any firm. Job portals may not form a viable proposition since the number of requirements is very less and hence offers no significant cost benefits [22]. The selection process always had a personal meeting with the owner. In many cases, this was the only selection step involved (47 of the 103 firms). Significant number of owners preferred to prioritise a culture fitment to a skill fitment. In few cases, a functional test was given and prospective employees were asked to work on the machine for a day or few days (14 of the 103 firms). The output, if found suitable, resulted in the person being hired. This act was very similar to simulations done by medium and large firms for enhancing employee skills [31]. Four of the small firms also mentioned using a psychometric tool for assessing candidates.

**Focus on on-the-job product training**

Most small firms showed evidence of investments in training (57 of the 103 firms). Induction training is the most prominent training practice which is also seen in other studies [31]. This becomes a necessity since some of these firms produced unique products catering to customers. A lot of the training is administered informally and is seen to be administered on the job [27]. Most new joiners are put under observation and can approach the older seasoned employees for any clarifications. The training is aimed at improving skills needed to perform daily tasks. In most cases, training is internally driven, however in cases where there is purchase of new machinery or adoption of a new process, external trainers are called for imparting training (seen in 27% of the small firms). Some firms have invested in creating in-house specialists or process experts who are responsible for regular re-skilling of staff [30]. This is seen in firms employing highly skilled staff where service guidelines are subject to frequent revisions. Occasionally owners have acknowledged of sponsoring their own self for both technical and behavioural training along with the second line.

Most of the small firms did not demonstrate any evidence of a formal compensation benchmarking exercise, performance management or a merit based differentiation in performance. Rewards were mostly in the form of recognition during annual family events.

**Quantitative Analysis and Findings**

In this section we discuss the quantitative findings from the study based on the analysis of primary data. Attempt has been made to understand the following: (a) The difference in approach towards human resources by firms led by transactional leaders and transformational leaders. (b) The role of contextual variables affecting focus on human resources. (c) Impact of formal HRM on business

There is a variance in small firms led by transformation leaders and transactional leaders.

Most firms originate by family members pooling in resources and creating a legal entity. Family members retain control of the firm. A family member who either has the necessary

skill, expertise or the required experience, manages the day to day functioning [28]. As organisations grow from micro firms to small firms, a leader has to have the vision of creating the first line of management. The managerial level is viewed as an investment in specialised product or business knowledge [18]. The leader along with the empowered first line of management is responsible for stimulating human resource practices in firms ensuring standardisation and reduction of biasness [59], [57].

This study categorises the data into two groups as seen in Table III.

The sample categorised into two groups were tested for the two hypotheses to understand if both the groups show:

**1. Difference in number of HR practices deployed at work**

**2. Difference in formal levels of HRM**

To understand the difference between the two groups, Levene’s test of equality of variance in SPSS is used (independent *t*-test). The basic rule of this test is; if  $p > .05$ , the group variances can be treated as equal and if  $p < 0.05$ , we have unequal variances and we have violated the assumption of homogeneity of variances.

**Table III: Grouping of data into the two designated groups**

<p><b>Group 1:</b> Small firms led by Transactional Leaders</p>	<p>1. The group was led by leaders who were involved in managing day to transactions 2. Interactions with them showed no signs of a documented vision document or a business plan</p>
<p><b>Group 2:</b> Small firms led by Transformational Leaders</p>	<p>1. The group was led by leaders who showed us the vision document and evidence of a business plan 2. This group comprised of distributed leadership where one of the leaders was responsible for managing service delivery while the other was responsible for acquiring new business 3. Higher proportion of</p>

	revenue was assigned as investment towards developing HR systems
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**H1:** Group 1 does not use the same number of HR practices as Group 2

The p value is <.05 which results us in rejecting the null hypothesis. This indicates that the two groups are significantly different from each other in implementing multiple HR practices.

**H2:** Group 1 has different formal levels for HR than Group 2

The p value is <.05 which results us in rejecting the null hypothesis. This indicates that the two groups are significantly different from each other. Small family firms having empowered professional managers have different formal levels of human resources indicating a more evolved human resource system. The fact that they deploy more number of HR practices indicates a higher focus on human resources.

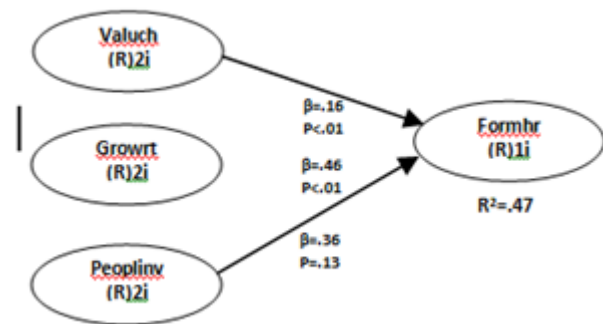
**Group Statistics**

Transaction al Led or Transformat ional Led	N	Mean	Std. Deviat ion	Std. Error Mea n
Number Transaction of HR al Led practice s used Transformat ional Led regularly?	69	1.942 0	.7452 6	.089 72
	34	3.205 9	.8800 6	.150 93

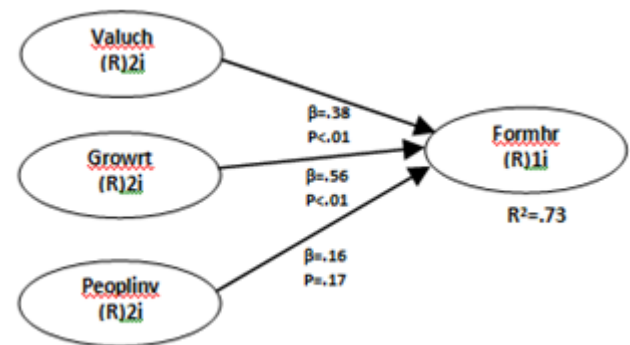
The two hypotheses lend confidence in the argument that transformational leaders approach human resources in a focussed manner. Related studies have clearly established that transformational leaders go beyond the normal reward penalty matrix by investing in developing people [56]. Multiple HR practices are designed and implemented to facilitate ease of working. HR experts are hired to ensure standardised deployment of sustainable and scalable HR processes [27]. Transformational leaders ensure alignment of HR objectives to organisational goals and create an exciting atmosphere for work; all of which call for a sharp focus on human resources [25], [17].

The study attempts to understand the role of Contextual Variables in determining the levels of Formal HRM in small firms. A

regression analysis was performed on the following constructs to understand their role in determining if the two samples ‘Group 1’ and ‘Group 2’ displayed any difference in their on the levels of HR formality.



SEM Model: Group led by Transactional Leaders



SEM Model: Group led by Transformational Leaders

The SEM analysis has been used to show the impact of the three contextual variables on the levels of HR formality. HR formality is an indication of the maturity of HR processes in an organisation. A combination of the three variables shows a much higher impact on formalisation of HR in the group led by transformational leaders. Complexity of business, the first variable, will require a firm to hire trained and highly skilled manpower. Investments in continuous up gradation of technology and related process will call for creating infrastructure for skill enhancement. Growth of a firm, the second variable, can happen in multiple ways. The small firm can intend to expand geographically or expand the number of business verticals. Both of the will call for re-orientation in the skill and the number of workers. Investment in people, the third variable shows the commitment of the leader towards employees. The commitment to upgrade both, hygiene and motivational



parameters, lead to higher focus on HR formality.

To understand the impact of leadership on business gains, relationship was established between the two different types of firms led by transactional and transformational leaders to HR practices. The two samples with varied formal levels of HRM were compared to their business outcomes.

**H3:** Group 2 having higher levels of formal HRM has higher impact on profitability than Group 1

Spearman's rho test indicates the presence of a significant positive correlation between small firms having a higher formal level of HRM to higher profitability, (rs(103) = .525, p<.01)

**H4:** Group 2 having higher levels of formal HRM has higher impact on employee turnover than Group 1

Spearman's rho test indicates the presence of a significant negative correlation between small firms having a higher formal level of HRM to higher profitability, (rs(103) = -.537, p<.01)

**Correlations – Group 1**

	Profitability	HR Formality
Spearman's rho	1.000	.525*
Profitability		.000
Correlation Coefficient		
Sig. (2-tailed)		
N	103	103
HR Formality	.525**	1.000
Correlation Coefficient		
Sig. (2-tailed)	.000	
N	103	103

\*\* Correlation is significant at the 0.01 level (2-tailed).

**Correlations – Group 2**

	Employee Turnover	HR Formality
Spearman's rho	1.000	-.537**
Employee Turnover		.000
Correlation Coefficient		
Sig. (2-tailed)		
N	103	103

Employee Turnover	Correlation Coefficient	-.537**	1.000
	Sig. (2-tailed)	.000	.
	N	103	103

\*\* Correlation is significant at the 0.01 level (2-tailed).

From the limited pool of firms as a part of this study, we see firms with higher levels of Formal HR displaying higher profitability and lower employee turnover. Formal HRM is important for a small firm as the firm continues in its journey to become a medium sized firm. Formal and structured HR practices have a positive influence on business outcomes and this has been seen in studies across other countries. The role of the dedicated HR executive is also seen to be an important aspect in the growth of small firms [58], [8].

**Discussion and conclusion**

The presence of small firms in a country is important to its economy. They are small in size but are present in millions, thereby acting as an engine for employment and growth. Entrepreneurial journeys initiated by an idea start with the establishment of a small firm. Being labour oriented, small firms account for employment generation. Survival of a small firm continues to be a challenge in an environment of internal resource constraints and an external environment that is unpredictable and fraught with high risk [32]. Access to resource is a hurdle faced in daily operations. It is in such challenging circumstances that entrepreneurial strategies have been seen to demonstrate innovation in the use of human resources [17]. Access to resources can lead to leaders constantly facing ethical dilemmas. In the absence of formality, one does not get to see either re-enforcement of ethical behaviour or reporting of breakdown in organisational ethics. Association with large and established stakeholders is a meaningful way for small firms to institutionalise ethical practices. In small firms, the power distance between the leader and the team is less leading to increased supervision which acts as a deterrent to unethical conduct.

This paper has attempted to investigate at the fundamental shop floor level, how leadership styles have an important role to play in the way

human resources are managed, leading to higher value to business. We have studied the two styles of leadership, their focus on HR intensity and its impact on the performance of small firms and propose key findings.

First, this paper extends the findings of larger firms where strategic focus on human resources leads to significant impact on organisational performance. The positive impact can also be explained keeping in mind parameters that have not been measured as a part of this study. Harmonious conditions at work have an important role to play [47]. Disruptions in production contribute to low productivity [7]. Focus on human resources ensures low disruptions, better quality of work and creation of an environment which provide impetus to individual performance and innovation. This is congruent to studies across other countries [22], [25].

Second, focus on formal HRM involves organised implementation of multiple HR practices. Small firms have invested in documenting HR practices and some of them have acquired professionals to drive these practices [19]. However, this study does not investigate the effect of each practice or the impact of bundling multiple practices. Synergy from the relationships between multiple practices can significantly enhance organisational productivity [42].

Third, this paper has studied the impact of HR practices to business outcomes. Entrepreneurial strategies in small firms focus on business profits and employee retention. While some of them are short term oriented, preferring to allocate resources only to manage business operational exigencies; other have exercised a longer term view by investing in their human resources which cannot be easily replicated by competition [27], [52]. However, the vertical alignment of HR deliverables to other specific business goals has not been analysed. Small firms are also placed in different stages of their career growth. There is a possibility of strategically aligning each of the practices at different stages. One has to stay focussed on the predominant business goal of survival and expansion, which for a small firm is a constant threat especially in turbulent external environment [40].

Skilled resources are important for continuity

and sustenance [36]. Leaders of small firms have been seen to invest in formal human resource practices to engage with their workforce with an intention of increasing productivity. While some firms have been seen to have transactional leaders who use the traditional reward mechanism to deliver performance, others are seen to be led by transformational leaders who create a vision and commit to resources to achieve the long term business goals. Resource constraints have not stopped some small firms [39] from investing in people related systems and ensuring a transition from informality to a formal system of managing their human resources leading to higher profits. This could also be viewed as a logical step towards growth; growing into a mid-sized firm thereby increasing in size, complexity and consequently having access to larger markets and resources.

### Limitations

Small firms are of interest to future entrepreneurs. Survival is important to long term sustenance of business. Traditionally HR is visualised as a cost centre and hence not given high priority. However in small business where business landscape is complex, retention of skilled talent has a direct and large impact on business outcomes. The leader needs to proactively invest in human resources in an otherwise resource crunch scenario. Decision making, investment in people through training and sourcing skilled talent with the right cultural fitment is important to growth. Entrepreneurs who double up as HR champions will gain from the findings of the study.

This study conducted is limited to a single city and involves the leaders view on varied constructs. Replication of the study in another state and extending the scope to include employees can help understand the impact of culture on human resource practices deployed. Role of industry and placement in the value chain also contribute to business outcome. Focus on formal HRM is seen to have a positive impact on productivity; however one has to understand the costs involved towards creating this focus. The enhanced productivity levels have to positively trade off with investments. These aspects can form the

foundation for further research to understand how leadership impacts human resources in

various industry verticals.

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**IMPACT INVESTING IN INDIA - A SNEAK 'PE'EK****Neelesh P.**

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**ABSTRACT**

*Purpose:* This study analyzes the role of Impact Investments in India in creating beneficial social and environmental impact, and suggests policy measures to render such investments sustainable.

*Methodology:* The study would use secondary information from the websites of PE Funds, Investee Companies, SEBI, etc. and news reports / finance journals, during the past few years. Our aim would also be to understand the various exit information from investee companies available in correspondence with the impact investing done sector wise. The returns from ESG oriented Mutual funds would also serve as a data source in this study.

*Findings:* With the recent increase in pandemics and natural disasters globally, employment and social welfare issues have become the topmost priorities of policy-makers. However, with most governments facing fiscal / budgetary constraints, contribution of private sector in the form of Impact Investing could be the way forward in complementing governments' efforts.

*Implications:* Impact Investing in India is estimated to grow to US\$8 bn. a year by 2025. This Study would provide suggestions for making our ecosystem supportive of such investments, so that Impact Investing is perceived as a viable proposition.

*Originality:* There have been a few reports discussing the subject, but this paper would focus on specific sectors and suggestions for stimulating investment.

**Keywords:** Impact Investing, PE Funds, Social Welfare, Environmental

**Introduction**

Impact investing is a fast growing, alternative form of investment strategy that has been around for almost 15 years since its introduction to the world market in 2005. In our country alone, over 5 bn US\$ has been invested in just the first half of the last decade. With private equity (PE) firms and venture capitalist firms sitting on stockpiles of capital to the tune of ~ 2 tn US\$ coupled with mandatory regulations for large corporate offices to record a part of their profits in socially responsible causes, impact investing is set to blossom in the future. It can broadly be defined as a fund that looks to invest in certain organizations that have the ability to generate both positive social or environmental impact and attractive financial returns for its investors. The financial vehicles that can be used to effect this investment strategy can vary from private equity to debt to convertible debt (flexible payback period with options of converting remaining part of loan to shares, etc.). With the Gen-Y and Gen-Z placing further emphasis on the broader societal good a firm is able to create while deciding on their investment strategy, it becomes imperative for funds to

position themselves accordingly. Although the United States of America and the European continent still dominate the impact investing scene, Asian economy is gradually creating interest globally. There are various hurdles in making the impact investment transition to mainstream such as government regulations, lack of awareness among investors, the need for verifiable and relevant impact management metrics, etc. There is a necessity to define what our impact themes will be and an understanding of whether this is really investment-worthy. Along with the financial capital required, it will be of utmost importance that high-quality professionals are recruited in this field to further the innovation and disruption of the status quo to create customized, localized and cost effective products to the underserved population of consumers. With maturing sectors such as microfinance, green or renewable energy, agriculture, housing, etc. and business models designed to create effective change and scale organically, it becomes crucial to ensure proper frameworks and benchmarks for creating growth continuity in this branch of investing. The foremost concerns among the impact investing circle when considering the

continuity of business operations after exit is the intention of the buyer and how serving the unserved or less served rural or semi urban population is a part of the company's process.

### Literature Review:

Mckinsey and Company conducted an extensive survey of the impact investing scene in the country and looked at its possible impact metrics sector wise, the type of investors involved in the funding, the different stages of a firm's growth story at which each investor enters, etc. (Pandit,2017; Tamhane,2017). They have found that the number and size of the deals in India for impact investing have risen considerably with new sectors such as housing, education experiencing significant investment in the recent past. It can be attributed to the maturing business models of these socially-oriented businesses and the satisfactory financial returns obtained by the investors during exit. They also explain how the roles and responsibilities vary among different investor categories to attain synergistic benefits. The worldwide trend also reflects the optimism in the impact investing sphere with new-age investors changing the game for traditional investors. It also sheds light on the relation between variables such as size of investment and the sector invested as well as the return in exit (in comparison to the prevailing market returns). They emphasize the need for innovation in the financial instruments used for impact investing in tandem with rigorous adherence to impact measurement standards (which need to have both global and localized context).

In another study conducted by the University of Washington, the author focuses on thematic impact investing factoring in United Nations' 2030 Sustainable Development goals (Rangarajan, 2019). The major themes tackled are Clean energy, Clean water, Workplace equality, Low Carbon, Industrial innovation, etc. This helped in analyzing the various funds' performance operating in these sectors and their behavior under different market conditions and the optimal action for the investor under such circumstances.

The United Nations' 2030 Sustainable Development goals theme has been taken forward in another impact report prepared by

Bamboo Capital Partners (Bamboo CP, 2019). In this paper, the organization outlines the origin of the SDG500 fund, wherein the aims of the United Nations such as poverty, hunger, gender inequality, education, climate action, etc. are fulfilled by systematically investing in various socially-motivated businesses that have the positive social/ecological impact ingrained in their working operation models and generating attractive returns for their partners. They believe that technology is a great leveler in today's free economy and helps alleviate lack of fundamental needs such as poverty, education, etc. and disrupts conventional market with innovative and cost-effective products. In particular, its usage in helping increase credit-worthiness of previously nascent and small companies to raise further capital infusion at later stages of its growth trajectory is highlighted. They further expand on the need for transparency in impact metrics and associated broader benefits while evaluating the exit strategy.

A study by the Global Impact Investing Network (GIIN) on the need of responsible exits from investee companies offers a detailed look at the criteria and rigor that each investor must put in place to ensure that there is continuity of impact/business operations in the corresponding companies even after initial investors are no longer actively involved in its daily functioning (Schiff, 2018; Dithrich, 2018). It also contains different case studies relating to various exit strategies for different impact instruments at unique growth stages in their respective ventures. They identify four major stages of investor life cycle: a) pre-investment b) investment structuring c) during investment d) divestment. Their examples included investee firms from a wide range of sectors such as microfinance, environmental conservation, clean energy, etc. It concluded that timing of exit plans must align with the investee's growth plans and the prospective buyer must have their financial and impact goals in full alignment with existing investors and fund partners.

Another study by the Global Impact Investing Network (GIIN) discusses the various global trends in impact management and the challenges ahead to make this form of alternate investing mainstream and ensure effectiveness



in fulfilling societal goals and financial aims (Glasgo,2019). It is shown the bulk number of deals in the impact investing zone fall into microfinance, housing, clean energy, etc. due to their easily identifiable and accessible goals and the population target audience that promise attractive returns on investment made in impact-oriented firms of these sectors. It also mentions how Asia is gradually occupying a big part of global impact investors plans due to its burgeoning population and widespread civic and environmental needs that require exhaustive and innovative capital. It emphasizes the need of a proper impact management framework in which firms across geographies and sectors can be compared on their performance and a repository of impact data can be used to benchmark and enhance investee performance. To meet this end, it has found IRIS+ as a proper tool to both provide contextualized and global meaning to impact outcomes by using extensive analysis on previous similar datasets and fixing appropriate and quantifiable impact milestones to be achieved.

An impact investing lens focused on the Asian zone and its myriad challenges commissioned by a group of companies, namely: Oliver Wyman, Marsh and McLennan Insights, AVPN has also thrown great insight into the mindset of the investor in the subcontinent (Yeo, 2019; Wang, 2019; Moore, 2019; Prakash, 2019). It offers a history into the evolution of impact investing as a mode of global investment and its Asian story with all its different players such as the actual impact investors, the fund partners, the capacity/impact building infrastructure institutions and their roles and attributes. The many investor profiles such as non-profit organizations, CSR groups, traditional and institutional investors have their own criteria such as portfolio fit, holding period, etc. Various impact investee entities in the South East Asia belt face a wide spectrum of hurdles in their mission to generate satisfactory impact, both socially and financially. Some of these include lack of category understanding (no ease in taxes, capital gains, etc.), the opaque nature in impact measurement (i.e. no universally applicable impact measurement standard) and the inefficient and yet-to-mature marketplace. It

envisages a future in which there is an environment conducive for impact investing to every willing, able capital provider and consensus is built through benchmarking and educating the newer entrants in the field on the best and innovative practices in impact management and measurement.

Other articles referenced include the Buffet model of factoring in impact while calculating the risk-return tradeoff i.e. Impact Rate of Return (IRR) (Foley, 2018). It talks about how the next generation is more geared towards solving the issues of grave importance in the world. Another enlightening piece involved a philanthropic manager and impact investor considering the obstacles ahead and the necessary steps to build a sustainable impact investing economy such as longer time-in-hold investments and flexible modes of financial vehicles used, the need for complementary benefits when the different stakeholders involved infuse capital into various firms (West,2018; Mcglashan,2018). A piece on social impact bonds also throws light on how this form of investment structuring with government participation can help incentivize positive measures in society and provide financial success for investors if these outcomes are met (Murphy,2018). A very important write-up on how impact investing is positively affecting changes in the lives of the underserved population in emerging economies of the African and Asian continents and the enormous amount of business opportunities available in these regions highlight the need for innovation, patience and flexibility required to succeed (Pilling,2018). Several success stories in the fields of micro insurance, agriculture are highlighted in the above article. An investigative analysis of the impact investing scope in education wherein the challenges of formulating the right impact metrics is often complex and requires expertise and loads of time (Jack, 2018). Some case studies on the education scene in Great Britain and United States of America are highlighted and show the actual areas such as non-government majority in the outside-school space as a viable avenue for impact investing. The article concludes with successful ventures in Africa and India where they were able to match an unmet demand by providing training and incentives

for success in completing the above measures. A work on the agriculture side in impact financing shows the huge possibilities in scaling up companies that work closely with small/medium scale farmers and how this will form a huge part of the impact investing space in the coming years (Murray, 2018). The use of data and technology in helping farmers understand their cultivation needs and the environment are shown as positives in this piece. Other articles referenced emphasize the prevailing adverse climate for impact investees in scaling up and how the education industry in rural or under developed areas can benefit from simple, target audience oriented initiatives. They also stress on accurate impact measurement methodologies to verify if the investment actually mattered to the consumer in creating significant positive impact or a narrow, superficial outcome incurring heavy cost.

This paper will try to understand and define certain impact metrics and measurement indicators that can help in identifying the success of the impact in quantitative or qualitative terms. We will also try to identify the size of the impact investing industry in the next few years by using the Gross Domestic Product (GDP) figures for the country as benchmark. This study will also avail the use of stock market to find the performance of certain ESG (environmental, social, governance) based funds in India relative to the market index performance to analyze the attractiveness of the impact investing space.

### **Research Methodology:**

The various sources of information used in this research include Moneycontrol, Financial Times, Economic Times, Livemint, Financial Express, Morning star, Business standard among others in the financial website domain. Impact information from Bamboo Corp and its SDG500 fund served as major reference points in our analysis. The Global Impact Investing Network (GIIN) was an important source for understanding different exit strategies and various impact vehicle structures in diverse sectors. It also shed some light on the impact management measurement and monitoring tools and its myriad challenges for performing comparative analysis or benchmarking. We aim

to use both quantitative metrics such as fund performance, growth percentage along with qualitative indicators such as women employment, number of households reached to identify the actual impact outcomes of these investments.

### **Data Analysis and Findings:**

Exhibit 1 gives us an idea of the upward growth trajectory in impact investing globally. This gives sufficient cause of optimism to supporters of impact investing that it is here for the long haul and can be taken mainstream very soon, as indicated by the ~ 22 bn US\$ invested in 2016.

Exhibit 2 gives an India-specific context towards the topic of impact investing. With incremental growth over the years (over 1 bn US\$ in 2016 alone), it is slowly but surely spreading its influence in the Indian subcontinent.

Exhibit 3 provides sector specific data on the amount of underserved people in India in 2015 who have been able to access basic resources such as loans, pay bills, receive education, affordable homes, etc. Based on the info, Financial Inclusion seems to be the biggest growth driver in the Indian chapter of impact investing with ~ 40 mn consumers availing credit rating, flexi loan structures with longer repayment options, micro insurance, paying bills, etc.

Exhibit 4 gives us a view of the potential trend in the next 10 years for impact investing in the country. It is estimated to grow rapidly with almost ~ 8bn US\$ investment in 2025. This upward trend is based on the strong financial market in the country coupled with the strict regulatory protocols followed.

An indicator of the growing impact investment scene in the country can be found in Lok Capital, a PE fund manager that invested nearly 1.8 mn US\$ in 2009 into a microfinance institution that operated in the lower-income segment giving micro loans for scaling and building operational efficiency to its customers. By 2014, it had realized its stated outcomes and had fully recovered its initial investment into the company. This is yet another signal that the impact investing landscape in SE Asia, and specifically India

and China, is maturing at a fast rate and further expansion is almost inevitable.

In another example of finding the right balance between segment and impact outcomes, Bamboo Corp SDG500 fund (split 4 ways) invested through the equity route in Orb, a clean energy company operating in Bengaluru. It has helped provide non climate harming energy to over 4500 businesses and supported over 1.5 lakh households while reducing the carbon footprint by over 3 lakh tonnes and providing employment opportunities to women, thus reducing gender inequality along the way.

Exhibit 5 shows two prominent ESG (Environmental Social Governance) oriented MFs (Mutual Funds) operating in the country and their absolute returns since their inception. This is a healthy signal for future impact investors as both of these funds have generated positive financial returns (Axis ESG MF registered a ~ 5% return while SBI MF ESG gave almost 14% return to its investors). Considering the fact that Axis MF ESG was founded only in the February of 2020, it is an appreciable performance at such a nascent stage while SBI MF has been in the marketplace for nearly 30 years. They received further validation from global investors with capital inflow of over 240 mn US\$ in just Q4 of FY 2020. In fact, the entire MF ESG industry in the country received a total of 500mn US\$, reflecting the worldwide trend of sustainable investing in emerging economies. The AUM (asset under mgmt.) for each of these MFs is around 1500 cr for Axis MF and 2200 cr for SBI MF. Gathering momentum from its decent performance, it looks like the ESG themed funds market will grow even further in the coming years. With this debunking of pre-conceived notions that attach social investing with no financial attractiveness and only social benefit, this gives out a clear message that strategic, well-structured investments in social firms do pay off handsomely.

Exhibit 6 is about finding the relation between GDP (gross domestic product) and the impact investing economy in India. Performing a regression between these two variables (GDP being the independent variable and able to forecast with the help of reputed organizations

worldwide such as IMF (International Monetary Fund), World Bank, Barclays, Goldman Sachs, etc.; Impact fund size the dependent factor in this equation). The impact investing sector in India attracted over \$5.2 billion between 2010 and 2016, with over \$1.1 billion invested in 2016 alone. This growing momentum carried through the latter part of the 2010s decade and the asset under management (AUM) for impact funds in India had swelled to 11 bn USD and impacted nearly half a billion livelihoods in the country. Considering this trajectory and India's aim of reaching 5 tn USD economy, it can be forecasted that by 2025, the AUM for Indian impact venture would be nearly 25 bn USD. We had assumed GDP annual growth rates to be at an average of 6% over the next 5 years and the equation is:

Assuming impact size as Y (dependent variable) and GDP as X (independent variable),  $Y = 0.54 - (1.25589 \times 10^{-6} * X) + (5.2256 \times 10^{-17} * X^3)$  (1)

Since the null hypothesis can be rejected as the significance f value is 0.002 (< 0.05), the alternate hypothesis that the variation in Impact size can be significantly explained by GDP figures is accepted.

Based on the projections, the impact investment is estimated to be 1.97 bn \$, 2.29 bn \$, 2.69 bn \$ and 3.16 bn \$ for the years 2021, 2022, 2023 and 2024, respectively.

The post COVID-19 world would require innovative and creative structuring of impact devices that can suitably aid the business and ensure that the results or impact outcomes are achieved. Social or Development Finance bonds must be taken mainstream citing global and domestic success stories. But, before the structure, the proper metrics must be identified to ensure continued impact. The impact areas of internal process, output must be clearly defined and delivered in a timely, reliable, comparable form. The service units expected to be reached and the timeframe within which the impact must be delivered has to be set out at the start. While self-reporting of impact measurements and metrics is acceptable initially, the fund managers must be encouraged to adopt more mainstream methods to ensure comparability.

It has also been found that digital firms and tech based impact services have the largest

reach and chances of success and sustainability in a post COVID-19 world. Education in rural and underserved areas needs technology to cater to a broad and populous demographic. Similarly, essential retail goods for the low income consumer market can be tapped into after the virus effect recedes and the new normal

### Conclusion and Recommendations:

As can be seen throughout this paper, the evidence for impact investing is overwhelming both in terms of acceptance aka growth rate and its consistent performance both in financial and social terms. The investors in these enterprises have successfully accomplished the dual goals of positive social or environmental impact and an impressive weighted average return on their investments. It has also been found that there is lesser volatility, i.e. stable and consistent returns for investors when they commit to infuse capital in impact companies. But, there are certain challenges such as consensus in impact measurement, lack of adequate benchmarking, regulatory hindrances, etc. that need to be tackled. There is a pressing need for flexible structuring of investments while lending capital to social firms for them to build their operational capabilities in a strong manner. In order for the impact investing economy to be sustainable and robust, it must ensure a platform for all the entities such as PE firms, philanthropic missions, non-profit

government organizations (NGO), impact investors where they can collaborate and put to use their resources in areas where they have sufficient know-how to create long lasting value for their clientele and themselves.

With the recent pandemic COVID-19 wreaking havoc on the global economy, its adverse impact on the low income population has been devastating. The Indian government's recent move in the recent budget for FY 2019-20 to incorporate a Social Stock Exchange would be a welcome move to help these social businesses attract significant funds from willing investors. Innovative instruments having elements of both debt and equity in nature can be structured appropriately once the holistic understanding of this ecosystem is in place. But, the annual financing gap of 565 bn USD to achieve the Sustainable Development Goals by 2030 needs investing from all frontiers and geographies to bridge it.

### Limitations:

The main hindrance while conducting research on impact investment sector is the scarcity of valid impact related data in the public domain. Another bone of contention that persists is the lack of a universal, plug and play impact measurement tool. It would be of immeasurable help if such a monitoring device can be used to understand an impact fund's performance in relation to the sector-specific and country-specific benchmarks.

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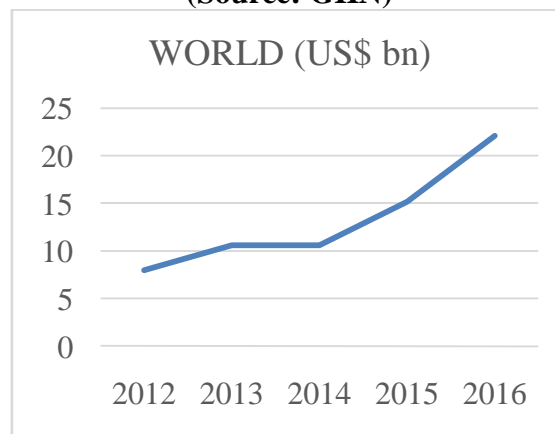
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**Appendix**

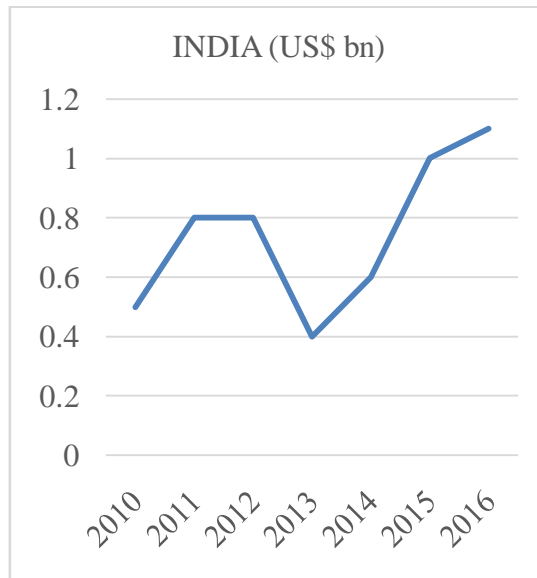
**Exhibit 1:**

**Growth of Impact Investing in World (Source: GIIN)**

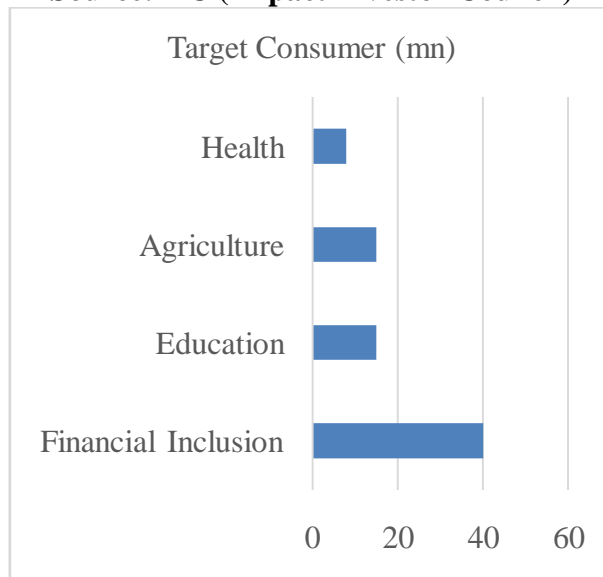


**Exhibit 2:**

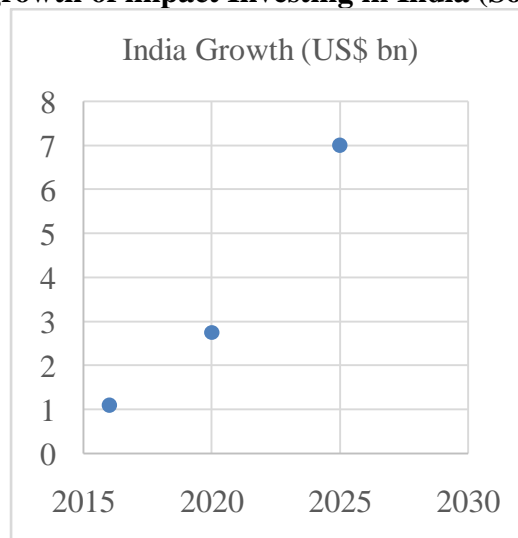
**Growth of Impact Investing in India (Source: GIIN)**



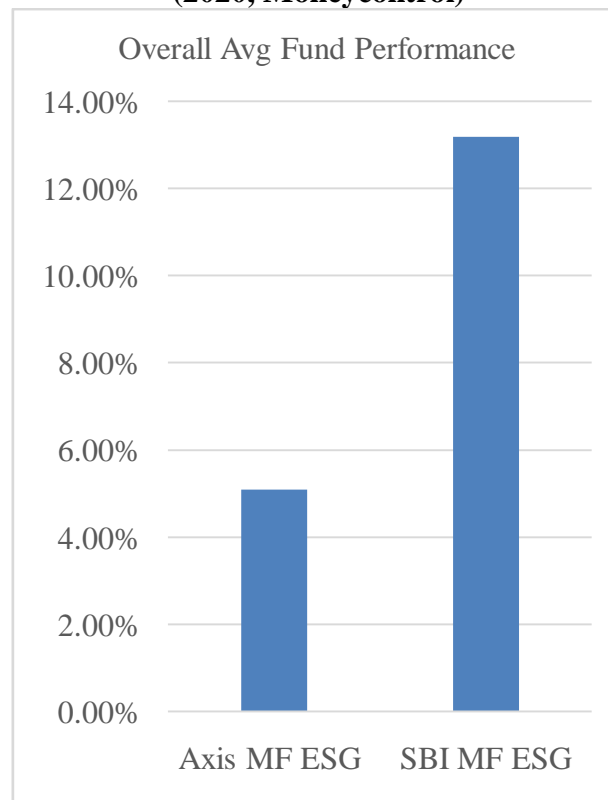
**Exhibit 3:**  
**Population reach in India through Impact Investing (2015)**  
**Source: IIC (Impact Investor Council)**



**Exhibit 4:**  
**Potential growth of impact Investing in India (Source: IBEF)**



**Exhibit 5:  
ESG oriented mutual funds’ performance in India  
(2020, Moneycontrol)**



**Exhibit 6:  
GDP vs. Impact Size**

Year	GDP (x) (in cr)	GDP <sup>A3</sup> (x <sup>A3</sup> )	Impact Size in India (in bn\$)	Impact Size in India (in cr)
2010	168000	4.74163E+15	0.5	3750
2011	176805	5.52691E+15	0.8	6000
2012	186,451	6.48181E+15	0.8	6000
2013	198,358	7.80459E+15	0.4	3000
2014	213,056	9.67129E+15	0.6	4500
2015	230,092	1.21817E+16	1	7500
2016	249,089	1.54548E+16	1.1	8250
2017	266,635	1.89562E+16	1.25	9375
2018	282,953	2.26538E+16	1.35	10125
2019	297,168	2.62426E+16	1.55	11625
2020	309,679	2.96986E+16	1.65	12375
2021	328,259	3.53712E+16	1.97	14775
2022	347,954	4.21275E+16	2.29	17175
2023	368,831	5.01744E+16	2.69	20175
2024	390,000	5.97500E+16	3.16	23700

**Exhibit 7:  
Multiple Regression Result**

SUMMARY OUTPUT					
<i>Regression Statistics</i>					
Multiple R	0.938428321				
R Square	0.880647714				
Adjusted R Sq	0.850809643				
Standard Error	0.162501364				
Observations	11				
<i>ANOVA</i>					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	2	1.558746454	0.779373227	29.51423037	0.00020292
Residual	8	0.211253546	0.026406693		
Total	10	1.77			
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>
Intercept	0.54494519	1.04907573	0.519452671	0.617506972	-1.8742278
X Variable 1	-1.28955E-06	6.8399E-06	-0.188534098	0.855152816	-1.706E-05
X Variable 2	5.00000E-17	0.00000E-17	0.000000000	0.999999999	0.00000E+00



**COVID-19 OUTBREAK IMPACT ON INDIAN OIL & GAS MARKET****Nikhil Dhole<sup>1</sup>, Pavan Totla<sup>2</sup>**<sup>1,2</sup>Symbiosis Centre for Management and Human Resource Development, SCMHRD, Symbiosis International (Deemed University), SIU, Hinjewadi, Pune, Maharashtra, India**ABSTRACT**

*The outbreak of the Covid-19 pandemic is an unprecedented shock to the Oil and Gas (O&G) Market which was already in a perilous condition before Covid-19 struck due to various geopolitical issues. On the top of this, with the prolonged country-wide lockdown, they started facing the brunt due to disruption of demand and supply chains.*

*Research Objective: This paper will help in understanding how Covid-19 has affected the finances and operations of Upstream, midstream and downstream sectors of O&G Industry in India due to lockdown caused by Covid-19.*

*Methodology: Studied and analyzed interviews of experts and official from O&G sector. Furthermore, PESTEL and Porter's five forces analysis was done to get comprehensive and holistic idea about the actual impact of Covid-19 on all three sectors of O&G Industry.*

*Practical Implications: Companies that will adopt more safety, Covid-19 guidelines and people centric approach will grow faster.*

**Keywords:** Covid-19, O&G sector, Lockdown, PESTEL, Porter

**Introduction**

The outbreak of corona virus was first identified in December 2019 in Wuhan, China. After that, it spread to many other countries and WHO declared it as pandemic on March 11, 2020. India was under strict 75 days lockdown and due to which (according to economic experts), India have lost more than ₹ 8 lakh crore and had over 26% unemployment rate. Kristalina Georgieva, the chief of International Monetary Fund, on April 9, said that, in year 2020, the world would witness the worst global economic fallout since the Great Depression in the 1930s. According to her, negative per capita GDP growth will be experienced by over 170 countries due to Covid-19 pandemic.

Before corona pandemic, Oil and Gas (O&G) sector has been impacted due to various geo political events in last few decades like Iranian revolution, Arab oil embargo, Iran-Iraq war and Gulf wars, which led to dramatic changes in oil prices due to supply shortages. Furthermore, global economic recession of 2008 had also caused severe price fluctuations [1] Now, this present lockdown has hit world economy hard and almost every business including O&G sector is suffering because of this economic slowdown. 2014 saw highest price of crude oil reaching to near \$150 per barrel however later on, Oil prices fell drastically as production exceeded demand [2].

Recent price drop, which had gone below \$30 per barrel was biggest drop since Gulf war in 1991(OPEC, 2020). This happened due to unprecedented decline in oil demand owing to pandemic lockdown (OPEC (2020)). To match the drop in demand, Organization of Petroleum Exporting Countries (OPEC) wanted to slash the production but Russia was not cooperative (OPEC (2020)). Due to this the futures price of crude oil went negative at NYMEX hub. It turns out that, at global level, many variables are responsible for crude oil prices, including the current major health crisis due to coronavirus, hedgers and speculators behaviour, consumer demand, overall Supplies and economic news. As an international oil-producing cartel, OPEC has considerable influence in determining global oil supplies and so the oil prices [3].

In case of India, government had implemented one of the biggest lockdowns in the world. This led to loss of economy as, among other reasons, the transportation sector was almost completely halted and so fuel consumption declined. Due to this low fuel demand and aforementioned factors, crude oil prices crashed at global level and thus production had to be cut down. Due to this extended lockdown all three sectors viz, Upstream, Midstream and downstream sector suffered heavily and many major projects launched before lockdown got delayed.

## Literature Review

There is a vast oil market literature [4]; [5]; [6]; [7]; [2];

[8] but as this health crisis is a recent and ongoing incident, the impact of the COVID-19 on O&G market is not yet adequately analyzed. The global economy could only grow at 2.4% as compared to expected 2.9%, as per report of OECD (2020). According to them, many central banks can adopt expansionary monetary policies and it is happening in many countries including India. In past, many studies have talked about impact of overall economic activities on oil price. For instance, Baumeister and Kilian (2016) showed that due to slowdown in economy after June 2014, crude oil price per barrel also declined by \$49 between June to December 2014. According to Killian [6] that decline was because of weakened demand for crude oil.

According to Fernandes [9], the mortality rates due to any disease has no relation with economic impact. He studied the relation between mortality rate due to 1918 Global influenza (killed 40 million people) and Ebola 2013- 2016(killed more than 11000 people) and came to conclusion that irrespective of mortality rate of any pandemic, economic consequences can be long-lasting and devastating.

ALOU et. al [10] employed the structural VAR model, developed by Primiceri (2005), with time-varying coefficients and stochastic volatility (TVP-SVAR model). They used this model to analyse the impact on the energy futures markets due to COVID-19 shocks, including S&P GS Indexes of crude oil and natural gas. They found that the energy commodities, S&P GS Indexes responded to COVID-19 shock and varied over the time not only because of fundamentals factors but also behavioural as well as psychological factors. According to them, there are 2 major factors responsible for the fall in oil futures prices (which went negative), firstly it was due to a structural imbalance between demand and supply, as demand decreased significantly after Covid-19 outbreak from many large emerging countries like India and China and secondly the shock caused due to fallout between Russia and OPEC which triggered the drop in spot prices. On the top of this, spread of Corona virus in

USA also adversely affected the commodity futures market and shale O&G production.

## Research Methodology

### PESTEL analysis

#### Political:

India is politically stable country and even during Covid-19 pandemic, it has not experienced any instability in governance. However, political interventions in Indian O&G sector is quite apparent from various policy decisions government has made so far. Before 1997, Indian O&G sector was dominated by only few National Oil Companies (NOCs) including ONGC, OIL, BPCL, HPCL. In 1997,

New Exploration Licensing Policy (NELP) was launched by the Government of India, to provide an equal platform to both Public and Private sector companies in Exploration and Production (E&P) of hydrocarbons. Due to limited success of NELP, government launched (Hydrocarbon Exploration Licensing Policy) HELP, with more incentives and benefits to investors. Beside this, in 2002, O&G sector was opened for private sector in all three sectors and prices were de-regulated by demolishing Administered Price Mechanism (APM).

Nevertheless, government kept interfering in price mechanism which was evident during international rise in crude oil prices between 2004-08 [11]. Despite rise in prices by almost 1.5 times, prices rose in India by just 0.5 times due to subsidies given by government to NOCs. Because of this, private sector companies, had to reduce its operations as it suffered losses. However, in 2010 for petrol and in 2014 for diesel, APM was completely abolished and yet during crude oil price hike of 2014, government did not allow to raise oil prices beyond certain limits.

Now, in recent developments of Covid-19, Brent crude prices were below \$30 per barrel. In this period, according to research analysts, Oil Marketing Companies (OMCs) earned profit as they inflated the market prices so the benefits were not passed down to consumers. Later on, as India imposed lockdown the revenue to federal exchequer reduced due to limited economic activities. Thus, Central as well as various state governments decided to

raise taxes on Petrol and Diesel, without allowing OMCs to raise it further so effectively government reduced OMC's profit margin to fill its coffers. Recent last tax hike was Rs 10 and Rs 13 on petrol and diesel respectively. This put India at top in World in terms of taxation.

In case of E&P, Government is promoting investments in India and has prepared Hydrocarbon Vision plan for North East Region to invest 130,000 Cr. Many new companies are bidding for blocks there and others have started exploration in new fields. Till now, in four rounds the government has awarded 94 blocks in the last two-and-a-half years with an exploratory area spread over 16 Indian sedimentary basins of about 1,36,800 square kilometres. The recent fifth-round of bidding under Open Acreage Licensing Policy (OALP) for the 11 O&G blocks, was opened in January and last date for submission was 18th March. This bid was first extended till April 16 and then till June 10, 2020. This fifth round has also merged two next, sixth and seventh rounds due to Covid-19 pandemic lockdown.

#### **Economic:**

Income of almost all O&G industries were affected due to decline in consumption amidst lockdown declared by government. Thus, the fortunes of downstream OMCs are unlikely to improve in nearby future. With high inventory cost and declining prices of all petroleum products, the dual attack is hurting revenues of all OMCs. According to CRISIL [12], Indian refinery industries would suffer inventory losses of more than \$3.3 billion in the January-March quarter after the 70% fall in oil prices. Covid-19 pandemic has dried up demand from airlines and road transport. Industry experts claims that, as compared to the prior lockdown period, the petroleum products consumption in the month of April was only 30-40%. Due to this, refineries were forced to bring down their capacity too. Had the lockdown ended by April 21, the consumption growth of petroleum products would have been around 2-3%, but now that it has been extended, it is likely to worsen.

Even after the pandemic is sorted out, fortunes of O&G sector are least likely to improve significantly. While Goldman Sachs claim that the cost per barrel will go above

\$40 a barrel, many others claims opposite to it. For PSUs like ONGC and OIL, around 70% of their revenue comes from oil production and due to cut in production, even their revenue generation is going to get affected. For instance, according to ONGC officials, the total cost of a barrel of oil produced by ONGC is around \$45 including cess, royalty and other sundry levies. So, when \$35/barrel was price of Brent crude oil, ONGC actually lost \$10/barrel. On April 22, Brent had crashed to a twenty-one year low of \$16/barrel. And thus. ONGC was losing Rs 6,000 crore annually on gas due to a pricing formula based on benchmarks in surplus markets. In addition to this, due to covi-19 impact and lockdown, ONGC has cut its Capital expenditure by round 5000 crore or 15% for 2020-21.

According to Moody's, OIL's EBITDA for FY21 will be about 55% lower as compared with FY20 and it0s credit metrics will be weaker than the tolerance level. Due to this, Banks may also not give loans to Oil companies.

On the top of this both central and state governments are increasing taxes on petrol and diesel to make up for the lost revenue due to lockdown. With the newly imposed taxes, which are highest in the world as on in June 2020, government has not allowed to increase retail prices thus companies had to adjust against their own profit margins. According to ICICI Securities, absorption of the latest duty hike by oil marketing companies has cut their net fuel marketing margins from Rs 14.5-16.5 per liter to Rs 2.3- 4.4 per liter.

Besides that, in April 2020, prices of natural gas were cut by 26% to its lowest rate since the pricing was made formula-driven in 2014. This move is likely to lower piped cooking gas and CNG prices but will also heavily affect the revenues of producers. ONGC is likely see a dent of close to Rs 4,000 crore due to this decision. On the top of this, many consumers invoked force majeure clauses which led to India's natural gas decline by 19% down in April 2020.

#### **Social:**

While there has been unprecedented decline in Oil prices at global level but it has not reflected in Indian market for users. This is due to

various reasons like earlier OMCs kept prices inflated to earn more profits and then government increased taxes on Petrol and Diesel. Thus, at social level, there is almost no impact due to changes in O&G prices.

Yet, as corona is likely to be a new normal in near future, thus, people may prefer private vehicles over public transportation, use of cars and bikes may see rapid rise. And as government is promoting competition in Oil retail markets, people may experience better quality service along with more safety measures at retail outlets. Better infrastructure at various retail outlets are likely to be the future as around 80,000 new outlets are planned to be opened according to CRISIL [13].

However, as profits has plunged currently due to low crude oil prices and many E&P works have stopped due to lockdown, many companies may cut the size of their workforce and this may adversely affect the job seekers in O&G sectors.

#### **Technology:**

In the recent development in between this pandemic, the nation's biggest oil firm, Indian Oil Corporation Limited [14], with all its 28,000 petrol pumps, has begun the supply of the world's cleanest diesel & petrol dispensing ultra-low sulphur fuel. BPCL and HPCL are also following the same lead and will soon provide clean fuel to all retail outlets.

Indian Oil Corporation Limited [15] with its expertise in Hydrogen production, is putting its might behind hydrogen fuel cell vehicles. Raw materials for hydrogen fuel cells can also be sourced locally. This can provide an alternative to lithium-ion battery-powered vehicles so as to reduce dependence on countries like China for battery import. With its strong balance sheet, IOL is now embarking project for hydrogen fuel cell vehicles worth Rs 300-crore. They are planning to build the hydrogen economy and hydrogen distribution network as future is with vehicles using alternative fuel.

During this pandemic many new technological interventions may come up or will be pushed by O&G industries for better safety and security of their workers as well as consumers. During this pandemic all three sectors, Upstream, midstream and downstream faced

one or the other type of difficulties in continuing their operations. Now is the time to implement new technologies to avoid disruptions in future.

In case of Upstream sector, many operations were stalled due non-availability of workers due to lockdown. Maintenance of the machineries and other containment initiatives were postponed. New technologies [16] using Internet of Things (IOT) or Augmented reality and virtual reality enabled Monitoring and Remote Diagnostics and Advanced AI models can be used for Preventive Maintenance so that dependence on the physical presence of the workforce can be reduced.

In early stage of pandemic, major refineries did not stop buying oil from exploration companies. However, after lockdown the demand of fuel fell abruptly and transport carriers such as rail tank cars, transcontinental tankers and tank trucks got queued up. Thus, keeping track of all this logistics and reducing pilferage and spillage from the containers is a difficult task. New technologies employed in this midstream sector are health monitoring and remote container tracking which provides ready alerts for pilferage and oil spillage and, besides this robust fleet management are controlling the already over-utilized transportation modes.

#### **Environment:**

Due to recent corona pandemic, worldwide use of hydrocarbon products have declined and existing as well as new E&P projects are also stalled. This is helping environment regain its breath and improve the air quality by reducing the pollution which was rising at high speed. The lockdown has helped Earth heal from the havoc that people were causing due to incessant use of hydrocarbon leading to rise in overall temperature of Earth.

#### **Legal:**

Corona pandemic has affected entire world and lockdowns were imposed in many countries including India. For its successful implementation some laws were introduced and one of the major laws was total ban of transportation except for essential services or goods. This deeply affected revenue of OMCs as they the sale at retail outlets declined abruptly due to less demand. To add to this

misery, government gradually started imposing more and more taxes on petrol and diesel. Government passed an amendment to the Finance Bill, 2020, which allowed them to raise the excise duty limit up to Rs 18 and Rs 12 on petrol and diesel respectively. In this, so far government has raised duty by Rs 10 and Rs 13 on petrol and diesel respectively. Although they have crossed the limit for diesel but still, they can raise duty on petrol.

On the other hand, Government is planning to bring O&G in GST ambit. Besides that, currently around 85% market is captured by NOCs and government has introduced new regulations to allow the entry of new private players to increase their share in Indian market under Authorization

for Marketing Transportation Fuels, 2019 [17]. According to this, any non-oil company with more than 250 crores can invest in petroleum retail market.

Furthermore, after the lockdown government may introduce new policy guidelines to OMCs for safety of consumers as well as workers for fight against corona and to reduce chances of infection. New guidelines of social distancing can also be made mandatory for E&P work.

Porter's five forces analysis Threat of New Entrants:

In case of Upstream sector, in 2019 under the discovered small fields (DSF) [18] policy, 67 DSFs were put on online international competitive bidding. some new entrants have won the bid and have begun exploration. Some other new entrants were Nippon Power, Oilmax Energy and PetroResources. In other case, originally these oil fields were discovered by ONGC and OIL but were unexplored due unviability of projects. But with current changed norms and increased incentives to developers, they were kept open for auction and some new player bided for it and won, viz, Ganges Geo Resources, a little-known private player won five bids. Arch Softwares won two contract areas. A consortium of Power and Shanti G.D. Ispat, Shanno Business India and Bagadiya Brothers also won two bids. Invenire Energy, Arsh Corporate Services, Gem Petro E&P and Keerthi Industries won one contract area each.

This shows that while conventional bigger players like ONGC, OIL are there in market

but now even the smaller private players are venturing into this high capex E&P sector.

Downstream sector: According to CRISIL [13] in India, the number of RIL outlets are 1400, Nayara Energy, formerly known as Essar Oil has 5525 Pumps and Shell own

160 outlets. Public sector retailers own 59,716 petrol pumps. On the top of that NOCs are planning to expand more than 70,000 outlets in near future and private sector planning to add around 8000 more outlets. However according to CRISIL currently there is room only for around 30,000 outlets to maintain current throughput levels so entry of more outlets will unnecessarily increase competitions and will reduce per outlet KLPM which currently is already low and stands at 160KLPM. Despite that, British Petroleum is investing over 7000 Cr in Reliance Industries Limited [19] petro-retailing business to acquire 49% share and will open over 5500 retail outlets in span of 5 years.

Apart from there smaller and local entrants some new major international entrants are also eyeing second largest O&G investment market. Recently major international companies signed deals with Indian companies to enter into Indian market and expand their network. ExxonMobil India LNG [20] Limited signed MOU with IOL to expand LNG business in India. They will deliver cost effective natural gas to consumers as LNG demand is likely to rise from 37 billion m<sup>3</sup> in 2018 to 75 billion m<sup>3</sup> by 2030. On the similar lines to exploit same LNG market, Total SA [21] has acquired a 37.4% stake in Gautam Adani's Adani Gas. They will be setting up 1500 CNG stations across India in next 10 years. Besides this, Saudi Aramco is investing \$15 billion in Reliance Industries Limited [22] to buy 20% stake in the company's flagship chemicals and refining business. This

will act as an entry gate for World's largest crude oil producer in India.

On the top of all this, to encourage alternate fuel, government is planning to open 12 biofuel [23] refineries with investment of \$1.5Bn. Furthermore, 5000 Compressed Bio Gas plants are planned to be opened by 2023 under the SATAT [24] scheme.

Bargaining power of buyers: Domestic market:

In India, transportation Industry, Households and other companies using fuel are the major buyers. As number of buyers are vast and suppliers are less, sometimes suppliers may have higher bargaining power in Indian market, for instance, recently at the outset of corona pandemic when Brent prices were low, Indian companies inflated the market price at retail outlets and earned more profits. Due to which, although at International platform Brent prices were historically low, but Indian consumers couldn't get enough benefits from this.

However, due to competition within NOCs and with rising private sector, the prices of the product almost similar at every outlet (sans government taxes) but they can maintain higher prices, for instance at Shell outlets, the cost of petrol is relatively higher than other NOC outlets.

International Market:

The main buyers of O&G products are: Refineries, NOCs, Distribution companies and overall, all these are included in country's energy basket. India imports more than 80% of its total need of crude oil. Currently India is 3rd largest importer of crude oil worldwide. Most of the countries from whom India import oil are members of OPEC and thus have to follow the standard price set by them. Global oil prices are determined by Global Oil Benchmarks viz Brent Blend, West Texas Intermediate (WTI) and Dubai/Oman. However, according to their quality characteristics (sulphur and density and content), the buyers can choose from variety types of oil. Nonetheless, pricing for all types of oil are as per the aforementioned three known oil benchmarks.

However, India [25] being one of the largest importers of crude oil from OPEC, has some bargaining power. OPEC had imposed Asian Premium of crude oil export to India and recently India asked Saudi Arabia to abolish it.

Bargaining power of suppliers:

In India is third largest importer of crude oil. In Indian market, some big suppliers in the O&G industry are fully integrated O&G industry. For instance, OIL is one of the largest companies with presence in all three sectors viz, upstream, midstream and downstream. Similar is case of other NOCs like ONGC and private sector companies like RIL, Shell India etc. Within

them [13], around 90% of market is covered by NOCs and private sector is trying to expand their network by investing and forming alliance with some major international O&G companies as mentioned before.

India's currently has 23 refineries [26] with refining capacity of 249 MMTPA. Among them, 18 are under public sector, 3 are under private sector and 2 are owned by joint ventures. Out of total refining production, the top three companies – IOC, BPCL and RIL - contribute around 66.7%.

Now the aforementioned facts may show that these companies hold the higher bargaining power, but in fact they hold moderate amount of bargaining power in Indian market. The reason behind this is interference by government in O&G sector of India and detailed accounts of how they are interfering and the consequences which oil companies had to suffer is already mentioned in Political and Economic aspects of PESTEL analysis.

Besides that, OMCs [13], private and NOCs combined, are investing into opening around 80,000 retail outlets and new rules for opening retail outlets only intensify the competition and will provide more options to consumers and thus further reducing bargaining powers of Suppliers.

Nonetheless, the bargaining power is moderate as the mostly only NOCs have network in relatively rural areas and thus for consumers of these regions, it difficult to switch the supplier. Also, prices in almost retail outlets (within respective states) are almost same in all NOCs and NOCs control 85% of market. In other case, only OIL is providing least sulphur and best quality petrol thus until other companies catch with that technology, it is going to dominate the market. India has implemented BS-IV norms and OMCs are asked to match the standard of productions, the sooner companies achieve that, the more bargaining power they will have.

Rivalry among existing firms:

The competitiveness of O&G industry and especially which have integrated network of upstream, midstream and downstream is intensive. While RIL has highest market capital mainly due to its investment in refineries, other companies have invested more in E&P sector.

Sr. No. Company name Revenue (till 2019)

Sr. No.	Company name	Revenue (till 2019)
1	ONGC [27]	USD 64 billion
2	Indian Oil Corporation [28]	USD 85 billion
3	Reliance Industries [29]	USD 92 billion
4	Bharat Petroleum [30]	USD 48 billion
5	Hindustan Petroleum [31]	USD 42 billion

Before 2002, entire market was dominated just by NOCs but after that private companies were allowed to enter in Market and now today, they have covered almost 12% of market. And private sector [13] will cover more than 15% in short span of time. Many local private players are getting into alliance with major global players to give tough competition to NOCs like RIL with BP Inc for KG basin, and with Saudi Aramco for refineries, Adani Gas with Total SA. Many other private players are also investing in retail outlets to expand their network to grab a piece in Indian market which earlier was exclusive for NOCs.

#### Threat of Substitutes

The main alternatives sources to O&G for producing energy which are used for heating, transportation, electricity etc. are, Coal and Nuclear Energy – which are mainly used for power generation in India. At household, government is promoting use of Biogas as fuel. Currently, India is the 2nd largest consumer of Biogas and is planning to open 5000 CBG plants.

Transportation sector is one of the largest fields to be dependent on crude oil. To reduce this, government is promoting Electric as well as hybrid vehicles and providing subsidies on the same. In last federal budget, government made provisions for battery charging stations of e-vehicles. In some cities like Delhi and Nagpur, e-rikshaws and buses are already in use and the numbers are escalating.

Besides that, as a competitor/alternative to battery operated vehicle OIL is investing in hydrogen cells. Government is promoting use of CNG in vehicle to reduce carbon emissions and replace use of crude oil. Government is planning to open 12 Biofuel refineries with an investment of \$1.5 bn. Many experiments are also being conducted to operate vehicles on

renewable energies like Solar energy. There is also concept of Hyperloop where pods travel mainly by magnetic field.

However, the investment required to replace oil altogether is enormous and R&D being done in this field is still embryonic and will take years to reach the level of replacing hydrocarbons altogether.

## Results And Analysis

### Impact on E&P – India

#### Oil & Gas Production Oil Production:

Due to lockdown, it is estimated that the decline in demand for crude oil in India will be more than 3.1 million barrel per day (mbpd). For instance, as the demand for refined products declined Cairn India has reduced its oil production by 20,000- 30,000 bpd as per Cairn officials.

#### Gas Production:

Lockdown lead to temporary shutdown of many industries along with lower demand from transportation and CGD (City Gas Distribution) business thus, gas production saw a reduction by 10%-15%. For instance, ONGC [32], India's largest gas producer, reduced its production to 53.4 Million standard cubic feet per day (MMSCMD) from 64.3 MMSCMD, almost 17% cut. CGD players as well as other Smaller gas buyers refused to buy gas from gas producers due to halted transportation.

#### Impact on Future Oil & Gas Investments

Due to decline in demand it is not viable to maintain the production volumes and due to same reason even the cash inflows of the companies are affected. This in turn has reduced the future investment of E&P players by more than 20% due to budget constraints, as ONGC cut by 15%. Such reduction in E&P activities in turn could delay the development of new O&G assets.

#### Profitability of Companies

As shown in PESTEL analysis, the low oil price scenario due to increased taxes are severely affecting the profitability of E&P companies. To make E&P activities viable after lockdown, it is imperative to provide a temporary tax holiday on royalty, cess and profit petroleum by the Government.

#### Field Service companies Operations:

Ongoing field operations were affected due to restricted movement of personnel and equipment. Contractors and employees were not able to reach to their respective facilities to carry critical tasks. As Domestic travel ban was imposed, the people working in the field were not able to return home which lead to over working and fatigue. The travel plans of expat crew are hindered due to ban on international flights. Therefore, crew replacement and rotation were affected due to such restrictions.

While importing goods, the essential services exemption had no applicability if the exporting country's flights were grounded and had lockdown. Due to local lockdown or unavailability of personnel even some of the essential service providers did not report for duty. Many manufacturing units were shut so due to absence of essential parts operations like drilling operations from a well integrity suffered. Today, due to non-availability of screening facilities of corona at sites, it's difficult to gauge the vitals of health statistics of workers.

#### 4.2 Impact on refining & marketing in India

##### Crude oil demand

The Government of India, March 25 onwards, announced a nationwide complete lockdown, so as to contain the Coronavirus spread in our country. This lockdown brought almost 70% of economic activity, exports, investment and discretionary consumption to halt.

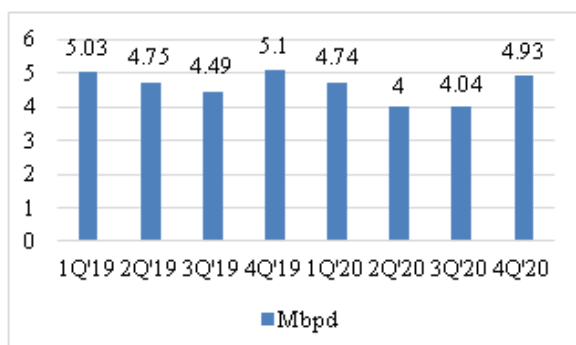


Figure: India crude oil demand in Mbpd [33]  
 India consumed 4.84 Mbpd of crude oil in 2019. According to OPEC study, as result of the lockdown due to COVID-19 pandemic, in 2020, overall, India's oil demand is expected to fall to 4.43 Mbpd. India's oil demand bounced into positive side in February 2020. It increased marginally by 0.04 Mbpd, but it was far from the average growth of 0.15 Mbpd of last three years.

Despite growth, the overall oil demand fell by 0.29 Mbpd Year-on-Year in the first quarter as the impact of the lockdown started appearing more in March. India's oil demand is further expected to fall by 0.93 Mbpd in the second quarter of 2020 and will only start recovering by 2021.

##### Demand for Key Petroleum Products in India

The long lockdown has severely dented the country's fuel consumption. In March it fell by almost 18% and in following month, April it further declined to more than 30%. As public movement and economic activity has come to a near standstill the demand for Petrol, diesel and ATF in the country has been severely impacted. However, as labor migration was permitted and at times sponsored by government so May-20 onwards fuel demand increased.

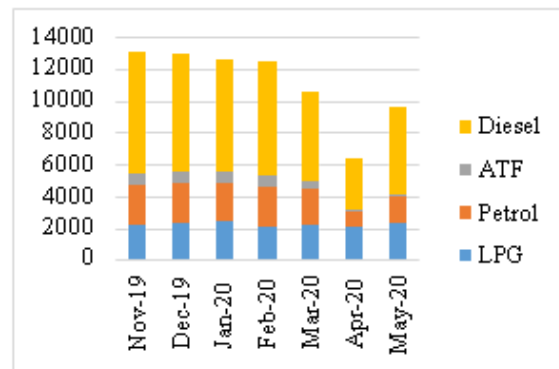


Figure: India - Petroleum products consumption in Million metric tonnes (MMT) [34]

In FY 2019-20, the growth in the petroleum products demand in India reached 213.67 MMT and shrank by 0.21%. During the last financial year, the growth in India's petroleum demand, has been the lowest in 10 years. As compared to February 2020, in March 2020, the demand for petroleum products fell by almost 2.1 MMT and by April 2020, by 8.2 MMT.

##### LPG

Even as the usage of transportation fuels took a beating, sales of LPG increased marginally in March 2020. Over FY 2019-20, sales of LPG in the country increased by 6%.



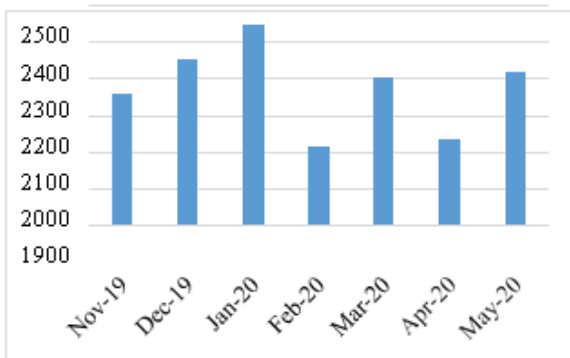


Figure: India LPG demand (Mmt) [34]  
 In March, due to multiple refills of LPGs, there was spike in LPG demand as compared to February. In March government declared to give free LPG cylinders to 8 crore citizens for the next 3 months and thus the loss in transportation was compensated by this supply of cylinders. Thus, the decline in demand was controlled.

**Diesel**

Diesel is primarily used in passenger vehicles, commercial vehicles, Indian Railways along with the industrial sector and agriculture and so it is the largest consumed liquid fuel in the country. Due to suspension of passenger train and restrictions on road transportation since March, consumption of diesel fell to 5.65 MMT, by 23% as compared to February which further declined by around 45% in April.

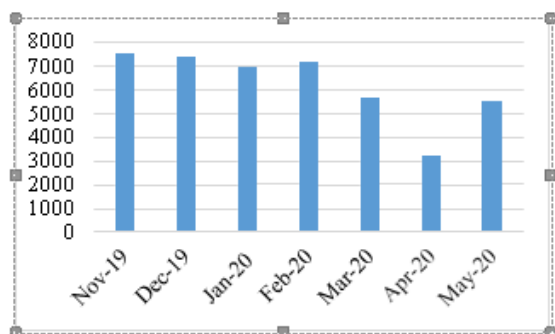


Figure: India Diesel Demand (Mmt) [34]

**Petrol**

Since last 30 months, India have witnessed continuous growth in Petrol demand but in March, it fell by around 15% to reach 2.15 MMT and by April it further declined to 0.97 MMT. During FY'19-20, petrol consumption posted a growth of almost 6%.

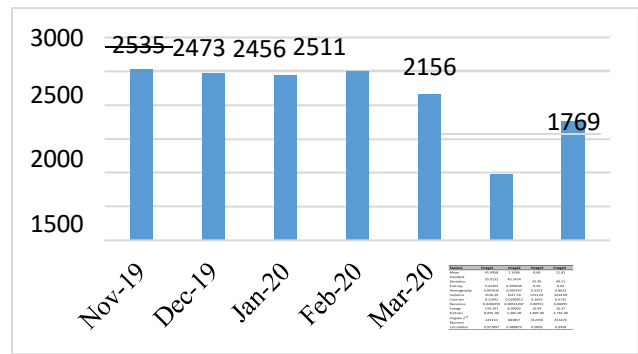
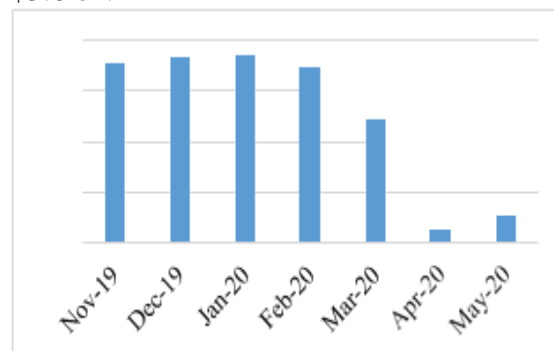


Figure: India Petrol Demand (Mmt) [34]

**Aviation Turbine Fuel (ATF)**

India has banned domestic as well as International flights except for emergency and for bringing in stranded Indians from foreign lands. Due to this, the second quarter of 2020 is going to affect aviation sector and so demand is likely to fall by over 60%. The Centre for Asia Pacific Aviation (CAPA) estimates that, in the April-September period, the Indian aviation industry will bear the losses of around \$3.6 bn.



3.6%. Since financial year 2013-2014, this was the first decline in annual consumption. Impact on Gas & LNG Market- Indian Perspective:

a) Impact on Natural gas demand:

In February'20, all India natural gas demand had increased 9.6% YoY with RLNG increasing 29% YoY. This rise in demand was because of buying of distressed cargoes as China issued force majeure on LNG cargoes because of lack of domestic demand in their country and thus the prices fell. Nonetheless, the 75 days lockdown had affected March-April'20 demand mainly from key segments like city gas distributors, gas-based power plants, petrochemicals, refineries and fertilizers to some extent. During February'20 [35] the total consumption of natural gas was 4631

MMSCM and their sectoral consumption of natural gas was

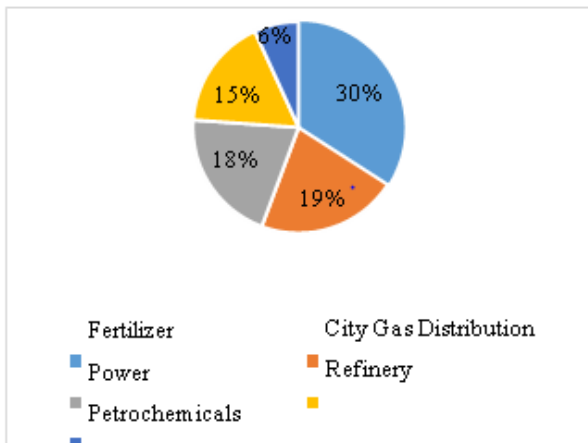


Figure: Sector wise consumption of Natural Gas

**Fertilizer Sector:** Under Essential Commodities Act, the fertilizer plants in the country are allowed to operate. It made sure that agriculture sector would not feel the brunt of lockdown as for the upcoming Kharif season farmers needed adequate fertilizers. Therefore, it is expected to be the least impacted segment.

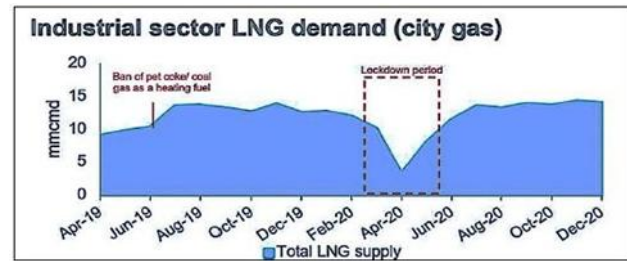
**CGD Sector:** As transportation sector was almost shut so CGD entities saw a deep decline in the sales volume. In near future, people are least likely to use public transport like buses so the sales won't revive anytime soon, however in long term with rise in private vehicles, this sector will prosper.

As many industries like tiles, refineries, petrochemicals and chemicals among others were either completely shut or were operating at lower capacity, there was significant decline in Industrial/commercial (IC-PNG) segment. According to Wood Mackenzie, in the CGD sector, demand drop of LNG was expected in the range of 70-90% during lockdown period.

Figure: India ATF Demand (Mmt) [34]

ATF consumption in the country declined to 0.48 MMT by over 32% in March to just 0.05MMT in April. Compared to the previous financial year, ATF consumption in financial year 2019-2020 declined to 8 MMT by around

Figure: City Gas demand by Energy sector



**Power Sector:** In the April'19- February'20, the consumption of LNG by India's power sector jumped 32% to 3,446 MMSCM which was highest as compared to the same period from last year. However, in April, the daily power consumption of country has fallen by around 26%, due to weakened demand from offices, industry, commercial establishment's closure, according to Power System Operation Corporation.

**Refinery & Petrochemical:** As compared to the corresponding period a year ago, the consumption of LNG of India's oil refiners increased 12% to 6,096 MMSCM during April'19 -February'20. However, according to industry officials, due to reduced demand Petrol, Diesel, Fuel Oil, ATF and Bitumen; The throughput of Many major refineries has been reduced by up to 50%.

**Impact on Domestic gas production**

Various industrial customers that have shut due to the lockdown have sent force majeure notices to their gas suppliers such as the city gas distributors and other gas suppliers who have in turn sent similar intimations to gas marketers and domestic gas suppliers.

Many industrial customers have sent force majeure request due to temporary shutdown of production and thus demand for gas has declined and so the production. According to PPAC, for the period April'19- February'20, India's domestic gas production stood at 79 million standard cubic meters of gas per day (MMSCMD) and with 64 MMSCMD (~80%) ONGC was the largest domestic producer during the same period. After the lockdown, 1st week of April'20 ONGC had to reduce its production to 53.4 MMSCMD from 64 MMSCMD. Such is the case of other small producers as well and experts claim that overall production is likely to go down by around 20%.

**Impact on Gas Transmission Players:**

Due to low transmission volume, gas transportation entities are also facing

challenges. Such companies are paid as per unit of volume transported and due to low transmission, it would result in lower transmission revenue. In case of gas transmission, the business operates on the cost-plus model, so if there are lower volumes the risk lies on the transmission company. Now due to demand slump, the utilization levels of the pipelines have fallen and thus it is hitting on their revenues.

This low cash inflow is likely to affect investment and construction of new pipeline projects.

**Impact on LNG Terminals & its utilization:**

Due to low international prices, India procured a record more than 40 deliveries of cargoes in February, and it was the highest-level procurement since the country began imports in 2004. However, it was short lived purchase as after lockdown many Indian companies declared force majeure. 19 LNG ships, from 24th March – 14th April'20 was offloaded, with total volume of 1.232 MT, in India. As compared to period before lockdown, the LNG off take was down by 23%. Even after that, as the lockdown was further extended more force majeure notices on long term cargoes were issued.

In between April 2019 and February 2020, the 17.5mn t/yr Dahej [36] facility operated at around 104% capacity. In the 1st week of April'20, this fell below 50% from around 70% at the end of March'20. Almost similar was the case of other terminals as well

**DISCUSSION Challenges faced by Indian E&P Companies**

**E&P Projects Delay:**

Due to dependency on a complicated global supply chain of equipment and expertise many complex upstream projects are likely suffer the hardest. This will result into delays in original schedules of many development, exploration and enhanced oil recovery projects. This will delay production from many new fields. The lockdown across India disturbed the timelines of the contract of the companies working in exploratory drilling and on seismic data acquisition.

**Managing Exploration & Production operations:**

Due to lockdown maintenance plans of many affected wells/pad suffered as the replacement parts or requisite man force was not available. Many E&P companies had to put well service activities on hold because service providers were not able to serve the operators. Managing the contract workers for processing plants, drilling rigs and workover rigs was a big challenge for many E&P operators due to absence of transportation facilities. Overall drilling cost and time was getting affected because of disruptions in crucial supplies for the drilling services.

India's largest offshore operator ONGC, suffered heavily due to absence of offshore helicopter services which left offshore personnel with extended duty days (officially it is 14 days) at the offshore platforms. In case of other small producers, the disruption in supply chain brought their operations to stand still.

**Challenges for Indian Refiners**

**Falling Demand:**

Most factories in India were shut, transportation was down to less than 10% of normal level as passengers as well as cargo movements were grounded during lockdown period, this severely affected the fuel demand and thus had catastrophic impact on earnings of refiners. The 3 national refiners which have coverage of over more than 85% of market had to cut production thus operating in such challenging times will be trickier for Indian refiners.

**Storage Access:**

Indian refiners are facing severe inventory loss because they made their purchases from February-March, which were relatively higher by then. This is burden of dual payment, one for inventory and other due to loss in sales. For instance, Reliance Industries Ltd is operating the world's biggest refining complex, suffered its worst profit in 11 years in the March quarter due to tumbling oil prices. According to CRISIL, Indian refinery industries would suffer inventory losses of more than \$3.3 billion in the January-March quarter after the 70% fall in oil prices.

**Impact on ongoing and future LNG Projects**

**Development of CGD infrastructure projects halted:**

As transportation sector was halted, midstream companies couldn't get enough component

supplies and imported products which were essential for the CGD infrastructure. Due to lack of manpower, setting up of the spur pipeline or trunk pipeline was also delayed and thus pushed back the timeline and overall project execution by around 3 months

Development of Pipeline infrastructure projects halted: Due to cash crunch, capital expenditure on various pipeline construction was squeezed and thus it took a hit, for

instance, before lockdown stopped all construction activities GAIL [36] was building multi-crore gas pipelines on over 323 sites to connect fuel sources with consumption centres including major pipelines like: Dhamra–Angul & Dobhi–Durgapur (901 Km): Bokaro–Angul & Durgapur– Kolkata (1001 Km) and Barauni – Guwahati Pipeline (716 Km). But after the lockdown was announced only one third of the sites were operational

On similar lines, in last two bidding rounds, 9th and 10th,

136 new Geographical areas (GAs) were authorised by Petroleum and Natural Gas Regulatory Board (PNGRB). Around 40 CGD entities won the and they had to construct 8,181 CNG stations, provide around 423 lakh PNG connections and build 1.74 lakh of steel pipeline (inch-KM) by 2029. However, due to aforementioned reasons all the works were affected and PNGRB has given extension of 3 months for project completion.

Development of LNG Regasification Terminals halted: In case of LNG terminals, a regasification project with project cost of US\$237 million and capacity of 195 Billion cubic feet, Jaigarh Port Floating, [37] is scheduled for commissioning in Q2 2020. The project is located in Maharashtra and as it is one of the highest affected state many activities in Maharashtra is banned and state is under lockdown and thus the commissioning of this port is likely to get delayed. In April 2020, the state of Odisha to order a temporary shutdown of Dhamra LNG Terminal which is scheduled for completion in mid-2021. Same is the case of Jafrabad, Karaikal and Chhara plants.

### Conclusion And Recommendations

Practically every major infrastructure/energy/industrial sector in India

has witnessed the present financial quarter getting washed away almost completely under lockdown and the next two financial quarters will be the minimum period required to see some tangible recovery to pre pandemic levels for these sectors including O&G sector. In our paper, we used Pestle and 5-porter model as part of our research methodology to analyse and discuss impact of Covid-19 on the Indian hydrocarbon sector from upstream to downstream. We will not summarise our above results and challenges again here but instead want to share a thought/ approach which we believe will be a long-term sustainable solution for the O&G sector in the face of crisis and that is the need of the hour and it is also our recommendation. We have talked about two approaches, first business as usual or second new strategies for sustainable future by resetting the button.

Hydrocarbon sector has always been in the line of fire for climate change issues, geo political issues including wars and toppling of governments etc. Other challenges daunting O&G industry are capital intensiveness, uncertainty with pricing and supplies, safety and stringent compliance to environmental laws, monopolistic approaches, skewed energy consumption globally, energy security etc. so do we really want go back to all this Post pandemic or use this lockdown time to proactively prepare for a more sustainable energy future?

A ex CEO of Shell company said that O&G will be primary energy provider globally for better part of this century but at the same time we have to use this energy resource judiciously and efficiently to secure it for our future generations. We also have to develop renewable energy resources and projects in parallel to aptly complement the hydrocarbon resources. This two-pronged approach will ensure a sustainable energy future for all. This is what we mean to press the reset button. Our central government is exactly working on this strategy. Moving forward, there will be more use of AI, Machine learning and analytics in O&G to address risk with respect to finance, pricing and demand/supply. Present trends are indicators moving in this direction. O&G companies are now willing to

spend more on R & D to develop green and integrated technologies.

India has decided to be a gas driven economy and is estimated to grow at 250% by 2040. National gas grid expansion project is a major infrastructure development in that direction and this will greatly reduce our Oil imports. To give an example, in two years from now, CBM gas from Jharkhand will be readily available in Bangalore. M&A of oil PSU's has strongly positioned our companies in global market and have given them more power to negotiate given the fact that we are a major oil gas importer. A major reset button pressed during this pandemic is formation of IGX Indian gas trading hub. This development will bring in price stability and more Options & future contracts.

During this pandemic, the decision taken by the government to allocate coal block to private players, Essar oil taking lead in CBM development and many new Indian companies entering the hydrocarbon sector through the last two bidding rounds are clear indication where energy sector is moving in terms of accountability and maximum domestic resource utilisation. So, our idea of resetting the button is to convert this Crisis into an opportunity. In the past century, many pandemics came and went, world wars and

economic recession/depression were witnessed for varying periods of time but they too are an history now. In the future also many such crisis will come in different forms. O&G sector in India can stand up and regroup with renewed and refined strategy based on some of the points mentioned above and then there is little chance that the sector can get bogged down, face depression or paint a pessimist picture.

In conclusion, during the recent cyclone that hit coastal Maharashtra, those structures which had strong foundation or that tress which were deep rooted by taking shelter of Mother Earth survived while others collapsed or were blown away. So, if our O&G sector use this pandemic time to rest and make stronger it's foundational policies, direction, strategies then it will survive Covid-19 and future crisis as well.

### Limitations

The topic is recent so most of the data was collected from reliable newspapers like economic times and business standard. Also, some of the content was from interviews and webinars organized by CRISIL Ratings titled "The crude crash cascade - Impact of low prices on India Inc and other such agencies.

The research is limited to study till April end and only for India.

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## FACILITATING FACTORS IN RETAINING MID-CAREER WOMEN PROFESSIONALS IN AN INCREASINGLY VOLATILE TALENT MARKET

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### ABSTRACT

*Recent reports and statistics have implied that women are not reaching top levels of management despite higher numbers of women actually entering the workforce, corporate India needs to understand factors that would encourage more women to stay on course in their careers.*

*Previous research has shown that women tend to exit careers at two critical phases of their lives, either with the birth of the first child or at the very critical mid-career phase. The purpose of this paper was to identify facilitating factors that could help organisations to retain mid-career women and enable these women to think about applying for higher level positions.*

*A survey was conducted with 282 women professionals to identify what factors they considered as ‘Facilitating factors’ in their career development and advancement and if these factors would enable them to stay in their jobs and encourage them to apply for higher level positions.*

*Factors such as support systems at home, a good and fair organisational culture, supportive management and supervisor, good work life balance policies were some of the factors identified as ‘Facilitating factors’ all of these factors showed a positive association to women wanting to stay in service and intent to apply to higher level positions..*

**Keywords:** Mid-Career women, Talent management, Work-Life Integration, Women’s career development, Facilitating factors

### Introduction

In 2018 The World Economic Forum published the Global Gender Gap Index report [1] which has many indicators, one of which is ‘Women’s labour force participation rate’, The report placed India at 108th position out of 144 countries for the year 2017 with a participation rate of 27 percent, down from 37 per cent in the previous decade despite having achieved a higher share of graduating women - 42 per cent. India is the only developing country that has seen a deterioration in women’s participation in the labour force. The report further states that for women in paid work and white-collar roles nearly 50 per cent drop out between junior and mid-levels, compared to 29 per cent across Asia.

A global study conducted by Grant Thornton in 2017 [2] of 5,500 businesses in 36 economies reports that “India continues to rank third lowest in the proportion of business leadership roles held by women for the third year consecutively”. The report further states that only 7.7 per cent of board chairs, 7 percent of the senior management - CEO/ Managing

Director and 17 percent of senior/mid-level positions are occupied by women in India. Even more astonishingly 41 percent of the Indian organisations that were surveyed did not have any women in management roles.

According to a study published by the ManpowerGroup in 2018 – The Talent Shortage Survey [3] – globally companies are currently facing the most severe talent shortage in over a decade and India is one of the ‘top 10 most-affected markets’. The report additionally elaborates that difficulties in filling vacant positions are being faced by around 56 per cent of Indian companies.

All the above findings render a bleak picture for Indian industry, on the one hand there seem to be talent shortages and on the other hand seemingly very little is being done by the very same industry to plug the talent outflows especially of women from the workforce. To further enhance the case for ensuring women stay on in the workforce a startling statistic revealed by IMF chief Christine Lagarde in 2015 stated that India’s GDP would increase by as much as 27 per cent if women’s

participation in the workforce were to become on par with global standards.

Many studies both global and Indian have tried to identify barriers to career progression of women, this paper seeks to acknowledge that though barriers do exist, a different side of the equation would be to understand why women stay i.e. what are the facilitating factors that enable women to stay in their current jobs or careers and what factors would help them to aspire to higher level positions. An attempt to address this particular research gap will be of interest to Indian industry and specifically those that may be hoping to enable more women who show potential to stay on longer to achieve greater career heights and success. With this in mind the researchers have exclusively focused on Mid-career women with at least 12 years of work experience.

### **Theory and Hypothesis**

Researchers have contended that to understand women's careers necessitates a diverse outlook and consideration of issues under a different lens than what is used for men, for instance, for women, career success or job satisfaction may appear different than that of a man. Also, a keener appreciation for balance and both work and family factors is also more relevant where women are concerned. [4] [5] [6]. Taking this into account concepts such as the protean career concept [7], which states that career paths are or should be driven by the individual's identity and values and not by the organization's needs, outlook and norms may be a much more relevant concept to study women's careers as women generally tend to follow non-traditional career paths [5]

### **Mid-Career women**

#### **Definition of Mid-career**

'Mid-career' is defined by Schner and Reitman, [8] as a "transition period of intra-career role adjustment". Burke, Vinnicombe, O'Neil and Bilimoria, [9] have defined it as 'mid-life or middle adulthood' and lies between 35 and 45 years. In fact, O'Neil and Bilimoria, [10] have said that the term mid-career was traditionally used to accentuate a sense of 'tenacity' in people in mid-life who fell between the 30 to 40 age brackets [11]. At this Mid-career stage Auster, [12] states that

many women face difficult compromises with respect to the needs of their children versus performance related organisational expectations as they move higher up their career ladders.

### **Organisational issues and Mid career women**

For mid-career women satisfaction is greatly influenced by flexible working patterns [12]. Marcinkus, Whelan-Berry and Gordon, [13] further report that for these women organisational support is positively associated with career achievements, organisational commitment and job satisfaction.

Many Indian companies today offer flexible work arrangement. Flexible work arrangements have been shown to promote freedom, studies indicate that people are tempted to work longer hours, sometimes even on weekends and evenings thus defeating the purpose, causing the boundaries between home and work to become blurred which can become particularly stressful especially if childcare responsibilities are also in the picture. Studies like the one by O'Connell and Russell, [14] indicate that employees may actually not be availing these policies as there is a negative connotation that is felt by them in availing these policies. [12][15] [16]

In two separate studies on flexible working Hochschild, [16] and Drew and Murtagh, [15] found that women opined that opting for flexible options at the workplace would in some way jeopardise their careers or they would lose their job security or other benefits. In these same surveys it was found that the overall managers perceptions about women who availed flexible or WLB policies was that they were lacking in commitment and seriousness towards their careers. This coupled with male attitudes and perceptions that men are more capable and suited for Leadership positions act as deterrents for women motivated to reach higher positions [17]

Hyman, Baldry, Scholarios and Bunzel, [18] reported that work intrudes into non-work domains when combined with a poor emphasis on work centrality and pressure from the organisation. Hyman and Summers, [19] further state that balancing the two domains is still challenging for many women and Burke, [20] argues further that women often feel



disillusioned, disturbed and dissatisfied when work interferes with their ability to care for their family.

Another factor that is well publicized and needs a special mention is the glass ceiling effect, Morrison, White and Van Velsor, [21] state that this effect disadvantages women who aspire for organizational advancement, which results in a lack of women reaching top corporate positions. Adding to this Ryan and Haslam, [22] present the notion of the 'glass cliff' defined as a 'precarious position at the top of the organizational hierarchy' which implies that women who do reach leadership positions, do not reach there in optimal conditions.

Other studies report that men and women equally suffer stress and also feel anxious about work-family balance and workload, but the McKinsey (2015) [23] report found that a combination of these three factors is more likely to be reported by women as the key motive they do not strive for higher level jobs. Additionally, it is seen that both women and men have contradictory standards and with reference to workplace relationships and promotions. Davidson and Burke, [24] state that in over-all men seem to be more attentive when it comes to professional opportunities whereas women seemed to put a larger importance on workplace relationships. O'Neill Vandenberg, DeJoy, and Wilson [25] additionally state that women strive for achievement in their professional life along with or parallel to their personal life. Moreover, Gino Wilmuth, and Brooks [26] state that women, when compared to men, are less likely to see advancement as a significant goal if it brings bigger responsibilities at work and may put them in the stressful position of having to choose between family/life and career goals.

### **The Indian Context**

Research in India on support systems has indicated that the 'joint family' structure is slowly disappearing and is an almost redundant concept in urban India; hence traditional support systems have gradually disappeared. Families have become nuclear where both the spouses go to work [27], and despite more women entering the formal labour market, household tasks, chores and caring

responsibilities are still predominantly performed by women [28].

In other studies, Adya, [29] found that balance was one of the frequently cited challenges of women in I.T. and Niharika and Supriya, [30] found five factors that contributed to work life balance of women in the I.T. industry mainly, telecommuting, flexi time and accessibility to child care facilities as also the ability to take time off in emergency situations.

In another study Krishna Reddy and Vranda, [31] report that work to family conflict (WFC) and Family to work conflict (FWC) both exert more negative influences in the family domain over the work domain. While Mathew and Panchanatham, [32], found that work life balance was chiefly affected by factors such as dependent care, health, role overload, absence of social support networks, mis-management of time. Baral and Bhargava, [33], reported that gender is a moderator when it comes to work life balance policies and work family enrichment and women tended to be more affected than men.

### **Facilitating factors**

Though extensive literature exists on barriers to career advancement and talent retention with respect to women, in comparison very little literature is available regarding what keeps women in their jobs, the authors therefore have tried to identify some critical factors that act as 'Facilitators'. The researchers postulate that there will be a positive correlation between almost all these facilitating factors as they are all inter-related and will all contribute heavily to women not only staying in their jobs but applying to higher level positions.

### **Work-Life Balance (WLB)**

Interest in the concept of Work life balance/Integration and conflict has been around for the last fifty years or more but it has increased manifold in recent years, in fact, Siegel, Post, Brockner, Fishman, and Garden [34] report that work-life conflict is undoubtedly higher now than it was a few decades ago which has sparked innumerable studies into various aspects of this issue. Many studies have focussed on the linkage between Work-life balance and career satisfaction, job satisfaction and career advancement. There are certain empirical studies that have found that

both organisational performance and employees' performance is positively associated to Work Life Balance [35] [36]. Research conducted by Nelson, Quick, Hitt, and Moesel ; Scandura and Lankau; Cegarra-Leiva Sánchez-Vidal, and Gabriel Cegarra-Navarro, [37] [38] [39]; all have come to the conclusion that WLB performance and low turnover intentions are positively affected by the level of job satisfaction.

Work Life Balance is many times explained through the concept of 'cross-domain transfers' of positive or negative interactions and experiences innumerable studies have explained these effects in detail, this particular study however has focussed on 'overall satisfaction' with work-life balance [40]. According to Valcour [40], Satisfaction with Work-life balance is defined as

"An overall level of contentment resulting from an assessment of one's degree of success at meeting work and family role demands".

**Hypothesis 1:** Work Life Balance will be positively related to Intent to apply to higher level positions

**Hypothesis 2:** Work Life Balance will be positively related to both Job Satisfaction and career Satisfaction

### Support systems

Research has shown for an employed professional, both work and non-work sources can supply some sort of support or support system [41] [42]. The different sources that have been established by many researchers are organisational support through different policies and programmes [43] and support from friends or family, colleagues and supervisors [44].

A) Family-supportive organizational perceptions (FSOP)

Numerous studies have proved that perceived organizational support is associated to greater organisational commitment, high satisfaction, and lower [43] [45]. Another finding from a longitudinal study conducted by Thompson, Jahn, Kopelman and Pottas [46] quoted by Ayman, and Antani. [47]. stated that "informal organisational family support increased retention possibilities and organisational commitment". In additional studies by Grover and Crooker [48] and Casper Martin, Buffardi and Erdwins, [49], found that when women got

support from the organisation, they were more likely to be committed, and would show lower levels of turnover and higher intention to stay levels.

FSOP is defined as the perception that an individual has that the prevailing policies, systems, procedures etc are supportive of the employee's family or other facets of his or her life. [50]. Evidence suggests that, for many employees support from their immediate supervisor, a mentor or in general from the organizational culture, positively affects measures of the work-family boundary [51] [52] [53] through several different means such as feeling increased perceived control [54] and lessening of job strain [55].

It has been found that employees will generally segregate what they perceive to be support from the direct supervisor, their team and the organisation [50]. Staff who thought their workplaces were being less family-supportive all reported greater turnover intentions and work to life conflict and lowered levels of job satisfaction [50].

FSOP has three main elements Family-supportive policies (such as child care and flexitime) that help to reduce the burden of day to day family responsibilities. The family-supportive supervisor who is concerned and accommodative to the support needs of the employee and the Family supportive organisation. which incorporate both specific management behaviours and general organizational perceptions regarding support.

In India however, employers have historically been known to provide very few family support programmes for their employees compared to their Western counterparts, the situation however is changing [33] [56] and the IT industry which functions more on a Globally parallel level is an example of a forerunner in this area.

**Hypothesis 3:** FSOP will be positively related to Intent to apply for higher level positions

**Hypothesis 4:** FSOP will be positively related to Job Satisfaction and Career Satisfaction

**Hypothesis 5:** FSOP will be positively related to WLB

B) Support systems outside work (SSOW)  
The topic of Social support from family and 'outside of work' sources has received less

attention than work-related sources of social support [42]. Studies have revealed that general health and well-being is positively associated with Social support from family and friends. A particular research study by Kaufmann and Beehr [57] that looked separately at outside work foundations of social support, stated that job satisfaction was significantly related to emotional support from friends and family. Adams King and King, [42] further state that Family members have an exclusive opportunity to offer both emotional and instrumental support to employees outside of the workplace. Research also exists on the efficacy of Support systems outside the workplace and their various positive outcomes at home [58] [59] [60][61]. Research also suggests that positive relationships exist between social support systems and career success [42], career development, [60], work satisfaction and work performance [58]. Further Bekker, Willemse, and Goeij [62] state that employees who are less eager to seek social support often face Family to Work conflict.

In India one of the biggest forms of support comes from other sources too such as extended family, grandparents, neighbours and hired or domestic help, most Indian household will have some form of hired or domestic help, some will have the option of relying on grandparents, extended family or neighbours very little literature exists on the role of these support systems in the available literature. This is a very relevant gap in research that needs to be covered in future studies. In the present study the authors have tried to address this lacuna by testing for Family support, spousal support and support from hired/domestic help.

**Hypothesis 6:** Support systems outside work will be positively related to Intent to apply to higher level positions

**Hypothesis 7:** Support systems outside work will be positively related to Job Satisfaction and Career satisfaction

**Hypothesis 8:** Support systems outside work will be positively related to Work life Balance  
*Job satisfaction (JS) and Career Satisfaction (CS)*

Career satisfaction can be defined as “the overall affective orientation of the individual toward his or her career” [63] and is generally seen to be a measure of subjective career

success wherein employees assess their level of professional development in relation to their individual ideals and objectives [64]. Korman, Mahler, & Omran, [65] also define it as the “contentment employees derive from various aspects of their career trajectories, including success, advancement, income and development opportunities”.

Job satisfaction, on the other hand, takes into account the present circumstances of an individual’s job situation. This implies that Career satisfaction is a much broader term than Job satisfaction and encompasses a wider variety of pertinent facets. Career success thus consists of responses to real and expected career-related achievements. However, researchers have also suggested that because of these differences they should be considered as separate concepts and variables in further studies

Rambur, McIntosh, Palumbo, and Reinier [66] have observed that Career satisfaction is related to turnover intention and leaving an occupation. Job dis-satisfaction has also been frequently identified as the single most significant motive for why people quit their jobs [67].

**Hypothesis 9:** Career Satisfaction and Job Satisfaction will both be positively related to Intent to apply to higher level positions

**Hypothesis 10:** Career Satisfaction and Job Satisfaction will both be positively related to each other

*Intent to apply to higher level positions (IAHP)*

Global trends show that the managerial careers of women seem to be less successful than men’s [68] [69] [70]. This proposes that women in mid-management experience substantial challenges and barriers in their careers that hamper their advancement to senior or leadership positions [24] [71].

Despite studies that assert that women leave the workplace for family reasons researchers such as Sullivan and Mainiero [72] have claimed that “women leave organisations for many of the same reasons as men—boring jobs and lack of advancement opportunities”. They further assert that organisations need to frequently scrutinise the number of women in “the pipeline” especially in key middle level jobs. They go on to add that along with these activities an assessment of promotion and

reward systems, whether women have been gaining the necessary work experiences, whether they have access to network connections, mentorship opportunities and are visible in the organisation hierarchy should also be ascertained, this would ensure that women are not prohibited from advancing to the upper level management positions.

Many studies exist related to parallel or associated concepts such as career progression, career advancement, career aspirations and even different types of career paths to reach the top, however the majority of the research evidences the barriers and challenges that women face, there has been very limited research on the facilitating factors that help women stay in their jobs and aspire to higher level positions.

The researchers have tried to bridge this research gap by identifying women's 'Intent to apply to higher level positions' and how various facilitating factors would enable this.

*Other Facilitating factors within the organisation*

#### **Mentorship programmes**

Career theorists right from the 1970's have defined mentorship as having inordinate possibilities to augment the progress of employees in the mid-career stage [73]. Kram and Isabella [74] and Phillips-Jones, [75] suggest that Mentorship programmes can be helpful in aiding personal growth and career advancement. Quite a few studies have looked entirely at women and mentoring relationships. For example, one early study by Riley and Wrench [76] revealed that women reported greater job satisfaction as well as job success levels if they had one or more mentors over women who did not. Studies have also revealed that although women can profit from mentoring and mentoring programmes, frequently and ironically female mentors seem to be lacking. [77]. In the present study the researchers have tried to assess the opinion of mid-career women as to the efficacy of 'Mentorship' as a facilitator in career progression.

#### **Networking opportunities**

Networking is another factor which has been generally perceived to be important for enabling women employees to reach higher

managerial jobs and attain enhanced career achievements [78] [79] [80]. Male dominated and patriarchal history coupled with cultural, social norms and an outdated legal system have led to a severely gendered view of networking in India [29]. It has been found that women managers have fewer and under-developed informal networks when compared to men, this is a vital factor that affects advancement of women to higher levels of management. [81].

Women are typically left out of 'male dominated' old boys' networks at the workplace and on social platforms. These "old boy" networks are traditionally made up of individuals - predominantly men - who are in positions of power in the organisation [82] [83]. Burke and McKeen [84] noted female managers still do not have access to these organisational networks that influence important decisions such as promotion to higher levels. In the present study the researchers have tried to assess the opinion of mid-career women as to the efficacy of 'Networking' as a facilitator in career progression.

#### **Sample**

A questionnaire was administered to 288 women professionals in the age group from 36 to 45, who had put in at least 12 years of service and were at the time of the survey in full time employment and who were identified to be in the mid-career stage of their careers. An attempt was made to cover women from as many varied industries as was possible. Annexure 1 shows demographic variables of the sample.

The questionnaire consisted of two parts, the first part asked the respondents basic questions such as age, religion, marital status, total years of work experience and so on. The second part consisted of a mix of some previously validated scales to test for level of Family-supportive organizational perceptions (FSOP), Work-Life balance (WLB), Career Satisfaction (CS) and Job satisfaction (JS). A scale was developed by the researchers to measure Support systems outside work (SSOW) and Intent to apply to higher level positions (IAHP). A pilot study was conducted to firstly to confirm validity of the scales used in this study and secondly to identify the prime barriers and facilitating factors from among

those identified in the literature review these factors were measured using a Bipolar scale, since the focus of this paper was on the facilitating factors data from these two factors from the main survey have only been presented here.

### III Measures used

#### Family-supportive organizational perceptions (FSOP)

Family-supportive organizational perceptions were assessed using a scale developed by Allen [50], which was developed from the work of Thomas and Ganster [85] who defined family-supportive supervisors and family-supportive policies as family-supportive dimensions at the workplace. Allen also added a third element which was 'Managerial/Organisational support' from the work of Thompson Beauvais and Lyness, [86] to form a 14-item scale to test FSOP. Participants were asked respond to the following prompt, "To what extent do you agree that each of the following statements represent the philosophy or beliefs of your organization." A sample item from this scale is, "Employees are given ample opportunity to perform both their job and their personal responsibilities well." The items were rated on a 5-point response scale ranging from 1 - strongly disagree to 5 - strongly agree. (FSOP,  $\alpha=.86$ )

#### Work-Life balance (WLB)

Work-life balance (WLB) has been measured using a five-item measure developed by Brough, Timms and Bauld [87] which has been tested in Anglo and Asian cultural scenarios. The Cronbach's alpha for the work-life balance measure was reported to be from 0.84 to 0.94 in various previous studies. Participants were asked to respond to the question 'When I reflect over my work and non-work activities (your regular activities outside of work such as family, friends, sports, study, etc.), over the past three months, I conclude that:'. A sample item from the scale was "Overall, I believe that my work and non-work life are balanced." The items were rated on a 5-point response scale ranging from 1 - strongly disagree to 5 - strongly agree.

#### Career Satisfaction (CS)

Career satisfaction was measured using the five-item scale developed by Greenhaus, Parasuraman, and Wormley [88]. This scale has been validated multiple times with Cronbach's alpha measures ranging from 0.70 to 0.87. A sample item from this scale is "I am satisfied with the success I have achieved in my career". Responses were recorded on a five-point Likert type scale which read from 1 - strongly disagree to 5 - strongly agree

#### Job satisfaction (JS)

Job satisfaction was assessed using a three-item scale validated by Spector et al [89] who reported Cronbach's alpha coefficients of 0.90. A sample item from this scale is: 'All in all I am satisfied with my job'. This scale has been taken from the original Michigan Organisational Assessment Questionnaire [90] instrument. Responses were recorded on a five-point Likert type scale which read from 1 - strongly disagree to 5 - strongly agree.

#### Support systems outside of work (SSOW)

The researchers developed a six-item scale adapted from a similar scale developed by Hui-Ying Tsai [91]. The original measures were modified slightly and two additional measures were added so that it included measures for support received outside work from spouse, extended family or friends and hired help. The scale showed alpha of 0.70 for this particular sample of the study. Respondents were asked "The following statements ask about the degree of support you receive from sources outside your workplace. Please indicate your level of agreement". A sample item from the scale was ". I have daily/regular help around the house or with chores and errands through Hired Help". Responses were recorded on a Five-point scale ranging from 1 - Not at all to 5 - All the time. The full scale is attached in Annexure 2.

#### Intent to Apply for a higher-level position (IAHP)

Intent to Apply for a higher-level position was measured using a two-item measure developed for this study. Cronbach alpha was found to be 0.76 for this particular sample. Responses were recorded on a five-point Likert type scale which read from 1 - strongly disagree to 5 - strongly agree. The questions were "I intend to apply for a higher-level position in my

organisation in the near future” and “I am taking all required measures so that I can rise to a higher position in my organisation”

*Mentorship and Networking*

Mentorship and Networking were measured using a Bipolar scale which asked the respondents to assess on a five-point scale whether the given item was perceived to be a barrier or facilitator. The scale ranged from 1 – Major Barrier to 5 – Major Facilitator. Chronbach alpha for the scale was found to be 0.75 for this particular sample.

**IV Results**

The data for the survey was analysed using SPSS 17. Results of the correlation analysis are shown in Table 1

**TABLE 1:**

Correlations								
Vari able	IAH P	WLB	FSO P	SSO W	CS	JS	Ment orshi p	Netw orkin g
IAH P	1							
WLB	.937*	1						
FSO P	.328*	.266*	1					
SSO W	.385*	.362*	.500	1				
CS	.276*	.259*	.884*	.461*	1			
JS	.378*	.338*	.934*	.376*	.247*	1		
Ment orshi p	.393*	.357	.292*	.478	.510*	.371*	1	
Netw orkin g	.148*	.128	.068	.069	.178	.044*	.072*	1
**. Correlation is significant at the 0.01 level (2-tailed).								
*. Correlation is significant at the 0.05 level (2-tailed).								

Results show that:

**Hypothesis 1:** Work Life Balance will be positively related to Intent to apply to higher level positions is supported ( $r = .937^{**}$ ,  $r < 0.01$ ), this shows that the higher levels of Work Life balance will enable or facilitate women to think of applying to higher level positions

**Hypothesis 2:** Work Life Balance will be positively related to both Job Satisfaction and career Satisfaction is also supported ( $r = .338^{**}$  and  $.259^{**}$  at  $r < 0.01$  respectively), this shows

that higher levels of Work life balance promote both Job satisfaction and Career satisfaction.

**Hypothesis 3:** FSOP will be positively related to Intent to apply for higher level positions is supported ( $r = .328^{**}$ ,  $r < 0.01$ ), this shows that women who viewed or perceived the organisation as being Family supportive were more likely to apply to higher level positions in the organisation.

**Hypothesis 4:** FSOP will be positively related to Job Satisfaction and Career Satisfaction is supported ( $r = .934^{**}$  and  $.884^{*}$  at  $r < 0.01$  and  $r < 0.05$  respectively) this shows that the more organisations are perceived as being family supportive the higher will be the levels of Job satisfaction.

**Hypothesis 5:** FSOP will be positively related to WLB is supported ( $r = .266^{**}$ ,  $r < 0.01$ ), this implies that women who view organisations to be family supportive will experience higher levels of Work Life Balance.

**Hypothesis 6:** Support systems outside work will be positively related to Intent to apply to higher level positions is supported ( $r = .385^{**}$ ,  $r < 0.01$ ), this implies that when women have greater access to support systems outside work it will enable them to think about applying for higher level positions in the organisation.

**Hypothesis 7:** Support systems outside work will be positively related to Job Satisfaction and Career satisfaction ( $r = .376^{*}$  and  $.461^{*}$  at  $r < 0.05$  respectively) this implies that when women have greater support systems outside of work it enhances their Job satisfaction and career satisfaction levels.

**Hypothesis 8:** Support systems outside work will be positively related to Work life Balance is supported ( $r = .362^{**}$ ,  $r < 0.01$ ), this implies that presence of adequate support systems outside of work will lead to higher levels of Work Life Balance.

**Hypothesis 9:** Career Satisfaction and Job Satisfaction will both be positively related to Intent to apply to higher level positions ( $r = .276^{**}$  and  $.378^{**}$  at  $r < 0.01$  respectively) this implies that when Job satisfaction and Career satisfaction are high women will want to apply for higher level positions in the organisation.

**Hypothesis 10:** Career Satisfaction and Job Satisfaction will both be positively related to each other ( $r = .247^{**}$ ,  $r < 0.01$ ), this implies that both the constructs of Job satisfaction and

Career satisfaction are interlinked. Job satisfaction and Career satisfaction will both influence each other, i.e. satisfaction with either one is dependent on the other.

Other significant relationships have emerged in the correlation analysis that were not postulated by the researchers, for example Networking opportunities and Mentorship programmes were both rated by the respondents as Major Facilitating factors. Mentorship programmes are seen to have significant positive correlation with Intent to apply for higher level positions, FSOP and both Job satisfaction and Career satisfaction.

Networking opportunities are also seen to be correlated to Intent to apply to Higher level positions, job satisfaction.

Networking opportunities and Mentorship programmes also show a correlation with each other, this shows that the two concepts should complement each other, in the sense that both are seen as facilitators to career advancement as well as show linkages to Job and career satisfaction. Yet they remain underutilised as facilitative options in Indian industry.

### Discussion and Implications

The present research has attempted to make some unique contributions to work-family and career literature. The insights would be particularly useful to top management, Human Resource Departments and policy makers especially in the post Covid-19 scenario where there will be new paradigms in terms of talent management, the present crisis has brought to the forefront the need to develop and establish new models and systems so that employees are facilitated to work in different scenarios. The complexity of women's careers has been in particular acknowledged to be difficult to conceptualise and define [4] [92] [93], developing an understanding for the way women look at their careers overall and career progression in particular will help organisations retain this critical resource. To this end this study contributes specifically from three critical angles, firstly, identification of what factors women consider to be facilitative to their careers and career advancement.

It is clear from the above results that for Mid-career women, Intent to apply to higher level positions can be enhanced by certain

facilitating factors, Family supportive organisational perceptions (FSOP) as well as support systems outside of work and high levels of Work Life balance will all aid in this process. Support systems at work and outside work facilitate and enhance work life balance for women, and will also enhance both Job and career satisfaction. All these factors will enable women to think about career advancement and applying to higher level jobs in the organisation. This is in line with the findings presented by Grover and Crooker, Casper Martin, Buffardi and Erdwins, Allen, Brotheridge and Lee; Duxbury and Higgins; Harrington and Ladge; Parkes and Langford; Nelson, Quick, Hitt, and Moesel; Scandura and Lankau; Cegarra-Leiva, Sánchez-Vidal and Gabriel Cegarra-Navarro [48] [49] [50] [51] [52][35] [36] [37] [38] [39]

Secondly, very little literature or empirical studies are available that advance the understanding of the work-life equation and its effect on career purely from women's perspectives and specifically from the viewpoint of mid-career women. A few studies such as the one by Kapoor, Bhardwaj, and Pestonjee [94], reported that careers of married women employees in India suffered due to their family responsibilities and inability to maintain work life balance.

Thirdly, one of the biggest research gaps identified by countless previous researchers has been that though studies exist using population samples from Western and/or developed economies and in some cases cross cultural studies or multiple countries, little to very few studies exist for purely Asian countries, cultures and contexts.[10][95][96] In an increasingly unpredictable and volatile job market where talent is hard to find and harder to retain Indian companies are going to have to look beyond conventional solutions to women's advancement issues, from the study it is clear that support systems, just like in Western studies form a very important part of career pathing choices however, support systems in India are much more complex and are multi-dimensional. Apart from this for Indian women the context of support and family responsibilities will change significantly because of social and cultural differences both at home and in the workplace, for examplein

India women's obligation to family roles such as childcare, eldercare and household chores and work, etc, is viewed to be a very important and prominent part of a woman's life and intrinsically linked to the inherent identity of women and prevailing cultural thought patterns in society [97], these are issues which cannot be ignored by organisations when thinking and planning for women's career pathing.

Indian organisations need to look at ways they can make their policies, structures and systems more Family supportive. This will aid in enabling women to reach higher or leadership positions in organisations. Though organisations in India are not responsible for much support outside of work. Indian women still have to rely on home grown support or hired help. European and Scandinavian countries have benefitted from organisation-controlled support systems outside of work. Indian Industry needs to think of similar options that may enable women to remain at work and rise within the organisation. For example, many companies in India have tied up for child care facilities and creche services with professionally run organisations specialised in these services, however this has been limited to the larger Multi-national companies or companies from the IT sector. This is a big contrast to European and western organisations where women have access to a wide variety of work-life benefits, some of which are mandated by law, such as paid parental leave dependent-care help etc which enables women to balance work and life much more easily [98] [99].

In two separate studies on flexible working Hochschild, [16] and Drew and Murtagh, [15] found that women opined that opting for flexible options at the workplace would in some way jeopardise their careers or they would lose their job security or other benefits. In these same surveys it was found that the over-all discernment among supervisors about women who chose these options was that they were not committed or serious about their careers. These gender stereotypes and narrow thinking related to women and career advancement has to be stopped. The primary concern for Indian industry should be to facilitate 'Gender sensitivity Programmes' as well as change outdated systems and structures

that promote gender related prejudices and biases. A study done by Parikh [100], reported that only when women had proved their competency and capability and "earned respect at the workplace" did they actually receive support from their supervisors.

For many mid-career Indian women, social and cultural constraints as well as family responsibilities prevent them from taking advantage of Networking opportunities. As far as Mentorship programmes are concerned many Indian organisations profess to have Mentorship programmes in place however and are perceived by women to be beneficial and having a facilitating effect on careers, however many times these programmes remain mainly on paper and are not implemented properly. These findings are in line with similar findings of Kanter; Bu & Roy; Kaplan & Niederman; Adya; Kram and Isabella; Phillips-Jones; Huang & Aaltio. [78] [79] [80] [29] [74] [75] [81]

As per the findings of the current study, higher levels of Job Satisfaction and Career satisfaction also influence mid-career women's Intent to apply for higher level positions. Organisations need to address basic issues such as flexible human resource and Work life balance policies, discrepancies in remuneration structures and adequate career and succession planning, better and enriched job profiles, access to plum assignments to ensure higher level of Job and Career satisfaction for mid-career women. If mid-career women are provided with equal resources as men many more will want to look at leadership positions and career advancement opportunities. This is line with the findings of Marcinkus, Whelan-Berry and Gordon [13] and Auster [12] among others.

As the nature of jobs has changed in the new millennium where concepts such as being available 24\*7\*365 is not uncommon, and work becomes more technology driven, the boundaries between an employee's life and work has become increasingly blurred, this has come more into focus during the recent pandemic situation. Family-friendly policies can help in many ways for example it is these policies that can help by reducing the number of hours worked, shifting where an employee can work from, or just simply creating



flexibility in the work schedule of the employee [101].

Previous studies have shown that perceived organizational support is associated with higher levels of commitment to work and the organisation, higher levels of satisfaction and lowered turnover rates [103] [104] [45] [105] [102]

Organisations that are sensitive to the needs of women and are seen as family friendly will be able to retain their female employees to a greater extent. Allen [50] states that only when employees perceive their organizations as "family-supportive" it would reduce work-family conflict and enhance commitment and job satisfaction. From an organisational perspective providing women with access to such policies and also alternative career patterns and paths may pave the future for many women especially when confronted with crisis situations both in their personal lives or in the external business environment.

In previous studies related to Mid-career women researchers have found that in this mid-career phase women face heightened critical life choices, mid-life or identity crisis. For instance, Marcinkus, Whelan-Berry, and Gordon[95] have put forward that, for women in this midlife stage, balancing work and family is a critical issue which also comes at a time when there may be incompatible demands on the career front, childcare and other individual level issues. Auster, [12] further puts forward that many women face difficult compromises with respect to the needs of their children versus performance related organisational expectations as they move higher up their career ladders. Hall, [7] adds that there is a reflective exploration of personal interests and values at this mid-career stage and many a times a reconsideration of individual needs and hopes [106]. Furthermore Amos-Wilson, [11] suggested that at the age of 40 an important transition takes place, which focuses attention on the re-evaluation of achievement. Many women who handle child care responsibilities coupled with career pressures reach a stage where they feel a compulsion to understand what gives real meaning to their lives, in fact for some it means reassessing their basic identity, purpose and values [107].

For others there is also an increased perception of fulfilment and attainment got from the satisfaction of having successfully managed the two facets of their lives [107] [108]

From a career advancement perspective, organisations need to understand this huge upheaval that many women would be going through at the mid-career/mid-life phase and concentrate policy making on support and sensitising.

In India many organisations are waking up to the fact that they hire if not a large but a significant percentage of mid-career women, and in today's volatile business environment and market, a critical foundation for competitive advantage should be the human resources that organisations employ [109]. Studies over the last decade have shown that as talent deficiencies become stronger the battle for retaining capable employees will become more and more pronounced and difficult [110]. Ironically, it is seen that though organisations are reeling under talent shortages, they seem to be powerless to retain the vastly experienced and educated female employees who already work for them. A 2008 Catalyst survey [111] states that:

Catalyst research on Fortune 500 companies has demonstrated that gender diversity in corporate officer ranks was associated with better financial performance. Organizations with the greatest gender diversity in their corporate officer ranks significantly outperformed companies with proportionally fewer women at the top. Return on equity was 35.1 percent higher in the most gender diverse companies, and total return to shareholders was 34.0 percent higher.

This should be a convincing enough statement for Indian industry to make greater efforts to retain women employees, specifically with the intention that they will rise to higher levels in the organisation. Studies such as the current one have proved that industry stands only to gain from the findings. An improved awareness about the efficacy of work life balance, support systems at work and outside of work and how these factors influence women's careers and how they view advancement can aid organisations in making positive efforts to retain this critical resource.

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Annexure 2

**Support Systems Outside Work**

The following statements ask about the degree of support you receive from sources outside your workplace. Please indicate your level of agreement.

Not at all		Sometimes		All the time
1	2	3	4	5
1. My husband supports me by doing chores around the house and running errands.				
1	2	3	4	5
2. My husband supports me by taking care of our child/children.				
1	2	3	4	5
3. I take help in household chores and errands from extended family members or a friend outside of my immediate family.				
1	2	3	4	5
4. I take help in childcare from extended family members or a friend outside of my immediate family.				
1	2	3	4	5
5. I have daily/regular help around the house or with chores and errands through Hired Help				
1	2	3	4	5
6. I have daily/regular help with childcare through Hired Help				
1	2	3	4	5



## EXPLORING WAYS OF MEASURING EMPLOYEE PRODUCTIVITY ACROSS INDUSTRIES AND ROLES

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### ABSTRACT

*This research paper is an exploratory research to understand different ways of measuring productivity across industries and roles.*

**Keywords:** productivity, optimum, benchmark

### Introduction

Employee productivity is a metric that is calculated based on the amount of output versus the amount of input. The amount of output and input vary across industry. The ideal value of employee productivity can be found using competitive benchmarking using forecasting. Profitability of workers isn't just an approach to quantify productivity in an organization. This is just its most evident use. A slacking profitability number can likewise be a side effect in an indicative test for the business. On the off chance that efficiency is low, in general, this could spell labourer withdrawal, issues in coordinated effort, "cyberslacking" (for example online time-squandering), or even wasteful email correspondences. Some of the time, it basically takes too long to even think about processing one's inbox before getting an opportunity to start the workday. What's more, this can truly slice in to representatives' generally gainful and significant working hours. In many cases, representatives are trapped in the "regulatory" or "little ball" subtleties of the activity. Estimating workforce profitability can likewise be a critical segment of getting ROI. For instance, the organization has seen decreasing productivity gains. It puts resources into innovation to help upgrade effectiveness – like new charging programming for venture supervisors or preparing on another email the board application for laborers. Estimating efficiency is vital to comprehension if this venture was savvy for the business for future development. A beneficial workforce is the motor behind each fruitful business. Having a

lot of persevering, profitable representatives will make arriving at your objectives and focus on a breeze. On the other hand, an ineffective workforce will make it difficult to complete anything. Business owners need workers who can get the job done, employee efficiency is the key to a company's overall success. Business leaders need to consider key employee performance advantages so they can develop reliable and accurate criteria for employee assessment. Doing so helps to determine strengths, weaknesses and potential management gaps in the organization. While performance evaluation is never fun, business leaders are helping to determine performance levels for each employee. Productivity of the employees is important to any business. More productive your employees are, the more successful they will be as a company. Highly engaged teams, according to Gall, are 21 percent more successful and have 28 percent fewer internal fraud. Engaged workers are creative and often have an idea or two. Their consistency of being competitive and positive at work help to be more successful. Highly engaged teams, according to Gallup, are 21 percent more successful and have 28 percent fewer internal fraud than low-engagement team.

### Literature Review

A number of studies have been conducted to analyze employee productivity over the past years. As employees are the biggest assets of a company and a substantial portion of the company's budget goes to employees, hence analyzing level of productivity expected from them becomes extremely important. Employee

productivity by private sector banks in India by Dr. Hawa Singh and Kamlesh, productivity for some private banks in India was studied. The Concept of Employee productivity is confusing. In 'the role and importance of employee productivity in industry 4.0', the relationship between employee productivity, industry 4.0 and knowledge management is studied. With advent of technology-based manufacturing, factors affecting employee productivity and how in turn it affects organizational performance has been observed. In Employee productivity and organizational performance: A theoretical perspective, Kenny S, Victoria talks about the role of trade unions in employee productivity and organizational performance and points out the need for more research in this area. The different investigations were featured on profitability examinations of the banks. Angadi and Devaraj (1983) in their examination found that outside banks possess better situations in efficiency and productivity followed by the state bank gathering and the 14 nationalized banks. Social duties, absence of successful preparation of assets at lower costs, appealing retail banking and expanding income from different sources are the key reasons for lack of efficiency and benefit of open area banks. Jain (1991) brought up the means to build the profitability of banks for example improve the frameworks and systems, presentation of improved innovation and advancement of the staff and so forth. Bhattacharya, Lovell and Sahay (1997) inspected the profitable effectiveness of 70 Indian business banks during 1986-1991 for example the progressing time of advancement. Study found that freely claimed Indian banks are generally productive, trailed by remote possessed banks and exclusive Indian banks. Satyanarayana, Kaveri, and Ravisankar (1997) have given various kinds of worker and branch profitability proportions in their book. Das (2002) examined the interrelationship between portfolio hazard, capital and operational productivity of open part banks for the period 1995-96 to 2000-01. Study reasoned that higher efficiency prompts decline in credit hazard and has a positive impact on bank capitalization. Mohan (2005) proposed that after the deregulation, business banks would need to create innovative methods of increasing

the earnings and charge based salaries of the banks will raise proficiency and efficiency levels. Jaffry, Ghulam and Cox (2006) inspected the work request effectiveness of the financial divisions in India and Pakistan during 1985-2003. Study found that outside banks were the most productive as far as work utilization than private household and open residential business banks. Money related changes in the economy have diminished the level of over-utilization of work in banking divisions. Bhandari (2012) presumed that the all-out factor profitability improvement was accomplished by 68 Indian business banks during 1998-99 to 2006-07. Study recommended that open part banks acclimated to the changing condition better and improved their exhibition comparative with their partners under private and remote possession. Das and Kumbhakar (2012) investigated the effect of banking deregulation on proficiency and all out factor efficiency change in the Indian financial industry during 1996 - 2005. Study pointed that productivity has improved in the post deregulation time and a solid capital base upgrades the effectiveness of banks. Kumar (2013) examines the absolute consider profitability Indian financial segment and the effect of data innovation on efficiency. It results in expanded electronic exchanges in the financial division driving higher efficiency. Singh and Kamlesh (2013) watched the expanding worker efficiency of private division banks during 2002 to 2012. Pandey and Singh (2015) underscored bank profitability during 2008 to 2013 for example the time of the web innovation wave. Study finds positive development in profitability however TEP doesn't generally continue expanding as the innovation improves. Das and Patra (2016) analyzed the adjustment in profitability and effectiveness of open area banks after the money related emergencies of 2008. In the time of globalization, deregulation, progression in IT and budgetary area changes rolled out noteworthy improvements in the working condition of banks. In this manner, there is a need to survey the presentation of efficiency of Indian banking.

### Hypothesis Formulation

The ideas of theories and examination questions contrast in that speculations guess connections and the exploration follows to test the proposed connections, while research questions frequently ask open-ended inquiries without anticipating what the appropriate responses may be. Given that a speculation predicts a relationship, its detailing regularly requires the utilization of hypothesis or earlier proof. Without the direction of hypothesis or earlier proof, one won't have the option to make an "informed conjecture" of the relationship, which is critical to speculation definition. In the event that there is an absence of earlier proof or hypothesis, research inquiries ought to rather be posed. Be that as it may, note it is not necessarily the case that an exploration question is utilized distinctly for considers that suggest open-ended conversation starters. Regardless of what kind of study is being directed, analysts should in every case first structure the examination question. With adequate hypothetical direction or potentially earlier proof, a theory could be gotten from the examination question to help thin down the exploration center. At the end of the day, the detailing of a theory requires the presence of an exploration question, yet specialists could ask research inquiries without figuring a speculation. For instance, for specialists who need to contemplate the drinking conduct of undergrads, they may at first offer an exploration conversation starter. Then again, scientists may see, subsequent to perusing past writing, that accepted practices assume a major job in undergrads' choices about drinking and choose to test the connection between the normal practices and the drinking conduct. Specialists could limit the exploration question to "What is the connection between accepted practices and understudy drinking conduct?" Based on the examination question, the accompanying theory could be figured: "There is a noteworthy connection between normal practices and undergrad drinking conduct." This speculation that proposes a connection between accepted practices and understudy drinking conduct helps point the examination a particular way (i.e., test whether the relationship is factually critical) contrasted with different

methodologies that can be utilized to respond to the examination question (e.g., talking with undergrads to discover what the accepted practices are and distinguish the relationship with the drinking conduct). A theory expresses the normal response to the examination question.

Notwithstanding the reasonable contrast between a speculation and an examination question, there is a methodological distinction because of the way to deal with the exploration plan. A theory is utilized all the more regularly for the quantitative examination strategy approach, while an exploration question can be replied by both subjective and quantitative examination systems. A theory regularly is figured in quantitative examination, though an exploration question is expressed and writing is analyzed before starting the exploration venture. The utilization of a speculation not just demonstrates that the analyst has adequate information and comprehension of the issue to embrace the examination, however it additionally provides the scientist guidance for information assortment and understanding. For subjective examination that adopts an exploratory strategy, an open-ended exploration question leaves space for answers to rise. A speculation, with its particular relationship expectations, dissimilar to in quantitative examination, is once in a while planned toward the start of the exploration yet frequently is produced as information aggregate and the scientist accumulates more bits of knowledge about the wonder under scrutiny. This section currently goes to the conversation of directional versus nondirectional theories.

### Research methodology

Given study is an exploratory research aimed at analyzing employee productivity including finding the methods of measuring productivity of employees in various industries, identifying factors that impact employee productivity. A number of observations have been made using surveys and telephonic interviews with employees working in various industries. A survey was floated with a few questions based on employee productivity analysis (questionnaire has been attached in Annexure 1). The survey was designed keeping in mind

inclusion of all the industries and questions based on how employee productivity is measured in these industries. The survey also included questions to analyze the factors that have an impact on employee performance and the rank-wise importance of those factors. The survey also included questions to identify the satisfaction levels of employees with the methods of measuring employee productivity used in their organization.

A total of 62 responses were received on the survey. Also, telephonic interviews were conducted with 35 employees with the purpose of understanding employee productivity in their organization.

As per telephonic interviews with around 40 bank employees, the various metrics of measuring employee are given below:

- Net Interest Income
- Fees
- Total Loan Book Size
- Number of customers
- Value of cross sold products
- Number of calls made
- Number of calls converted
- Number of meetings
- Customer's wallet share
- Operating Profit
- Number of cases sanctioned per month
- Total Income generated from new and existing products

Human effort in organization is indispensable. It constitutes a posh phenomenon to managers of such organization to grasp.

Accordingly, it's believed that each behaviour may be a goal directed. Thus, for a corporation or individual to interact in any productive venture, it must have underlying factors including the individual therein direction. Hence the effect of labour environment in achieving set target for the organization must be in adequate condition. Therefore, the character of office concerned with this stuff that influence workers productivity, which constitute the "why" of individuals behaviours? Why do people do things differently? Why is X's moral above Z's? These questions are often answered with the understanding

of the character of labour environment and the way these affect productivity. However, the organizational target can only be achieved if the environment is conducive. Work environment consists of the office buildings, its furniture and layout also because the physical conditions under which workers operate. It's also concerned with the external factors to the business which the office serves, the industry or other activities within which the business lies, the custom and laws of the community within which they operate. These environmental factors are always changing and therefore the office must react to the changes, but how does the customs and laws reduce workers morale? This question are often answered after investigation. Office and work environment are dynamic, but the foremost dynamic factors within the office is human factor. Workers today are more educated than before. They're more likely to boost questions on their environment of labour since management itself is dynamic. It's adhered and addresses itself to the supply of excellent environment of labour for workers productivity. But what are those increases that enhance productivity? Therefore, answer are going to be made after investigations. However, poor work environment and bad conditions have posed an excellent danger to figure health and thus make them to work with less joy and enthusiasms and work progress is hampered and disrupted. An understanding of the effect of labour environment on the productivity of employees can't be over-emphasized or seen as overstatement in every organization. Experience has shown that workers are directly influenced by the environment they find themselves or where their competence will achieve nothing in terms of productivity if the environment isn't conducive. This is often in respect of workers publicly enterprises today especially those in Edo City Transport Service and issue of unproductive nature of workers is compounded with the poor

nature of the environment. Therefore, due to the adverse effect of labour environment on morale of employees, the necessity for provision of excellent physical work environment for workers was stated by Mill in 1930 after the primary war. During this era, various management teams were concerned with the importance of maintaining loyalty and morale through the elimination of irritants like temperatures, noise and pollution from their environment. This was later opened up to incorporate a wider area of disturbing influences like feeling of insecurity in reference to employment, unfairness on the part of supervision and not being accepted by one's fellow employees. There's an excellent need for normal of working condition received legal backing by 1963 law and act of parliament which made it mandatory for all business organizations to supply the minimum standard of interest which will enhance the performance of

employees as an objective.

### Conclusion

We can conclude from this study that as employees are the biggest assets of a company and a substantial portion of the company's budget goes to employees, hence analysing the level of productivity expected from them becomes extremely important. Hence a significant effort must be made by organizations to understand the same. In addition, employees must be clearly communicated about all such metrics to ensure maximum profitability for an organization.

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## A STUDY ON CUSTOMER PERCEPTION TOWARDS PERSONALIZED SHOPPING EXPERIENCE IN INDIA POST COVID-19

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### ABSTRACT

*The retail landscape in India is set to change after this global pandemic. It will become more competitive because of price pressures from discounters and online players. Fashion retailers will look for new approaches that differentiate them from other market players. An emerging trend in fashion retail is Personalization in which retailers create unique experiences for individual customers. This is widely popular in emerging markets like China where brands interact with customers and provide customized offerings based on their past purchases. Some fashion brands in India have also started offering virtual try-ons, home trials and 'livestreaming' of merchandise to enable customers to shop from the comfort and safety of their homes. This number is expected to increase in the coming months. The purpose of this research is to understand the shopping concerns of customers during this pandemic, the important factors that they will consider before availing these offerings and also their willingness to trade off personal data for personalization. This will help companies get an overview of customer behavior post lockdown and better design their value proposition to improve their customer satisfaction, drive loyalty, and gain a competitive edge. This paper adopts the triangulation approach which requires qualitative data collection followed by quantitative data analysis to provide rich and diverse findings on this growing trend.*

**Keywords:** *apparel, shopping, fashion, retail, personalization, india*

### Introduction

Experience orders our judgements about consumption while shopping in this digital age [30]. This statement is particularly true for retail businesses. And more relevant in the fashion apparel business. Customer experience is an important determinant of brand loyalty and repeat purchases. The apparel customers generally look for two types of attributes when shopping in-store – hedonic and utilitarian. The former includes delight, leisure, amusement and fun. On the other hand, functional and tangible benefits are provided by the latter [14]. Personalised shopping or personalisation is a retail concept which has evolved over the years. Few decades ago, it meant greeting customers by name, knowing about their preferences in advance before they had to ask. The meaning has evolved in recent years. Today, with the creation of new technologies in the marketplace, customer journeys are created across many touchpoints on new channels and devices [10]. Now retailers have an opportunity to leverage big data and other technologies to enhance the customer experience. With strong analytics of past purchase behaviours, brands can understand their customers better and deliver differentiated

one-to-one experience in the form of livestreaming / virtual store tour, home trials, virtual try-ons, personalised product recommendations, expert sales service and a seamless unified commerce [26]. These 1:1 experiences come under the umbrella of personalised shopping in the modern retail language.

India has been a focal point for the fashion industry for the past few years. With its growing middle class and internet population, it has emerged as an important market for international brands as well. Strong economic fundamentals and powerful manufacturing sector gave it the position of an important sourcing hub [23]. Severe disruptions in supply chains have occurred due to the coronavirus pandemic. It is clearly visible that consumer demand has been crushed across the global economy. Further, it is also expected that Covid-19 will lead to the biggest economic contraction since World War

Fashion, being of discretionary nature, is very vulnerable to this damage when compared to other consumer sectors. Indian fashion market was badly hit by the halt of production and retail stores in malls and high streets [24]. Fashion players, both domestic and international, are now evaluating strategies to

reopen and provide a safe and hygienic shopping environment to the consumers. They are looking at alternate shopping formats which differentiates them from other players. This is where personalisation comes in.

China is leading this trend in personalisation for the past few years now. This pandemic has just given a stimulus to this trend. As the first country to be hit by the virus and then subsequently recover after a long shutdown, other countries are looking at China for a playbook. Its revival will be a deciding factor in the recovery of fashion industry globally because it plays a pivotal role in the supply chains and is also the world's largest fashion market. Retailers which already have good omnichannel strategy in place are in a better position to retrieve revenues which were foregone due to the lockdown. However, it is imperative to innovate now than to be a 'me too' player in the market. It will be truly the survival of the fittest during such tested times. Here is an example. Many brands preferred to stay quiet and communicate nothing to consumers during this sensitive time rather than risk a mistake. Downside here is that people now crave connection

and brands who are not present may lose mindshare after. The luxury brand Louis Vuitton went ahead and shared positive message in the Chinese language on social media. While stores were closed, it concentrated on customer outreach with a pop-up store on WeChat on the occasion of Valentine's Day. It featured live chat ready store assistants to communicate with shoppers in real-time. Online sales double compared to last year due to this strategy [20]. Consumer confidence has certainly taken a hit during the lockdown. Brands are focussing efforts on e-commerce platforms like WeChat to connect and sell to the customer on a more personal level. Livestreaming emerged as an innovation to follow in personal shopping space. Sales assistants in brick-and-mortar stores are being trained to become livestream hosts. Brands are turning to apps like Taobao Live, Yizhibo or Xiaohongshu to turn its empty stores into virtual shopping stages. This format is an intersection of entertainment and commerce. However, the absence of privacy legislation in a country like China helps brands to use

customers' data to track their activities and interaction. The same is not true for a democracy like India where information gathering will not be that easy.

Indian retailers are tweaking these shopping formats popular in China according to their customer base. Some are already using WhatsApp to video call customers and show their merchandise, thus giving them a way to shop from the comfort and safety of their home. It was reported in May that the Future Group, the owner of Central and Brand Factory, received approvals for a concept called store-on-wheels from resident welfare associations in Bengaluru to bring a shopping experience for customers right at their doorsteps. Sales executives are providing assisted shopping through WhatsApp video calls by giving customers a virtual tour of their stores. Arvind Fashions, the seller of brands like Tommy Hilfiger, Gap, US Polo Assn and Calvin Klein, is in active discussions with malls to deliver products at the car park. This will be available for shoppers who make online purchases and choose to pick from store. Other than that, customers are also being allowed to set an appointment at their preferred date and time slot to visit the store. Store managers will then to limit the number of customers in store at one point of time. This will enable salespeople to pay more attention and cater to the needs of each shopper. As entries in stores are limited due to social distancing rules, they don't have to wait in queues for long [28]. Central, the department store led by the Future Group launched a new service called 'Store at your Door' in April. The purpose of this service is to help shoppers shop from their homes and get the merchandise delivered at their doorsteps. Any interested shopper can register through their website. A video chat on WhatsApp is scheduled with a personal consultant who takes the customer through the merchandise according to his/her apparel needs. A set of products specially curated for that customer is then delivered to their home for them to choose [3]. The payments happen using cash or card. The products brought through this service are eligible for return or replacement till the stores reopen. This whole personal experience aims to provide ease and flexibility to shop from a wide range of brands



in a single, smooth process during this phase of the lockdown. Industry experts agree that there will be a major shift in India's retail landscape due to COVID-19. They believe that it will be more technologically driven. Retailers will have to adopt tech because contactless shopping is set to become the new norm. Customers will try to avoid crowded stores as much as possible. Stores will need to focus more on conversion rates

and less on footfall to generate revenues. Omni-channel experience will play an important role for consumer brands in India. Magic mirrors will be used since it supports touchless shopping. Virtual and augmented reality are two other interesting areas which can become popular in stores of India. Today, when most of the urban population owns powerful smartphones, implementation of these technologies through mobile applications will open new windows of opportunities for brands. It will break down the physical barriers and take the store to the homes of shoppers. Another important aspect of shopping is payments. Managers have to provide contactless payment options so that sales do not stop due to payment issues. Making use of QR codes and tap-and-go technologies can boost conversions at the store due to flexibility [16].

The central goal of this research is to understand the shopping concerns of apparel customers in India post COVID-

19 lockdown and their preferences in an omni-channel shopping environment. It also gives an idea about the trade-offs which an average Indian consumer is willing to make while opting for such services. The market insights will help the fashion brands understand the relevance of personalisation in Indian retail market and design a better value proposition for their customers after the lockdown. In the following sections, the paper offers a literature review on personalisation in physical and digital shopping space, motivations of customers and privacy aspects. This is followed by research methodology and data analysis. Finally, the paper discusses findings and conclusions with recommendations for practitioners and business managers to help them draw strategic plans for sales and marketing.

## Literature Review

With the rapid improvement in information and communication technology, brands and marketers are increasingly looking at personalization in retail [33]. But it is usually hard to apply as the word means something different to each actor in the business value chain. This hinders the coordination between service providers and marketers who are willing to apply personalization [43]. Earlier definitions of personalisation were mainly written in the setting of physical stores [38], now with availability of big customer data in retail industry, the term is often being talked about in an online context. Some refer to personalisation as the customisation of some elements of marketing mix to an individual based on his/her past purchase data [13; 37]. Following the same definition, some have described it as a form of one-to-one marketing where the company caters to a "target segment of size one" [4]. But there are several ways adopted by different brands to achieve this goal.

It has been found that environmental elements stimulate customer behaviour [7]. The retail environment is going through an evolution as latest technologies are being introduced [5]. With new innovations in stores, brands are trying to engage their customers through online and offline channels. In marketing theory, the term customer engagement is described as the intensity of a shopper's participation in the offerings of the organization [43].

Technological innovation and advancements provide opportunities to influence consumer attitudes and their behaviours [35]. Research has found this effect to be stronger in fashion retail [36]. Therefore, interactive devices are being introduced widely in online and offline stores to provide

unique experiences to customers and gain a competitive edge [43].

The fashion business suffers from a major disadvantage in online apparel shopping which is not so evident in other sectors. Consumers have this need to try on the clothing physically before buying it [17]. The absence of physical touch is a big reason as to why only a small portion of apparel sales happen online. Therefore, to give a store-like experience, there is more implementation of tools like virtual try-

ons online with the artificial reality or AR [25]. Physical stores are also using technology to create smart in-store experiences for their shoppers. To provide more personalised service, tools like virtual mirror or virtual dressing rooms are being created. These allow the customers to see themselves in different styles without trying on the merchandise physically [12]. Features like these will be particularly necessary in stores when customers are ready to shop again after the coronavirus induced lockdown. With the onset of this pandemic, fashion brands in India are increasingly looking for innovative options to sell online and offline. Store on wheels and other retail concepts are being tested to reach the customers and provide them personalised service on a national scale. However, these brands do not have a playbook to know the current requirements from the consumer's perspective. The past literature focusses on importance of personalisation in a brick and mortar setting during normal times. Most of the studies on the recent trend of digital personalisation are in the context of other developed nations like the USA, UK and China. This gap in literature was identified by careful investigation of recent studies in this field. This research focusses on the fashion ecosystem of India during the pandemic. However, the COVID-19 pandemic and Personalisation are current trends and have a significant impact on the industry. This study tries to determine the important points of consideration while shopping for apparel customers in the country. This will help managers make key decisions at a strategic level to come up with different and innovative solutions for its loyal customer base. Successful implementation of ideas will help brands to retain its customers post the pandemic. It will also guide the sales associates in stores on how to interact with a customer when he/she walks in the store to check out the products and what extra services or benefits to offer in order to make his/her shopping experience special and memorable.

It has been found that a good personal rapport between a retailer's personnel and customer plays a key role to improve customer satisfaction and loyalty [18]. The whole shopping experience can be enhanced by

offering more personalised attention to customers and treating them well [28]. The interactivity between the sales associates and customers has been found as an important source of competitive advantage in retailing [21]. The customers have this expectation that salespeople in the store know about their preferences and assist them with shopping personally.

Interactive digital directly stimulates interest in customers. Technology influences emotional experiences of customers when they shop in-store or online [15; 17]. This in turn results in more shopping enjoyment. It also results in improving the confidence level of shoppers in terms of fit [25] and reduction of risks associated with online shopping as perceived by shoppers [22]. Right now, shoppers in different countries associate great risks with visiting malls and stores on high streets due to rising cases of coronavirus. This has led to retailers moving to platforms like WeChat to communicate to

directly communicate and sell to their customers. In fact, it saw a 159 per cent boost in transaction volume for its mini-stores programme during the peak of the outbreak in January and February 2020 [24]. Brands are increasingly experimenting with social commerce to recover from loss of sales in stores. This is not just in China. Almost 25 percent of US and European consumers also expect their spend via social channels to go up in July 2020 [24].

Data Privacy is another serious concern when it comes to personalisation. Firms use personal information of customers to improve service and design personalised offerings. Studies have found that consumers who value privacy and transparency are less likely to participate in personalisation [6]. A consumer research report concluded that the youngest age group 16–24-year olds - are consistently the most receptive to personalised marketing strategies and they are the most willing to share their information in return for personalised offers [10]. According to another report, consumers are more open to sharing their personal information with businesses in return for better experiences. However, they expect firms to be transparent about how they collect and use the data responsibly [1].

**Table I. Sample profile**

Total number of respondents (n)		188
Age	Below 18	0
	18-25	128
	26-35	56
	36-45	2
	Above 45	2
Gender	Male	142
	Female	40
	Prefer not to say	6

### Research Methodology

This study was conducted using primary as well as secondary data. As not much secondary data, in the form of research papers and studies, is available on this latest trend, consumer and market research reports were used to gather information. This supplemented primary data collected from respondents using a questionnaire survey. The questionnaire for this study consisted of six sections: Shopping Concerns, Personalisation Preferences, Personalisation Relevance, Physical Experience, Digital Experience and Trade-offs. Part one of the questionnaire consisted of 3 sections - Shopping Concerns, Personalisation Preferences and its Relevance. In the first section, a ranking question was asked to understand the concerns of the customers which would influence their apparel shopping decision at an offline store post the lockdown. In the second section, three questions were asked. The customers had to rank different personalised options such as livestreaming / virtual store tour, home trials, virtual try-ons, appointment-based store visits, personalised product recommendations, expert sales service and a seamless unified commerce on the basis of their preference. They were asked if they had experienced personalised shopping before. The respondents then ranked marketing channels which required more personalisation according to them. This question was to draw a comparison between channels which shoppers believe are more personalised than the rest. The third section was designed to test the relevance of more Personalisation in the fashion retail shopping environment for the Indian customers.

It consisted of probing questions such as the importance of experience provided by a fashion brand vis-à-vis its products and how a brand's understanding of a customer's personal

requirement preferences influences his/her brand loyalty. As fashion retailing moves towards an omni-channel environment spread across physical and digital ecosystem, it is important for a brand to maintain a uniform of level of customer service across channels. A question inquired about how consistency in service is important for customer satisfaction and brand loyalty from the customer's perspective. Respondents were also asked how often they availed personalised deals sent to them via SMS or emails by the brand and the likelihood of word-of-mouth endorsement / referrals to others if a brand offers personalised shopping experience. Part two of the questionnaire included 3 sections

- Physical Experience, Digital Experience and Trade-offs. Visiting brand outlets in malls or independent stores is part of the physical shopping experience. In first section, 3 statements were made with regard to the store experience. The importance of engagement with knowledgeable store associates who have information about sizes, inventory status and responses to common shopper queries was checked. Also, the need to find the right balance between having the right product and a variety of product in stock. To understand the shopper's expectations from an omni-channel environment, they were asked if they expected the in-store associate to have access to their past purchase records and get recommendations accordingly. In digital experience, questions about how the timing of promotional messages, social media engagement and apology mail after a poor shopping experience influenced their next shopping decision were asked. There are trade-offs to get this experience. Customers were asked whether they were willing to spend more money and share personal data to receive personal services like coupons, loyalty rewards, special offers.

It has been indicated by research that both the rating and ranking scales are valid and reliable measurement tools for studies [33; 27). For the ease of data collection from the respondents, the questionnaire survey for this study used a 5- point Likert rating scale instead of the 7- point ranking scale. 188 responses were collected using Convenience Sampling. The age of the respondents ranged between 18 and

45 years and most of them belonged to either urban or semi-urban areas. Around 76% of the respondents were male and 21% were female. The sample profile is displayed in Table I. The sample size was divided such that 50% of the respondents had already experienced some form of personalised shopping in their life while the other half did not.

The survey consisted of six aspects - Shopping Concerns, Personalisation Preferences, Personalisation Relevance, Physical Experience, Digital Experience and Trade-offs. There were 3 demographic questions, 3 ranking questions and 11 Likert scale questions. Principal component factor analysis is a common SPSS tool to analyse Likert type questions. It was performed on the data to understand different attributes of personalised shopping experiences of customers. It helped identify the shopping concerns of apparel customers after COVID-19. For the analysis of ranking questions, Friedman’s ANOVA was performed because of the ordinal nature of the dependent variable. This non-parametric statistics test was applied to test the null hypothesis of equal mean ranks. Followed that up with Kendall’s W test to determine the agreement between the respondents.

For the purpose of this research, to check the importance of certain factors over the others, three hypotheses were proposed for the ranking questions. Being a health crisis, this pandemic has certainly made customers more concerned about their health and hygiene practices. Therefore, the first hypothesis checks the influence of a safe and clean store environment on the shopping decisions of customers.

Hypothesis 1 (H1): A safe and hygienic store environment will take a preference over all other shopping concerns of apparel customers.

The role of technology has a big role to play in retail during this pandemic. This will be particularly true for a discretionary and high-touch product like clothing. People will look for no-touch or low-touch options while shopping to prevent the transmission of virus, as much as possible. Some companies have started taking steps like virtual trials and livestreaming. Another hypothesis is proposed to check its importance.

Hypothesis 2 (H2): Technologies like virtual try-ons and virtual store tours will be preferred

modes of personal shopping for apparel customers.

These days, people look for a greater degree of personalisation in an omni-channel environment. This is a source of differentiation between brands for them. A typical Indian fashion customer looks for a variety of choices and a good customer service program in brands. This wins their trust and gives a sense of confidence to the shopper. They may look for a better, personalised customer service. The final hypothesis is proposed.

Hypothesis 3 (H3): Customer service will be the most preferred channel for more personalisation for apparel customers.

**Table II. Kmo and bartlett's test**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		<b>.818</b>
Bartlett's Test of Sphericity	Approx. Chi-Square	668.766
	Df	55
	Sig.	.000

**Table III. Structure matrix**

	Component		
	1	2	3
The experience provided by a fashion brand is as important as its products.	.789		
A brand’s understanding of my personal needs/preferences will influence my loyalty.	.768		
Consistency of customer service across physical and online stores is important for brand loyalty.	.832		
I avail personalized deals from promotional SMS/emails sent by the brand. (On my birthday, anniversary, other special occasions)	.610		
How likely are you to recommend a brand to others if it offers a personal shopping experience	.752		
Being able to engage with knowledgeable store associates during shopping.		.603	
Receiving promotions when I am near the store or outlet will influence my shopping behaviour			.750
Social media engagement with brands has an influence on my shopping choices.			.757
Receiving an apology email after a poor in- store or online experience will influence my next shopping			.532

decision.			
I wouldn't mind spending more on brands that offer better experience/service.		.77	6
As a customer, I would be willing to share my personal data in exchange for benefits such as coupons, loyalty rewards, special offers on items I like.		.84	1

**Table IV: reliability statistics**

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
<b>.838</b>	.84	11

**Results And Analysis**

In principal component factor analysis, initially an oblique rotation method - Direct Oblimin rotation was performed to decide on the rotation method based on the assumption that the factors are uncorrelated. It was found that one value in the component correlation matrix exceeded 0.32. Therefore, Direct Oblimin results were followed (based on the criterion in Tabachnick & Fidell, 2007, p. 646). It facilitates an easier interpretation of each factor and also maximizes the sum of the variance of the squared loadings. Then a scree test plot was used to determine the number of components created. It is a graph of the eigenvalues on the y-axis and all the factors on the x-axis. The components are listed in decreasing order of their eigenvalues. Generally, the accepted convention is to keep all the factors above the inflection point and eliminate any factor below it. Since the actual cut-off point can be subjective. For the purpose of this study, eigenvalue of 1.00 was used as the cut-off point for factor extraction. Three factors or components with eigenvalue of greater than 1.00 were found and they accounted for 60.6% of the total variance. The 11 variables loaded heavily on one of the identified 3 factors. The factor loading cut-off for analysis was +0.50. The factor loadings of 11 variables ranged from +0.532 to +0.841. Check Table III for factor loadings of different variables. Cronbach's alpha is a popular technique to determine the reliability of the

factors when working with Likert Scale. The coefficients ranged from 0.814 to 0.836 which is pretty good for an exploratory research like this one.

To analyse the ranking questions, Friedman's ANOVA along with Kendall's W test was performed. In the first ranking question to understand the shopping concerns of apparel customers, they ranked different factors which would influence their buying decision post lockdown. The mean ranks (displayed in Table V) showed that a safe and hygienic store environment (with mean rank of 1.81) will be a priority for shoppers, followed by availability of new and comfortable clothing collections (mean rank 2.87) and promotions and discounts at the store (mean rank 3.55). Hence, the null hypothesis for H1 can be rejected. It can be concluded that a safe and hygienic store environment will take a preference over all other shopping concerns of apparel customers in India. Kendall's W is always between 0 and 1. W = 0 indicates perfect disagreement between respondents and W = 1 means perfect agreement. Kendall's W score of 0.599 shows reasonable level of agreement between respondents (Check Table VI). Another way of looking at it is that 59.9% of the variance in the ranks was accounted for by the options, as ranked by 188 respondents.

Another ranking question inquired about their preference among different PS formats (Check Table VII for mean ranks). It was found that people are most comfortable to have product trials at their homes (mean rank 3.25). Livestreaming and Virtual trials are their 2nd preference with the mean rank of 3.38 for both. Hence, the null hypothesis for H2 can be rejected. It can be clearly derived that technologies like virtual try-ons and virtual store tours will be preferred modes of personal shopping for apparel customers in India. They are also open to more personalised offers (mean rank 4.01) and appointment-based store visits (mean rank 4.14) post lockdown. Kendall's W score of 0.110 (Check Table VIII) indicated low level of agreement between the raters.

The last ranking question asked respondents to rank different channels where they would like to see more of personalisation in the coming future. The mean ranks are listed in Table IX.

Website (with a mean rank of 2.55) and Brick and mortar store (with a mean rank of 2.61) were ranked relatively higher than E-mail (4.57) and Online ads (4.86). Personalised customer service ranks relatively lower than other channels with a mean rank of 3.49. This proves our hypothesis (H3) wrong. Hence, the null hypothesis for H3 can be accepted. Kendall's W of 0.288 (Check Table X) indicated some level of agreement between the raters.

**Table V: Friedman's Test For Ranking Q1**

	Mean Rank
Safe and hygienic store environment	1.81
Availability of new and comfortable clothing collections	2.87
Digital experience at store (virtual trials, online payments)	3.90
Promotions and discount offer at store	3.55
Desire to update your current wardrobe	4.43
Loyalty to a particular brand	5.61
Desire to try out new fashion lines - WFH, Anti-bacterial wear	6.19
Revenge spending - spending extravagantly after the long quarantine	7.65

**Table VI: kendall's w test for ranking q1**

N	188
Kendall's W <sup>a</sup>	<b>.599</b>
Chi-square	788.155
df	7
Asymp. Sig.	.000
a. Coefficient of Concordance	

**Table VII: friedman's test for ranking q 2**

	Mean Rank
Trials at home	3.25
Livestreaming / virtual store tour	3.38
Virtual try-ons	3.38
Personalised product recommendations/offers	4.01
Appointment based store visits	4.14
Seamless unified commerce	4.76
Expert sales service	5.07

**Table VIII: kendall's w test for ranking q2**

N	188
Kendall's W <sup>a</sup>	<b>.110</b>
Chi-square	123.576
df	6
Asymp. Sig.	.000
a. Kendall's Coefficient of Concordance	

**Table IX: friedman's test for ranking q3**

	Mean Rank
Website	2.55
Brick and Mortar Store	2.61
Mobile App	2.91
Customer Service	3.49
E-Mail	4.57
Online Ads	4.86

**Table X: kendall's w test for ranking q3**

N	188
Kendall's W <sup>a</sup>	<b>.288</b>
Chi-square	270.46
df	8
Asymp. Sig.	.000
a. Kendall's Coefficient of Concordance	

### Discussions

The findings indicate that customers are quite sceptical to visit malls and brand outlets to shop for apparel shopping during this pandemic. The data suggests that almost 59% of the respondents placed a safe and hygienic store environment as their top priority while shopping during or post coronavirus, which is not surprising going by the trends. They are looking for easy personalised solutions which allows them to shop in the comfort and safety of their homes. Shopping models which were prevalent in other developing nations like China and US before the pandemic are finding their way into the Indian market. However, they are not being completely replicated. Management in retailing firms are modifying the options according to their preferences of their Indian customer base. Flexibility is another thing which is being taken care of while designing the operations side of it. A shopper will be more likely to select a hybrid option of ordering a product online and picking in store or the car park, with taking the hassle or risk of visiting a brand outlet.

For example, livestreaming is a wildly popular social commerce phenomenon in China. It is

combination of live video streaming and commerce in which influencers model clothes, accessories and other goods and broadcast it to millions of their fans and followers who can make a purchase using the links embedded. As the novel coronavirus was gaining pace in China, merchants started to register on Alibaba's live streaming platform, Taobao to keep selling their stock during the lockdown. The number of merchants who used it for the first grew by 7 times between January and February 2020 [19]. India did not consider this selling format till now. But the circumstances have pushed the retailers to think out of the box to create options and gain an edge in the current competitive space. Though, it's not practical to exactly replicate the livestream model from China while lockdown. Some brands like Central, American Eagle and others are running pilot projects with video calls on popular messaging app WhatsApp. Calling it distance selling, Reliance Brands, which sells some of the super-premium labels in the country, has rolled out the option to shop via video conferencing apps like Zoom and Microsoft Teams. At the end of June 30, it was reported that it was serving customers in 38 cities with video calls, e-catalogues and phone assistance by store managers [41]. A store associate showcases products to an interested shopper with his/her group of friends at the same time in a conference call. Sellers are now understanding the advantages of virtual selling over e-commerce. As a medium of shopping, it is more interactive and social. The salesman can explain the products attributes to a consumer in real time during the call. Plus, there is a trust factor because of the one-to-one communication with the brand representative. Also, the customers realise the efforts of the brand in creating initiatives like these during the current situation. This may translate to increased brand loyalty and repeated purchases from the brand after the lockdown ends.

Resuming operations in the Unlock phase, brands are following rigorous norms of physical distancing and regular sanitisation [42]. Masks are now a must to visit stores. Thermal screening at the entrance is the new normal. Digital modes of payment are being encouraged by store managers to avoid touch. In case the customer prefers to make the

payment in cash, some stores are also using devices to sterilise the currency using UV rays. Trials is another area which demands innovation in the fashion business. Using trial rooms is not allowed under government guidelines, brands have started looking for alternatives. Stores managers at United Colours of Benetton are insisting that customers don't try on clothes before purchase but if they do, exchanged clothes are kept in quarantine for 24 hours before putting back on display. Some are using steam ironing to sanitise clothes after each trial.

As the country slowly emerges from an extended lockdown, availability of comfortable clothing collections was the second biggest influencer of shopping decision. It was reported by Unicommerce Consumer Trend Analysis that the two most popular product in online fashion category are nightwear and comfortable home-wear [9]. There is desire to update the current wardrobe after the quarantine and this was evident from our data. Promotions and discounts will catch more attention when customers are back and ready to shop.

More personalisation is the future in the fashion business. Gen Z and Millennial customers today agree that the experience provided by a fashion brand, online as well as offline, is as important as its products which is clearly in line with findings from our data which shows that over 85% of our respondents agreed to that statement (with mean rank of 4.09). Today, with the access of customer data, retailers can use customer information in a responsible manner to deliver better products and services. Buyers want the brand to understand their personal need/preference and this will influence their loyalty (mean rank 4.09). Consistency between online and offline brand store is another influencer of their loyalty (mean rank 4.35). The integration of data across channels will make the whole purchase process smoother. However, contrary to results from other consumer research reports, receiving offers when they are near the stores will not impact their shopping behaviour that much (mean rank 3.34). Brand engagement on social media will also not play that big a role in their choice (mean rank 3.32). The analysis also confirmed that customers

wanted physical store and website to be more personalised than others (e-mail and online ads) as these are the top sales channels for any fashion brand. Shoppers are somewhat willing to spend more (mean rank of 3.82) and share data but expect services like expert sales service and seamless cross-channel shopping in return. Loyalty coupons, exclusive deals, rewards or special sale offers for items that interest them, are some of the benefits they expect now [1]. While India is still at a nascent stage of personalisation, companies need to be quick to adapt to the new normal. Investments in innovation and market research & development will help brands transform their methods. A big differentiator post COVID-19 will be customer service which prioritises their personal expectations, preferences and needs to be treated as personal rather than just another segment.

### **Conclusion And Recommendations**

The analysis of responses for this study clearly suggests that customers are ready and excited about the possibilities of personalisation in the Indian apparel market. Half of them have already experienced this in some form or another. The

customer base is now very diversified coming from different cultures, backgrounds and qualifications. People in India today are more aspirational. Boost to internet penetration and online commerce in the recent years has empowered the middle-class population and made them much more comfortable with ordering clothes and accessories online. But with so many choices of national and international brands at their fingertips, the buyers look for more. This pandemic has pressured many retailers to take their businesses online. Brands are preparing for digital transformation and finally taking a leap. They are coming up with ways to make the experience smoother. Personalisation is serving as a medium to achieve the same.

Shoppers today want to be recognised and remembered. They feel that brands should pay attention to their personal needs and give recommendations accordingly. For example, if a customer purchases a white t-shirt on the brand's website, when he visits a brand outlet a week later, the salesman should recognise him

with his past purchase record and suggest a blue or black denim jeans to go with the white t-shirt. This will make the shopper feel important and increase his brand loyalty. Brands today try to create 'living profiles' or personas to predict different aspects of a customer journey. They need to allow customers to carve their own brand journey [2]. What brands can do is pay attention to nuances which matter to their choices. In clothing, this can be fabric, style, feature or fit. With this information, the salesman can suggest a shirt or trouser. Almost 75% of the respondents to the survey also agreed that having the right product in stock is more important than having a wide variety of products.

The objective of this study was to understand the customer's perspective towards personalisation in India so that companies are equipped to better design their value proposition post COVID-19 lockdown and have a differentiating factor in the competitive space. There were interesting insights from this study which can help fashion brands create a strategy and come back strong after the economy opens up. Some of the recommendations are as follows. Having safety protocols inside stores should be the top priority. Handling tried on merchandise and payments will be important in gaining customer confidence especially in the fashion industry. This is already being taken care of as some of the stores reopen in different parts of the country. The pandemic was like a shot in the arm for fashion industry in India. Brands need to take advantage of this crisis and invest in the customer experience while making sure that right products are available for customers at the right places. There are young and fashion-conscious consumers who see fashion as a reflection of their personality and aspirations. They are attracted towards international brands because of the quality experience in terms of sales service, ambience and ease they provide in their stores. Indian brands can better leverage customer data to reach out to them with personalised deals. Taking the time to interact with customer on a personal level makes him/her feel special and valued. According to the data, it was clear that customer may be not be that loyal to brands. They are more likely to choose the one with



better deals and services. Starting with the basics, a brand can figure out ways to sell and deliver the merchandise to customer's place. Be it WhatsApp shopping or 'order online, pick-up in store', it needs to take small steps to provide convenience to its client base. Companies should invest in providing training to sales associates on a larger scale so that they are ready to understand a shopper better and recommend stuff, looking at their past purchase data. There are certain trade-offs which the customers are willing to make in return for the enhanced service. First is in terms of 'data'. Privacy continues to be top of mind for customers [8]. Still they are willing to share information with trusted brands if they receive tangible benefits such a frictionless buying process. It was recently reported that the online fashion platform, Limeroad suffered a serious security breach and details of its 1.29 million shoppers were up for sale on the darkweb [11]. This included their private information like first name, last name, phone number, and email IDs. Incidents like these are a major dent on consumer confidence, not just for the brand but for the whole industry. Therefore, it is upto the brands to respect their trust and carefully manage this responsibility. Second is in terms of cost. It was found from the primary and secondary data that customers are willing to spend more with companies that offer a better experience [32]. This is also particularly true for brands which provide them with targeted recommendations [35]. So, stores can have better systems in place which ensures are satisfied or atleast not dissatisfied with the in-store experience. Fashion retail chains can start working towards a 'Phygital' retail model which incorporates various technology concepts to ensure a seamless brand experience for consumers. This study attempts to provide important messages to practitioners and managers. The recommendations can help them get actionable insights into the customers' minds. An incremental change in the business model on the operations and technology fronts can have a greater impact in the long term for the business. This study makes it clear that Indian fashion companies need to adapt their processes according to current customer demands. It is time that conventional fashion

retailing in India be complemented with if not replaced by interactive digital technology measures to provide customers the ease and safety of fashion retailing.

### Limitations

Despite being backed by data analysis, the results and findings have to be seen in the light of certain limitations. There were certain influences outside the control of the researcher in this study. Since this is new technological trend emerging on the back of COVID-19 in the retail business, there isn't much research literature available on its feasibility and impact in the Indian scenario. Prior research studies where provide theoretical foundations of research questions were limited. Therefore, online literature and consumer research reports by renowned consultancy firms of the world were reviewed to prepare a new questionnaire survey to get the data from customers. Another one is the research being more customer-centric and less firm-centric. The purpose was to understand the customers' take towards personal shopping. The perspective of retail firms could not be collected due to constraints of time, communication and logistics during the lockdown. Future researchers can do a longitudinal study to arrive at more specific results. The present exploratory study made the use of convenience sampling to collect data points. This type of sampling often suffers from biases and can lead under-representation or over-representation of the population. This makes it difficult to generalise the results to the population as a whole. Almost 68 percent of responses came from people in the age group of 18-25 – the millennial age group. This may have made the findings more aligned towards young shoppers of fashion. As already pointed out in review of literature, the word personalisation means something different to different people and groups. There was not a way

to measure the degree of personalisation demanded by shoppers in the present scenario as it is quite subjective. Maybe further research in this field and area of interest can uncover new insights with the use of a new research model and overcome the limitations of this study.

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**ANXIETY ASSESSMENT OF SENIOR SECONDARY ADOLESCENTS****Bharat Kumar<sup>1</sup>, Dr.Gurbir Dullet<sup>2</sup>**<sup>1</sup>ph.d scholar, psychology,<sup>2</sup>assistant professor<sup>1,2</sup>himalayan garhwal university, pauri garhwal, uttarakhand, india,  
singhal.bharat@rediffmail.com**ABSTRACT**

*The objective of this study was to study the level of anxiety among adolescents. A group 1500 adolescents of age group 15 to 17 year from private and government schools was chosen for the study. While selecting samples, equal numbers of male and female adolescents are selected using convenient method from equal number of private and government schools. T. Aeron Beck anxiety inventory was used to measure anxiety level. t-test was applied for statistical analysis of data and to find out significant difference among adolescents. Statistical analysis of score says that 13.53% adolescents are facing severe level of anxiety. 31.4% are facing moderate anxiety and 43.6% are facing mild level of anxiety. Total 17.07 % adolescents in government schools are facing higher anxiety as compared with 10 % adolescents of private schools. It is observed that more of adolescents of government schools are facing higher anxiety as compared with 29.87% adolescents of private schools. Male adolescents are having higher level of anxiety (44%) as compared with 35.63% female adolescents. Adolescents working in private schools face low level anxiety as compared with studying in government schools. Overall adolescents studying in government schools are facing higher levels of anxiety as compared with private schools. It is suggested that corrective measures should be taken by schools to improve mental health of adolescents*

**Keywords:** *Adolescents, Anxiety, Private schools, Government schools*

**Introduction**

Adolescence is a human development's most important phase that are often characterized by neurobiological, social, psychological, behavioral, hormonal variations. In the period of this development, the adults are supposed to meet and cope up with some very common elements of stress that include puberty associated changes that are physical and sexual, demands of their school life, initiation problems and maintenance of friendships with their fellows, their intimate and romance matters, choice of career, working life and its beginning, getting independent to some extent from their families etc. Along with this, there are some other serious and weird kind of stressors that are linked to the family for example, any sort of psychological and body illness, passing out of beloved ones, drug abuse, alcohol intake, smoking, separation of parents, personal concerns etc. Personal concerns include the teenage issues, some serious hidden illnesses, failure in school life, pregnancy and menstruation, abuse of any kind etc.

If all these stress causing factors stay in life for a longer period, they can result in mild to

extreme anxiety. The commonest sort of affective disorder is anxiety and this can affect anyone at any stage of life. Anxiety is now days becoming a customary problem and is quite natural. It has been suggested that one out of eight kids are likely to experience anxiety. With maturity, social interaction, learning from social circle, parents, guardians' etc children somehow learn to keep themselves cooler and to deal successfully with their anxiety related concerns. Sometimes, child anxiety if not treated initially can be alarming and become chronic and protracted. If left untreated it can turn into a mental disorder. When this anxiety is left uncontrolled, it interferes with the child's every day activities, learning and interaction. It is observed that children start avoiding communication with their relatives and friends and turn into introverts. The cognitive behavioral therapy or talking therapy is the considered as the most effective therapy for the treatment of anxiety in youngsters. In this investigation we have aimed to access the prevalence and various levels of anxiety among adolescent of classes 11 and 12 studying in various schools affiliated with CBSE Boards in Dehradun city.

### Significance Of The Study:

Adolescents are future of a country. The development of science and technology has made human life and the society so complex and dynamic that the adolescents have to face different challenges in life to adjust pleasingly with their daily activities. Therefore, in the context of this rapidly changing situation and time, it is important to study what are the levels of anxiety of adolescents. It is found from some studies that the adolescents studying in government schools are less prone to face anxiety than the adolescents of private schools and vice-versa. A comparative study of anxiety of adolescents studying in private and government school will explore the fact in present time.

### Review of literature

Anxiety is defined as mental health issues that affect the overall health of the affected individuals. According to Tiwari (2008) board exams cause restlessness and anxiety of tough subjects, lack of confidence, memory problems. According to Kumar; B (2018), there is a lot of difference between girls and boys in terms of their emotional progression, for difference in level of anxiety of male and female adolescents, there is a dimension of emotional maturity that generally causes such differences. The evidence obtained from epidemiology indicates that disorders related to anxiety are often more prominent in children and adolescents. Generally speaking, in children and adolescents the life time prevalence for any disorder regarding anxiety is in range from 10 to 20 percent approximately according to Costello et al., in 2014. For the developmental periods most of the childhood and adolescence fears are considered suitable and hence the circumstances which give rise to such conditions are considered as adaptive. These conditions are adaptive in nature since they help the children and adolescents to anticipate danger and risks, threats and harms. The clinical expression of such conditions are generally regarding the inappropriate fears that develop in the people and end up in acute anxiety and distress. (Moore et al., 2010). On the other hand, for anxiety related disorders, the people who get

anxiety in their later adolescence demonstrate general risk factors for the anxiety disorder related events in adult stages. There are so many disorders such as social phobias, PD, GAD and OCD. These all disorders generally manifest the symptoms of waxing and waning whereby the exacerbation of symptoms is linked to experiences that are highly stressful. (DSM-IVTR; APA, 2000). It is indicated by the ample evidence that the essential and foremost factors contributing to the anxiety symptoms maintenance are biological predispositions. All these factors include hormonal concerns, neurobiological issues, and family genetic history. However, it is always important not to underestimate the environmental factors. For depressive disorders there are more consistent outcomes but for many children and adolescents the studies have indicated that those who are more exposed to the chronic stress related things undergo unexpected and unpredictable situations. This could be a big risk for children and adolescents to develop anxiety related disorders. It has been suggested by research that after the relocation in families, people especially children tend to suffer from GAD, the disease is also caused due to changes in school, life events that turn out to be stressful and unpleasant. (Vasey and Ollendick, 2000). It is a known fact that increase in anxiety sensitivity is generally due to the stressful events related to the family discord and health. (McLaughlin and Hatzenbuehler, 2009). The practices regarding parenting are often leading to various psychological disorders such as anxiety. Over protective parents, for example generally practice inhibited behavior and avoidant nature in kids and this is their own way to encourage them to perceive negative circumstances, this ends up in impaired potential to cope and increases the level of stress and anxiety. Along with this, specificity to a certain degree is there inside these links between life events and anxiety related disorders. It is seen for example that the separation of parents was linked directly and indirectly to GAD, in the same way children mostly suffered from phobias after the death of their parents. (Kendler et al., 1992). In this way, the internalizing disorder

causes are prevailed by these theoretical models especially if we consider anxiety and depression. Both anxiety and depression are variants of the stress related models. For the diathesis stress model the fundamental assumption is that diathesis are mentioned interchangeably as vulnerability. In the same way, stressors or some environmental circumstances are essential for the development of some illnesses, which is not sufficient all alone. Hence, internalizing symptoms as assumed ends up from communication of various vulnerabilities including genetic vulnerability, cognitive, environmental or atmospheric vulnerability and neuro biological vulnerability etc, all these are considered as stressful events. As an alarm activated whenever the danger is perceived all the children experience anxiety at their life stages, in the same way these alarms also get activated in embarrassing situations, stressful and anxious situations. In the same way, the children need to be taught the ways to deal with anxiety and manage such events. On the other hand, it is seen that when children suffer from lower anxiety levels, these little anxieties are often helpful and children learn to manage and deal with anxiety. Children brought up under high anxiety level have negative impact on their private and social associations. This can lead to various problems regarding emotions and general health. (Herrero, Sandi,&Venero, 2006). The transitory emotion is linked with the term anxiety and it has immediate affect on the cognitive learning of a child in specified circumstances and initiate the worrying feelings inside them. Such children often suffer from nervousness and tightness. As a result of it, memory of these children is affected. (Bigdeli, 2010; MacIntyre, 1995). In present research author has tried to measure the degree of anxiety among adolescents.

#### Statement of problem:

To find out the general anxiety level of among adolescents.

#### Objectives:

1. The comparison of level of anxiety in males and females adolescents.

2. The comparison of level of anxiety among male adolescents that are students in private schools and government schools
3. The comparison of level of anxiety in female adolescents that are students in private schools and government schools.
4. The comparison of male and female adolescents and their level of anxiety in case when they are studying in private schools
5. The comparison of male and female adolescents and their level of anxiety in case when they are studying in government schools

#### Hypotheses Of The Study

1. In the anxiety level of male and female adolescents, there is no significant difference
2. In the anxiety level of adolescents studying in private and government schools there is no significant difference
3. In the anxiety level of male adolescents studying in private and government schools, there is no significant difference
4. In the anxiety level of female adolescents studying in private and government schools, there is no significant difference
5. In the anxiety level of male and female adolescents studying in private schools, there is no significant difference
6. In the anxiety level of male and female adolescents studying in government schools, there is no significant difference

#### Research Methodology

**Tools Used For Data Collection** To analyze the level of anxiety, BAI, standardized psychological scale developed by Aaron T. Beck (1988 and revised in 1993) was used. (Table:1)

**Table: 1 Range of Anxiety as per BAI**

Range Of Scores	Interpretation
0-7	Minimal
8-15	Mild
16-25	Moderate
26-63	Severe

**Population** For the present study, the population is the adolescents studying in class 11<sup>th</sup> and 12<sup>th</sup> in private and government schools affiliated to CBSE located in Dehradun city.

**Sample Lay Out** Convenient method was used to select 1500 adolescents from Dehradun city,

Uttarakhand. Out of 1500 adolescents, 750 were selected from 15 government schools and 750 from 15 private schools. From each school 25 male and 25 female adolescents were selected (Table: 2).

**Table: 2 Distribution of Sample**

School Type	No. of Schools	Number and Location of Schools in Dehradun City					Adolescents	
		North	South	East	West	Centre	Male	Female
							25+25 from each school	
Private	15	3	3	3	3	3	375	375
Government	15	3	3	3	3	3	375	375
<b>Total</b>	<b>30</b>	<b>30</b>					<b>750</b>	<b>750</b>

**Procedure of Data Collection** The collection of data was spread over a period of 15 days (November 2020). Written consent was taken from adolescents and school and rapport was established with adolescents. The instructions were explained and doubts were clarified. After the completion of the inventories, the investigator conveyed his gratitude to the adolescents, teacher and head of the school. Data were collected, scored and statistical analysis was done for interpretation.

**Statistical Analysis of Data** On the basis of the scores obtained by adolescents, sample was divided into four categories. Percentage, mean and standard deviation were calculated for different categories of anxiety level (Table: 3).

t-test was applied to compare anxiety scores with regard to gender and types of schools.

**Analysis Of Results**

**Anxiety scores of adolescents** Out of 1500 adolescents 13.53 % are facing severe level of anxiety, while 31.4 % are facing moderate level of anxiety. It means total 44.93 % adolescents are facing considerable level of anxiety. 43.6 % adolescents are facing mild anxiety and 11.47 % adolescents are facing minimal level of anxiety. (Table: 3)

**Table: 3 Anxiety Scores Of Adolescents**

Category of Anxiety	Adolescents		Male Adolescents				Female Adolescents			
	Total	%	N	%	Mean	SD	N	%	Mean	SD
Minimal	172	11.47	73	9.73	5	1.58	99	13.2	3.91	1.67
Mild	654	43.6	302	40.27	11.31	7.15	352	46.93	11.78	2.3
Moderate	471	31.4	240	32	21.93	2.49	231	30.8	21	2.98
Severe	203	13.53	135	18	45	38.03	68	9.67	55	10
<b>Total</b>	<b>1500</b>	<b>100</b>	<b>750</b>	<b>100</b>	<b>20.48</b>	<b>14.96</b>	<b>750</b>	<b>100</b>	<b>17</b>	<b>19.94</b>

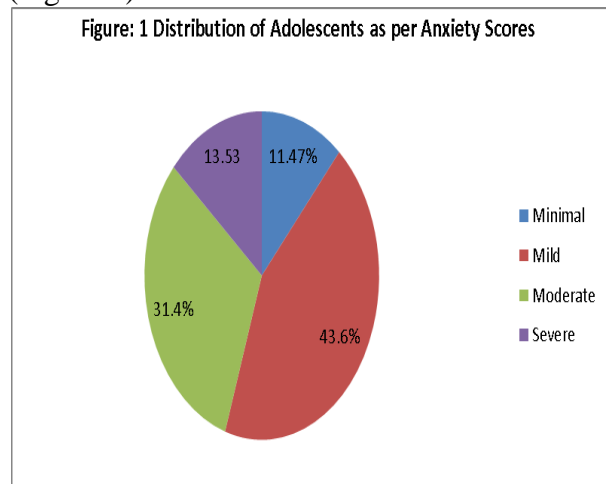
**Anxiety Profile of Adolescents Based on Gender and Type of Schools** Out of 750 male adolescents, 18 % have severe anxiety. 32 %

adolescents have moderate anxiety. 40.27 % adolescents have mild level of anxiety and 9.73 % have minimal level of anxiety. Among



female adolescents 9.67 % have severe anxiety, 30.8 % female adolescents have moderate anxiety. 46.93 % female adolescents have mild level of anxiety and 13.2 % have minimal level of anxiety (Table: 3). It means more male adolescents are facing severe level of anxiety as compared with females, similarly high difference is observed at mild level of anxiety. More female adolescents are under mild level of anxiety as compared with male adolescents. Hence, 135 male adolescents have severe anxiety as compared with 68 female adolescents. 240 male adolescents have moderate anxiety as compared with 231 female adolescents. 352 female adolescents have mild level of anxiety as compared with 302 male

adolescents and 99 females have minimal level of anxiety as compared 73 male adolescents (Figure 1).



**Table: 4 Anxiety Scores Of Adolescents Based on School Type**

Category of Anxiety	Adolescents							
	Private Schools				Government Schools			
	N	%	Mean	SD	N	%	Mean	SD
Minimal	106	14.13	5.56	1.195	66	8.8	5.38	10.24
Mild	345	46	11.75	1.817	309	41.2	12.41	1.524
Moderate	224	29.87	21.34	2.232	247	32.93	22.07	1.873
Severe	75	10	49.96	7.756	128	17.07	53.47	12.31
<b>Total</b>	<b>750</b>	<b>100</b>	<b>17.65</b>	<b>12.51</b>	<b>750</b>	<b>100</b>	<b>22.01</b>	<b>15.66</b>

Table:4 reveals that adolescents studying in government schools are facing higher level of anxiety as compared with those studying in private schools. 17.07 % of government school adolescents are facing severe level of anxiety as compared with 10 % of private school adolescents while at minimal level of anxiety, 14.13 % adolescents of private schools are present as compared with 8.8 % of government

school adolescents. At moderate very less difference is observed between adolescents of private and government schools but greater difference is observed at severe and minimal level.

**Comparison of Scores for Anxiety of Male Adolescents Based on School Type**

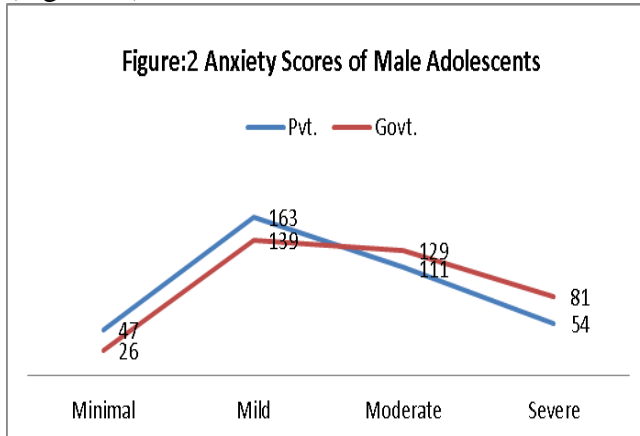
**Table: 5 Anxiety Scores of Male Based on School Type**

Category Of Anxiety	Male Adolescents							
	Pvt. School				Govt. School			
	N	%	Mean	SD	N	%	Mean	SD
Minimal	47	12.53	05	1.31	26	6.93	05	1.150
Mild	163	43.47	11.25	1.93	139	37.07	12	1.797
Moderate	111	29.6	20.66	2.71	129	34.4	21.5	2.470
Severe	54	14.4	48	9.57	81	21.6	51	9.401
<b>Total</b>	<b>375</b>	<b>100</b>	<b>18.83</b>	<b>13.81</b>	<b>375</b>	<b>100</b>	<b>23.25</b>	<b>16.10</b>

Table: 5 shows that more male adolescents of government schools are facing severe anxiety (21.6%) as compared with male adolescents of private schools (14.4%). 34.4 % male

adolescents of government schools have moderate level as compared with 29.6 % private school adolescents. 43.47 % private school male adolescents come under mild level

of anxiety as compared with 37.07 % adolescents from government schools. More male adolescents of private school (12.53%) have minimal level of anxiety as compared with adolescents of government schools (6.93%). It can be observed that there is a greater difference in the anxiety among male adolescents studying in private and government schools. More male adolescents of government schools are facing high anxiety as compared with adolescents studying in private schools (Figure: 2).



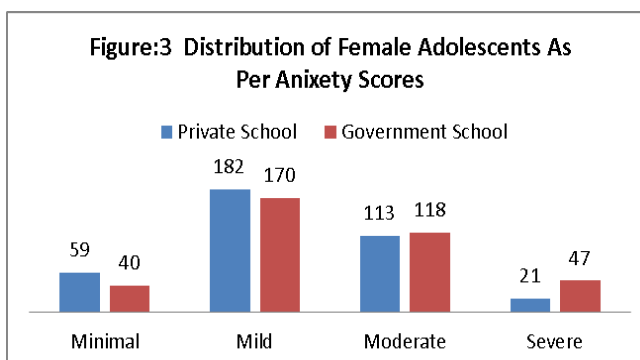
**Comparison of Scores for Anxiety of Female Adolescents Based on School Type** The researcher tried to describe anxiety of female

adolescents studying in private and government schools. Table: 6 reveals that out of 375 private schools female adolescents, 59 of them come under minimal anxiety (15.73 %), 182 adolescents have mild anxiety (48.53%). 113 adolescents have moderate level of anxiety (30.13 %) and 21 adolescents have severe level of anxiety (5.6 %). While out of 375 female adolescents studying in government schools, 40 have minimal anxiety, 170 falls under mild category and 118 are at moderate level and 47 adolescents come under severe level.

It's clear that near about double number of female adolescents of government schools are facing severe level of anxiety as compared with female adolescents of private schools, while difference at moderate level is not too high. More adolescents of private schools are at minimal level of anxiety as compared with adolescents of government schools. In this way high anxiety can be observed among government school female adolescents as compared with female adolescents studying in private schools.

**Table: 6 Anxiety Scores Of Female Adolescents Based on Gender**

Category Of Anxiety	Female Adolescents							
	Pvt. School				Govt. School			
	N	%	Mean	SD	N	%	Mean	SD
Minimal	59	15.73	6	1.084	40	10.67	5.63	0.897
Mild	182	48.53	12.2	1.704	170	45.33	12.75	1.250
Moderate	113	30.13	22	1.753	118	31.47	22.70	1.276
Severe	21	5.6	55	5.941	47	12.53	57.72	5.512
Total	375	100	16.46	11.21	375	100	20.76	15.219



**Statistical Analysis of Anxiety Scores of Adolescents Based on Gender Type** The researcher calculated t-value to find out significant difference between male and female

school adolescents with regard to their anxiety. Calculated t-value is 3.8236, which is greater than the table value at 1% level of significance. Similarly extremely significant is observed between male and female adolescents at minimal and moderate level of anxiety and significant difference is observed at severe level of anxiety (Table: 7). So we can reject first null hypothesis and it can be concluded that there is a significant difference in the degree of anxiety of male and female adolescents (Table 7).

**Table: 7 t-Value Table of The Level Of Anxiety Of Male And Female Adolescents**

Anxiety Level	Adolescents		t value	Df	SED	P Value	Result
	Male	Female					
Minimal	73	99	4.3280	170	0.252	<0.0001	Extremely significant
Mild	302	352	1.1651	652	0.403	0.2424	Not significant
Moderate	240	231	3.6807	469	0.253	0.0003	Extremely significant
Severe	135	68	2.1292	201	4.697	0.0345	significant
Overall	750	750	3.8236	1498	0.910	<0.0001	Extremely significant

**Statistical Analysis of Anxiety Scores of Adolescents Based on School Type**

Table:8 reveals that for minimal and mild levels of anxiety scores, t value is lesser than table value which means there is no significant difference in the anxiety level of adolescents studying private and government schools at minimal level. But for moderate and severe levels calculated t value is greater than table value which means difference is highly

significant. For over all anxiety scores of adolescents studying in private and government school, calculated t value is higher than the table value at 1% level of significance. This means that extremely significant difference is present. So second null hypothesis is rejected and it is concluded that there is a significant difference in level of anxiety of adolescent studying in private and government schools in Dehradun.

**Table: 8 t-Value Table of The Level Of Anxiety Of Adolescents Based on School Type**

Anxiety Level	Adolescents		t value	Df	SED	P Value	Result
	Pvt.	Govt.					
Minimal	106	66	1.0137	170	0.178	0.3122	Not significant
Mild	345	309	6.2111	652	0.106	<0.0001	Not significant
Moderate	224	247	2.2717	469	0.189	0.0236	Significant
Severe	75	128	2.2231	201	1.589	0.0273	significant
Overall	750	750	5.9573	1498	0.732	<0.0001	Extremely significant

One objective of this study was also to compare male adolescents studying in private and government schools with regard to their anxiety level. The researcher calculated t-value

to find out significant difference. Table 9 presents the same.

**Table: 9 Significant Differences in Anxiety Level Of Male Adolescents**

Anxiety Level	Type of School		t value	Df	SED	P Value	Result
	Pvt.	Govt.					
Minimal	47	26	0.000	71	0.307	1.000	Not Significant
Mild	163	139	3.4879	300	0.215	0.0006	Extremely Significant
Moderate	111	129	2.5112	238	0.334	0.0127	Significant
Severe	54	81	1.8036	133	1.663	0.0736	Not Significant
Overall	375	375	4.0349	748	1.095	<0.0001	Extremely Significant

**Analysis of Anxiety Scores of Male Adolescents** From table 9, it's clear that t-value is greater for moderate and mild level of anxiety; it means the difference is significant.

Overall t-value is 4.093 which is greater than table value at 1% level of significance. So t-value is a significant. Hence the 3<sup>rd</sup> null hypothesis is rejected and it can be concluded

that there is significant difference in the degree of anxiety between male adolescents studying in private and government schools in Dehradun.

**Analysis of Anxiety Scores of Female Adolescents** Table: 10 reveal that for mild and moderate level of anxiety among female adolescents studying in private and government schools, t-value is 3.425 for mild level and 3.4766 for moderate level which are greater than the table value at 1% level of significance. greater than the table value at 1% level of

significant, so we can say that there is significant difference in the level of anxiety of female adolescents at mild and moderate level. t-value for total anxiety scores is 4.4054 which is greater than the table value at 1% level of significance. So t-value is significant. Hence 4th null hypothesis is rejected. So it can be concluded that there is a significant difference in the degree of anxiety between female adolescents studying in private and government schools in Dehradun.

**Table: 10 t- Value Table For The Level Of Anxiety Of Female Based on School Type**

Anxiety Level	Type of School		t value	Df	SED	P Value	Result
	Pvt.	Govt.					
Minimal	59	26	1.8003	97	0.206	0.0749	Not significant
Mild	182	139	3.4250	350	0.161	0.0007	Extremely significant
Moderate	113	129	3.4766	229	0.201	0.0006	Extremely Significant
Severe	21	81	1.8357	66	1.482	0.0709	Not significant
Overall	375	375	4.4054	748	0.976	<0.0001	Extremely significant

As per data of table 11, at minimal, mild and moderate level of anxiety, calculated t- values are greater than the corresponding table value at 1% level of significance, so it can be concluded that there is significant difference. Similarly high significant difference is observed at severe level of anxiety. For overall

anxiety scores t-value is 2.5802 which is significant at 1% level of significance. Hence the 5<sup>th</sup> null hypothesis is rejected. And it can be concluded that there is significant difference in the degree of anxiety between male and female adolescents studying in private schools in Dehradun.

**Table: 11 t- Significant Differences in Anxiety Level Of Male and Female Adolescents Studying in Private Schools**

Anxiety Level	Adolescents		t value	Df	SED	P Value	Result
	Male	Female					
Minimal	47	59	4.3015	104	0.232	<0.0001	Extremely Significant
Mild	163	182	4.8554	343	0.196	<0.0001	Extremely Significant
Moderate	111	113	4.4040	222	0.304	0.0001	Extremely Significant
Severe	54	21	3.1189	73	2.244	0.0026	High Significant
Overall	375	375	2.5802	748	0.919	0.0101	Significant

As per t-value mentioned in table 12, calculated p-values are lesser than 0.0001 for

moderate, severe and mild level on anxiety and at minimal level t- value is greater than the

calculated table value at 1% significant level. It means at minimal level of anxiety there is significant difference. The t-value for overall anxiety score is 2.1763 which is greater than p-value at 1% level of significance. So t-value is

significant. Hence the 6<sup>th</sup> null hypothesis is rejected. So it can be concluded that there is significant difference in the degree of anxiety between male and female Adolescents studying in government schools in Dehradun.

**Table: 12 Significant Differences in Anxiety Level Of Male and Female Adolescents Studying in Government Schools**

Anxiety Level	Adolescents		t value	Df	SED	P Value	Result
	Male	Female					
Minimal	26	40	2.4924	64	0.253	0.0153	Significant
Mild	139	170	4.3137	307	0.174	<0.0001	Extremely Significant
Moderate	129	118	4.7307	245	.254	<0.0001	Extremely Significant
Severe	81	47	4.4709	126	1.503	<0.0001	Extremely Significant
Overall	375	375	2.1763	748	1.144	0.298	Significant

### Interpretation And Discussion

The following findings were drawn on the basis of analysis and interpretation of the data:

1. Among male and female adolescents, more males have higher level of anxiety as compared with females.
2. Adolescents studying in government schools are facing more anxiety as compared with adolescents studying in private schools.
3. Male adolescents studying in government schools are facing higher anxiety level as compared with those studying in private schools.
4. Among female adolescents, those studying in government schools are facing higher level of anxiety level of anxiety than those studying in private schools.
5. There is a significant difference in the anxiety of adolescents. Less number of male adolescents studying in private schools of Dehradun is facing high anxieties level with a very high difference as compared with those studying in government schools.
- 6.

### Conclusion

It is concluded from this investigation that in the anxiety related to gender and type of schools the children are studying, there is a significant difference. There is a greater difference in the level of anxiety as observed in this investigation. Therefore, it is essential to work with all the factors leading to higher anxiety so as to achieve the educational goals

and objectives. The study revealed that the adolescents of government schools of Dehradun are more prone to face higher levels of anxiety. Adolescents studying in private schools have better condition of anxiety levels. All the adolescents had not enjoyed the lower level of anxiety. Therefore, necessary facilities should be made available for increasing quality of education to lower down the anxiety and creating an effective teaching-learning environment in every institution of the state.

### Educational Implications

This investigation is in fact a diagnostic study, which is aimed to reduce the level of anxiety in children for the improvement of their mental and physical health. It is the responsibility of both government and private schools to sort out the cases and provide them the proper counseling. Therefore, to fulfill the anxiety related concerns and to improve the mental health of the kids, there is a need of remedial measures. By monitoring the level of anxiety, proper changes can be made in educational environment.

### Limitations

1. Study is limited to 1500 adolescents studying in private and government schools of CBSE board located in Dehradun city.
2. Research is limited to qualitative assessment.

### Suggestions

1. Study may be conducted on large population to increase its comprehensiveness.
2. Anxiety levels of middle school students and college level students could have been assessed to make it a comparative one.
3. It is suggested that study may be conducted in other cities to increase comprehensiveness of its conclusions.
4. A study may be conducted on large sample to search very definite conclusions regarding anxiety and Depression.

5. Anxiety and Depression of the adolescents of various disciplines like natural sciences and social sciences can be measured and compared.

6. Different variables like work load, work habits, age, interests, adjustment and self-concept can be undertaken in relation to anxiety.

7. A study should be conducted to find out the remedial measures for the anxiety.

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**Conflict Of Interest** Author has declared that no competing interest exists..

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## MODELING THE CHALLENGES FACED BY FARMERS TO ACCESS AGRICULTURAL CREDIT: AN ISM MICMAC APPROACH

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### ABSTRACT

*Purpose:* This paper aims to understand the importance of agricultural credit and the various challenges faced by the farmers to access Institutional/Non-Institutional loans so that the interdependencies among the various challenges can be created in the form of hierarchical structure that can be helpful for the easier analysis.

*Methodology/Approach:* Interpretive structure modelling has been utilized as the methodology to analyze the relationship among the challenges faced by farmers to access agricultural credit. MICMAC Analysis has likewise been utilized to discover driving and dependence powers of various challenges to settle on better decisions.

*Practical/Theoretical Implication:* This research paper would serve as a prelude to various financial/non-financial institutions to gain insights into the problems faced by the farmers in getting agricultural credit and assign their credit policies accordingly.

*Originality/Value:* The primary research of the paper is original in nature and would help in tweaking the agricultural credit policies..

**Keywords:** Challenges, Farmers, Institutional/Non-Institutional loans, ISM, MICMAC

### Introduction

In India, agriculture has played a great role in boosting the Indian economy. Numerous financial analysts and strategy producers progressively accept that the future development of the residential economy to a huge degree will rely upon the vigorous performance of the rural and agriculture division. It's contribution to national income, foreign exchange, industry, and employment opportunities defines the impact it carries. In 2018, it has been noted that agriculture affects about 17–18% of the country's GDP and employed more than 50% of the Indian workforces. Despite being such a great economy booster, farmers have to face various challenges while accessing the agricultural credit both in the forms of Institutional loans or Non-Institutional loans. The investigation found that, in spite of the fact that the proportion of farming credit to agriculture GDP has expanded from 5.4 percent in 1970s to 8.7 percent in 2001-02, it might be noticed that agrarian credit as an extent to add up to credit has declined from 20.5 percent to 10.5 percent during a similar period demonstrating lower arrangement of credit in agribusiness.

There is no doubt that credit is one of the key factors for the sustained growth of the

agriculture industry. It capitalizes the farmers to undertake new investments, import new technologies, production, and marketing strategies that empower the welfare of the farming industry [1]. But along with that, it becomes a dire necessity for small and marginal farmers who don't have a strong background to finance their own agricultural needs. Access to credit is a remedy to destitution decrease among those rural poor. Extra capital because of access to credit improves the degree of the family unit's profitable resources, and furthermore raise their expenses and it is that expenses that lead to progress in utilization (food and non-food) of the rustic poor.

To make sure that there can be smooth functioning and a regular supply of sufficient agricultural credit to the farmers, this paper attempts to retrospect the agricultural policy and the various challenges faced by farmers in availing of the finance for agriculture.

In this paper, we concentrate on identifying various challenges faced by farmers to access agricultural credit and to develop a hierarchy towards better credit structure in the agricultural industry. In particular, we mean to address the accompanying objectives:

- Finding various challenges faced by farmers while accessing Institutional/ Non- Institutional loans.
- Developing a contextual relationship among the significant challenges.
- Developing a hierarchical structure of challenges.
- Proposing the required measures that need to be taken for having a sustainable agricultural credit mechanism.

Various challenges have been discovered through literature review and secondary research. After that, Interpretive Structure Modeling (ISM) an interpretive device has been utilized to build up a progressive model that depicts the level of challenges alongside showing the interdependencies among challenges[2].

The following sections of papers are given as below.

Section 'Review of Literature' provides the relevant literature of the undergoing agricultural credit policies impacting the farmers and various challenges related to the financing of agricultural credit. Section 'Identification of Challenges' describes the various challenges. ISM and MICMAC methodology is explained in Section 'Research Methodology'. After that, Section 'Results and Analysis' describes the results of the analysis that has been done so far. At last, pertinent suggestions from management perspective has been showcased to help the financial institutions to make better decisions while availing credit to farmers taking their problems into consideration.

### **Review Of Literature**

Over the past six decades, agriculture has always occupied a key position in boosting our Indian economy. Rajesh Rai, J.Rai[3] has explained how the lifestyle of farmers has improved due to advancements in credit utilization through various sources. Authors additionally examined that the cropping intensity has expanded because of appropriate credit use by utilization of present-day farm innovation, high yielding assortments, and other auxiliary endeavors like domesticated animals' production and dairy, upgrading the general pay and work opportunity in the agriculture business and in this way improving

the overall GDP development of our economy. Due to this, it turns out to be very important to continue enhancing our agrarian industry and to ensure that the progression of credit which is one of the basic contributions for agriculture advancement can have smooth functioning.

A large volume of literature is available on the concept of agricultural credit and how it has impacted the farming industry. Various researches had tried to showcase the influence of the Institutional/Non-Institutional agriculture finance over farmers' needs and the rate of progress it has made to the livelihood of rural areas.

It cannot be denied that there has been significant progress in the improvement of agricultural credit for the past four decades. Ajit Kumar Mishra and Upasana Mohapatra [4] highlighted that how different institutional wellsprings of agrarian fund like co-operative societies, commercial banks including the Regional bank, Lead bank, and some non-institutional sources like Money Lenders, Landlord have been playing their noteworthy parts in giving advances to the farmers the nation over.

But there has been constant manipulation of credit policies in the institutional credit structure as we have seen commercial banks rising as the significant contributor of institutional credit to agribusiness as of late. Even regional rural banks are finding it hard to match up with the commercial banks in some remote districts as explained by K. Venu Madhava Rao [5].

With all these interventions by the government in improving the credit structure and making an expansive based institutional set in the mood for taking into account the credit necessities of the rural division, there have been some states like Kerala where the perception of farmers are also changing and they led them to go to institutional loans rather than the money lenders and it helps to reduce the farmer's distress of paying high rate of interest to money lenders, landlords, etc. John K. Mathew[6] in his research also mentioned the importance of RBI in playing a vital role to reduce lending from non-institutional sources in Kerala.

Even after regular government intervention, financing of agriculture is plagued with various



key problems. Dharendra Ojha [7] mentioned that there is only a slight improvement in conditions of farmers to access loans for livestock, irrigation purposes, equipment purchases. Plans like Agricultural Gold advances, Kisan Credit Cards, Kisan Gold Card Scheme, Dairy Plus Scheme, Scheme for financing seed processors by State Bank of India in the past has improved the provincial way of life to a limited degree yet the monetary Institutions don't fill the need of agribusiness as required. The author argued that farmers are still underprivileged, suffering from lower average returns than are enjoyed by non-farm families. On an average, the per capita income of land-owning cultivators is almost half of the non-agricultural. The author attempts to interface the agrarian business headway to the Indian economy and propose that since the Indian economy is an Agriculture economy so if the state of the Agriculture economy won't improve, it will influence the Indian Economy and its development.

Sharmishtha Matkar, Anil Keshav Jadhao [1] have made an attempt to study the rationale behind the distress of farmers in getting loans and why the banking framework is as yet reluctant on different grounds to furnish credit to small and marginal farmers. Authors explained that many farmers in remote locations are still adopting traditional farming activities that are high risk inherent to various climatic conditions like an intermittent failure of the monsoons, droughts, diminishing soil fertility, water scarcity, and many more. This led the banks to put a high rate of interest along with high demand for collateral security that turns into a standard as opposed to a special case alongside accompanying misuse and hopelessness that regularly came about.

At the macro level in India, one can argue that different institutional firms have played different roles to decrease the chances of exploitation of farmers by informal agencies. But as Venkateswarlu Yerukala [8] mentioned that in spite of all these efforts, smallholder farmers that constitute nearly 80 percent in the farming industry live in most vulnerable conditions even today. Having small patches of land for cultivation is not enough to secure their lives with minimum basic needs. In these high-risk ending situations, farmers are left

with no hope to repay their loans. Finally, they are bankrupt with no hope to think about their future needs, resulting in them to commit suicides with huge pressure. Due to this main reason, banks and other institutional firms always hesitate to provide any long-term loans to them. Moneylenders and other landlords take advantage of this situation and try to squeeze a high rate of interest and exploit the farmers' conditions.

Various policies mentioned by MP Antony [9] played a negligible role in the development of smallholder farmers. Base on the survey data of Kerala, the author analyzed some auxiliary, operational, and different other issues of institutional financing of agriculture, dependent on the standards like the size of account and amplexness of credit, advance strategy and payment, cost of credit and so on. The author also analyzed the inadequacy in the availability of credit and how it is unevenly disseminated among the districts, harvests, and size gatherings of cultivators. Through his examination, it was likewise settled that there are huge intraregional and local differences in agrarian credit dispersion. This prompted a high credit hole among specific locales. The author likewise demonstrated his speculation that there is no complementarity between open, private, and co-operative banks in financing agribusiness. Because of all the above reasons, the author comprehends that the extent of rural credit to add up to total credit is consistently declining as of late and is lower than the required level in the Kerala district.

It tends to be seen from the literature review that a great deal of studies has been done in analyzing the agricultural credit structure and how much it is serving the cause to eliminate the problems faced by farmers in availing those finances. Through these studies, various key challenges can be identified but fewer efforts have been done in the past to investigate the interactions among those challenges to access agricultural credit. Therefore, a model, which builds up connections among distinguished challenges, expect its own significance and will be covered in later sections.

### **Area Of Study And Identification Of Challenges**

Agribusiness assumes a noteworthy job in the

monetary improvement of India. Agribusiness is the wellspring of business for more than 70% of populace in this nation. The improvement of agriculture to its fullest potential is subsequently, the boss of Indian economy and the thriving of India is exclusively subject to agribusiness. But still, Indian farmers faces various problems in getting loans and this is a major area of study to understand the various challenges of Indian farmers while accessing the agricultural credit. In this paper, rigorous literature review through various researchers discussing various challenges faced by farmers to access agricultural credit has been done. Based on a literature survey and secondary research, fifteen challenges were identified. After that, the credibility of the challenges has been checked through Agri value chain business' experts. In view of the inputs got, the total number of challenges was dropped to eleven as certain challenges were irrelevant or having same meaning as that of other challenges. The relevant literature of these challenges has been explained below:

### 1. High Rate of Interest

High rate of interest by financial institutions proved to be a significant factor in causing the sufferings of farmers. Despite the fact that the rate of interest is decreased by numerous monetary institutions giving credit yet if we contrast it from the interest rates in different other divisions, we find that rate of interest for vulnerability-based farming is very high [7]. Due to high rate of interest, various farmers always hesitate to take loans from banks. The rate of interest charged from the farmers should be relatively low across different institutions [8].

### 2. Credit Inadequacy

Another challenge faced by the farmers is credit inadequacy in banks. Banks suffer from insufficient funds to be offered to farmers when required. This problem can be linked to the fact that most farmers in rural areas are not able to fill their interest payments in time. There is a serious extent of over levy and default in reimbursing and the circumstance presents a sorry situation in the business banks' loaning regarding its recuperation. Due to which banks are not able to maintain the

adequate credit levels and their outstanding balances keeps on increasing. Thus, it is necessary that regardless of whether the credit gave by the bank has expanded its advances, an exertion must be taken by the bank to decrease its outstanding balance, with the goal that the recouped bank credit ought to be siphoned back into Agriculture segment further for its development [10].

### High Transaction Cost

Aside from interest payment, farmers need to manage other transaction costs that can be truly challenging for them. These may incorporate loss of their earning days, income stamps, letter of ensures, cost of photos, loan agreement, and other unidentified charges being brought about at different stages to facilitate the authorization of loans, and so on. These high exchange costs hamper the soul of the farmers for getting advances. Beginning from the phase of getting application forms, filling up the forms, acquisition of required documents, acquiring ensure/witness, enlistment charge, legal advisor's expense, submission of forms, replying of complaints/inquiries, assortment of authorized credit, pay off requested by/paid to the bank authorities/specialists, and so forth., farmers need to bring about these enormous expenses at regular interval of time [11].

### 3. High demand of Collateral Security

As a result of the high risks inalienable in customary cultivating activity like critical challenges including increasing pressures on land, diminishing soil fertility, water scarcity, intermittent failure of the monsoons, adverse environmental conditions and other customary vicissitudes of farming, many bank officials hesitate to provide loans to small and marginal farmers because of risk of loan repayment. Even if some banks provide small finances to farmers, there is high demand for collateral security which farmers have to bear. Banks also don't have many options as they have to take care of rural indebtedness also [1].

The farmers imagine that it's very difficult to give worthy security just as an assurance to the bank. Ordinarily, security for credits might be as hypothecation of the property possessed by farmers. In any case, the farmers don't have that much property aside from the land which they think that it's difficult to offer as security. Regardless of whether a few farmers can

organize some guarantee, the person offering guarantee requests remuneration for remaining as a guarantee. A helpless farmer doesn't have the cash to pay him. Therefore, he faces embarrassment and feels down and out with the entire framework [11].

#### **4. Lack of Education among Farmers**

In many rural areas, most of the farmers are not that much educated to understand different procedural formalities of banks and always finding it difficult to get agricultural credit in the right time window. They are uninformed about the different guidelines, terms, and states of the financial organizations in regards to farming account. They depend upon the data given to them by bank authorities and different operators associated with the procedure. They are not much aware of the nuances of financial sector. A large number of them even don't have the foggiest idea about the loan fees, the measure of endowment, the various plans and the reimbursement plan, and so forth [11].

It is very important to impart knowledge about institutional credit regarding procedure and formalities and there should be single window clearance while disbursing agricultural credit to the farmers, it should be easier to the illiterates and less educated persons [8].

#### **5. Corruption in Credit Structure**

Through different writing audits, it has come to see that probably the greatest challenge that farmers face in the present age is the corruption in the entire credit structure. It is seen as nepotism, partiality, pay off, intimidation, support, and so on. The issue lies not just around who is engaged with this demonstration of debasement yet additionally about the way that state hardware (for the most part) helps in sustaining such exercises. Private cash moneylenders along with bank authorities make various obstacles and demand the bribe to solve various sanction issues. The helpless farmers start thinking that it's hard to fulfil the ever-developing needs of numerous people. Eventually, they can't get the loans and burn through their time and vitality with no positive outcome [11].

#### **6. Heavy formalities of loan payment**

The formalities in different budgetary establishments are so heavy because of which poor people and ignorant farmers of smaller

districts falter in going to banks and they like to go to the nearby cash moneylenders where there are less conventions[7]. Subsequently, the farmers advance toward non-institutional sources to get the loans and various private money lenders take advantage of various illiterate farmers. There is a dire need of government intervention to manipulate the loan sanction policies in order to make it less cumbersome to less-educated farmers [11].

#### **7. Intra-regional and Inter regional disparities in credit distribution**

The phenomenon of heterogeneous credit distribution across Indian states is well understood and it seems correct seeing the diversity of various states across the nation. But the issues show up when credit imbalance across Indian states cannot be justified by state-explicit factors representing credit demand. Data reveals that states which garner higher deposits, have better banking networks and score high on infrastructure availability attract more credit as compared to other states [12]. This affects farmers of various other underdeveloped regions and they are not able to enjoy various agriculture credit facilities.

#### **8. Exploitation by private money lenders**

Due to various challenges in accessing agricultural credit through banks and other financial institutions, farmers are left with no option other than going to private money lenders. Different private money lenders exploit this and attempts to fetch high rate of interest by loaning them significantly in the wake of knowing the states of small holder farmers. There is a dire need of government intervention in the agricultural credit system to eliminate informal agencies from agriculture and also to ensure complete institutionalization of agricultural credit towards welfare and empowerment of farmers [8].

#### **9. Lack of coordination among public, private and other banks**

MP Antony [9] through his research established that there are significant intraregional and inter-regional disparities in agricultural credit distribution. This leads to a severe lack of coordination among various financial institutions placed in various regions. The author likewise demonstrated his theory that

there is no complementarity between open, private, and co-operative banks in financing agricultural credit. The credit policies should be decided taking the state of economic affairs into consideration within the various regions. Public, private and other banks should work in co-ordination to make sure that flow of adequate amount of credit can be possible at right time to right individual.

#### 10. Small and Marginal farmers not getting loans

Smallholder farmers are most vulnerable in terms of accessibility of agricultural credit. Having small patches of land for cultivation is not enough to secure their lives with minimum basic needs. They almost always left with dissaving and indebtedness. Hence, they are very much needy for the credit to lead their lives and to invest in their future agriculture [8].

But it is likewise felt that the availability of long-term loans is progressively advantageous to large farmers and they get the greatest advantages from the financial offices. This prompts an enormous hole in agribusiness credit appropriation between bigger farmers and smallholder farmers [7].

Above challenges has been tabulated in Table 1

S.No.	Challenges	References
C1	High Rate of Interest	[7], [8]
C2	Credit Inadequacy	[10]
C3	High Transaction Cost	[11]
C4	High demand of Collateral Security	[1], [11]
C5	Lack of Education among Farmers	[11], [8]
C6	Corruption in Credit Structure	[11]
C7	Heavy formalities of loan payment	[7], [11]
C8	Intra-regional and Inter regional disparities in credit distribution	[12]
C9	Exploitation by private money lenders	[8]
C10	Lack of coordination among public, private and other banks	[9]
C11	Small and Marginal farmers not getting loans	[8], [7]

**Table1. List of challenges and relevant literature**

#### Research Methodology

Apart from bringing all the challenges faced by Indian farmers while accessing agricultural credit, there is a need to understand the reasons behind the existence of these problems for such a long period of time, what could have been done or how to improve the current framework, where to concentrate more and where not and above all how to build the efficiency of current credit structure. The potential answers of every single such inquiry were investigated while examining with Agri value chain specialists, yet some other discoveries aside from list of difficulties can't be made. However, after examining the listed challenges faced by farmers independently, they appear to be either similarly significant or generally more significant with one another. Therefore, after discussion with the subject matter experts, it has been decided that if we can develop the interrelationship among these challenges, we can understand which challenge is impacting which other challenges, where there is a need to focus more and where not and finally we can have deep root understanding of the problems faced by farmers by considering each aspect of challenges interrelatedly rather than in isolation.

Through various researches, it has been found that ISM has been widely used by scholars of various research disciplines for establishing the prominent relations among factors of interests, especially with the point of examining the causal connections among the factors of interests

ISM technique suits the prerequisite of my research to develop the solid idea of relationships among the different challenges faced by farmers to access agricultural credit. Next, MICMAC examination has been utilized to determine indirect relations between these challenges.

#### ISM

J.N. Warfield[2] mentioned about the ISM as the methodology to analyse the complex socioeconomic systems. "It's an interactive computer-assisted learning process into a set of heterogeneous directly related elements that are structured into a comprehensive systematic mode. ISM also gives the basic ideas to develop a map of the compound associations

between the numerous elements concerned in multifaceted circumstances” [13].

In easy language, it helps to build a contextual interdependencies or relationships among the identified challenges in the form of hierarchical structure that can be helpful for the easier analysis.

The different advances associated with development of ISM are given underneath [14].

- **List down the challenges as variables**  
The initial step of the ISM methodology is to list down all the variables which are pertinent to the research problem [15]. Here, different challenges faced by the farmers in getting loans are selected as variables. Variables have been selected based on a rigorous literature review. The credibility of the variables has been checked through Agri value chain business’ experts.

In the end, eleven challenges faced by farmers are identified as variables. (See Table 1)

- **Defining Contextual Relationship**  
Now we have to develop a framework to define the relationship between the defined variables [15]. The opinions of different Agri value chain business experts have been taken through survey analysis to gather the relevant relationship among the recognized challenges.

- **Structural Self-Interaction Matrix (SSIM)**

The relevant connection between each pair of variables has been built up as indicated by Agri value chain business' specialists, speaking to whether one variable prompt another. Four symbols are utilized to decide the connection between two variables (i and j):

- V: means variable i is leading to variable j
- A: means variable j is leading to variable i
- X: means variables i and j is influencing each other
- O: means variables i and j has no relation with each other (See Table 2)[16].

Challenges	C11	C10	C9	C8	C7	C6	C5	C4	C3	C2
C1	V	O	X	A	O	A	O	O	O	A
C2	O	A	V	X	O	A	O	V	O	
C3	V	O	V	O	A	A	O	O		
C4	V	O	X	O	O	O	O			
C5	O	O	V	O	O	V				
C6	V	O	V	V	O					
C7	O	A	V	O						
C8	O	A	O							
C9	O	A								
C10	O									

**Table2. SSIM**

- **Reachability Matrix**  
Now, SSIM has been changed over to an initial reachability matrix by supplanting with 1 or 0 according to transformation rules. (See Table 3)

If the (i,j) entry in the SSIM is	Entry in the Initial Reachability Matrix	
	(i,j)	(j,i)
V	1	0
A	0	1
X	1	1
O	0	0

**Table 3. Rules to convert SSIM into initial Reachability Matrix**

Subsequent to getting the initial reachability matrix, the property of transitivity has been checked to get the final reachability matrix. This implies on the off chance that (i, j) = 1 and (j, k) = 1, at that point (i, k) = 1[16]. (See Table 4 and Table 5)

Challenges	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11
C1	1	0	0	0	0	0	0	0	1	0	1
C2	1	1	0	1	0	0	0	1	1	0	0
C3	0	0	1	0	0	0	0	0	1	0	1
C4	0	0	0	1	0	0	0	0	1	0	1
C5	0	0	0	0	1	1	0	0	1	0	0
C6	1	1	1	0	0	1	0	1	1	0	1
C7	0	0	1	0	0	0	1	0	1	0	0
C8	1	1	0	0	0	0	0	1	0	0	0
C9	1	0	0	1	0	0	0	0	1	0	0
C10	0	1	0	0	0	0	1	1	1	1	0
C11	0	0	0	0	0	0	0	0	0	0	1

**Table 4. Initial Reachability Matrix**

Challenges	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11
C1	1	0	0	1*	0	0	0	0	1	0	1
C2	1	1	0	1	0	0	0	1	1	0	0
C3	1*	0	1	1*	0	0	0	0	1	0	1
C4	1*	0	0	1	0	0	0	0	1	0	1
C5	1*	1*	1*	1*	1	1	0	1*	1	0	1*
C6	1	1	1	1*	0	1	0	1	1	0	1
C7	1*	0	1	1*	0	0	1	0	1	0	1*
C8	1	1	0	1*	0	0	0	1	1*	0	1*
C9	1	0	0	1	0	0	0	0	1	0	1*
C10	1*	1	1*	1*	0	0	1	1	1	1	0
C11	0	0	0	0	0	0	0	0	0	0	1

**Table 1. Final Reachability Matrix**

**Indicates transitive relationship**

**Level Partitions**

The final reachability matrix has been parcelled into various levels based on reachability and antecedents sets for every challenge through a progression of iterations called a level partition[14]. This partition is done to comprehend the arrangement of challenges level-wise. The "reachability set" for a specific challenge incorporates the challenge itself and different challenges it may assist with accomplishing, and the "antecedent set" comprises of the challenge itself and different challenges that may help in accomplishing it. Accordingly, the intersection of these sets is determined for all challenges. The challenge for which the reachability and the intersection sets are the same is given as a first level. At that point, this challenge is isolated out from different other challenges for the following level-iteration process. A similar level-iteration process is repeated until all levels of each challenge are established [16]. (See Table 6)

S. No.	Reachability set	Antecedent set	Intersection	Level
C1	1,4,9,11	1,2,3,4,5,6,7,8,9,10	1,4,9	II
C2	1,2,4,8,9	2,5,6,8,10	2,8	III
C3	1,3,4,9,11	3,5,6,7,10	3	III
C4	1,4,9,11	1,2,3,4,5,6,7,8,9,10	1,4,9	II
C5	1,2,3,4,5,6,8,9,11	5	5	V
C6	1,2,3,4,6,8,9,11	5,6	6	IV
C7	1,3,4,7,9,11	7,10	7	IV
C8	1,2,4,8,9,11	2,5,6,8,10	2,8	III
C9	1,4,9,11	1,2,3,4,5,6,7,8,9,10	1,4,9	II
C10	1,2,3,4,7,8,9,10	10	10	V
C11	11	1,3,4,5,6,7,8,9,11	11	I

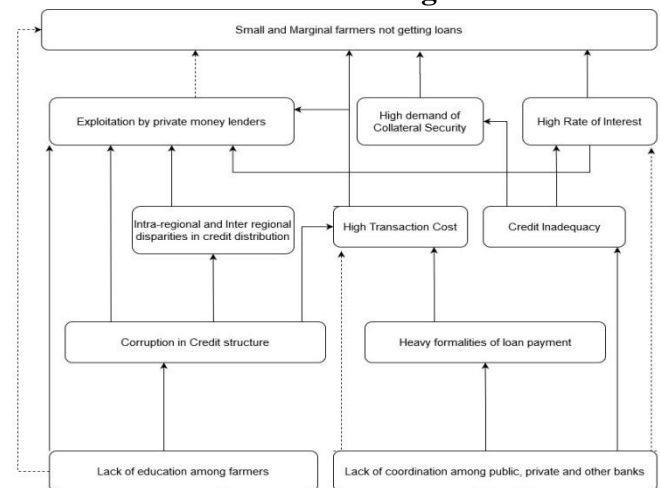
**Table 6. Partitioning of Reachability Matrix after Iterations**

**Digraph**

The challenges or variables has been sequenced in a structure way according to their levels (See Table 7) [17]. A digraph with significant links and applicable transitive links is created. (See Figure 1)

Challenges	Challenges Names	Level
C11	Small and Marginal farmers not getting loans	I
C1	High Rate of Interest	II
C4	High demand of Collateral Security	II
C9	Exploitation by private money lenders	II
C2	Credit Inadequacy	III
C3	High Transaction Cost	III
C8	Intra-regional and Inter regional disparities in credit distribution	III
C6	Corruption in Credit structure	IV
C7	Heavy formalities of loan payment	IV
C5	Lack of education among farmers	V
C10	Lack of coordination among public, private and other banks	V

**Table 7. Final level of Challenges in ISM**



**Figure 1. Digraph with significant direct and transitive links**

\*(→Direct Links, ---> Transitive Links)

**Consistency Check**

Next, the conceptual inconsistency of the ISM model has been tested and improved after validation by subject experts.

**MICMAC**

After performing ISM methodology, with the help of reachability matrix with driving power and dependence (See Table 8), we can make the use of MICMAC analysis to look at the quality of the relationship between driving power and dependence power of all the challenges faced by farmers to access agricultural credit. The challenges acting as variables have been divided into four groups dependent on their driving and dependence power. These clusters are:

**Cluster I:** Autonomous cluster that incorporates characteristics with weak driving power and weak dependence

**Cluster II:** Dependent cluster that incorporates characteristics with weak driving power but strong dependence

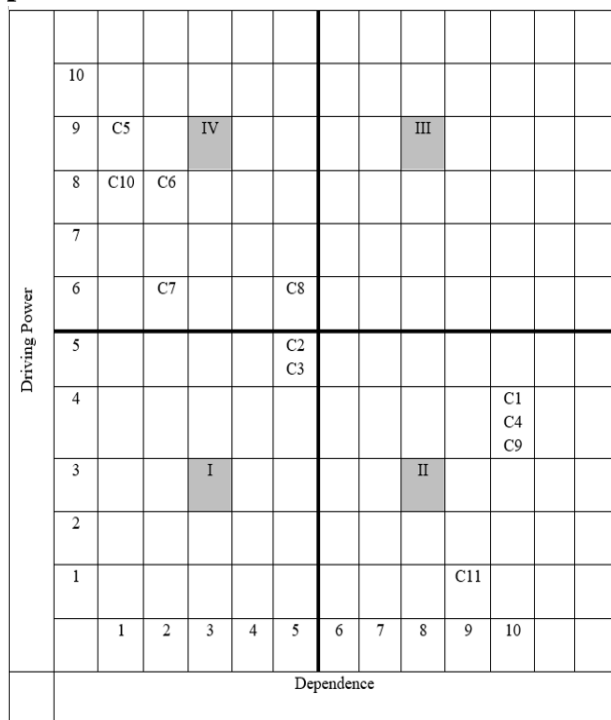
**Cluster III:** Linkage cluster that consists of characteristics with strong driving power and strong dependence

**Cluster IV:** Driver cluster that includes characteristics with strong driving power but weak dependence

[16]. (See Figure 2)

Challenges	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	Driving Power	Rank
C1	1	0	0	1*	0	0	0	0	1	0	1	4	5
C2	1	1	0	1	0	0	0	1	1	0	0	5	4
C3	1*	0	1	1*	0	0	0	0	1	0	1	5	4
C4	1*	0	0	1	0	0	0	0	1	0	1	4	5
C5	1*	1*	1*	1*	1	1	0	1*	1	0	1*	9	1
C6	1	1	1	1*	0	1	0	1	1	0	1	8	2
C7	1*	0	1	1*	0	0	1	0	1	0	1*	6	3
C8	1	1	0	1*	0	0	0	1	1*	0	1*	6	3
C9	1	0	0	1	0	0	0	0	1	0	1*	4	5
C10	1*	1	1*	1*	0	0	1	1	1	1	0	8	2
C11	0	0	0	0	0	0	0	0	0	1	1	1	6
Dependence Rank	10	5	5	10	1	2	2	5	10	1	9		
	1	3	3	1	5	4	4	3	1	5	2		

**Table 8. Driving power and Dependence power of variables**



**Figure 2. MICMAC Analysis**

**Results And Analysis**

**ISM**

The various challenges faced by farmers to access agricultural credit has been mentioned in Table 1. After that, the interrelationships of the pairwise comparison between the challenges were addressed by the experts. In light of experts' judgments, the selected

challenges acting as variables have distributed into five levels. For this, different iterations have been performed (see Table 6 and 7). Lastly, a digraph with some significant direct connections and applicable transitive connections has been made by means of vertices edges and nodes as appeared in Fig. 1. It suggests that 'Small farmers not getting loans' is positioned at the level I and structures the top level in the digraph. 'Exploitation by private money lenders'(C9), 'High demand of Collateral Security'(C4), 'High Rate of Interest'(C1) are positioned at level II. 'Intra-regional and Inter-regional disparities in credit distribution'(C8), 'High Transaction Cost'(C3), 'Credit Inadequacy'(C2) are positioned at level III. 'Corruption in Credit structure'(C6), 'Heavy formalities of loan payment'(C7) are placed at level IV. 'Lack of education among farmers'(C5), 'Lack of coordination among the public, private and other banks'(C10) are placed at bottom level V. The challenges placed at base level impact different other challenges placed above but they themselves are not influenced by any challenges. Loans not accessible to small and marginal farmers seems to be the result of so many other factors that play their part in acting as a hurdle to the smooth flow of agricultural credit to farmers. The conceptual consistency of the model has been verified through experts.

**MICMAC Analysis-** Classification of challenges faced by farmers to access agricultural credit

MICMAC is condensing of 'Matices d'impact croise-multiplication applique a classment' or cross-impact matrix multiplication analysis.

The four clusters of challenges are:

- **Autonomous factors**

Cluster I representing autonomous factors are having weak driving and dependence power. This cluster has two variables i.e. C2(Credit Inadequacy) and C3(High Transaction Cost). These variables are relatively disconnected from the system.

- **Dependence factors**

Cluster II representing dependence factors are having strong dependence power and weak driving power. This cluster has four variables i.e. C1(High Rate of Interest), C4(High demand of Collateral Security),

C9(Exploitation by private money lenders), C11(Small and Marginal farmers not getting loans). These variables form the top level which needs other variables to affect or influence them.

- **Linkage factors**

Cluster III representing linkage factors have strong dependence and driving power. No variables fell in this cluster.

- **Driver factors**

Cluster IV representing driver factors are having weak dependence power and strong driving power. This cluster has five variables i.e. C5(Lack of education among farmers), C10(Lack of coordination among the public, private and other banks), C6(Corruption in Credit structure), C7(Heavy formalities of loan payment), C8(Intra-regional and Inter-regional disparities in credit distribution). These variables drive the majority of other variables. To avoid the happening of other variables, one must need to concentrate on these variables first. (See Figure 2)

### Discussion

To the best of my knowledge, no research has been made to this day to develop the model that understand the seriousness and interplay of numerous challenges faced by farmers while getting agricultural credits. Many researchers opted for finding out the problems that farmers have to face in various regions. But there were not many studies to find the interrelationship between those challenges. This paper tries to develop the interdependencies among those challenges so that we can find out which challenge is driving which other challenges and the focus can be shifted towards resolving the basic ground issues behind accessing agricultural credit.

The first focus of the study was to identify important challenges faced by farmers to access financial loans. By means of heavy literature review, initially, fifteen challenges were listed. But after consultation with the experts, some of the challenges were left out and it brought down to eleven most recognized challenges. The credibility of these challenges has been cross-checked between different experts through a telephonic interview.

The next objective was to develop the interdependencies among the identified challenges in a hierarchical structure as the main idea was that the selected challenges could not be considered independently, rather they seemed to be dependent on each other. So, in order to make it informative and have a better understanding of the hidden relationship among challenges, ISM methodology has been used. It gives an inventive form to investigate the interrelation and the translation of the manner in which the challenges or variables are interrelated. Lack of education among farmers regarding the processing of loans and various other proceedings, and Lack of coordination among public, private, and other banks are placed at the bottom of the hierarchy of the model and leads other challenges positioned above them.

After that, to look at the quality of the connection between driving power and dependence power of all the recognized challenges, we utilized MICMAC analysis. Initially, in any developing region, it is very difficult to focus on every challenge altogether for any financial institution setup. MICMAC analysis helps us to find those challenges that have high driving powers so that financial institutions can first focus upon those basic issues that can be treated as root causes of all the challenges. In our study, Lack of education among farmers, Lack of coordination among the public, private and other banks, Corruption in Credit structure, Heavy formalities of the loan payment, Intra-regional and Inter-regional disparities in credit distribution are the challenges that have high driving powers. MICMAC analysis also helps us to find those variables that are highly dependent on other variables and are weak drivers. Financial institutions should, in this manner, accord high need in handling these challenges moreover. Autonomous variables are weak drivers and weak dependents and do not have much influence on the system. Here, Credit Inadequacy, High Transaction Cost are those autonomous variables, and management can afford to not pay too much attention to these challenges compared to other challenges. Through this research, financial leaders can understand the flow of these challenges and can manipulate their credit policies



accordingly.

### Conclusion

In many developing countries like India, agribusiness represents a critical factor to annihilate poverty and boosting the economic situation. But it has been found that access to agricultural finance remains a major challenge for various farmers. The government tried various policies to mitigate the challenges faced by the farmers but still, problems persist at larger scale. A lot of researches had been done in the past depicting the challenges faced by farmers in different regions of India.

Remembering manageability angles, an endeavor has been made to build up a model to make sense of the interpretive connection between various upsetting components of accessing agricultural credit, through a thorough writing survey and master discussion. The proposed organized model is simple and ready to clarify how different challenges affect the accessibility of agricultural credit to farmers and how these challenges can cause the powerlessness of the agricultural business going down sooner rather than later. It can help in improving the access of suitable financial requirements to farmers especially smallholders and agrarian Small and Medium Enterprises as an approach to increment agricultural profitability, and encouraging the participation in farming industry to accomplish economies of scale and more grounded nearness in business sectors.

Different financial institutions can use this

model to manipulate their policies to have better agricultural credit mechanisms and try to mitigate the problems faced by farmers while taking up any agricultural practices.

### Limitations

The current study shows that 11 challenges have been recognized as the problems faced by farmers to get to credits. These challenges are recognized from some journals and industry specialists of the Agri value chain, that has been talked about with academicians. The current investigation is altogether abstract decisions of some industry specialists and academicians. The conclusive outcome of ISM and MICMAC are acquired in the line of the judgment of industry specialists and it is somewhat close to home judgment and any prejudicing by the person who is making a decision about the issues faced by farmers lately and might control the last end. The future extent of this investigation grows to recognizing the various other significant challenges which can be identified with agrarian credit in future.

Further for the better understanding of linkages between the challenges, one can utilize judgment of best experts to change over this ISM model to the TISM model. TISM model can further help to understand the interpretation behind the linkages between various challenges and can give an appropriate logic behind the judgement as in why one variable is affecting another variable.

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## CROSS SELL AND UPSELL STRATEGIES BY UNDERSTANDING CUSTOMER PREFERENCES IN TELECOM SERVICE PLANS

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### ABSTRACT

*A good customer experience is very important in any industry. In India, the telecom industry is dominated by three market players-Vodafone Idea, Airtel, Reliance Jio. Hence, it is of vital importance to provide a good customer experience by understanding their preferences and providing them services accordingly. In Telecom industry, there are many services which are provided to a customer. The objective of this paper is to study ways of enhancing the customer experience by understanding the value added services like subscriptions, data consumption and validity preferred by customers. A primary research would be done by collecting data through a survey questionnaire to understand the customer and the type of subscription preferred by them which can be bundled in their service plans and find ways to upsell and cross sell a customer. A research would be done to identify ways to target customers who are likely to upgrade their plans to get the subscriptions offered by the telecom firms. This approach can be used by the telecom companies in their recommendation engine to target suitable customers ensuring customer satisfaction and business value*

**Keywords:** Telecom, Service Plans, Customer preference, Upsell, Cross sell, OTT

### Introduction

Telecom industry in India is growing at an amazing pace at witnessing many developments. In India, there are 3 dominant telecom operators- Jio, Airtel and Vodafone. With Jio emerging in the market with low price points, it has become essential for the telecom operators to strive to maintain their dominance and subscriber base. It is easier for the operator to retain their existing customers than attract new customers as each of the players in the market has similar offerings. Hence it has become of vital importance to ensure customer satisfaction. These firms try to provide the best customer experience to their users and avoid churning. Traditionally, telecom operators focused on providing network, SMS, high quality voice calls and data to their customers. However, in 2020 the pattern has now changed. People are now primarily focusing on the data services rather than the voice calls. India has a greater consumption of data when compared with US and China. The data consumed per mobile phone in India is more than 9 GB/month with every subscriber which is the highest in the world. There are plans now available with unlimited calling and high speed data to satisfy customer needs.

With COVID 19, telecom firms have further faced a rising demand for data packs. In fact, telecom sector are said to be one of the few that may have escaped unscathed from the pandemic and the resultant lock down. Telecom firms are now playing a critical role in terms of supporting business operations of other industries. With majority of the companies shifting to work from home, there is an increase in the data consumption pattern. Telecom firms are seen to launch new “work from home plans” providing only data services at desired rates. There lies immense opportunities for telecom operators to leverage the “new normal” and provide offerings likewise. Network has become essential not only for remote working but also for supporting online learning and leisure. The lock down has caused many users to subscribe to video streaming services for their entertainment purpose. Netflix alone has had a 16 million increase in their subscriber base during the lockdown. Schools and colleges too are now having classes scheduled in the online mode. There is a huge dependency of data on people’s life for their day to day activities. This has a huge impact on the data revenue putting telecom sector in the spotlight.

As seen, OTT services have become an essential. Video, audio and other streaming

services are used by nearly everyone. This has been recognized by telecom firms. They have slowly started to indulge in providing OTT services along with the traditional services. Telecom operators have partnered with different streaming services and are providing these services bundled with their plans. Even Global telecom operators are doing the same. Verizon has provided users with the facility to hold their existing subscription and use the subscription provided by the telecom operator. Once this subscription ends they can resume their earlier subscription. Such services can easily lure customers to upgrade their plans. The OTT services which are provided by the telecom firms are given in subsidized rate. Telecom operators win an advantage of having a customer dependent on them for their OTT services. There are various OTT services, rewards, and benefits which can be offered by a telecom operator as a recommendation to the customer in order to attract them.

It is important that while recommending a customer we must not target inappropriate customers. Hence this study attempts to understand customer's current usage and preferences as there seems to be a great underlying opportunity for a telecom operator to provide these subscriptions to desired customers and improve their business and customer satisfaction.

The objective of this paper is to understand customer preferences in different subscriptions which can be bundled with the plans. It aims to understand the customer preferences in video streaming services, audio streaming services, educational platforms and Food Apps. It identifies the most preferred mode for streaming these services like Smartphone, TV/laptop, tablets or as there is a cost difference while subscribing to video streaming services in different mode. These subscriptions may be bundled with the plans. Furthermore, it proposes a framework to predict customers who are likely to upgrade their plan and the type of customers which should be targeted by the telecom operator. We will understand the probability of a customer to upgrade his or her plan. Only those customers should be targeted as it otherwise may result in an unpleasant customer experience.

## Literature Review

Over the years, bundling has been spoken about in economics literature in reference to if the firms must bundle their offerings or provide them separately. Bundling is nothing but a practice of marketing two products or more in a package at an eye catching price.

Earlier researches were done majorly to understand why firms engage in bundling. This turns out to be a strategy which increases demand of the offerings. It can help in reducing churn and also upselling and cross selling subscribers. If the plans are bundled well it may help in up selling and cross selling opportunities. Growth of OTT services has been studied in various case studies. OTT has become prevalent supporting the increase of consumption of data by individuals. This has caused the rapid development of the telecom industry.

In the paper, questions were asked like: "What motivations do consumers have to watch video content?", "Are there differences between users and non-users of online video platforms with respect to motivations for watching video content?" There were over 1500 responses collected from the people in 2009 [3]. The respondents were adult users. A likert scale was used to capture the motives of a user for different subscriptions like video content, movies, TV content. It also included Music videos. The results that were obtained were varied but they helped in getting some insights, for example, customer satisfaction is different for online streaming and television. The analysis was done through exploratory factor analysis, and also through ANOVA.

India has seen a great increase in online content consumption, with free data available. Jio says the usage of India rose to 120 GB data from 20 GB in around six months after the service was introduced. Jio has already announced ideas to create huge mixture of songs around ten million, six thousand films and sixty thousand video songs, television shows comprising of 1 lakh in almost ten different languages.

It could be derived that in the near future there can be huge investments in the areas which are technology-driven and related to entertainment. There has been 4G data access given by Jio at a cost as low as Rs.50 per month. It is a bull that has now been set free in industry to offer at the

lowest price whatever they want. As per the analysis, the competition level had increased beyond expectations after the launch of Jio.

With OTT, coming to play, the dynamics of Telecom industry has changed majorly [9]. Telecom companies are not just competing inside their own industry but also other different and outside industries with OTT services. For example, In Pakistan, there 154 Million users as of December 2018 distributed amongst four telecom companies. This industry has reached its saturation already. They can gain a new customer by snatching users from the competitors. Telecom industry is going through a neck to neck competition. This has led to the rise in the need for services better in quality because there has been an increase in the demand for internet for various purposes. In 2017-2018, 78,966 million PKR invested in increasing the reach of its telecom services firms, which is 24 percent of the 2018 overall telecom revenues. Pakistan

Telecommunications Authority's (PTA) annual report of December 2018 indicates a 17 percent investment growth in 2017-18 in comparison to 2016-17. This sector had raised the internet use, which had resulted in more revenue for telecom businesses. The explanation behind not raising same percentage revenue is OTT. Customers buy the fixed internet plans and use OTT to communicate which cannibalizes telecom companies' voice and SMS revenue.

In Indian context the impact of the OTT on telecom was discussed context and it was concluded that the consumer preference was responsible for the changes made in the industry [15]. However, there are few concerns which have been discussed by the author about telecom with OTT services. In the book "Future of telecom", future of telecom companies was anticipated [9].

The authors listed the telecom business players in which there are four players. Network operators are the first ones. Network operators are cellular companies [9]. Resellers are the second type players but they do not have their own infrastructure or content, they just either resell the content or infrastructure, over the top services are the third type of players, these are smaller over the top companies, and The last one is the OTT Ecosystem companies, for example Google and Facebook. The author is

of the opinion that every player has different options in the future. The Network operator, the first player, can expand its current services and further give service like OTT companies. Telecommunications Company's infrastructure is critical to survive. OTTs need infrastructure for the telecommunications companies [9]. The other big group, OTT-Ep. OTT can integrate its services into the infrastructure and invest. Organizations can only rely on the OTT to further broaden their services.

Network providers will pay more attention to customers in 2019, despite the launch of 5G. It is possible to reestablish the link which OTT broke with the end user and telecom companies. Network optimization will be the priority [8]. Similarly it is also said the network is still the architectural king. Role of enterprise. Companies simply need to concentrate on agile methods and network optimization. In addition to network efficiency, with the launch of 5 G, telecom companies will play an significant role in the ecosystem and it will be one of the popular places where telecom companies will gain revenue [6]. The ecosystem that will integrate all facets of Telecom life , health, transportation , and education through AI, Machine Learning and Digitalization. In 2021 21 billion wired computers will be in life [11]. Increase internet speed and advanced technology made the power important. Current technology has power as an important in the future and the network side companies need to manage the energy sources. As demand will keep increasing there is a need to provide good network and sufficient data.

### Research Methodology

A primary research was done to understand customer preference. The best way to figure out a customer preference is by seeing the past data or by studying their buying behavior. Another effective way would be to do a market research. In this research paper, a survey questionnaire was floated across. A structured questionnaire was prepared in a Google form which was used to collect data from users directly. Convenient Sampling method was used to collect data. Around Four hundred responses were collected from people from different locations in India. The age group majorly comprised of customers between

twenty to thirty five years of age. The correspondents comprised of users ranging from Vodafone Idea subscriber to Airtel to Reliance Jio. It consists of users who are prepaid as well as postpaid users. All of the users were users with smart phones and have a significant data consumption pattern.. Customers were asked the kind of subscriptions they are currently using and the type of subscriptions they prefer. The markets targeted in the research paper comprised of the top used services in India. A secondary research was done to analyze and study various published articles and findings. This was to understand various algorithms through different findings. These algorithms have been used in different industries for different goals. But the approach is something that could be used and applied even in the telecom industry. A benchmarking was done with global telecom operators to see what are they doing different in terms of their offerings. What strategies could be used by the Indian Telecom firms to upsell and cross sell a customer. Benchmarking was done in terms of their offerings and the way these plans are recommended to the users. Telecom companies like China Unicom, AT&T, Verizon, T-Mobile, Telefonica were benchmarked through visiting their website and browsing through the different plans and services which are available.

In the video streaming service, the markets targeted were Netflix, Prime Video, YouTube Premium, Disney+ Hotstar, Zee5, ALT Balaji, Voot, and SonyLiv. Customers were also asked the type of mode the preferred for content consumption. They may be using smartphones or laptops/computers, television, or a tablet. Knowing these preferences will help us customize the video subscription plan accordingly. In Audio streaming services, the markets targeted were Gaana, YouTube Music, Saavan, Wynk, Spotify, Amazon Prime Music, Hungama, and Apple Music. Similarly in educational platforms the markets that were targeted were LinkedIn Learning, Online College Platforms (MIT, Stanford), Coursera, Shaw Academy, Udemy and BYJU'S app. For food apps the top 3 market players Zomato Gold, Swiggy super and Dine-out subscriptions were taken into consideration. This industry has been highly affected by the COVID. But

they have smartly indulged in supplying groceries which has helped them keep their business and also contribute a great deal to the society. This also will be in high demand post the pandemic. Customers were also asked to rank their preference amongst video streaming services, Music streaming services, educational platform and food apps. This was done in order to understand what are the most preferred subscription which should be targeted. The data gathered was analyzed in order to answer the research questions formulated above. The data was analyzed through excel and a visual analytics tool called Tableau. Each of the currently used video streaming services, audio streaming services, educational platforms and food apps were analyzed and compared with their preference list. Customers were also provided with different plans and asked to select the most desired plan. All the users were asked to give reasons as to why they selected a particular plan. They were plans ranging with different features and subscriptions. This helped in deciphering the customer's requirement or preference. Based on the observation and analysis of the collected data results were calculated.

### Results And Analysis

The responses of the users were analyzed in Microsoft Excel and Tableau. Preferences have been calculated by giving the top ranked subscription the highest points and subsequently decreasing the points for the below subscriptions. The summation of the points defined the ranks of the subscriptions. This one done using Pivot Tables and V look up in Excel. The weighted sums of the ranks were taken by giving the highest points to the top ranked subscription. The subscriptions currently used by customers and other analysis were analyzed visually using Tableau software. Amongst the prepaid users, around 54% of the users use 1.5 GB/Day and amongst them around 50 % of them fall in short of data. When compared with all the prepaid users around 45% of the users fall in short of data. But when compared with postpaid users, only 15% percent of the users fall in short of data. Of the users who fall in short of data, only 53% of the users recharge through top ups. There

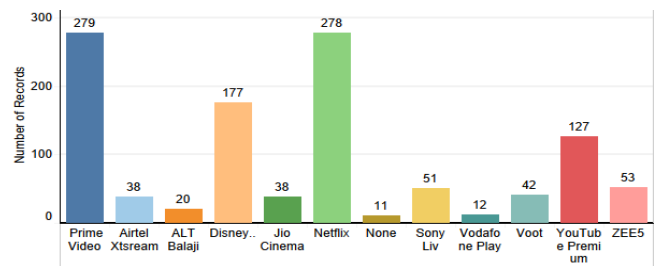
lies an opportunity to upsell and cross sell a customer here.

As per the analysis, customers prefer to have video streaming services the most followed by audio streaming services, Food apps and Educational platforms. Around 86% of the users currently use or wish to use the video streaming services and 75 % of them prefer music streaming services. 87% of the users currently use food apps while educational platforms are currently used only by 50% of the people. The data of these people have further been analyzed to understand the subscriptions used and preferred by them.

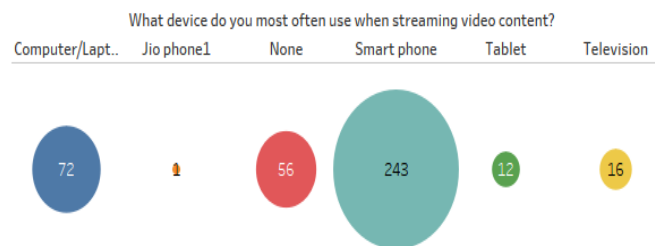
**A. Video Streaming Services**

Netflix and Prime video have found to be the significantly most used and preferred subscription as well. There are around 80% of people using these subscriptions amongst the one who use video streaming services. The next is Disney+ Hotstar and YouTube subscription which are preferred by people followed by the other services which too are being used but not as significantly as the top subscriptions. There is a pretty much difference in terms of the dominance provided by Netflix, prime video, Disney + Hotstar when compared to the other market players. Telecom firms have already indulged in partnering with video streaming services and providing them in their plans. However this is majorly limited to postpaid plans. Very few prepaid plans have video subscriptions provided in them. Zee5 subscription is currently being provided in many of the plans as a subscription. However, the number of users actually using it is fairly less. Only 15% of the users actually use Zee5 subscription. Similarly the Vodafone Play app and Airtel Xstream app is being used very less by users. The content needs to be further developed and enhanced as per the liking of the customer

The most preferred mode for consuming these subscriptions is smart phones as chosen by 70% of the people. It is important to consider the mode of consumption as Netflix is provided in different price points depending upon in the device used for consumption..



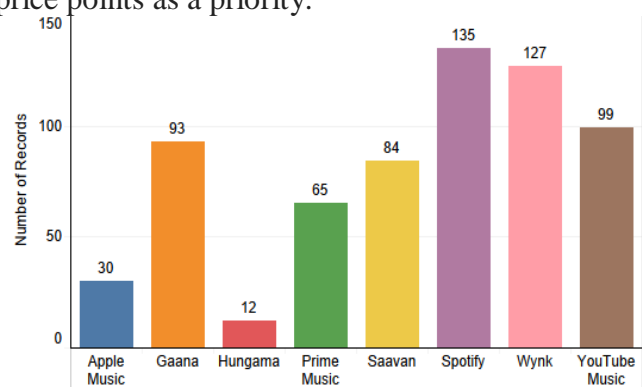
**Fig 1: Current Consumption pattern of Video Streaming Services**



**Fig 2: Most preferred Mode of Consuming Data**

**B. Audio Streaming Services**

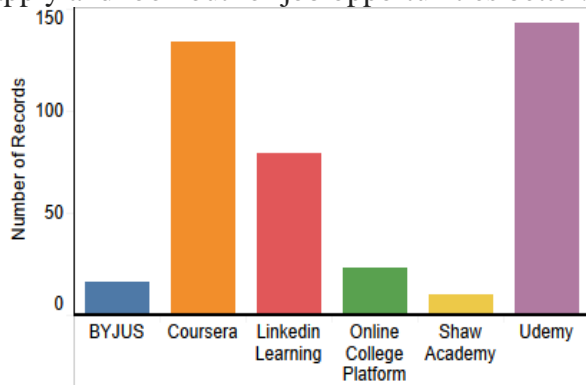
While considering the audio streaming services. Currently, Spotify is the most used music subscription followed by Wynk and YouTube Music. Gaana and Saavan are more or less equally being used. However, when this is compared to the preferred subscriptions Wynk is being ranked as the most preferred subscription followed by YouTube Music and Saavan. Amongst Airtel has already partnered with Wynk and Jio has partnered with Saavan. YouTube Music and Spotify are two subscriptions which are now rising and can be tapped upon. Even the other market players have a significant number of users using them. This analysis was made visually through Tableau. Hence for a music subscription, any of the players could be considered keeping price points as a priority.



**Fig 3: Current Consumption pattern of Music Streaming Services**

**C. Educational Platform**

COVID-19 has majorly affected the education sector. Majority of the students have now been shifted to studying online. To compliment them many users use educational platforms to get certifications or learn something new besides their curriculum. The currently used educational platforms as well as preferred platforms are the same. Udemy and Coursera are ranked the highest. The tie up with these educational platforms can be purely made on the basis of price points. The next most used educational platform is LinkedIn Learning. The users who have premium LinkedIn accounts have access to these courses. So there is an added benefit of having a premium LinkedIn account as well as a platform where users can get educational certifications. This would help them in enhancing the knowledge as well as apply and look out for job opportunities better.

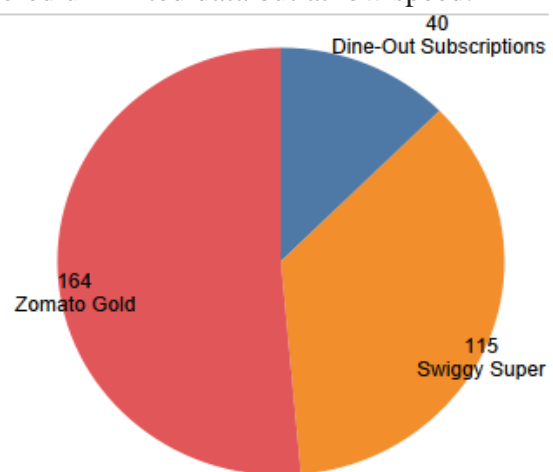


**Fig 4: Current Consumption pattern of Educational Platforms**

**D. Food Apps Subscription**

As per the primary research, Zomato Gold followed by Swiggy supper ranks the as the most preferred food apps subscription. Both are significantly being used by users. Swiggy supper is currently not functional due to COVID, but post the pandemic, there is a good chance for it to be functional again. Even during the lockdown users have been ordering food or groceries through this app. It did see a downfall but it hasn't stopped and is still functioning. They have made it compulsory to have contact less delivery. All payments are to be made online and cash on delivery has been cancelled to avoid any kind of problems. All the delivery boys have it mandatory to wear face masks. Since they supply groceries, users have started to use them again.

Along with subscriptions there are many factors which influence the buying decision of user. The user may not simply buy a plan because of the subscription. While they do consider validity, price, and data provided there are few other factors which a user considers. Hence it is necessary to have a good amalgamation of all these factors. Users were asked of different reasons which are of importance to them while selecting the plan. Customers have stated that data roll over is an important feature that they consider. They would prefer unlimited data per day. Few of the telecom sectors are currently offering limited data per day. This is a feature which is not preferred by them. Many users have shifted to Jio because of the facility provided to them of unlimited data. Jio is offering high speed data of a certain limit post which they are offered unlimited data but at low speed.



**Fig 5: Current Usage pattern of Food Apps**

This at least does not hamper or affect the users' daily activity. Users also prefer corporate postpaid plans. Corporate plans turn out to be cheaper comparison to the regular postpaid plan. There is more data offered at comparatively cheaper price. Hence people opt for corporate plans. Even the Family plans which are provided by the telecom firms are preferred by customers. Postpaid plans have more benefits in terms of subscription provided to the customer in comparison to the prepaid plans. Another reason why customer did not select plans with subscriptions was because these users already had subscriptions with them. There was no benefit of them taking this plan. Hence there needs to be a way to keep pull in such customers. This situation can be dealt like the way Verizon is doing.



While talking about the global telecom firms, it is found that the Indian telecom firms are majorly doing the same as what the other telecom firms are doing. Indian firms too have tie ups with device brands. For example, if a user wants to buy a smart phone. If the user buys a smart phone from the service operator, he gets an exclusive discount and benefit. The benefit could be ranging from getting a discounted sim to having special plans with added subscriptions and better data option. Companies have also indulged in giving points to users when they have made certain referrals. Referrals in terms of getting a user signed up to their service operator through a code. If user A has referred User B to join a service operator through a code and the User B uses this code to join to the same network, the service operator would give few points to User A. In this manner the more points that is given, adds up and the user can buy something from the store or use up these points in making their recharge. It is very important that we suggest the right plan to the right customer at the right time. This is taken care by the recommendation engine. A recommendation engine suggests the customer with a plan which the user is likely to buy. It is necessary to suggest the right customer the right plan. There would be no point in recommending a 3 GB./day pack to a user who uses 200 MB/day. This would irritate the customer and also create an unpleasant customer experience. To ensure we target only suitable customers, a model is suggested to predict those customers who would upgrade. The approach that is taken here is to find similar customers like those who have already upgraded. Customers who are similar to each other may have the same likings and requirements. We must take the advantage of this and target those customers.

#### **E. Predicting customers who will upgrade**

This is done by first analyzing the data base of the telecom. Data from the third party would be needed to get more information about the user. Then preprocessing of the data needs to be done which includes cleaning of the data by handling the missing values and removing the outliers. The data needs to be made consistent for building the model. Amongst the many

variables present in the database, only few variables will be able to help us in providing valuable information. For the same, we can use weight of evidence and information value concept.

The predicting power of independent variables in relation to the dependent variable is given by the weight of evidence. This can be used in the telecom sector, as a measure of the separation of users who have upgraded and who have not upgraded. "Upgraded Customers" is in reference to the users who have upgraded their plan to a higher plan or who have bought a new add on data, roaming or subscriptions packs and "Not upgraded Customers" refers to the customers who have not upgraded or not bought an add on pack.

Weight of evidence =  $\ln(\% \text{ of non-events} \div \% \text{ of events})$

To calculate weight of evidence for a continuous variable, we need to split data into ten parts or lesser depending on the distribution. We then need to calculate the number of events and non-events in each group followed by checking the percentage of events and percentage of non-events in each group. We next calculate Weight of evidence by taking natural log of division of percentage of non-events and percentage of events

An important and useful technique is Information value which helps in selecting variables which would be important in a predictive model. It helps to rank variables on the basis of their importance. The information value is calculated using the below formula;

Information value =  $\sum (\% \text{ of non-events} - \% \text{ of events}) * \text{Weight of evidence}$

The next step would be to do clustering and identify the similar type of customers. Grouping objects into similar groups means clustering. Clustering performs the identification of smaller groups of data in a data set. Clustering is classified as hierarchical clustering and partition clustering. In the marketing domain, clustering is used. A type of clustering that can be used is K means clustering. Hence we do clustering. Once we get the column with the cluster of similar customer. We select a cut off value from the information value we get preferring more prediction power. We must consider only those variables which are above the cut off value. We

then need to find the probability of a customer to upgrade. Hence we do a logistic regression of the selected variables and clusters. This could be used in predicting the probability of the customer to upgrade. Logistic regression helps in the predictive analysis like all the regression analysis. Logistic regression is used to describe data and to explain the relationship between one dependent binary variable and one or more nominal, ordinal, interval or ratio-level independent variables. The logistic regression output varies from the range 0 to 1. The between value is considered as threshold to determine what belong to the class 1 and to the class 0. If the value is greater than 0.5 it is considered to be in the class 1. Conversely, if the value is below 0.5, then the value is considered to be in the class 0. In this case, class 1 would be classified as those users who will upgrade and class 0 would be those users who have not upgraded.

### Discussion

Telecom operators can benefit by predicting and analyzing the customer behavior but also the kind of customers who would purchase it. This can help them in service development, marketing strategies etc. The strategies can be made exclusively to target and promote the plans such that the customer buys it. Telecom sectors can implement this frame work suggested above to identify the right customers they can target. This is an approach which could be implemented by the firms. Once we are able to predict the customers correctly, we can target them in an appropriate manner. This leads to a better customer experience. The telecom firms will be ensure the eligibility, applicability, suitability and contact policy while predicting correctly and then recommending the plans to the customers. The telecom firm as well is benefitted as they know what product that can provide to the customer. In this research, we have seen that currently Over the top services that are being provided by the telecom services include ZEE5 subscription (Vodafone and Airtel), Shaw Academy (Airtel), Amazon Prime (Postpaid plans of Vodafone and Airtel). Netflix too is being provided by Vodafone in their RedX plan (Rs.1099) for smartphone as well as TV. However as per the research, we have seen that

Zee5 is not used by many of the users. Vodafone Play and Airtel Xstream are being used by only few users only. Netflix and Amazon are the being used the highest. Users also use Netflix in smartphones majorly. Hence providing Netflix only for smartphones would be cheaper to the company as well as the customer. More users would be tempted to buy it. Similarly Shaw Academy is used by just 10% of the customers. Coursera and Udemy are courses which are preferred by customers. Postpaid users stick to their plan in spite of it being expensive because of the data facility given to them. Data roll over facility must be provided to even the prepaid users as this would provide them a much better experience and comfort. These services must be incorporated in their plan. This will help the firm in upselling and cross selling the customer. Once we predict the customers, who are likely to upgrade, we can accordingly customize plans.

Similarly, there may be many products that can be offered to a customer. In Telecom, we can suggest a user to upgrade his plan to a higher priced plan, or get an additional pack of data or roaming services. Value added services are another feature which is bought by customers. In this way, we have many products to offer a customer, There must be a defined set rules based on which a customer can be recommended products. These rules can be set as per the prediction model predicts. These are few rules which should be taken into consideration while setting up rules for recommending products to customers.

### Conclusion And Recommendation

Telecom Industry is a highly competitive industry. As per the current times prevailing, source of income or the chance to grow as an operator solely lies in providing the customer what they wants. The research paper brings out the requirement and preference of customers in the Video streaming services, music streaming services, Educational Platform, and food apps sector. These subscriptions after a good deal with the provider can be provided to customers to engage them and lure them into the best plans of the telecom operators.

Similarly there are many ways to engage a customer. A customer should be given few

rewards on reaching certain milestones of loyalty with the service provider. Telecom sectors can also promote fitness activities by giving certain number of points on completing certain number of steps. This not only promotes a healthier life style but engages the customer through the telecom app. The more data that we get about the user from the third party will help us understand the customer preferences better so as to suggest him the right plan and also customize the plans accordingly as per the majority of the customers. Another way to upsell or cross sell a customer could be by providing 100 MB complimentary data/when he or she exhausts their current data. Along with it there must be a message prompting the user to make a recharge for a data pack through the data provided to them. Although, when recommending a customer it is mandatory to take into consideration the contact policy. There must be a contact policy defining when a customer must be contacted and how many times. A rejected recommended plan should not be recommended again soon. Else it would again create an unpleasant experience for the customer. A well-defined contact policy will avoid this and take into

consideration the number of contacts with the customer. This provides a good customer experience to the customer as they are provided with the plans as preferred by them with a well-defined protocol.

### Limitations

This paper covers the consumer preferences of users in over the top side limited only to video and music streaming services, educational platforms and Food Apps. There can be other over the top services which could be bundled and provided in the telecom sector. The sample size is of around 500 users only of different location of age group 20-35 years of age. It cannot be considered for the all age groups and population. Only India has been covered in this research. The model approach suggested here is not applied and tested with data but is done on the basis of past research. There could be different types of clustering used. This can be done through trial and testing which suits our results the best. Similarly logistic regression is one approach that can be used. There can be other algorithms which can be tried and tested. This paper has only provided a framework to proceed

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**HIGHWAYSECTORININDIA: EMERGINGISSUESAND CHALLENGES****Piyusha Harish Nikam<sup>1</sup>, Priya Singh<sup>2</sup>**<sup>1,2</sup>Symbiosis Centre for Management and Human Resource Development,SCMHRD, Symbiosis International (Deemed University),SIU Hinjewadi,Pune,Maharashtra,India  
piyusha\_nikam@scmhrd.edu<sup>1</sup>, Priya\_singh@scmhrd.edu<sup>2</sup>**ABSTRACT**

India has the 2nd largest road network in the world. The Ministry of Road Transport and Highways (MORTH) has planned to develop around 60,000 km of roads in the next five years at about 40 km/day. It is known fact that Indian highway sector has progressed reasonably well since the beginning of highway development program. However, the challenge is how to achieve current target amidst the current global pandemic. In this crisis led situation, the sector is about to get hit by the worst economic slowdown and can experience a significant impact on trade and economic activities. In this paper, we have attempted to study past growth trends in the Indian Highway Sector. However, in recent future, it is expected that this growth rate might get affected due to various reasons like economic slowdown, availability of alternative mode of transport etc. Similarly, we have also attempted to analyze and predict the challenges the sector might face due to economic slowdown. The research also aimed at performing a volatility, uncertainty, complexity and ambiguity (VUCA) analysis. We feel that there is necessity of setting up of task force to address contractual challenges and amendment in Model Concession Agreement MCA.

**Keywords:** Highways, Indian Roads, Challenges

**Introduction**

India has one of the world's second-largest network of highways. Roads and highways are an important asset, on which the nation moves. Indian roads carry about 65% of freight and 85% of passenger traffic. It is estimated that this traffic will grow at 7-10 percent per year. Indian highways consist of 2% of the total road length but carry almost 90% traffic and hence are the most important of all roads. National Highways (NH), for example, constitute only about 2% of total road network but they cater to nearly 40% of the road traffic. Roads and highways are considered to be a major infrastructure that impacts on the economic landscape and prosperity of a country. Besides, providing mobility to people, they provide much needed infrastructure for the movement of goods and services so that the supply of them meets with demand points. The road ministry has targeted a construction rate of 40 km/day for 2020-21. Enhancing connectivity and internal and external trade has made it necessary for improving the coverage and efficiency of roads and highways. India plans to increase connectivity by expanding the road network under the Phase-I target of Bharatmala by completing 24,800 km by 2021-22, including 2000 km of coastal and port connectivity. Further ministry is planning to

double the length of national highways (NHs) to 2 lakh km by 2022-23 from the existing 1.32 lakh km. The Indian road sector has shown indications of reformation over the last five years from 2015 and is achieving new peaks of development. In the last few years, the government has appropriately focused on tackling and resolving the gaps in road sector. Through various schemes and initiatives, the government has achieved to provide exists for contractors, rescheduling of premium, restructuring of loans, providing more financial channels and change in the concession agreements. But over the years the country's road development has seen significant changes. The sector has seen tremendous growth in last few years. In the begin of development, road construction was entirely in the public domain with government planning, financing, and regulating projects. However, gradually different aspects of road construction were thrown open to the private sector. Today, the private sector has a major role to play in road construction in the country. Though the road sector is witnessing an increased pace of project award and construction. In the presence of heavy government push with several policies and a number of projects in line substantial opportunities are on offer for the participants involved. Despite of all these initiatives the

sector is not hassle free to act lucrative enough for investors. This sector is immersed into sea of challenges and these challenges have dilated on account of the current global pandemic led economic crisis. These Challenges could prove as hurdles in achieving the ambitious targets. Given to increase in the cost of construction of highway projects and scarce availability of funds with poor condition of economy due to the pandemic the sector may face major setback, we attempt, in this study, a critical understanding of the Indian highway sector with a view to examine the emerging issues and challenges that the sector might face in near future

### Methodology

The study begins with the approach to understand the current scenario of India's Highway sector. We have tried to give an overview of the sector by performing sectoral analysis. This sectoral analysis through light on growth trends in the sector. At first, we tried to understand how the sector has progressed in last few years by analyzing the target vs achievement data and also tried to review the investment scenario with the help of available data. Further, an attempt will be made to identify the key challenges faced by the sector and possible setbacks in the upcoming future. Moving forward we tried to enlist challenges due to COVID-19 and how this has created a VUCA world and analyzed the approach to tackle through this VUCA environment.

### Literature Review

MoRTH, Annual Report, 2019 [1] in this report a brief introduction about the sector is over led. It gives all the data and figures at glance for FY 2019 for the road sector. It also enlists the major Initiatives by MoRTH and NHAI. This report provides all the information related to major highway projects their current status and an overview of highway sector state wise. It gives facts and figures related to major road initiatives such as Bharatmala, Setu Bharatam, Chardham Mahamarg Vikas Pariyojana, Logistics Parks etc. It also gives information regarding Funding Models and fund allocation from different modes. It gives a snapshot of Highway sector for FY 19 with the lacking and measures to be taken moving forward.

NITI Aayog, Strategy for New India @ 75, 2018 [2] gives the targets and future growth prospects for highway sector. This report helps to evaluate the opportunities for the sector the targets for next five years and the resources required to achieve them. In short it gives us the snapshot of the future growth for Highway sector.

KPMG report, Roads and Highway Sector Current Trends and Future Road Map, 2019 [3] this report discusses about the current status of highway sector and enlist the various issues the sector faces and might encounter in future. It gives a picture about the risks and volatile environment and provides a thorough sectoral analysis. It talks about the possible solutions and way ahead for the sector.

Economic Survey of India, 2020 [4] it acts as a great source of information in order to get to know the trends for last five years and how highway sector evolved. It provides statistics related to do trends analysis for highway sector and helps to identify the challenges.

Demands and Grants Analysis, 2020 MoRTH [5] this report helps to critically analyze the Highway sector development pace of construction and utilization of funds allocated to various projects. It also gives idea about project delays and compensations for last few years. It analyses the growth of the sector and puts forward the obstacles barring the sector to achieve the required targets.

Ramakrishna Nallathiga, 2019 [6] the paper discusses about journey of India's Highway sector. The paper starts with setting back ground to this development. This paper first discusses the progress of highway sector in India in terms of the approach taken and then highlights some of the major features of it. Finally, it also discusses the major issues and challenges that have emerged in the sector.

Veerasak Likhitrungsilp, Sy Tien Do, Masamitsu Onishi, 2017 [7] This paper examines the similarities and differences of risk perceptions of the public and private sectors for the investment of PPP transportation projects in Vietnam. Questionnaire surveys are used to collect data for assessing the likelihoods of occurrence and impacts of risk factors from 123 experienced professionals from both public and private entities. They found that two major factors

causing critical risk were land acquisition and compensation.

Wendrila Biswas, 2016 [8] This paper talks about the overall challenges encountered by any PPP project. It lays a background about PPP projects their objectives importance financial benefits and need. Further it goes on explaining PPP in different sectors such as highways, railways, healthcare, power sector and their models. After studying all the key models of ppp in the above mentioned sectors the paper lays down important overview of PPP projects their working and challenges.

Ramakrishna Nallathiga and Mona Shah, 2014 [9] This paper first discusses the Indian government's decisive role in the road sector development through PPPs. Later, it discusses some of the major achievements made under the PPP model of road development in India during the five-year plan periods. Finally, it also discusses the major issues and challenges that have been emerging for the road development under PPP model in this sector. The possible solutions to tackle the problems is also discussed.

A.V.Thomas, Satanarayana N. Kalidindi , K. Ananthanarayanan , 2003 [10]This paper talks about the risk perception of highway BOT projects and the problems associating the same. Initially the paper discusses the BOT model, how it works and the responsibilities of key stakeholders. It used a methodical approach of studying risks associated with different stakeholders such as government authorities, advertisers, banks, NBFCs and consultants of Indian BOT ventures. Using this approach, the paper identifies 8 sorts of risks associated with highway BOT projects. The major risk being revenue collection estimated based on the traffic. The paper brings to our notice that despite the fact that there is reasonable understanding among stakeholders concerning the risks.

## Discussions & Findings

### A. Roads and Highway Development in India

India's road network (including highways) is one of the most extensive networks with about 3.34 million km length comprising National Highways (65, 569 km), State Highways (1,30,000 km) and Other roads (Major District

Roads, Rural Roads and Urban Roads (3.14 million). Highways are an important segment of the road network because of their greater share of passenger and freight transport. India had neglected its highway development for a long time, but it picked up the momentum after the establishment of National Highways Authority of India (NHAI) as a nodal agency in 1997. The launch of National Highway Development Program (NHDP) in 2001 gave a major push to highway development, especially through two major initiatives: Golden Quadrilateral (GQ) (later termed as NHDP Phase 1) and North South East West Corridor (NSEW) (later termed as NHDP Phase 2). Both the above initiatives added to a significant jump in the highway length. This bolstered to extend the NHDP further in more phases (phases III to VII), especially in improving the lane capacity by converting existing 2 and 4 lane highways into four and six lane highways. Apart from the development of national highways under NHDP, the development and maintenance of about 41,290 km of NHs is being carried out with budget funds. These sections of NHs are executed by respective State Public Works Departments (PWDs) and Border Road Organization (BRO). These highways were provided with development works of:

Improvement of riding quality

Widening to 2/4 lane

Strengthening of roads

Construction of bypasses

Rehabilitation/construction of bridges.

In the initial stages of the highway development, the NHAI used the traditional procurement model of Engineering, Procurement and Construction (EPC) contracts, which involved highway developers having the limited role of project execution only. Subsequently, it began to involve the private sector players through awarding of long-term concession contracts involving BOT variants for various stretches of national highways. NHAI has been given more independence to select and implement projects in order to aid speedy development by seeking private sector participation.

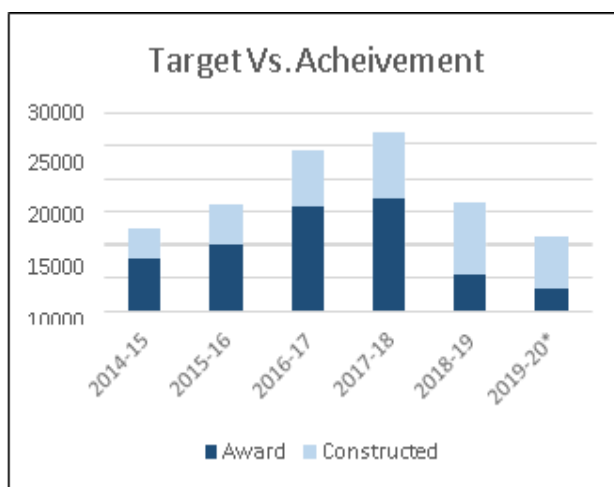
### B. Sectoral Analysis

Growth Trends in Indian Highway Sector

Over the past five years road project execution especially under road ministry has grown at a rapid pace on the back of strong ordering activity by the government.

**Table I. Award vs constructed**

Year	Award (Km)	Construction (Km)
2015-16	10098	6061
2016-17	15948	8231
2017-18	17055	9829
2018-19	5493	10855
2019-20*	3211	7925



**Fig. 1. Target Vs. Achievement**

FY 2019, the total construction by NHAI was 7925 and award 3211 km until Jan 2020. The construction was the highest and is showing upward trend. There is reduction in length awarded. It has been mainly due to the fact that ministry decided to award only those works where land

acquisition activities have practically been completed. This was with a view to facilitate smooth implementation of the project. This approach will lead to timely completion of projects.

The current annual rate of increase for projects awarded is 17%. If we consider the same rate of increase for 2020-21, around 71000 km length of highway projects can be awarded in this financial year. For current fiscal per day construction target has been fixed to 45 km per day, average construction in FY19 was 27 km per day, as per revised estimates for FY19, MORTH spent INR 99300 Crore. on highway

development which was higher than the budgeted amount of INR 91700 Crore. Among that, INR 42500 Crore came from budgetary allocation and INR 65000 Crore came from IEBR.

**Bharatmala an Opportunity Untapped**

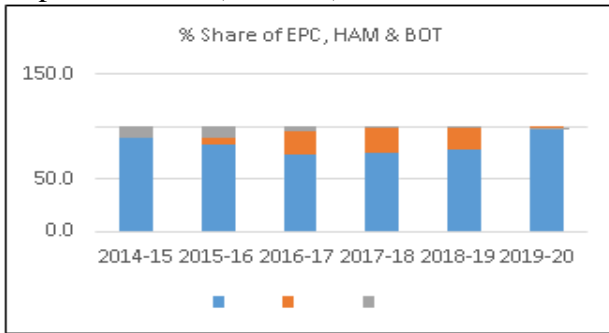
Bharatmala Pariyojana Phase-I launched in October, 2017 for development of road stretches with an aggregate length of about 34,800 km. The Bharatmala Pariyojana program focuses on optimizing the efficiency of freight and passenger movement across the country by bridging critical infrastructure gaps through effective interventions such as the development of economic corridors, intercorridors and feeder routes, the improvement of national corridors, border and international connectivity routes, coastal and port connectivity routes and new expressways. 255 road projects has been awarded until October 2019. This 255 projects comprise a length of 264916 Cr. Out of these approved projects, 226 road projects with an aggregate length of about 9,561 km have been awarded for construction. This scheme not only will help boost the highway infrastructure but has and will create tones of opportunities for investors making the sector more lucrative for private stakeholders. Bharatmala is expected boost order-inflow of large players significantly. With huge growth expected in ordering activity and construction under Bharatmala, order-inflow from NHAI to the large road players is expected to see significant improvement going forward.

**Table II. Total expected outlay - bharatmala pariyojana - phase i**

Component	Length (km)	Outlay (Rs. Cr)
Economic Corridor Development	9000	12000 0
Inter-corridors and Feeder Roads	6000	80000
National Corridor Efficiency Improvement	5000	10000 0
Border & International Connectivity	2000	25000
Coastal & Port Connectivity	2000	20000
Expressways	800	40000
Sub-total (A)	24800	38500 0
Balance Road works- NHDP	10000	15000 0
Sub-total (A+B)	34800	53500 0
Roads under other existing schemes (LWE, SARDP-NE, NHIIP, Setu Bharatam, Char Dham)	48877	157324
<b>Grand Total</b>	<b>83677</b>	<b>692324</b>



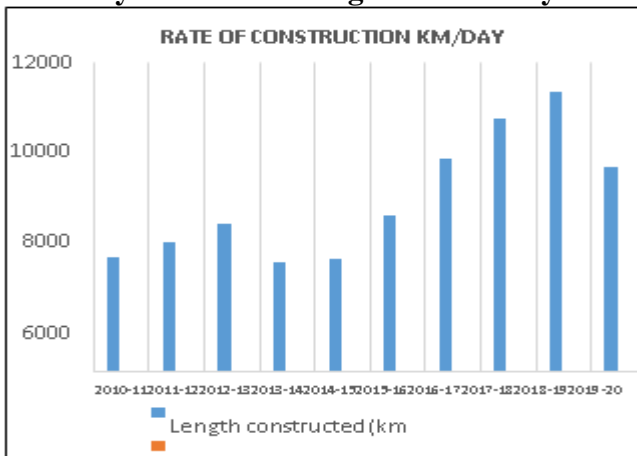
National Highway Awarded by Mode of Implementation (2014-20)



**Fig. 2. National Highway Awarded by Mode of Implementation (2014-20)**

The trend in project mix has witnessed a sea change over FY2014-FY2017, with BOT projects (which had been the only component of project awards prior to FY2014) seeing dwindling interest from the road developers. The reasons behind this change are aggressive project tendering, leveraged balance sheet of developers, tightening liquidity and cash crunch. Consequently, from FY2014 onwards, the government started tendering more and more EPC projects (as the risk of funding and clearances would not be borne by the developers). Consequently, a new Hybrid Annuity Model came into being, with 345kms (8% of total project awards in FY2016). The share of HAM projects has decreased from 36.72% of the Rs. 198,164 crore projects awarded in 2017- 18, to a mere 1.5% of the Rs. 48,288 crore projects awarded up to January, 2020 in the FY 2019-20. This indicates that in terms of cost, 93% of the road projects awarded in FY 2019- 20 have been awarded under the EPC model.

**Per day constructed length trend analysis**



**Fig. 3. Per day constructed length trend analysis**

**C. Issues and Challenges in Indian Highway Sector**

**Implementation**

Implementation of road project is carried out as per the concession agreement. Delay in land acquisition process by NHAI leads to delay in the start of construction for the project. The concessionaire is required to start the construction work once it achieves the financial closure. Due to hitch in the entire process and getting approvals from the authorities, developer is unable to achieve financial closure and is required to pay damages/penalty for not achieving financial closure on time. Concessionaire should keep in mind the following aspects as priority during the implementation of the project:

- In depth study of Detailed Project Report and Concession Agreement
- Timely achievement of financial closure.
- Good coordination with team from project sight to various organizations.
- Finalizing the location of structure and design should be done on priority.

**Timely Completion of Projects**

Completion of project on time is the main objective of the developer/contractors. Owing to the above issues, there is delay in the commencement of the project. Once construction has started, the concessionaire may face challenges like unfavorable climatic condition, change in design lay out and scope of work, utility shifting and lack of support from the state government in which the project is located. The procurement of raw materials and availability of manpower also poses problems in some rural and hilly areas of the country. As far as the supply of raw material is concerned, steel and cement are adequately available, but there is shortage of bitumen and stone aggregates as they are available naturally. Some state governments are moving a step forward for supporting the road development while some are reluctant to facilitate such work.

**Project Management**

Construction of the road projects on time and in within the stipulated budget is the biggest challenge faced by the sector. According to a World Bank report, 40 percent of the road projects face 25-50 percent cost overruns

owing to reasons like behind schedule implementation, delay in civil works, corruption, and poor project management. These issues and few suggestions to be adopted by the concessionaire are

Preconstruction activity should be accomplished before the financial closure; otherwise it will affect the progress of work.

Concessionaire should do timely financial closure as to avoid penalty and concession period remains the same.

Fortnightly review of the work in progress mentioned in the concession agreement to meet the deadlines.

There is also uncertainty amongst the private sector regarding bidding norms and changes in the government policies. The authorities are working on the issues related to the funding mechanism and planning an increased share of private investment in the next plan period.

### **Funding**

Funding is the major issue confronting the road developers/ authorities. Conventionally the road projects were funded by the budgetary resources but as there is huge investment demand posed by the sector, the government is inviting private funding for the road development. When the private players invest their money, the main objective is to earn return on investment. Many projects proposed by the authority are not commercially viable because the private players borrow from the market at high costs. To offset high costs for the developer, the government is providing VGF scheme to fund up to 40 percent of the project cost.

### **Land Acquisition**

The land acquisition is the biggest issue in the execution of Road projects at present, tenders for roadways should be skimmed after 80% of the land required has just been procured. Though the implementing agencies are trying hard to achieve this target, in reality they are yet to encompass this figure. As the bids are invited without completion of the total land acquisition when the award winners reach the site to start the work the land owners refuse to handover the land causing delay in the implementation of projects escalating the cost of project implementation. Often, this refusal to hand over a site to the contractor is caused

by delays in paying compensation to the landowner. Governments need to plan for and facilitate these payments promptly, and local bodies need to support the agency in taking over the land. Tenders should be floated after at least 90% of the land has been acquired, allowing the agency to begin work with maximum possible efficiency.

### **Changes in Bidding Norms**

NHAI makes changes in the Model Concession Agreements very frequently. There has been no stability in the bidding norms of NHAI for awarding projects. Alterations in technical and financial criteria for the developers/contractors cause discontent among Concessionaires. As the investment in roadways is long term financial decision because long gestation period of the project and alterations leads to uncertainty about the sector.

### **Other Issues**

Besides above-mentioned problems, there are few others, like clearances from railway boards for Rail Over Bridges (ROBs), problems related to shifting of utilities, local law and order problems and poor performance by the concessionaire. Clearance from the railways board is required over the design, layout, Detailed Project Report (DPR), and then only the project can come into action. Shifting of utilities like

electric lines, water pipelines etc. by some government departments take time and hinders the progress of projects. Anti-social groups in some states obstruct the construction of projects demanding additional benefits from the developers. Instances have been seen from the North Eastern states. Due to the cash flow issues, performances of some contractors are not considered up to the expectation, which leads to the termination of contracts. The termination of these contracts imposes further delay in executions as well indulgence in the long-drawn litigation process.

### **Investors Financial Challenges**

Stock prices of infrastructure stocks have touched the lowest due to halted operations. Investors have taken money out of road stocks. This is because of the volatility of the stock markets and the revenue loss and financial challenges. Stocks for major highway bidders such as Sadhbhav Engineering, Ashoka

Buildcon, Dilip Buildcon etc have seen sudden drop of about 30% to 40% of their value after the announcement of nationwide lockdown.

### **Slowdown in bank lending**

Though our coverage universe have a history of on-time execution and have relatively robust balance sheets, due to the recent lending problems cropping up in the banks there remains a risk of reduced funding as banks collectively step down funding for infrastructure projects. Typically in HAM projects banks are contributing 40-50% of the funding. Any potential lending curb can affect the financial closure of these projects.

HAM ordering has led to high equity requirement

The HAM model is being preferred for new tenders, as it requires lower government funding as compared to the traditional EPC model. With average equity requirement across our coverage universe ranging from Rs 3-18bn, we expect there could be growth challenges in case companies fail to achieve timely financial closure.

### **Equity recycling needed to maintain future growth**

Companies may have to rely on fresh fundraising options to fuel the current equity requirement. Companies like DBL await monetization proceeds from its BOT divestment. To maintain the high revenue growth rates in future, pure EPC players would need to ensure timely execution of projects along with monetization of assets at appropriate intervals. Pace of asset monetization and investors' appetite to buy equity in these assets is key for long term re-rating.

### **D. Impact of COVID 19 on Key Stakeholders**

The key stakeholders in the highway sector that are going to get affected by the current pan India lockdown are the National Highway Authority of India (NHAI) and the Developers/Contractors working under a PPP contract with the Authority.

#### **Impact on NHAI**

Direct losses in toll revenue and indirect losses on account of claims being raised by toll operators. As per the MORTH circular which

came on 25th March, 2020, the toll suspension (due to pan India lockdown) would be treated as force majeure event (under the Main Clause Force Majeure event, sub-clause Political Events mentioned in Model Concession Agreement (MCA) for PPP projects by NHAI) and thereby resulting in a loss to NHAI. ICRA has estimated the revenue loss for NHAI operated toll plazas at Rs 821 crore. It has also estimated a compensation of Rs.1001 cr to BOT Concessionaires under force majeure (estimate upto April 20, 2020). NHAI had estimated that its revenue collection in the FY 2019-2020 was estimated to increase by 3% than last financial year. The losses NHAI has incurred due to COVID 19 can cause the overall revenue to fall by around 7%. There has been delay in asset monetization plan due to the outbreak. The NHAI was looking to auction two bundles of TOT projects in FY20 and raise ₹9,000-10,000 crore but these bids have been postponed due to COVID 19 outbreak. Also, the delayed bidding process when started can suffer amid economic slowdown and market crash scare as investors are less willing to invest in such a scenario. There has also been delay in project awards leading to further delay in completion of Bharatmala Pariyojna-Phase I. Also, the construction process of existing projects will be delayed causing a steep rise in project cost and timelines.

Impact on Private stakeholders of PPP/ Toll Operators/ Contractors

Direct losses in toll revenue amid the low traffic on account of the pandemic. CRISIL has estimated a 90% toll revenue loss in the month of April and 60-75% in May taking into account the traffic for essential services. Even after the lockdown the losses are going to persist due to change in the travel pattern of passengers and freight. The interests and loan payments to lenders are at stake due to low revenue generation and stranded projects.

### **E. VUCA world for Highways due to COVID-19**

Any sector can be studied using different perspectives and one of the interesting ways to do so in a constantly changing environment owing to the pandemic is applying the VUCA approach. As the name goes VUCA stands for Volatility, Uncertainty, Complexity,

Ambiguity. The VUCA framework is futuristic, insightful and progressive approach towards analyzing any sector business or organization. It make us aware of the possibilities and the way of tackling future problems using an informed approach.

Defining VUCA for Highway sector in light of COVID-19

### **Volatility**

The highway sector has been volatile due to the various reasons amidst the pandemic. The pandemic is going to

impact the Indian economy severely and this might lead to volatility in the fund flow for various highway projects.

Demand-side risk:

Given the nationwide lockdown all toll plazas are supposed to remain close highly impacting the revenue generation. This has created a demand-side risk for the sector given the stranded projects and thus impacting the investors sentiment to invest for future rolled projects.

Supply-side risk:

Also, the sector might face supply-side risk due unavailability of funds and labor force.

Liquidity risk:

The road assets being under construction and non-operational liquidity for payment related needs will be a key challenging the coming few months.

Contractual risk:

The current pandemic has made to revoke the Force Majeure clause in the concession agreements signed between the parties. It is necessary for stakeholders to brace themselves for this change.

Uncertainty

The operations of toll plazas are about to remain close for few more days, thus creating uncertainty over revenue collection. Though work for some road sector projects has resumed but there is still uncertainty about the compensation to be covered in the force majeure event.

Complexity

Highway sector has always experienced complexity and currently the pandemic has made the environment even more complex for the sector. There will be lot of complications in tackling the arbitration in the previously awarded projects also a sudden shift from a

labor-intensive sector to a machine- driven sector can lead to a complex environment.

Ambiguity

As we look around various micro and macroeconomic factors are affecting trends in the highway sector. Highway sector being the biggest contributor towards development of economy can fall to the lowest levels due to the unstable economic environment. Also, the ambiguity in the normalization of the situation raises speculations for recovering the funds exhausted in the current projects affecting the future rollout of new projects.

### **F. Challenges due to covid-19**

Issues and challenges pertaining due to COVID 19 Challenges for key stakeholders

Investors have withdrawn their money out of road stocks due to uncertainty prevailing the markets and ambiguity about the resumption of operations of stranded highway projects .It is becoming hard for the road sector investors to continue with the increasing interest on loans without any substantial development in the awarded projects.

Resource and workforce Mobilization

Exodus of migrant workers will impact upcoming and current projects heavily. Making the labor available will be a mammoth task in front of the stakeholders. In the absence of employment this workforce can shift to alternatives and can

cause an inorganic labor scarcity in the sector. A labor- intensive sector like roads can switch to high end technologies in absence of labor availability and a paradigm shift will be observed in the work methodologies used.

Contractual Challenges

Arbitration might increase due to contractual breach in the light of the current pandemic. Penalty clauses are needed to be redefined and re-discussed. Revision of Model Concession Agreements of NHAI and establishment of Force Majeure Task Force for similar events in future should be done on priority basis.

Change in workplace Environment

Construction activities will not be carried out in similar fashion as they were Pre-COVID. Managing infrastructure projects with compliance to social distancing norms can be a big challenge as the industry being highly labor intensive. This might change the construction processes and way of working and can also

make the process tedious and time consuming, thus increasing the project execution timing.

Reduced ability of Government to fund New Infrastructure Projects

Rolling of new bids is at standstill due to the pandemic led situation. There can be subsequent reduction in budgetary allocations as funds will be paid on health infrastructure on priority basis. Thus, the VGF that was provided by government to accelerate road development will contract leading to fund crunch.

### Conclusion

Highway development has been the focus of the current government since it came to the power. The reason for this is quite evident because development of roads and highways lead to economic development of a nation. Looking at the rate of the per construction, it is predicted that if we go at the same pace, we will be able to bridge the infrastructure gap in the next 5 to 6 years. A major shift is expected from traditional ways of construction to technology enhanced construction. Going forward a major shift is expected from construction to capacity augmentation of existing highways. Further in order to adapt to the changes due to the pandemic there is a necessity that the stakeholders adapt aptly to the contractual challenges to stay in the business. Based on the current dynamic environment the sector should brace itself for following changes:

Shift from construction to O&M and capacity augmentation work

Shift from construction to O and M is expected in coming years. There is a dire need for shifting the focus from construction of new highways and road ways to Operation and maintenance of existing roads and the capacity augmentation to facilitate for the ever-increasing traffic. Separate funds should be allocated for the same.

Focus on efficiency of freight and passenger transport

Bharatmala Pariyojna was implemented for increasing the freight and passenger efficiency and is targeting the same for coming years. Multimodal Logistic parks are the main focus in this development. Multimodal logistic parks are a systematic development of aggregation

and disaggregation of freight by efficiently connecting different modes of transport for a continuous and uninterrupted freight moment. The main goal of this is to switch to faster modes of transport such as rails and coastal transport and reduce the traffic congestion on roads.<sup>35</sup> multimodal logistic parks have been identified under this scheme and development of this logistics parks is expected to gain momentum in coming years. For smooth passenger transport intermodal stations are being considered and their development is expected in coming years. Use of IT enabled solutions and convergence with state transport ministries is essential to bring out this development.

Provision of innovative Financial Channels

In order to strengthen the sector post pandemic the government should focus on provision of variety of modes of funding. It should also focus on strengthening of NBFCs. Current Financial channels should be restructured and the liquidity should be maintained in the market. Existing sources of finance should be used to their optimum capacity with an increase in the internal budgetary resources. New funding mechanisms such Value Capture Financing and establishment of Multilateral Funding Institutes should be tapped. Also, launch of new PPP models through policy reforms should be explored.

Financial Ease can help to get road infrastructure back on track

COVID-19 has caused immense financial losses for both NHAI and Private stakeholders. In order to boost the sectoral growth and bring highway construction on track to achieve the targeted construction financial ease by government and lending agencies can prove as health booster for Highways. The government seems to try hard to bring back the growth of the sector on track by providing force majeure packages, however this can create extra burden on NHAI and MoRTH. MoRTH has declared that toll suspension due to pandemic led nationwide lockdown will be treated as a force majeure event and compensation will be awarded for the same. This would help This would help recover toll operators from direct revenue loses. However, in order to provide instant stimulus to the sector this compensation is needed to be given instantly, because

compensation delayed is compensation denied. The Aatma Nirbhar package announced by the Prime minister for NBFCs, HFCs and MFIs can prove as tetanus shot for the rusting and stagnant highway sector. NBFC's are sinking due to the increase in NPAs in their portfolio and are reluctant to provide a lending hand to the drowning construction industry. They themselves are facing liquidity challenges as loan repayments by their borrowers have dipped by almost 40-80%. This package will reduce the liquidity crunch allowing flow of new loans for PPP projects. Also funding from ADB and World Bank can help revamp infrastructure operations in the country post lockdown. Thus all this measures if taken at the proper time implemented diligently can surely help restructure the sector.

Thus, from all the analysis done we can conclude that a paradigm shift is necessary to support the crippled Indian Highway sector. Though the losses due to pandemic are huge and no new projects being awarded in the coming months, it might seem that the sector lack investment opportunities. But with proper government support and stimulus from lending agencies highway sector can recover again. As per our observation we conclude that highway sector might undergo drastic changes due to the change in freight and passenger movement and innovative solutions are needed to tackle these problems. Also highway sector being the labor intensive sector in absence of workforce can move to artificial and technological assistance. Taking into consideration all these factors the stakeholders should brace themselves for this huge change and try to adapt to it in order to survive in this VUCA world..

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**GREEN HRM: A COMPETITIVE EMPLOYER BRANDING STRATEGY****Pranjal Jain<sup>1</sup>, Dr. Manish Sinha<sup>2</sup>, Kaptan Singh<sup>3</sup>**<sup>1</sup>Symbiosis Centre for Management and Human Resource Development, SCMHRD, Symbiosis International (Deemed University), SIU, Hinjewadi, Pune, Maharashtra, India<sup>2,3</sup>Human Resource Development, SCMHRD, Symbiosis International (Deemed University), SIU, Hinjewadi, Pune, Maharashtra, Indiapranjal\_jain@scmhrd.edu<sup>1</sup>, manish\_sinha@scmhrd.edu<sup>2</sup>, kaptan\_singh@scmhrd.edu<sup>3</sup>**ABSTRACT**

*With the growing concern for environmental conservation, corporations these days, are using the concept of Green Human Resource Management as a way of employer branding to attract suitable talent and recruit them on the basis of such criteria. Hence, this study aims to test the perception of corporates in the field of Green HRM and whether this concept is being used as a part of Employer Branding. This study investigates the attractiveness of such element among others branding practices and discover whether the move of corporates to focus in this area invites more qualified applicants. After an extensive secondary research in the areas of both Green HRM and Employer Branding and scale identification, a primary research, using an objective questionnaire on Likert scale, will be conducted among the potential and recent graduates from B-Schools to create a comprehensive ranking of various Employer Branding methods. The paper clearly establishes Green HRM as a measure for employer attractiveness, however, not a preferred one that influences the desirability of a company. This study can be utilised by corporates to design their employer branding strategies based on the preferences of potential employees and focus appropriately on Green HRM functions. The study brings out the importance of green values as an influencer of an organisation's involvement in Green HRM practices along with other branding practices..*

**Keywords:** *Green Competencies, Employer Branding, Environment Management System, Green Recruitment*

**Introduction**

Environmental Conservation is one of the first things that a company thinks of while focusing on any CSR activities. But due to the recent development and a considerable amount of research in the matter, companies are now moving from this traditional approach to a more active one, and hence, the concept of Green HR comes into the picture. It's a comprehensive set of activities that allows companies to divert their attention towards their internal processes to make them more environment-friendly and take the whole company towards sustainability. Though it primarily requires hiring and building talent, and also motivating them towards this need, if we go deeper into the subject, it also involves specific set of competencies that the employees could be evaluated upon.

Now, seeing how attractive it sounds, many organisations are taking this as an opportunity to invite more qualified applicants by forming this as a part of their employer branding strategy, and there is established research that argues in its favour. But there is no present study that tries to include this factor into the

overall construct of Employer Branding. Even though CSR has found its way into the list of measures, this particular strategy hasn't. This might be due to the fact that it doesn't sound as attractive when put in a comparison to other dimensions of Employer Branding, and for the same reason, this study aims to answer the uncertainty, that even if Green HR is added as an Employer Branding practice, would it matter to the applicants as well that it does when they consider other benefits-driven factors.

**Literature Review****A. Introducing Green HR**

Green HR is the implementation of such policies that encourage the sustainable use of resources within organisations. Green initiatives within HR form wider programmes of CSR, which involves two key fundamentals: environment-friendly HR practices and the conservation of information capital. A research was conducted to notice various sustainable activities that an employee can participate in between his recruitment and exit, with a special reference to ITC's use of biodegradable paper

and water and energy conservation in order to reduce the carbon footprint [1].

Green HRM has gain popularity in the recent past as organisations have felt that HR has a crucial role to play in implementing Green practices at work place. A study tests the model that incorporates the indirect effects of Green HR conducts on employee organizational citizenship behaviour toward environment, through sustainable employee enablement [2]. Employee enablement motivates them to work and perform effectively and efficiently [3]. The study presented that GHRM practices indirectly effect employee OCBE and the individual green values results in a positive relationship between green employee enablement and OCBE [2].

However, green management is not merely concerned with the incorporation of environmental issues within an organisation, but also look for making the existing production processes and products of the organisation environment-friendly as a whole [4]. Green competencies are the most important requirements to achieve overall green performance. Green Competencies Scale involves factors like Green knowledge, skills, aptitudes, consciousness, attitude, and behaviour, and green training seems to affect these competencies directly [4]. Environmental deprivation is one the major concerns that requires immediate activity from businesses in coming up with proactive environmental management practices [5]. Entire corporate world now considers conservation of the natural environment as a “megatrend” [6]. As a result, organisations must incorporate duties which fosters such awareness within their organisational strategy, *i.e.*, “green management” [7]. So as to build up the abilities of green administration inside organisations, researchers as well as professionals contend that the representatives of the organisation themselves must secure essential aptitudes and knowledge with respect to environmental management practices [8]. In the end, employees are the ones responsible for implementation of such practices and ensuring that they are fairly fused with organisational goals [9]; [10].

And while talking about green competencies, we must not neglect the participation of top

management to ensure this. Their commitment is pertinent in ensuring that such organisational goals are successfully realised only to improve its overall performance [11]. The leadership is accountable for designing and establishing policies and for communicating them accurately across all departments [12]. Generally speaking, it speaks to the passionate responsibility, goal, conviction, and demeanour of the top administration in seeking after the common objectives [13].

A causation link between top leadership and Green HR has been established by another relationship between the leadership and the company’s CSR. As the management ensures that the company’s CSR activities are in line with its vision statement, similarly, they have a role to play in deciding upon its GHRM policies. A study has developed a significant correlation between management commitment and CSR, keeping the dimensions of GHRM in mind, but it could not find an as significant relationship between CSR and GHRM [7]. But this is something we’re not putting entirely out of the picture yet, as the HR department itself ensures the implementation of CSR programmes, there exists a relationship between Green HR and CSR [14]. However, Voegtlin & Greenwood (2016) suggest that there additionally exists a converse relationship between these two ideas, whereby not just HRM is viewed as a forerunner of CSR, yet CSR can likewise be considered to add to HR practices [15].

Research suggests Green HR practices to be one of the imperative methods for “employer branding” when it comes to recruitment [16]. The common belief in this regard is that an organisation which ventures positive values towards the environmental preservation is more likely to fascinate potential and more talented candidates [17]. After “Green recruitment” comes “Green training” to ensure that the “Green talent” stays. Many organisations have increasingly been practicing training in green issues.

In the established literature, the concept of environmentally sustainable development has been defined in various ways; which mostly seek to explain the need for creating a balance between economic growth and preserving the nature for inter-generational equity. The issue



with respect to an organisation achieving sustainability remains unclear. And therefore, numerous businesses are executing a strategic tool called Environment Management System for taking steps towards sustainability and in better ways than their competitors, which incorporates documentation of duty and strategy; arranging; usage; estimation and assessment; and survey and improvement [18]. A clearer understanding of Green HR practices can be based on the three mechanisms of evolving green ability, encouraging employees, and facilitating green opportunity, and in terms of training, policies to amplify employees' environmental consciousness, to arm them with the required skills, and to develop green ability and proficiency for personnel in the organization as factors for Green HR practices can be identified [16]. While explaining the simplified meaning of GHRM, companies must keep a note of other GHRM practices undertaken by the organisations worldwide, and list down few potentially imaginative HR initiatives for making a complete green organization involving areas like recruitment, performance and rewards management, training and development, etc. [19]. However, the practices cannot solely be initiated by HR executives; rather an important role for HR executives will be to guide line managers gain co-operation from the complete staff towards employing environmental strategies [20]. While analysing the company's Green initiatives, it is important to rate their performance on a rating scale. A behaviourally anchored rating scale instrument based on "learning organization" behaviours could prove useful here. Sustainable policies that manifest pledge to improvements in ecological performance presents an ecologically responsible side of the company and which also encourages its staff to undertake eco-initiatives [21].

### **B. GHRM as Employer branding**

As we have seen a correlation between CSR and GHRM, let's use the same logic to make a correlation between CSR and Employer attractiveness. Another reason for doing this was the lack of established literature in GHRM as an element of Employer Attractiveness. A study has shown that millennial job seekers appear to be fascinated by the CSR-based

company image [22]. A related concept to CSR is Corporate Social Performance (CSP), in other words, defined as a business organisation's configuration principles of social responsibility, processes of social responsiveness and policies, programs, and observable outcomes as they relate to the firm's societal relationships [23]. Furthermore, research suggests that a firm's CSP may influence perceptions of organisational appeal [17]; [23]; and therefore, Backhaus & Stone (2002) has added to this literature by noted a proportionate relationship between and organisation's attractiveness rating and its CSP score [23].

### **C. What is Employer Attractiveness?**

Employer branding is one such concept that transcends through every industry, where all the players are constantly trying to enhance the attractiveness of their brand among potential recruits. Indeed, the inspiration to utilize procedures to draw in and hold staff has never been all the more squeezing as financial markets are progressively perceiving 'human capital', or the abilities, experience, and information on representatives as wellsprings of significant worth to the firm and its investors [24].

Ambler & Barrow (1996) instituted the term 'Employer branding' to understand the advantages offered by an organisation that together generate an exclusive employer interest in the minds of candidates and current employees alike, and which make them enthusiastic to come and stay with that organisation [25]; [26]. The idea was that the return on HR can be enhanced by robust corporate equity together with the brand's clientele, while simultaneously, the return on brand equity from external clientele can be enhanced by the improved return on HR [25]. However, here we try to move away from the common notion of Employment Value Proposition (EVP) as in what a corporation can offer to its employees to a larger concept of Employer attractiveness, which includes what a corporation stands for. Moreover, Employer branding is not merely about the advantages the employer is offering, rather giving a personality, picture, and uniqueness to the organisation as an employer so as to draw its potential employee base, and to persuade and

hold its present ones [27]. Sivertzen, Nilsen, & Olafsen (2013) has listed many scales for measuring Employer branding like Employer Attractiveness, Company Repute, Purposes to apply for a job, and social media linking each scale as a consequence of the former [28]. For employer attractiveness, a Berthon, Ewing, & Hah (2005) developed a 25-item scale consisting of five dimensions, namely – economic, development, social, interest, and application value [29]. The scale, in itself doesn't include any of the elements that can be understood as dimensions of CSR. Hence, Ersoy & Aksehirli (2015) lists 5 other CSR dimensions to establish a positive correlation with Organisational Attractiveness [30]. These dimensions are – Environmental activities, Diversity activities, Employee relations, Product sustainability, and Community relations [30]. As a result, some of the dimensions, when individually analysed, received partial support for a positive correlation, but the overall CSR perception received a strong support when correlated with Organisational Attractiveness [30].

Now that we have seen two dissimilar areas of research in Employer Attractiveness, it is important to look for studies that combine the two. A study on Management Schools in India listed 7 factors, after rejecting some irrelevant ones, and aimed to discover the difference in perception of first year B-school students and that of second year ones [31]. The factors used were – Global Exposure, Economic, Recognition, Application, CSR, Learning Value, and Interest/Fun Value [31].

#### **D. Green HRM and Environmental Sustainability**

Aggerholm, Andersen, & Thomsen (2011) proposed a structure that reconceptualises employer branding as an incorporated piece of a CSR methodology, along these lines giving us another method of moving toward employer branding as supporting sustainable development of the organisation and long-term relationships between employer and employee, finally instituting CSR and Sustainability to 'Employer Branding' [32]. Hence, this paper aims to go deep into the concept.

'Green skills' is defined by the Commonwealth Department of Education, Employment and Workplace Relations as the expert and

professional aptitudes just as the generic abilities, for example, ecological approaches, development and critical thinking required for new green occupations, and the greening of existing employments overall industry parts as a reaction to climate change and sustainability goals [33].

Pederson (1999) shows that obtained green abilities are all the more emphatically connected with people's own green skills and conduct [34]. The examination shows that proving obtained green capability characteristics, for example, natural information, green buy mentality, and expectation during worker choice would unquestionably be useful for ventures to distinguish singular green execution potential [35]. Shah (2019) has expanded to these established constructs and suggested that GHRM is a multi-dimensional paradigm with seven broad dimensions like Green Job Design, Green Recruitment, Green Training and Development, Green Performance and Compensation Management, Green Health and Safety, and lastly, Green Labour relations [36]. However, for the purpose of this paper, we only look at practices which can be included in the current Employer Attractiveness construct.

If we dive into some of the factors, environmental knowledge positively impacts the environmental behaviour and intentions, and hence the concerns for it. Here, demographics is one factor that determine levels of concern for the environment and environmental knowledge [37]. Buysee & Verbeke (2003) made five asset fields where organizations can take purposive developments/ventures to get greener, for example, interests in regular green capabilities, employee aptitudes, organisational skills estimated by the inclusion of functional territories, for example, R&D and item structure, formal schedule based administration frameworks and methodology, and in conclusion, endeavours to reconfigure the vital planning process, by expressly thinking about ecological issues and permitting the people answerable for environmental management to partake in corporate strategic planning [38].

But the most suitable practices were listed by Dögl & Holtbrügge (2014) namely Green Strategy & culture, Green technology

& products, Green recruitment & evaluation, and Environmental reputation [39]. Environmental reputation was taken here as a practice as the research suggests that Green HRM, in itself, consists policies that fosters the sustainable application of resources within associations and also the cause of environmental sustainability [40].

#### **E. Does Green HR matter?**

The key essentialness of a company's assets and capabilities has been uplifted by ongoing observations that it is better able to comprehend, develop, and leverage core competencies outpace those that are thoughtful with more traditional approaches to strategic business planning [41]; [42]. In any case, a company's obligation to the existing skill base also may make it tougher to obtain new resources or proficiencies [41].

But has Green HRM, howsoever attractive it sounds, been given more thought than it should have? Needless to say, it does give corporations a competitive edge in terms of taking steps towards sustainability, but just like CSR, it doesn't fall into Employer Branding like other materialistic dimensions of Employer Attractiveness. Therefore, the objective of this research is to first establish GHRM as one of the factors of Employer Attractiveness, and then find out its exact place in the minds of potential recruits under the whole desirability construct. Though the two concepts of Employer Branding and Green HRM have been talked in unison by researchers, they are still perceived to be quite distinct, and for the same reason, we are expanding the current construct of Employer Attractiveness to include Green HRM, as it has never been done previously.

#### **F. Research Hypotheses**

Seeing the gaps in the established literature, it is of importance that the matter be explored in a profound manner. Green HR is important, but the value of such importance still needs to be determined. Referencing the above stated literature and the doubts that come with it, the objective of this study is to answer the question as to whether 'Green HR Management' should be considered as one of the scales for measurement of employer attractiveness? And if yes, whether such a factor motivates the

upcoming managers in the early years of their careers? We will answer both these questions by a way of primary research that follows.

#### **Research Methodology**

A scale consisting measures of Employer Attractiveness was developed with 29 items under 9 dimensions. The measures were obtained from: Berthon, Ewing, & Hah (2005), Bhanot, (2016) Sivertzen, Nilsen, & Olafsen (2013), and Dögl & Holtbrügge (2014). The broad dimensions were Learning and Development, Social Value, Innovation Value, Career and Rewards, Application Value, Global Opportunities, Corporate Reputation, Corporate Social Responsibility, and Green HR Management. More details and items about these dimensions are given in Table 1.

A structured questionnaire was prepared and administered to a total of 97 respondents, comprising of current management students and recent graduates who have been working in corporates for not more than one year. The target group consisted respondents from a mix of specialisations like Human Resources, Marketing, and Finance. Due to common age group and almost common work experience, this particular target group have similar perceptions about the career and prefers common practices to evaluate the desirability of a company. The questionnaire consisted 29 items of Employer Attractiveness divided under 9 dimensions. The desirability with respect to all those items were measured using a 5-point Likert scale to get an overall item as well as dimension mean. Within the Likert scale to check the importance of an item for its desirability, 1 = "Not at all Important", 2 = "Less Important", 3 = "Neutral", 4 = "Important", and 5 = "Very Important." Post that, the respondents were asked to rank the already-listed 9 dimensions in an order of preference to identify the best practices.

#### **Results and Analysis**

The collected data was then subjected to a statistical analysis, consisting of Cronbach's Alpha to check the reliability of the items taken along with few descriptive statistics like Means and Standard Deviations. The following table shows the overall reliability of the constructed model

**Table 1. Overall reliability statistics**

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.830	.823	29

Since all of the 29 items were already divided into factors when obtained from secondary literature, factor analysis was not required. However, Factor-wise Cronbach's Alpha was obtained, primarily to ascertain the reliability of a new dimension, i.e., 'Green HR Management' and not the other ones. These factor-wise values have been mentioned against each main dimension in Table 2

**Table 2. Item-wise statistics**

S.No.	Constructs and Items	Sources	Item Reliability	Item Mean	Standard Deviation
1.	<b>Learning and Development</b>		<b>0.518</b>	<b>4.29</b>	
	a. A springboard for future employment	Berthon, Ewing, & Hah (2005);		4.11	0.610
	b. Feeling more self-confident for working there	Bhano t (2016)		4.37	0.697
	c. Gaining career-enhancing experience			4.35	0.662
	d. Feeling good about yourself for working there			4.55	0.559
	e. Hands-on Inter-departmental experience			4.09	0.751

**Table 2. Item-wise statistics (contd.)**

2	<b>Social Value (Interest/Fun working environment)</b>			<b>0.655</b>	<b>4.18</b>	
	a. Having a good relationship with your supervisors	Berthon, Ewing, & Hah (2005);		4.20	0.671	
	b. Having a good relationship with your colleagues	Bhanot (2016)		4.37	0.634	
	c. Supportive and Encouraging colleagues			4.27	0.621	
	d. A fun working environment			3.99	0.757	
	e. Working in an exciting environment			4.05	0.782	
3	<b>Application Value</b>			<b>0.371</b>	<b>3.85</b>	
	a. The organisation both values and makes use of your creativity	Bhanot (2016);		4.04	0.644	
	b. Opportunity to apply what was learned at a tertiary institution	Berthon, Ewing, & Hah (2005)		3.84	0.786	
	c. Opportunity to teach others what you have learned			3.64	0.819	
	d. The organisation is customer-oriented			3.88	0.807	
4	<b>Career and Rewards</b>			<b>0.666</b>	<b>4.40</b>	

	a. Good promotion opportunities within the organisation b. Job security within the organisation c. An above average basic salary d. An attractive overall compensation package	Berthon, Ewing, & Hah (2005); Bhanot (2016)		4.47 4.46 4.31 4.37	0.663 0.693 0.651 0.712					
5	<b>Innovation Value</b>			<b>0.736</b>	<b>3.87</b>					
	a. The organisation produces innovative products and services b. Innovative employer (novel work practices/forward thinking) c. The organisation produces high-quality products and services	Sivertzen, Nilsen, & Olafsen (2013)		3.76 3.97 3.87	0.788 0.809 0.716					
6	<b>Green HR Management</b>			<b>0.859</b>	<b>3.62</b>					
	a. Green Strategy & culture (reward culture that fosters environmental value) b. Green technology & products (use of renewable energy sources; packaging from recycled materials)	Dögl & Holtbrügge (2014)		3.72 3.69 3.49	0.887 0.917 0.903					
	c. Green recruitment & evaluation (JD contains environmental objectives) d. Environmental reputation (environmental protection score is better than industry average)							3.57	0.900	
7	<b>Corporate Social Responsibility</b>			<b>0.366</b>	<b>3.63</b>					
	a. Quality CSR initiatives taken by the organisation b. The organisation is stake-holder focused	Bhanot (2016)						3.61	0.885	
8	<b>Global Opportunities</b>									
	a. Opportunity to get global exposure	Bhanot (2016)						4.00	0.764	
9	<b>Corporate Reputation</b>									
	a. Having heard a lot of good things about the company	Sivertzen, Nilsen, & Olafsen (2013)						4.18	0.707	

Note: For the purpose of this research, along with most of the pre-established scales of employer attractiveness, 4 items from Green HRM were added from a separate source. As an additional analysis, we have obtained the Cronbach's Alpha of these items excluding the ones under 'Green HR Management'. As Green HRM, being a relatively new concept, has not yet found its place in the previously established scales of Employer Attractiveness, the following table shows the Reliability Statistics of the rest 25 items without Green HRM.

**Table 3. Reliability statistics w/ohrm items**

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.795	.791	25

**Discussions**

**A. Green HR Management as a measurement of Employer Attractiveness**

As it is evident from the past literature cited here, Green HRM can be an effective strategy for enhancing employer attractiveness. However, how effective is not depicted in any of them. Whatever arguments given in the literature, were not backed by data which would have affirmed the value of Green HR practices, and which would have helped corporates and HRBPs device their strategies accordingly. Hence, through this paper, we have analysed the importance given to such items when listed together with other and apparently more important strategies.

From Table 1, Table 2, and Table 3, there is no doubt that Green HRM should be included as one of the main dimensions of Employer Attractiveness as, along with having a reliable Cronbach's alpha value of its own, it increases the overall reliability of the data. Considering the validation of all the scales mentioned, this study doesn't aim to revalidate the existing dimensions as they have been validated by the already established literature, and therefore going into their reliability is not the objective here. However, we do aim to establish Green HRM as a validated scale, and considering the reliability statistics from Table 1, Table 2, and Table 3, we have succeeded in adding it to the current construct. This can obviously be validated further by future studies in the same field.

**B. Whether Green HRM attracts upcoming managers in the yearly years of their careers?**

To answer this question, let's have a look at the following Table, which gives an overall ranking of the 9 dimensions of Employer

Attractiveness according to their respective means as well as according to the preference list created by the respondents at the end of the questionnaire

**Table 4. Overall preference ranking (in the order of first to last)**

Based on Factors' Overall Means	Overall Means	Based on Rankings given by the respondents
Career and Rewards	4.40	Career and Rewards
Learning and Development	4.29	Learning and Development
Corporate Reputation	4.18	Global Opportunities
Social Value	4.18	Corporate Reputation
Global Opportunities	4.00	Social Value
Innovation Value	3.87	Application Value
Application Value	3.85	Innovation Value
Corporate Social Responsibility	3.63	Green HR Management
Green HR Management	3.62	Corporate Social Responsibility

Here we see a consistency in the responses as the rankings given by the respondents are almost similar to the rankings developed when arranged in a descending order according to their overall means, with an exception of the two-place difference of 'Global Opportunities'. Another important finding to mention here is that the overall means of 'Social Value' and 'Corporate Reputation' are equal, but 'Corporate Reputation' precedes 'Social Value' in the rankings given by the respondents.

Moreover, Table 4 further validates the point of Green HRM being included as one of the dimensions of Employer Attractiveness due to its ranking being close to that of 'Corporate Social Responsibility', which stands as an established dimension already.

Now, coming to the main question of whether Green HR practices really matter to potential recruits. Let's go over some of the specific practices that falls under Green HRM. For example, in staffing, the job description itself covers tasks related to organisational, environmental, and societal obligations, green reporting, health and safety responsibilities [36]. When it comes to recruitment, the candidates must be aware of their environmental responsibilities [36]. Green Training involves an arrangement of measures

that instigate workers to acquire environmental protection abilities and direct their attention towards environmental concerns [43].

Employer Attractiveness, in traditional terms, has been understood as the benefits a company offers to its employees. Setting all benefits aside, they even promote their CSR activities to show how socially conscious they are, and more often than not, such CSR includes taking steps towards environmental concerns. But do you think that companies can, or rather should, start promoting how their whole system has become environment friendly, and how such values have been imbibed in their employees?

### Conclusion And Recommendations

This paper is the first in its domain to contain a comprehensive list of items that form Employer Branding. The paper aims to expand the current construct from the past literature as well as analyses the reliability of the constructs as a group. Earlier in this paper, we stated two hypotheses with respect to this study, and therefore there are two main conclusions worth mentioning. First being the validation of Green HRM as one of the scales to measure employer attractiveness. With a significant number of responses and the analysis shown above, it has been established that Green HRM is, at the least, a factor that can't be ignored, and in the long term, it will give the corporations a competitive edge in the industry. Second, being the importance given to such a factor. Since the study clearly shows that Green HRM is not something that the upcoming graduates actively look for in a company, and it doesn't hold much ground in front of other factors, it would be beneficial for the business organisations to not make this a priority employer branding strategy for attracting qualified candidates, but don't overlook it either. One thing we have established with certainty here is that Green HRM holds a strong ground against CSR activities. Though the latter is also mandated by law, there are companies which use it to enhance their attractiveness. Now, they can also focus equally to the newly established category of Green HR which projects the efficiency of their internal processes.

The implications of this paper are two-fold. First, these findings certainly give the corporates insights into all the verticals of employer branding and assign weightage to each vertical according to the targeted audience. Secondly, in addition to the corporates, it provides a locus standi to the future researchers to explore these verticals broadly, and for a bigger and more diverse audience to gain further insights into the subject matter and notice the shift in interests, if any. That being said, there are limitations with this study which are discussed in the next section.

### Limitations

The primary limitation is with respect to the target group. For a more comprehensive study, and with time, groups must be divided in terms of demographics, work experience, and industry that they have been working. And due to the same limitation, with more resources, the study can be expanded for future works, especially because different age groups of people from different educational background have different motivating factors, and these factors can be accounted for the independent variables for further analysis. For further study, the dataset must be divided, first for a correlation analysis between the independent variables like the ones mentioned above and the dependent one, i.e., the importance given to each factor. Second, the difference of means of these distinct categories should also undergo through a t-test to check the significance of this difference.

Lastly, a very patent limitation with the current study is the number of responses. With more time and resources, a larger audience should always be taken into consideration with a considerable number from each target group, that are distinct by any of the independent variables like the ones mentioned above. Both of these limitations, when overtaken in future studies, will help in expanding the current construct of employer attractiveness and hence, the employer branding itself, and can also pave the way for Green HRM as an established as well as an important scale, which the corporations will not be able to overlook

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## “AN ANALYSIS OF DIGITAL TOUCH-POINTS OF GLOBAL BUSINESS TO BUSINESS COMPANIES IN STEEL AND AUTOMOTIVE INDUSTRIES

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### ABSTRACT

Digital initiatives are the initiatives that include all the efforts taken to solve any problem, enhance customer experience, increase brand awareness, and many others. The digital world has changed the way industries handle B2B communication. That also includes how you can successfully market your products. In the research paper, digital initiatives are taken by different industries – the main focus on the automotive and steel industries – will be discussed. The digital initiatives will be categorized based on their objectives, and the effectiveness of these initiatives will be analyzed. Multiple efforts have been taken in the industries to automate their processes, increase customer leads, and to make the selling process easy with the other vendors and OEMs (Original Equipment Manufacturers). The means of research are through the telephonic interviews of the people in the industry and secondary research using multiple research papers and other online sources. The respondents will be belonging to one of the three main categories: Senior Management, Purchase/Supply chain, and R&D/Engineering/QA. In the end, a novel digital outreach program idea for the industries will also be discussed.

**Keywords:** Digital initiative, Digital Marketing, Business to Business, Supply chain management

### Introduction

Digital technologies are playing a great role in the transformation of B2B organizations, which now have access to a wide variety of digital platforms that help in regulating their interactions with different stakeholders of their network. Still, the role of systems in changing relationships of a company with its multiple stakeholders, like customers or suppliers, of its business networks is not clear. The essence of change of trend, the effect on companies' relationships, and recognition of issues associated with these changes need appropriate theoretical vision calibrated with respect to a B2B market.

However, adopting digital initiatives in the steel industry has always been a challenge and has a history of lengthy processes of approvals and long lead times. While the industry has made huge investments in the fields - process control, process optimization, research, and development – concentrating on the product, it has been slow in adopting new digital technologies. In the last few years, the industry has opened the doors for multiple digital technologies and is adapting them at a faster pace, but it still lacks behind compared to that of industries like banking and media. [1]

Digital initiatives have played an important role in enhancing the business relations among both internal stakeholders – Research & Development (R&D), Sales, Marketing, Manufacturing, and many more – and external stakeholders - OEMs (Original Equipment Manufacturers), Tier 1 and Tier 2 vendors, End-customers, etc. Digital initiatives enhance the customer journey by reducing the physical interruptions, providing personalized recommendations, and reducing the time taken with the help of the AI and automation tools.

Thus, by the end of this research paper, we aim to design a digital plan digitizing the value chain specific for the automotive industry. Here, we will be analyzing the different touch-points of the customer journey and study the digital initiatives taken by the different companies in multiple industries to enhance the business relations with their clients and vendors.

Our paper will be organized as follows. After the introduction, we will have a literature review discussing the viewpoints on digital initiatives and their effectiveness in optimizing the value chain. After the literature review, we will discuss the methodology adopted in our research. We then discuss three cases of digitalization in a Business-to-Business (B2B)

automotive and steel industry context followed by the results. Then we have the results related to the interviews conducted as part of primary research. Based on our research and analysis, we propose a possible number of digital initiatives. Then in the last, we have a conclusion and limitations related to the results and methodology adopted during our study.

### Literature Review

With the changing landscape of the industry, it has become difficult for a single actor to provide a complete solution, for the end-to-end value chain, on its own as the structure of the digital market becomes more complex and dynamic because of the coming latest digital technologies. Stakeholders have realized the need of support from viable alliances and need of a value network with the right partners.

The capabilities to handle partnership relations [2] will have to be one of the key competencies that new business actors need to have. The structure of the social relationship is also transforming.

With the coming new digital technologies, the structure of social relationships experiences the transformation for both the company and the customer. In addition, we need to also consider the fact that digital technologies have been embedded into products and services increasingly (i.e., connected cars or IoT enabled home appliances), and the separation of business processes from the underlying IT (Information Technology) infrastructures is becoming more difficult. As we adopt the digital business strategies, we approach towards dynamic and complex ecosystems with the aim of innovation and development as the strategies are used to coordinate across firms, including the domains of process, product, and service. The complete value network is strengthened by a logic of creating value and results in specific strategic postures with the help of the logic's application. Including a perspective of network [3, 4] provides another outlook that is more suitable and easily adaptable for companies, especially in the case of an organization that has been able to digitalize its demand and supply chain [5].

In the past few years, multiple discussions and researches have been performed to study the effect of approaches of digital business on the

concept of turning supply chains into value networks and value ecosystems or constellation. The definition of "value network" constitutes a change between a traditional value creation vision anchored in a value chain perspective to a renewed value creation vision assisted by the perspective of network.

[6] accurately connects the value network to a particular concept of the method of creating value and form the foundation of value network on the concept that "each product/service needs a set of value-creating activities that are executed by a number of actors forming a value-creating system," there the value network. [7] discusses the concept of value network as one in which a group of actors unites in order to provide value to the end customer, where every actor feels responsible for the failure or success of the network. The structure agrees with the value constellation concept introduced by [8]. As per this outlook, the system, that creates value, consists of multiple economic actors who come and function together with the aim of co-producing value. As the value network emerges as the main concept for study in the digital field, industrial marketing researchers continuously promote to use the network approach for the study of Business-to-Business (B2B) exchanges. This is the scenario with the Industrial Network Approach in association with the group of Industrial Marketing and Purchasing (IMP). Nevertheless, as far as we know, due to emerging technology, the network strategy was not presented with a view to reporting on the general restructuring of the markets.

The works mentioned above, all deal with the idea that digitization fundamentally changes the approach followed by companies while doing business. As analyzed by scholars, one important basic aspect of the digitization revolution is that it explicitly focuses on coordination between companies. The decline in transactional costs (both within or between organizations transactional costs) has been observed because of the adoption of digital technologies [5]. To identify external sources and have their access is the main issue, when "integrated firms do not offer any kind of specific benefit due to the lower access costs to

external resources. This issue can be in means of “coordination between companies.”

### 2.1 Actor-Resource-Activity (ARA) Model

More lately, [9] endorsed “coordination between companies” as the main issue with digitization that is not a subject of connectivity and recombination and not the topic of “displacement and replacement. Transactions are being digitized, data is being generated and analyzed in new ways, and previously discrete objects, people, and activities are being connected”. Therefore, we construct on the concept of the centrality of the communication issues among teams when it comes to digitization and propose that we use a model that permits a deep knowledge of different means followed by companies to get connected or establish a connection with each other. The Actor-Resource-Activity (ARA) model describes a business exchange by using the concept of three “layers”: resource ties, activity links, and actor bonds. The model captures “the compounded connections among resource combining and activity coordination and the succeeding impact on the structure of actor”. ARA model judges an activity as a “sequence of acts directed towards a purpose” where “developing, purchasing and selling a product and processing information are considered activities. Resources sustain activities. Activities can be considered as resources – various elements, tangible or intangible - when we can make use of them”. The resources can be classified into four different types: organizational units, production and product facilities (both are considered as physical or technical resources), and management relationships (considered social resources) [10]. Actors combine resources and link activities by interacting with others. Here, considering the ARA model, Actors can be organizations or individuals. The reality of considering a company an actor must be linked with the idea that a company needs to interact with others to acquire an identity or a personality.

According to the above-mentioned concepts of “activity,” “resource,” and “actor,” any Business-to-Business (B2B) relationship can be clarified by the mechanism or process by which activities, resources, and actors are

interconnected. In starting, activity links connect the companies, where the links include administrative, technical, commercial, and many other activities of a firm, which can be linked in multiple ways with another firm when a relationship evolves. The logic for further adjustments between activities is definitely considered as a benefit in functionality: “the more adjustments, the more fine-tuned the two [activities] become in relation to each other and their performance improves”. Still, a surplus amount of “linking” can also be injurious as it obstructs a reengineering operation when new situations come into the light. The linked activities, at the network level, establish an operation pattern or design. Companies attach different resources to stay linked with each other, with the aid of network links. Resource tying is the source of innovation: “resource ties cause some innovation in the use of resources and are important to the innovation potential of the company”. Still, too much of “tying” may have pessimistic outcomes as it creates difficulties in the process of redeploying the resource, in combination with other resources. Those connected resources form a constellation of resources at the level of network.

In the end, companies connect using the bonds of actors, that form a network of actors at the network level. The bonds of actors are an essential means of deploying other resources for a firm.

These three layers of connection have an interplay between them, and hence they are not independent. The presence of relations between actors is seen as a precondition for the creation of ties between action and resources. The advancement of a professional network can be defined in terms of alterations affecting the design of activities and the constellations of the web of actors’ resources. New adaptations and coordination are useful for changing activities. When a new combination takes place, the resource constellations can be altered or modified, and the actors’ web is updated with actors shifting their associations with one another. Here, in this study, our emphasis will be on a number of ways in which digital technology affects resource ties, activity links, and bonds related to actors differently.

## Research Methodology

The objective of the research is to digitalize the value chain specific for a steel industry company by understanding pain points of different customers along the customer journey and shortcomings in current digital initiatives spanning across multiple industries. In this work, systematic combining is used as its study approach and in-depth interviews and case studies as practical data collection and analysis-level tools.

Systematic combining provides a method for empirical research. In systematic combining the research framework along with data collection and study or analysis evolve at the same time. This type of combining is based on the theory of the abductive approach, which is a mixture of deductive and inductive approach. In practice, when performing research and analysing data, every researcher had in mind a pre-conceptualization of the phenomenon resulted from the examination of literature review and analysis using the technique of conceptual analysis. That pre-conceptualization was interpreted and modified, whenever necessary, during the process of analyzing and coding the data. To further illustrate, the empirical material is slowly established through systematic combination when findings of unanticipated empirical are made, and the theory is refined and modified when used in practice. The methodology of the case study can be used in the field of business marketing to build, as well as test theories. In addition, a case study, as used in this study, could be applicable to circumstances in which researchers need a deeper understanding, strong contextual sense, and a move toward theory building.

The selection of cases is an apposite stage in case research. As a part of the study, multiple companies are chosen, based on theoretical sampling, to cover the different types of business relationships, in which the cases are selected so that they represent the problem of the study. Multiple companies like ArcelorMittal, Maruti Suzuki, Tata Motors, JSW Steel, and Wheels India, are chosen as part of the value chain study. The respondents will be belonging to one of the three main categories: Senior Management, Purchase/Supply chain, and

R&D/Engineering/QA. Due to the confidential purposes, the identities of respondents are not revealed. In the business relationship the perspectives of both parties are studied to be certain of the value of the findings. The views of all parties – involved in any business partnership – are considered and analyzed in order to be confident of the validity of the results.

Current pain points and digital technologies are analyzed from the data derived from the interviews. The interviewees were asked about the difference in the history and current state of the value chain and were expected to answer in as detail and accurate as possible. During the interview they were also asked to highlight the key people and events involved in the complete value chain: from the first point of generating quotations until the delivery of the order and after-sales services. Finally, they described the pain points and the implemented digital initiatives (if any). The informants were chosen based on the hypothesis of the principle that the best way to elicit the information is to take interviews of the people who have knowledge of the event and are the stakeholders in the procedure. The interviewing process was terminated when the responses of the interviews became repetitively related to the multiple parts of the value chain, indicating the data saturation.

There were a total of 53 formal, in-depth interviews, where each interview lasted from 1 to 2 hours. The interviews were with personnel from distribution staff, quality assurance, product development, sales, purchasers, vendors, and other employees who are responsible for the cooperative operations among two companies. The interview questions were semi-structured so that the scope of the questions and answers is not limited, encouraging interviews to answer the questions while considering the multiple scopes according to multiple departments, and the interviews were recorded with the permission and transcribed to get as much use from them as possible. In order to relate and combine the material according to a theme, qualitative data analysis was used.

Following data collection, Interview data were analyzed and mapped all pain points and suggestions across the value chains of the

respective departments. We also placed a focus on the current implemented digital initiatives and their shortcomings.

## Research And Analysis

### 4.1 Digital Initiatives in Steel and Automotive Industry

#### 4.1.1 Maruti Suzuki

In the case of assembly lines in the automotive industry, multiple models are built on a single assembly line. As assembly lines are continuous moving lines, there is a stream of bodies (white bodies – the chassis of the car) of different colors and models that are sequentially loaded onto the lines. These have to fit with their corresponding parts on the line. A complete car is made by combining these bodies with their respective parts on the line. On the other side, a variety of parts are produced by the suppliers for different models. Let's consider an example of a supplier who supplies bumpers for all models.

The supplier and the OEM decide the quantity of the parts, which need to be delivered on a daily basis by the supplier to the OEM. According to the product mix and schedule, the supplier decides the production plan. From the OEM, the supplier is conveyed about the product mix but not the schedule (exact time). So, there could be a scenario where the bumper supplied by the supplier can be different than that of expected by the OEM. For example, the supplier may supply bumpers for Model A in the morning, whereas the Model B is being loaded onto the line in the OEM facility. The supplier is right in supplying as long as it is in his/her daily schedule. But it halts the working of the assembly line due to the unavailability of necessary parts. In addition to this, the transport vehicle and trolleys are stuck as they contain the wrong parts. The situation becomes worse if the production of the bumper for Model B is scheduled in the final part of the day.

Both the parties - supplier and the OEM – suffered huge losses due to this issue faced constantly. To address this problem, a number of suppliers deployed people (called runners in industry jargon) to check the sequence of vehicle loading on the assembly line and convey the same to the supplier. This helped the supplier in knowing the exact schedule, and

they could plan their supplies accordingly. With the help of this exercise, suppliers could plan their supplies according to the schedule of OEM and avoid losses. In today's digital world, this problem is solved by a platform, made by Maruti Suzuki, known as e-Nagare. This platform helps suppliers in knowing the precise time, quantity, and delivery location for each and every part. With the help of this platform, suppliers knew the sequence a day in advance and no longer needed the runners for the assembly line. The platform minimized the problems of incorrect supplies and line stoppages and also helped suppliers in planning the supplies of products with lucidity.

Due to this capability of the platform, the OEM was approached by multiple suppliers with a request to add them to the platform's network. The rate of adoption of the platform increased at a high rate.

In today's digital world, Maruti Suzuki utilized digital technologies to enhance the experience of all stakeholders across the value chain with an aim to provide the correct information to the correct person at the time. This should be one of the main considerations while enabling a business process with technology. [11]

#### *Bajaj Automotive Ltd. (BAL)*

The Bajaj Group is amongst the highly respected business groups in India. It consists of a wide range of industries, including iron and steel, home appliances, automobiles - two-wheelers and three-wheelers, lighting, insurance, finance, and travel. Bajaj Auto Limited (BAL), the flagship company of the Bajaj group, is an Indian global two-wheeler and three-wheeler manufacturing company, headquartered in Pune, Maharashtra. It manufactures two-wheelers – scooters and motorcycles – and three-wheelers, i.e., auto rickshaws.

Due to the manual management like identifying, verifying, and then stamping of authorization receipts at the BAL gate manually, it led to high turnaround time. Due to manual management, it was taking more time in Logistics and Inventory management, synchronization of Vendor and BAL data, and it was not possible to have any real-time status data of material, resulting in discrepancies in data between vendor and client. There was also no state-of-the-art facility that could be in sync

with the client's Brand image and perception [12].

To tackle all these challenges faced and stand unique in the market, BAL took the following measures:

- RFID tags were placed on all the vendor vehicles. These tags were having information about the vendor and the material inside the vehicle.
- Boom barriers were installed on all the Entry and Exit gates. These barriers were capable of automatically and instantly opening the gates on a successful read of an RFID tag.
- The trolleys, which carry the material, were also incorporated with RFID Tags with the relevant data like type of material.
- The system generated a digital receipt automatically once the desired material reached the assembly point.

Bajaj automotive successfully enhanced efficiency in the entire supply chain of motorcycle manufacturing and realized ROI by eliminating losses due to theft. In addition to this, BAL also realized the following benefits:

- Saved on the time taken to receive goods
- Reduced time for production.
- Fast, efficient, and real-time access to all the information.
- Easily integrable systems with other vendors.
- All the investments were recovered within six months.

3) Analyzing Equipment failure using advanced analytics A global group known for its base smelting metal technology was struggling with the problems of downtime and production losses due to the unanticipated collapse of equipment. Due to this, the maintenance resources were diverted to breakdown repair activities from planned maintenance activities. With the help of a predictive model, the company was able to predict the failure – that was about to happen - on average, seven days in advance, having an accuracy rate of 81 percent. It was leveraging the existing sensors technology to collate equipment and operating data. This enhanced the company's experience as this technology-led in better planning and synchronizing the maintenance interventions and saved the time,

which was generally lost in re-planning, expediting, and procuring parts and failure and damage cascading across assets [1].

#### 4.2 Customer Journey

As we consider the management perspective, the journey can be divided mainly into four categories: Pre-sales support, Problem Resolution, Repurchase, and Relationship Building. We will start our discussion by pre-sales support.

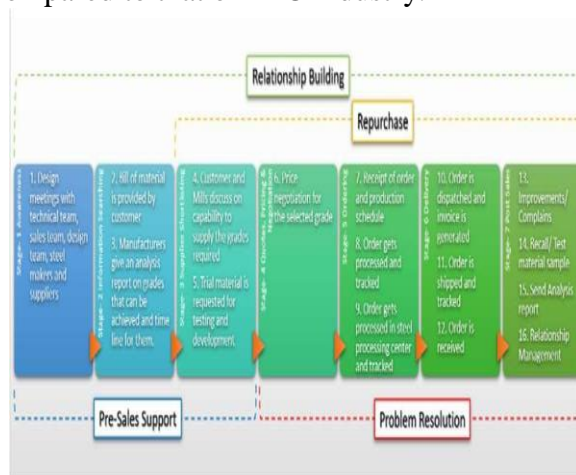
Pre-sales support or pre-sales process is the set of activities that are performed before the customer is acquired. In other words, we can say these are the activities that are performed to generate the awareness about our offerings, company among the defined set of the target audience, and convert the potential leads into our customers. The first step in creating a product is proper research that needs to be executed by the product owners, along with technical teams, to understand the current situation and challenges faced by the companies and end customers. After the research and analyzing the customer needs, the multiple meetings are held with the internal stakeholders like the technical team, sales team, design team, and multiple steel manufacturers and suppliers to come up with a product. Once the technical details are finalized, multiple campaigns are run to create awareness of the product and to target potential customers. Once the potential customers ask for RFP (Request for proposal), all the necessary details are submitted, and manufacturers give an analysis report on grades that can be achieved and a timeline for them. After discussing the capacity to supply required grades, the trial material is provided for testing and development.

Coming to the next stage: Problem resolution. Once the material passes the trial stage of the customer, the final price is negotiated for the selected grade. After deciding the price, the order receipt is generated, and timelines related to the production and delivery are mutually decided among the manufacturer and customer. Order is produced and delivered according to the pre-decided timelines. To track the order, the customer will need to contact the POC (Point of contact) either through e-mail or phone call. There is no digital technology implemented so far that it could update the



customer with the status of the intermediate stages of the product. Once the order reaches the customer facility, the product goes through the process of Quality assurance before using it. If the test fails, a complaint is raised through POC, and the product is replaced after the inspection by a technical officer appointed by the company.

After completing this cycle, the customer gives an order for repurchase, and the complete cycle mentioned above repeated. This is known as the Repurchase journey. Providing a better experience to customers builds healthy relations with the customer, and it is necessary to build healthy relations in the B2B industry as here the volume of customers is less, but the amount associated with an order is large as compared to that of B2C industry.



Source: Based on the interviews conducted as part of primary research

Figure 1: Customer journey in B2B steel industry

### 4.3 Analysis of inputs received from Stakeholders

The rate of adopting digital technologies has increased as compared to that of before COVID-19 situation. Companies have realized the need to switch to digital technologies to tackle the challenges faced by the industry.

To analyze the inputs provided by multiple stakeholders during our interviews, we have divided the stakeholders, according to their departments, into three main categories: Senior Management, Purchase/Supply chain, and R&D/Engineering/QA. Also, we have divided the categories of inputs into different categories: Order placing, Tracking, Communications, Inventory visibility, Information searching, and R&D feed.

Information Searching, and Research and Development (R&D) feed.

The results have been shown in the below figure. We observe that Senior management is willing to apply digital initiatives across all the categories while technical department

– R&D, Engineering, Q&A – prefer digitization in the Information searching category. Purchase and Supply chain department have given more importance to Order placing, Tracking, Communications and Inventory visibility as compared to that of Information searching and R&D feed.

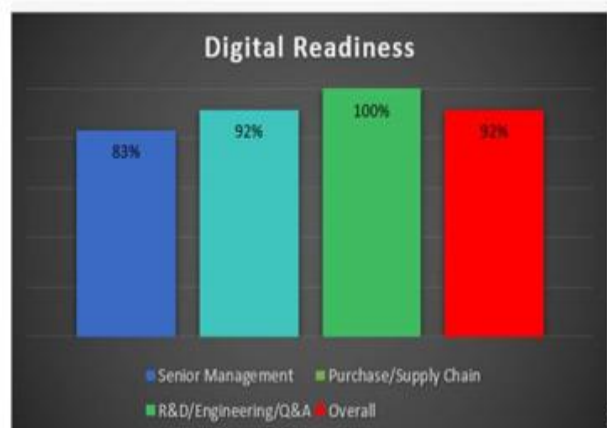
As observed, the preferences of digital initiatives change according to the roles and departments of the respondents. However, Order placing, Tracking, and Communications require the implementation of digital technologies at a much faster rate compared to that of other categories. Overall, 92% of the interviewees have shown interest in adopting



digital technologies

Source: Based on the interviews conducted as part of primary research

Figure 2: Preference of Digitalization of stakeholders for different departments



Source: Based on the interviews conducted as part of primary research

Figure 3: Digital readiness according to different stakeholders

## Recommendations

Based on our discussion with the multiple corporate stakeholders and as part of secondary research, we have analyzed that digital technologies are the new trend in the coming post-pandemic world. With the social distancing becoming the new norm, it is not possible to physically visit the customers and interact. By adopting digital technologies in the value chain, we can not only decrease the turnaround time in the supply chain but can also provide personalized offerings based on the customers' scenario and needs. Providing more transparency in the value chain will become one of the key competencies in the coming world.

Keeping in mind the above factors, we have suggested some digital initiatives which will be playing a great role in the success of any organization in the coming post-pandemic world.

### 5.1 Supply chain visibility (SCV)

During our interviews, we have found out that currently, stakeholders face a lot of problems while tracking the order. They do not get any updates related to the intermediate stages of the production cycle, and they have to contact POC (Point-of-contact) of the company to get the status, either through e-mail or phone call. To tackle this problem, we suggest a supply chain visibility model, where the user will get the real-time status of the order along with additional features.

Supply chain visibility mainly helps in knowing the location of inventory at a given time, i.e., components or products that are in transit are able to be tracked in real-time as they move from their initial destination, mostly manufacturers, to their final destination. We propose our design with the two basic features: Supply chain visibility and Grievance address system.

#### 5.1.1 Supply chain visibility:

In our current systems, a company places its order by communicating the SPOC (Sales manager of a manufacturing company) on e-mail. After receiving the order from OEM's Procurement department, Salesperson initiates the process in the company's ERP (Enterprise Resource Planning) system. Once the order has

been entered into the ERP system, the progress is notified for every stage to a salesperson. Here, OEM does not receive any communication and thus is unaware of the status at intermediate stages. In our solution, we have divided the production stage into five different parts: Plant, Loading Point, Logistics, Stockyard, and Out for delivery – In transit. A notification will be provided through an e-mail to all the stakeholders, including OEMs, whenever there is a progress in the stage of the order. OEMs will also be able to check the status on the company's portal – by using the unique credentials given to every customer - where all the data will be displayed in the infographic form and user will have the liberty to place a new order, modify the existing orders and many more. This will reduce the human efforts required to keep track of the status of the order, and the user will be updated with the status of the order in real-time.

#### 5.1.2 Grievance address system:

This feature can be accessed using the same portal as discussed above on the website of the company. In case of any grievances like a product not meeting the pre-defined standards, the product received is damaged, etc., the user can file a complaint using the portal with the supporting documents as proof. Once the documents are submitted, then depending on the type of defect, the respective action will be taken. In case of any technical defect, an employee from the technical team will be assigned and asked to visit the customer facility to check the defect and take further action. In case of defects where the supporting documents are sufficient to take further actions, the action will be taken by either refunding the money or replacing the product. This portal will help the user to check the status of the complaint and will be promised to resolve the complaint within a particular time period. In case the complaint is not solved within the promised time, then it will be escalated to the higher management

Source: Based on secondary research and interviews conducted as part of primary research Figure 4: Supply chain visibility model

The main agenda of the supply chain visibility (SCV) model is to strengthen and optimize the

supply chain. This would allow a quick response to any errors or alterations in the SCM. That globalization, rivalry and challenges in the rising market have made it harder for companies to keep their eyes on their ever-expanding supplier networks. To attain a clear view of the entire supply chain is nowadays a difficult and complicated task and will be one of the competency factors in the coming world.

One of the goals of SCV is to have a clear view of the entire supply chain. This can be achieved by making data instantly available to multiple stakeholders, including the customer. In addition to this, we discuss how supply chain visibility plays a vital role in the success of any organization.

3) The convolution of the supply chain: Having good supply chain visibility enables the supplier network activity tracking precisely and accomplish SCM, especially in case of organizations that function on a global scale and use numerous modes of logistics and shipping to serve their customers. Even the firms that do not deal with the global demand and supply have good chances for the supply chain to become widespread and complex. In the times when proper conveying and the skills to make quick, fast and well-enlightened decisions are critical as well as challenging, the best solution to increase supply chain visibility can be to invest in a cloud technology which has the capacity to manage big data or to work with a logistics company which focuses in transportation management.

a) Customer demand:

Today, where customers have a plethora of choices, companies need to provide seamless customer experience by providing shorter cycle times, transparency, and an effective supply chain with an effective flow of data and knowledge. A framework that offers a holistic view of the supply chain can help in generating better consistency while classifying SKUs, imposing timelines, and calculating units.

b) Compliance with regulatory demands: Supply chain visibility tools help businesses monitor and comply with the ever-changing landscape of government regulations. The tools are particularly useful for organizations that need to handle the complexities of trade

agreements and government tariffs on a global scale. Additionally, businesses can better predict and will need less time to adapt to new regulations in the industry and in terms of transportation used.

## 5.2 Newsletter

In our research, one of the important points that came into notice was that customers are not aware of new offerings or about any developments in existing offerings of the company. Companies spend a lot of time researching the offerings, and simply, the company who replies and provides information first gets the order. In this method, both company and customer lose opportunities as customer loses a chance to explore and compare the products of different companies and companies, even though with the better technology and offerings, lag behind in the competition because of poor communication.

Thus, with the changing landscape, it has become important to continuously engage your audience with your brand, its latest events, and offerings. In order to make your communication effective and relevant, it is important to segment your audience according to the type and their needs, so that only the content, which aligns with their needs and demands, is communicated to them. In order to achieve the aim, Newsletter marketing is preferred in the industry due to its effectiveness and high conversion rate compared to that of other marketing techniques.

Companies use multiple techniques to make the newsletter attractive and to make sure that the customer is engaged throughout the newsletter. Based on our understanding through the multiple interviews conducted as a part of primary research, the newsletter can be divided into four main parts: Subject Line, Problem faced in the industry, How the company's solution will solve the problem, and in the end, there will be Call-to-Action section.

1) Subject Line:

It should grab the reader's attention and simultaneously, must convey about the message of the e-mail, means a brief idea of the company's offering. 2) Problem faced in the industry:

This section gives a brief idea about the problems or challenges faced by the industry and its stakeholders.

#### 3) Company's solution:

This section describes the company's offerings in brief and aims to give a fair idea about the offering and benefits to the reader.

#### 4) Call-to-Action:

This section acts as a next step for the reader after reading the mail. If the reader wants to know more about the offerings, he/she can use the call-to-action options, like Read the brochure, Schedule an appointment – and connect with the company. With the help of this section, the company gets the contact information of potential clients.

Newsletter marketing is the exercise that is used by companies to send educational and product-focused content through an e-mailed letter to a subscriber list, which comprises the information of existing clients and as well as potential clients. Online industries use newsletters to keep their brand recall and recognition high among consumers, to establish jurisdiction in the space, and to notify readers about the products that will be using them. These newsletters allow companies to communicate and deliver the right message at the right time [13].

### Limitations

Above, we have studied and analyzed the different initiatives adopted by multiple organizations and suggested some of the new ideas that can be adopted to enhance the customer journey and provide a seamless experience to the customer and OEMs. But we have to consider the various limitations of our work.

As we all know, there is an incredibly large variety of ever-updating emerging digital innovations that already exist and the very rapid time they develop. We are also aware of the fact that our classification does not grasp every case related to digital technologies and their transformations. Starting with our first limitation, which is our limited knowledge of

all technologies available in the B2B space, due to the limited number of cases we could investigate.

The second limitation is because of the approach opted for this research. By focusing our research mostly on Tier-1 vendors and OEMs, we have limited our scope to the primary parts and systems of this industry. The scope of the research can be further expanded to Tier-2 and Tier-3 vendors. The firms that supply parts, as well as systems straight to OEMs, are known as Tier-1 vendors. The firms that are not in business directly with the OEMs but supply parts that are the components of the final products, like cars, are known as Tier-2 suppliers. Tier-3 suppliers are the suppliers who supply raw materials like plastic or metal. Obviously, Tier-2 and Tier-3 vendors also play a great role in the overall supply chain system and will have a significant effect on enhancing the customer experience. Applied the same to these, where optimizing their value chain can also result in an overall decrease in turnaround time and provide a seamless experience to the vendors and OEMs that are at the end phase of the value chain.

Now, the further steps of our research will be to study a greater number of cases related to B2B companies' digital initiatives and increase the scope of our research by capturing more aspects of the digitization journey. We agree that with further research in this field, there is a possibility of development or modification for good – at least incrementally

– in the framework or model, we have proposed. In addition, we aim to further develop our model in a harmonizing manner after examining the internal characteristics of the firms that belong to the same category as that of our typology. Internal characteristics may contain elements like different types of aspects within organization (formalization or centralization aspects), type and characteristics of skills held, the degree of digital growth.

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**FACTORS AFFECTING FMCG DISTRIBUTOR ROI”****Anubha Mishra<sup>1</sup>, Gurudas Nulkar<sup>2</sup>**<sup>1,2</sup>Symbiosis Centre for Management and Human Resource Development, SCMHRD,  
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Hinjewadi, Pune, Maharashtra, India<sup>1</sup>anubha\_mishra@scmhrd.edu, <sup>2</sup>gurudas\_nulkar@scmhrd.edu**ABSTRACT**

*To study the various factors that affect distributors in an FMCG market, analyse the impact of these factors on distributor ROI, and to further check how these parameters and their impact can vary across business sizes and pop class. The study started off with secondary research through literature review on papers written on the theme. Once a basic understanding was developed the approach moved to primary research. In-depth and extensive telephonic interviews were conducted with internal (Organisational Sales Teams, Sales Managers and Field Officers) and external stakeholders (Distributors). Further conducted field visits to a distributor point to develop a thorough understanding of Distributor operations on a day-to-day basis. The study charts out the different cost and investment parameters that shape the ROI health of a distributor along with suggested actions for optimisation of the same. On identification of factors affecting Distributor ROI in this study, suitable scalable actions could be suggested and worked upon in order to optimise the business and make the distributor more profitable with the same investment. By developing a thorough understanding of distributor ROI and factors impacting it, it is further investigated as to how these parameters vary across business sizes and population classes.*

**Keywords:** Distributor, FMCG, ROI, Investment, Costs

**Introduction**

Distribution Makes an essential element in the FMCG ecosystem. Creating value will not be enough if it cannot be delivered efficiently.

FMCG sector makes up for India's 4th largest sector, of which personal care and household products take up 50 per cent of the sales. It is predicted that the Indian retail market will be at USD 1.1 trillion by 2020. The advent of modern trade has seen considerable growth and is estimated be at 20- 25 per cent growth rate per annum. FMCG sector is expected to reach at USD 103.7 billion revenue by 2020 with a growth rate of 9-10 per cent [1].

A country as geographically and demographically rich as India, the distribution networks form a complicated structure. Since vast majority of people who consume the goods live away from the manufacturing point, the distribution channel forms a crucial part and become a point of strategic edge to FMCG companies.

Distribution networks in this paper refer to the channel or course that FMCG products travel from manufacturers to consumers. These are pathways for the flow of information, products and money in the system. It is essential to learn what investments a distributor has to make and what are the different factors that impact his

journey/relationship with the industry/company in order to optimise the ROI efficiently.

It is important to understand the distributors are not employed by the FMCG companies. In fact, Distributors are

Channel Partners. In most cases, the relationship between the distributors and the company can be called a transactional one, or a sale-purchase relationship, where the distributor purchases stock from the company and takes charge of the sale of the same at his responsibility. Which means that entire process from hereon is looked after by the Distributor as he runs his business by employing suitable manpower and making use of his resources in terms of godown and vehicle facilities.

[6] Over the decades, FMCG distribution has evolved, even though not much has changed, there is scope for a major wave of disruption to arrive soon. According to a study done by Economic Times, the distribution landscape in India would be completely reimaged and reinvented by 2030. Before we delve into that in detail, let us first look at how the FMCG distribution scenario has come to become what it is today, for it is important to look where we come from and how the journey has been to plan where we want to go and how.

The most traditional, rather skeletal way of defining the channel structure that has been in place since forever can be expressed as follows-

- Companies manufacture products, from the manufacturers the supply goes to regional storage units or warehouses.
- From these warehouses, the products now travel to Distributors through Carrying and Forwarding agents who act as bridges. Every state or company-defined territory has assigned C&F agents who mediate this transaction on a regular basis.
- Every state has hundreds of distributors who facilitate the movement of goods from the godowns to the retailers as per requirement.
- Finally, retailers become the interface or the point where consumers buy products.

This was the FMCG value chain in a nutshell.

[6] Till 1980 there was very little change in this model. However, the next two decades made up the period of tweaks in the model. Organization Sales reps were moved to the Distributor for better oversight, called Distributor Sales Reps (DBSRs). Also, some driving organizations beginning to isolate the sales teams into category teams, still essentially serving the General Trade, to concentrate on every SKU. Further, it was observed that driving FMCG organizations embrace innovation to follow essential deals at both the distributor and branch level.

The dawn of the new millennium observed some bigger changes to the channel structure and organisation. Some of the major changes were - more extensive reception of innovation to capture stock and sales, both primary and secondary, through the execution of Dealer Management Systems (DMS) and Sales Force Automation (SFA), introduction and eventually fast development of Modern Trade (MT) from 2000 onwards, trailed by internet business over the most recent five years, FMCG organizations re-appropriating their Sales Reps to outsiders to decrease intricacy for GT inclusion, while additionally conveying Sales advertisers in-store to connect with end-buyers/customers to improve the shopping experience.

GST introduction in 2018, which just because permitted producers to see India as 'One Market' and adjust their distribution arrangements as

needs be, almost made C&F agents redundant and solidified distributors.

On the demand side, a ton of new retail channels are developing that are upsetting "Where" and "How" customers are shopping. We have seen the development of modern trade in the most recent decade, e-commerce or online retail over the most recent 5 years, and now hyperlocal conveyance models like "Click and Collect", and so forth. As customers move to an "Omni" method of shopping, anticipating that the items should be available "when" and "where" they shop, FMCG organizations should adjust their distribution models to empower this.

On the supply side, factors like changing yearnings of distributors, emerging role of Modern Trade, expanding multifaceted nature of FMCG business because of expanding classifications and aptitudes, expanding rivalry for rack space in GT, the ascent of private names, and the ascent of new distribution "aggregators", are affecting the customary distribution model.

Along these lines, distributor agitation is expanding quickly which could go from 15-30% every year. It is likewise getting tougher to supplant leaving distributors as the distributor network keeps on contracting. This is probably going to majorly affect brands' capacity to increment or even keep up their immediate distribution or coverage.

Furthermore, Salesforce turnover (through all levels, and particularly at the field level) is additionally expanding, and it tends to be as high as 30-40%, yearly. This is because of firm rivalry from new-age systematic e-commerce conveyance, food-tech organizations, cell phone retail, hardware and clothing retail (single and multi-brand outlets), QSRs, adornments chains, MT chains, and so forth. This is making it trying for FMCG organizations to enlist and hold salesmen, squeezing their model and margins.

At long last, expanding channel struggle on valuing, limits, and range between GT, e-commerce and MT is expanding estimating and edge pressure on FMCG organizations as they shuffle their volume growth desire with prices and margins while attempting to manufacture their "Omni" channel approach. While the end buyer might be profiting in this contention

through lower costs, the weight on margins over the value chain keeps on amplifying.

The general retail in India may grow twofold to \$1.5 trillion by 2030 from the present \$700bn, and keeping in mind that it is hard to foresee how huge each retail channel will be, we can anticipate GT's offer in, by and large retail, however still prevailing, to boil down to half (from the present 85- 90%). What's more, huge numbers of GT/Kiranas in Metros

and Level 1 and 2 urban communities are required to move up to look and feel increasingly like MT. MT will proceed to develop and could have a portion of 25-30% by 2030, driven by its venture into Level 1, 2 and 3 urban communities with various arrangements and sizes. E-commerce could without much of a stretch record for 15-20% of all-out retail by 2030 determined by higher digitisation and extending infrastructure.

Two situations are probably going to rise:

Situation one - with the distributor network contracting, and the requirement for scale, innovation, higher margins, speed, alongside a requirement for better-prepared salesforce, numerous brands are probably going to move to bigger distributors who have a multi-state or even national impression. This will move the level of influence among brands and distributors and is probably going to require a vital synergy between them, with more arranged Terms of Exchange, Joint Business Arranging, and so forth, to drive upscaling.

The other situation, which is more probable, will be a distinct advantage. It will require FMCG organizations to surrender the responsibility for distribution model, and band together with different players for the best market coverage among urban and rural markets, concentrating their own endeavours on promoting, marketing and in-store marketing to make top tier customer experience ("retailtainment"). In this situation, they are probably going to band together with aggregators, e-commerce conveyance organizations, rural distribution organizations, and distribution arms of MT to drive inclusion.

Aggregators present a one-stop-answer for GT/Kiranas, by giving the whole bin of items, yet in addition empowering them through deals preparing, innovation, credit terms and

financing alternatives, and even speculation to improve in- store marketing and look and feel of the store. This is probably going to make the everyday existences of the Kirana proprietors a lot more straightforward, as they can concentrate their time on selling, instead of managing many salesmen for orders, payments, new item listings, stock monitoring.

While Modern Trade keeps on being a major retail channel for selling FMCG items, it is additionally developing as a significant contender to FMCG distribution, as most enormous B2B retailers have built up their own deals and distribution systems to sell into General Exchange/Kiranas, Supermarkets, and so on. This is beginning to cause significant channel strife between conventional Distributors and MT distribution arms, and keeping in mind that brands may profit in for now because of expanded deals, the drawn-out effect is required to additionally upset the distribution arrange. Moreover, MT's becoming stronger of conveying to the GT channel is probably going to likewise permit them to sell a greater amount of their private name items through that channel, legitimately contending with set up FMCG marks and making a greater battle for rack space in GT.

Despite the fact that this may appear to be problematic, it is probably going to rise as the most productive model in the coming years, where disaggregation will prompt "abandoning" a huge of the distribution system, and lead to banding together with local and national players to empower the most effective and least 'cost to serve' distribution model for FMCG brands over all channels. This will permit brands to concentrate on making the 'pull' and in-store client/customer involvement with (China, approx. 25% of FMCG business is conveyed by Aggregators) that shoppers will request in 2030, and let the accomplices do the distribution.

With a vast and diverse demography and geographical region, India has a complicated FMCG distribution channel which needs some examination and practical sight to comprehend the fundamentals and intricacies of the system. To cater the needs of 1.3 bn citizens and more overseas, there is a need for efficiency at every step of the FMCG value chain, of which distribution makes an essential component. To



ensure that Distributors manage their business effectively companies must make sure that their channel partners are healthy, as it is going to impact them in more ways than one. The health of a distributor can be quantifiably defined by their Return on Investment (ROI). The purpose of this paper is to study the various factors that impact Distributor health affecting their ROI. It further studies different costs and investment parameters that shape the ROI health of a distributor. On identification of factors affecting Distributor ROI, suitable scalable actions could be suggested in order to optimise the business and make the distributor more profitable with the same investment. The study will also identify if these parameters vary across pop classes and business size and how.

### Literature Review

Customer satisfaction is paramount, even when customers are satisfied, they look for means to be more and understanding this on a fundamental level helps in retention [17]. Results from research has shown a considerable interdependence between customer satisfaction and economic performance. This approach was used by Sadia Samar Ali and Rameshwar Dubey [16] in their research on redefining retailer satisfaction index. This justifies the importance of keeping a check on our channel partners' health as it will imply satisfaction which in turn will help in maintaining retention.

Distribution is defined as series of operations which physically bring goods into the hands of the final consumer from the manufacturer/producer [7]. Calling attention to the importance of distribution, Farris & Olver [9] brought in the concept of "compromised demand" which occurs when the preferred brand is not well distributed, the consumer moves on to the next preferred brand.

Owing to incrementing income with higher aspiration levels, rural market has significantly expanded in India, with an increasing demand for branded products [1]. By estimates, rural FMCG market is set to reach USD 220 billion by 2025. Such an expansion calls for systematic upgrade in the distribution system in rural markets. It is observed [14] that mechanised vehicles played an essential role in

retailer satisfaction when it came to rural delivery mechanisms.

Importance of distributor is further emphasised by comparing Vendor Managed Inventory (VMI) practice against Distributor Managed Inventory (DMI), which facilitates more coordinated flow of information than the three-tier chain of VMI (manufacturer-retailer-consumer) [12]. Saab, Correa and Bowers [12] stressed on the concept of a four-tier chain (manufacturer-distributor-retailer-consumer), referring to distributors as separate entities or channel partners for intermediation, by illustrating quantified examples. The implementation of DMI proved to reach a more strategic

situation as the system became stable and fluctuations at any level in the supply chain got significantly dampened. It allowed considerable reduction in stock and was able to cope up with instantaneous changes in demand. Despite its capacity, FMCG in India faces numerous hurdles with fragmented market and diverse channels. Not only that but continual regulatory changes too affect the structure and poses difficulty in adaptation.[11]

It has been seen that a distributor is frequently powerless on fundamental variables like own venture capacity, inventory space, administrative ability or IT-utilization [15]. This makes the distributor begin coming up short in his fundamental employment of driving stocks into the retail outlets in his general vicinity. He regularly gripes about slackness in the market demand so as to conceal his own weaknesses [7]. There is no such helpful system/model accessible to sales managers leads today for understanding the wellbeing of the distributor. The elements distinguished as driving indicators of distribution disappointment may be percentage mechanised routes, capital leverage and warehouse space.

Ignoring the early indications of bombing wellbeing regularly prompts drowsy developments and a subsequent misfortune in a piece of the overall industry for the organization in the product line or SKU.

It is discovered that there is huge effect on sales affecting distributor ROI, so it very well may be considered as one of the key variables

for organizations to be considered in their business expansion methodologies [15].

On an average there has been a speedy settlement of primary and secondary claims of distributors and there is no much weight on the distributors towards expanding their market credit limit [13]. One of the significant segments of ROI is paid stock and it been discovered that there has been superfluous primary stock charging to distributors which can be improved so as to empower supportable supply chain management as the non-portable stocks are being arranged later as market returns or harms.

Larger part of the distributors is monitoring their ROI consistently. The organizations need to take commencement and normalized designs for return for money invested must be fixed. Normal length must be fixed for the detail accommodation of ROI for distributors so as to keep up standard track [13].

Beat arrangement is one of the best devices towards economical flexibly chain the board. In [13] it's been discovered that there is no attention on beat arrangement and realignment or towards organizing of outlets. This will additionally expand the costs in conveying of items to retail outlets and which will likewise affect the accessibility, perceivability and newness viewpoints.

### Research Methodology

Since the sales data of distributors or any FMCG company is highly confidential, the approach towards the paper is of a qualitative study. The interviews were conducted through the months of April, May and June 2020.

Due to the abruptly changing circumstances the extensive limitations posed by the COVID-19 pandemic, the requisite on-field primary research on learning about Distributor operations had to be made up for through the channels available, that is, virtual or telephonic communication. The selection of external stakeholders (distributors) for the interviews was done using the Snowball Sampling Method keeping in mind that the variations across business sizes and population classes is captured. To further develop an understanding of the FMCG landscape, interviews with internal stakeholders were conducted as well, which included the central Sales Development

Team of major FMCG brands, Zonal, Regional and Area Sales Managers, and Field Officers. The interviews were done one-on-one and followed a specific and well-defined line of questions that led to in-depth discussions.

Apart from telephonic interviews, for the sake of learning, visits were conducted to a nearby distribution point, taking care of all necessary precautions once the lockdown was relaxed. This gave thorough insights about day-to-day distributor operations and the role of every component that contributed to it, including the distributor, godown in charge, loaders, drivers, sales representatives, computer operators etc.

### Research Objectives

The objectives of the study are:

- To study the various factors that affect distributors in an FMCG market.
- To analyse the impact of these factors on distributor ROI.
- To map a distributor journey, from onboarding to sustaining a long-term relationship.

### Fmcg Distribution

(Corporate Finance Institute) Fast-moving consumer goods (FMCG), also called consumer packaged goods (CPG), refer to products that are highly in-demand, sold quickly, and affordable. The term “fast-moving” is used with reference to the fact that these products are quick to sell since buyers use them on a regular basis like packaged food, soft drinks, stationery, cleaning products, less expensive consumer electronics like headphones, and so forth. Some of these products may be perishable like eatables such as meat, fruits, baked goods and vegetables. FMCG sales are impacted by numerous factors like discounts offered, marketing at all levels (especially word-of-mouth) and most importantly, seasonality.

The FMCG channel structure shifts across nations however all channels can be portrayed utilizing straightforward ideas, for example, directness, levels, density, assortment, innovation [6].

Directness suggests the exchanges happening between the makers and clients without the intervention of a mediator. Roundabout distribution happens when the maker utilizes

distribution network to deliver goods to the buyer.

The idea of levels alludes to the quantity of diverts associated with moving the item from the producer to a definitive buyer. In the car division, makers are engaged with establishment vendors who deliver the items to the end purchaser which forms a one-level channel. In the FMCG business, producers regularly offer the merchandise to wholesalers, who offer it to the retailers, who thusly offer it to the shoppers making up a two-level channel.

Density is about the number of outlets accessible inside a specific territory. Contingent upon the number of outlets, a distribution channel is considered as selective or intensive. The sale of cars has lesser outlets in a city and is viewed as selective, while for cleansers with several outlets is considered intensive.

Assortment implies the different sort of outlet an item is sold at. Bread distribution may display higher assortment since they are sold at different outlets including paan shops, superstores, mom and pop stores and even online and so forth. While the distribution of high-end clothing may show low assortments since they are sold uniquely at specific stores.

Innovation alludes to the new channels used by manufacturers to circulate their item.

Intensive arranging, compelling perspective, exertion and speculation is required to set up a distribution channel. Distributor margin and the cost incurred in dealing with the channels form a considerable piece of by and large marketing cost.

Indeed, even from an open point of view, setting up a distribution channel opens new doors for labour employment and furthermore helps in making FMCG items accessible to individuals with a wide social and economic spectrum.

From a competitive perspective, having a robust distribution network gives manufacturing companies an edge over their competitors. Therefore, channel management and distribution form an important element in a company's business strategy. In India, most manufacturing organizations face the issue of structuring, developing and viably dealing with the distribution channel.

The structure of the distribution network in India is traditional and one of a kind. The significant parts in the channel incorporate – retail, wholesale and logistics infrastructure. The shopper significantly interfaces with retail outlets, where India has over 9 million outlets in the distribution channel, incorporating markets, general stores, superstores and so on. India has just 8% of the organised retail penetration. Customary retail in India offers shoppers various preferences like accommodation, home conveyance, credit, and customized service. Then again, present-day retail offers intermittent special offers, lower costs, more extensive variety, a superior vibe, and greater brands.

The explanation behind such boundless presence of the conventional market is because of the accessibility of lower rentals, modest labour cost, credit from providers, fewer duty obligations and a lawful structure which forestalled the Foreign Direct Investment (FDI) as of not long ago.

### A. Manufacturer to Consumer: Value Chain

The following diagram gives a skeletal representation and summary of the FMCG Value chain through urban distribution.



**Fig 2: FMCG Value Chain (Source:Primary Research)**

- a) The product gets manufactured at the Manufacturer. This can be considered as a starting point. Some FMCG companies have their own end-to-end manufacturing set up, while in some cases certain parts or rather steps of the process are outsourced.
- b) From the manufacturing plants, the products are transported to Regional Warehouses. Every state, or any other company defined territory/region, will have a warehouse which will store the stock that is to be delivered to the distributors in the region.
- c) The delivery of goods to distributors from warehouses is looked after by designated

Carrying and Forwarding Agents. The C&F agents act as the bridge between the company and channel partner to facilitate primary sales. They also help with addressing the return of damaged or defective items back to the warehouse from the distributor whenever necessary.

d) Every region will have hundreds of distributors that will facilitate the movement of products to the consumer via outlets. They receive stock from the regional warehouses through the C&F agents on a regular basis.

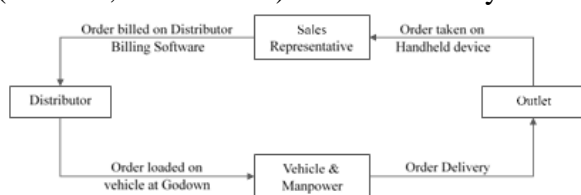
e) Once the stock has arrived at the distributor point (or godown), it is then the responsibility of distributor to make sales happen. From the distributor, the stock gets delivered to the outlets that come under their territory on a regular (mostly weekly) order basis. Finally, the consumer can buy the products from these outlets, completing the chain.

In reality, the value chain is a lot more networked and complicated than a simple linear model as expressed in Fig. 1. For the sake of simplicity of the study, the skeleton version has been taken as a reference.



**Fig. 3: C&F Agent to Outlet Chain (Source: Primary Research)**

- Primary Sale – The sale of stock from the warehouse to the distributor through the C&F agent, or to put it simply, the purchase of stock by the distributor is referred to as primary sale.
- Secondary Sale – The sale of stock to the outlets (retail or wholesale) from the distributor to be further made available to the consumer is called secondary sale.
- Tertiary Sale – The final purchase of products by the end consumer from the outlets (retailers, wholesalers) is called tertiary sale.



**Fig. 1: Distributor day-to-day operations (Source: Primary Research)**

## B. Distributor Operation

The day-to-day distributor operations can be charted out as shown in the fig. 3.

Every day sales representatives visit the outlets charted out in defined routes for them. These defined routes are known as “beats” in FMCG terms which are designed with the help of the field officer when the distributor is being onboarded. Most companies provide a handheld device to the sales rep on which the order can be taken at the outlets. This simplifies the order taking process and gives a better command on Sales Rep management and track outlet wise sale in a very detailed manner. Some companies even facilitate incentives/rewards based on the efficiency of the device usage.

Once the sales reps are done with their beats, they return to the distributor point to sync the orders with the Billing Software. The interface is developed and implemented by the company, sometimes with the help of a third-party developer, and is operated by the designated computer operator at the distributor point.

Once the order is billed on the software, outlet wise invoices and loading sheets are generated with reference to which the ordered stock is loaded on the delivery vehicle at the godown and delivered by a driver with the help of loaders. The entire godown management is usually looked after by a godown in charge or manager.

## Distributor Roi

By definition, Return on Investment (ROI) is a performance measure used to evaluate the efficiency of an investment. ROI tries to directly measure the amount of return on a particular investment, relative to the investment’s cost [4].

Distributor ROI is usually targeted at 18%, denoting healthy ROI, taking a reference from investing the same amount used for business in a Fixed deposit in a bank which would give an interest rate of 6-8%. The 18% ROI value makes Distribution a reasonable choice for business investment against FD.

**A. Calculation for ROI**

By the simple definition of Return on Investment (ROI), it is the ratio of Earning and Investment to give a mathematical judgement of whether one has a profitable business or not. Distributor ROI gets calculated as follows:

$$ROI = \frac{\text{Distributor Earning (or Profit)}}{\text{Avg Investment}} \tag{1}$$

$$\text{Distributor Earning} = \text{Distributor Income} - \text{Cost Incurred} \tag{2}$$

On an average, FMCG companies give approximately 5% mark-up margin to distributors. The 5% then becomes the Distributor Income every month.

To run the business, a distributor has to bear a number of expenditures including Manpower Salary vehicle cost, etc. The total cost of running the business is borne by the distributor out of the income he makes every month from the 5% margin. Suppose, the total cost becomes x% of total monthly sale. That would lead to Distributor Earning being (5-x)%.

**B. Factors affecting distributor ROI**

As discussed above, the calculation for ROI is done as follows-

$$ROI = (\text{Distributor Earning (or Profit)} \div (\text{Avg Investment})) \tag{3}$$

$$\text{Distributor Earning} = \text{Distributor Income} - \text{Cost Incurred} \tag{4}$$

We can see from the equation that ROI depends directly on distributor earning and inversely on the average distributor investment. Broadly, we can say that these parameters play a major role in impacting the ROI of the distributor. The variations can be summarised as shown below-

**TABLE I. DEPENDENCE OF ROI ON PARAMETERS**

Parameter	Parameter Change	ROI
Average Investment	Increases	Decreases
Distributor Earning	Increases	Increases
Distributor Income	Increases	Increases
Distributor Costs	Increases	Decreases

From the above table we can summarise as to how broadly the costs and investment impact the ROI. This analysis, by itself, is not enough. In order to understand the aspects of

Distributor ROI, we need to delve further into these parameters and check at a micro level as to what are the building blocks that come into play. We will be taking each parameter one-by-one into a detailed discussion.

**1) Investment of a Distributor**

Investing is putting money to work to start or expand a project - or to purchase an asset or interest - where those funds are then put to work, with the goal to income and increased value over time [3]. The term "investment" can refer to any mechanism used for generating future income. In other words, investment can be defined as the cost that once incurred gives a return in due period of time.

The investment for a distributor can be defined in terms of business days, which is under the three main components – stock holding, credit days and claims pending [13]. The average investment constitutes approximately 25-30 days of designated area sales and the split can be described as follows-

- Average stock holding or inventory – approximately 10 days
- Credit Days – 9-10 days
- Claims Pending – 1-2 days

stock holding is of 10 days for a distributor, then it will be a ten-day stock cycle, on the eleventh day stock will get replenished and distributed in the next ten days.

Credit days, here, refers to the average market credit given to the retailers.

Claims are the pending claims from different schemes, incentive programs or damage claims to be settled with the distributor by the company.

**2) Distributor Income**

As defined in equation (2),  
 Distributor Earning = Distributor Income - Cost Incurred

We can see from the equation that the distributor earning or profit is defined by the distributor income and the costs incurred.

As discussed in the previous sections, most FMCG companies give approximately 5% mark-up margin (the figure varies from company to company) to distributors which becomes their income every month. The distributor margin is a sacrosanct figure that is

subject to change only according to the company's requirement, and is a rare event. Therefore, we can safely conclude that for the purpose of this study and ease of understanding, we have kept the figure constant at 5% for exemplified explanations.

If we take into consideration that one could increase distributor income, it can only be possible by increasing the sales since the margin is fixed.

The sales of a distributor can be increased in two ways:

- Pushing more sales at retailer level.
- Take up more outlets under their territory.

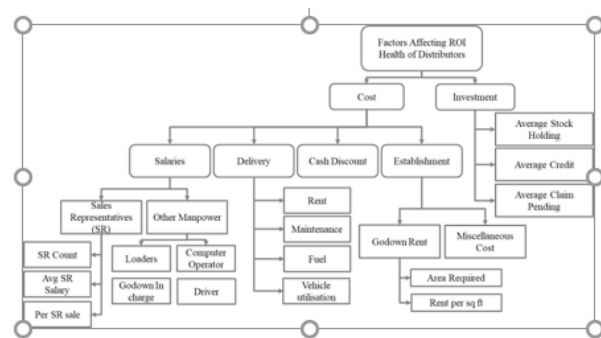
To push more sales at outlet level, the distributor and field officer have to train the Sales Rep as to how to go about it. Although, this method will not lead to a steep increment in the distributor sales.

However, if the distributor adds more outlets under his territory, it may show a more significant rise in the monthly sales. If the distributor adds considerable number of outlets under his purview, it could mean that he needs to employ another sales rep to cater the risen need, which will incur additional salary cost on the distributor. Not only that, but this will also see costs incurred by vehicle rent and additional godown space.

### 3) Distributor Costs

To run the business, a distributor has to bear a number of expenditures. The total cost of running the business is borne by the distributor out of the income he makes through the fixed margin. Following are some of the major costs incurred in distributor operation:

- i. Sales Rep Salary
- ii. Cash Discounts
- iii. Vehicle Cost (Rent, fuel, maintenance)
- iv. Godown Rent
- v. Other manpower required
  - o Computer operator
  - o Godown in charge
  - o Loaders
  - o Driver



**Fig. 4: Factors Affecting ROI Health of Distributors (Source: Primary Research)**

#### a) Salaries

Since the distributor employs the sales representative and other manpower (loaders, godown keeper, managers, computer operator and driver), their salaries have to be managed by him. The amount of wage paid to them depends on the amount of work that the distributor gets out of them which can be judged by the number of hours devoted or the value of sales handled by them (for sales reps). For the same amount of work, the value of salary changes from city to city. This is because of a factor called "cost of living" [8]. The cost of living is the amount of money needed to sustain a certain standard of living by affording basic expenses such as housing, food, taxes, and healthcare [2]. Because of this, a sales representative may be paid higher in a metro city compared to a small town.

#### b) Cash Discounts

In a cash discount, the distributor usually reduces the amount that the outlet owner has to pay for the goods supplied. This is an option that is used in case of distributor supplying to wholesalers since the size of order is much larger. The value of discount is set which can be either by a small percentage or fixed amount.

#### c) Vehicle Cost

To provide the products to the outlets based on the orders taken by the sales representatives. The delivery vehicle may be owned by the distributor (which was the case for large distributors), then the costs incurred will be for maintenance and fuel. If the delivery vehicle is rented, then usually just rent per day is the cost accounted for. It may be observed that owned vehicle incurred much less expenses than rented vehicle. However, for conclusive proof,

thorough quantitative research is required in this area.

#### d) Godown Rent and Miscellaneous Costs

Godown rent is simply the rent paid for the area used by the distributor which includes the godown space for stock keeping as well as office and walking area. The area required by the distributor depends purely on the size of business and the type of products the distributor deals with (large food cans will take up a lot more space than smaller soap bars). But rent per square feet depends on the area where the distributor point is located.

Additionally, distributor operation at the point incurs some miscellaneous costs which includes refreshments for the manpower, stationery, internet charges, fees for CA etc. It again depends on the size of distributor's business.

Following is a table summarising which parameters affecting Distributor ROI vary as per business size, population class or both.

**TABLE II. Dependence Costs On Business Size And Pop Class**

<i>Costs</i>	<i>Business Size</i>	<i>Pop Class</i>
Salaries		Yes
Cash Discounts	Yes	
Vehicle Cost	Yes	
Godown Rent	Yes	Yes
Miscellaneous Cost	Yes	

#### Observations And Conclusion

From the research, we can conclude that the major factors impacting Distributor ROI are Distributor Investments (Stock holding, Credit and Claims pending) and Costs (Salaries, Vehicle and Godown Rent and Miscellaneous). Thorough analysis of these factors will give internal stakeholders as to how to address attrition rate of distributors by providing subsidies or incentives. The analysis can help

in keeping track of the ROI health of the channel partners and be able to pre-empt issues so that the managers can address any expected contingencies.

From the study, various parameters impacting the FMCG Distributor Health have been outlined and addressed in detail. It was seen that all these factors are interdependent and addressing one could mean addressing all of them in balance. While some of the parameters like vehicle cost and miscellaneous cost depended mainly on the business size of the distributor, the salaries of sales representatives and other manpower depended on the cities the distributor was based in. For metros the salaries would be higher than in Tier 2 cities. This is due to many forces at play which can be summarised by the concept of Cost of Living. It was also observed that godown rent depended on both business size as it will determine the godown area required, and population class it will determine the rates of rent available.

The in-depth study of Distributor ROI health can help in evaluating which distributors who are channel partners to the company are at a risk of leaving. It can be check for internal stakeholders to address distributor attrition.

#### Limitations And Recommendations

Following are the limitations of this study:

Since the study being qualitative in nature, the major limitation faced was the lack of quantitative analysis to chart out the values for healthy and unhealthy ROI and weigh them against ideal values. This could help judge the health of

distributor in a scorecard manner which will be much easier to make sense of.

Lacks further requisite speculation for cost of living based parameters to make finer judgement of ideal salary values by pop class which will help in addressing salary cost based issues with Distributor ROI.

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## AN ANALYSIS ON THE IMPACT OF PANDEMIC ON CONSUMPTION PATTERN OF HYGIENE RELATED PRODUCTS

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### ABSTRACT

*The objective of this paper is to study the change in consumption pattern of the hygiene related products during a pandemic. The study analysis the shift in consumer's requirement prior pandemic from the medical stores and Provisional stores (grocery stores) in terms of hygiene related products to the consumer's requirements post pandemic in the same product segment (hygiene related products). The study draws samples from the population of medical stores and provisional stores and from the consumers purchasing from these stores prior the breakout of the pandemic and after the breakout. The t-test methodology would be used to analyse the results. The consumption forecasting is be done using model based on updated sales. This paper would attempt to predict the future consumption pattern of the hygiene related products which could help FMCG companies foraying in this segment to gain more market share and become market leader. Also, paper would attempt newer ways to reach to market through various RTM (Route to market) strategies for better penetration. The study would eventually help in preparing companies for situation like these without affecting their business.*

**Keywords:** RTM, FMCG, Essential Goods

### Introduction

In the late December 2019, an outbreak of unknown virus infection took place in Wuhan, a place in mainland China, later spreading throughout the world in a span of a month. CCDC researched on the infection microorganism and labelled it as novel beta-Coronavirus or 2019-nCoV. There have been two more zoonotic breakout in 21st century earlier as well bringing global health issues. This viral infection has been declared a pandemic- It is an outbreak of a disease throughout the world.

As per WHO, COVID-19 is one of virus-based disease and spread is mostly through human to human contact. The infection is observed in the form of respiratory problems ranging from cold to serious issues. It is more lethal for people having any earlier underlying problems like cardiovascular issues, diabetes, chronic respiratory issues and cancer. The recovery capacity is minimum for people over 60 and children below 5. The COVID-19 infection spread through saliva or discharge from the nose when an infected person cough or sneeze.

In this paper, we would focus on understanding that how events like these which disrupts the supply as well as demand side of products will have an impact on personal

hygiene products. Now, what is Consumer behaviour? - Consumer behaviour is the study of individual, group or an institution concerning certain activity under a different scenario. It studies the use of numerous goods and services at disposal, purchase decision pattern concerning emotional, mental and behavioural responses. So, we can say that Consumer behaviour is the blend of psychology, sociology, marketing, economics particularly behavioural economics, anthropology, ethnography. The consumer behaviour is mostly connected with buying behaviour- from pre-purchase event to post purchase-including consumption, disposal and feedback. It considers all human which are directly or indirectly related to products buying decision. Understanding purchase and utilisation behaviour is a key task for a marketer as it helps in deciding which products would be in demand at what time in what quantity. The consumer behaviour depends upon a lot of factors and examining and finding proper gaps in existing offerings, can only help a company nurture and grab a significant market share by innovating new products or revamping existing product lines. Based on customer behaviour, an organisation can look for various methods of reaching to customers

via various channels like General Trade, Modern Trade, E-commerce, etc.

As COVID-19 began spreading across the globe, business started shutting down as central governments went onto imposing complete lockdown except emergency situations or purchase of essential goods. This is by far one of the most severe ever taken by various authorities and thereby taking a huge toll on almost all big economies across globe. With the lockdown imposed, employers started laying offs or went on salary cut as sustenance of organization became tough by each day. The buying pattern saw a steep shift from traditional store purchase to preference moving to e-commerce. With the immense growth in 4G smartphone penetration among different Indian strata and increasing earnings, e-commerce was expected to reach the mark of 200 billion dollar by 2026. That estimate could now be achieved in far less time, mostly due to a behavioural change due to COVID-19.

From a cultural lens, our values differ in two dimensions-Individual centric and collective-centric. Individual-centric aims for freedom and personal achievement whereas collective-centric focuses on group goals and lays importance to society. These different cultural fits are found in different parts of the world. The western part of globe is more individual-centric whereas eastern part is more collective-centric but this crisis has created moments which has paved ways for social solidarity. The pandemic has changed the chorus from "I" to "We" and this shift could also become into a permanent effect as world moves out of pandemic. For businesses facing existential crisis today should start to relook for positioning their product for a world after COVID-19 based on the analysis though no one knows the future or predict what the new consumer would triumph, one can only analyse history and try to incorporate all possibilities.

### **Literature Review:**

We live in an era of technology. 2020 has revolutionised human lives completely. Everything around us is literally driven by data. All the key decisions are not on the basis of intuition rather backed up by data. Earlier in times when technology was not so prominent, collecting data for effective analysis was much

harder than today. The different geographical locations remained secluded and even information transfer took days. So, capturing details of any disease or issues was not precise and data collection at the deepest level was rather hard-hitting. But now, in today's world it is possible. Now, even though people are under lockdown (restricted in their homes), collecting data through online portals on internet, sales data from grocery stores, hypermarket, etc is possible and reliable. So, a structured analysis and prediction in the consumer sentiment is possible. Using descriptive statistical modelling one can analyse previous trend in purchase, sell and other decision made by the consumer and with the help of predictive analytics one can predict possible future behaviour based on previous response for a given situation.

With the Coronavirus pandemic has hit all human lives across the globe, it has affected lifestyle, purchase behaviour, priorities of different goods and services one avail at a regular level. With the uncertainty oozing all around, people have become thoughtful about what to buy, when to buy, how much to buy. As per a report by Nielson, in the initial phase of virus spread, consumer behaviour had shifted to health and hygiene items like gloves, sanitizers, mask, etc. As the disease spread, there was a pattern of bulk-buying, i.e. storing goods which have shelf life in huge quantities, more than one could use under a normal circumstance, store visits shot up along with basket size. The quarantine stage where a surge in supply chain and e-commerce was observed. Consumers are living in unprecedented times. Their behaviour is ought to change on a massive scale. Social Distancing, work from home has led to immense growth of virtual social togetherness through social media, meeting apps, online news. Consumer spending on discretionary products such as movies, restaurant visits, luxury goods and services and travel has come to complete standstill and postponed effects will be realised in apparel, home décor, grooming industry even after a long time after crisis subsides. The imperative for consumers is health and hygiene, healthy and natural vegetables, ghee, rice, pulses, personal hygiene products, hand sanitizers, etc. which have seen a tremendous growth in terms

of demand. Also, the brands now cannot use traditional methods of reaching consumers, they must look for exploring other channels of distribution in order to have better penetration of products so a consumer does not have to go far to buy products amid lockdown and restrictions across the country. According to a report by Accenture, around 64% people are fearful for their own health, 82% of the people are worried about health of people in their surroundings, 64 % are worried for job security while 88% people are also worried about extreme effects on economy. Their analysis also suggests pattern in the eating habits from junk or frozen food or packaged food to fresh food, fresh fruits and vegetables. There was also a key understanding from the report that around 30% people who were part of survey would like to continue full time from home rather than going to office. Since the majority of the population is working from home so a leisure time is now possible. This is a new behaviour that is rekindling in the society, more and more time is spent with family due to lock down which enhances bonding among family members. Also, due to surge in demand for hygiene product during the bulk or panic buying mode a lot of new companies entered into sanitization business as they had to shut down existing business due to lockdown. A lot of automobile companies entered into ventilator manufacturing in order to meet demand supply gap and also to keep their revenue stream flowing.

Given the context, it is important by what factor the health and hygiene industry has grown and will this consumption pattern sustain and has the potential to grow even after pandemic lessens or if consumer will move back to pre-pandemic behaviour. Hence, this research focuses on the problem statement "An analysis on the impact of pandemic (COVID-19) on consumption pattern of hygiene related products".

#### **Scope of Study:**

The Study is focused on analysing the consumption and awareness of consumer towards health and hygiene products amid COVID-19. Primary data source is retrieved by connecting to people on google forms. Most of the respondent are end consumer of products and belong to close relation with author. If

considered geographically, most of the respondent belong to northern and wester part of the country.

#### **Research Objective:**

In view of COVID-19, following is key objective:

- 1) Estimate awareness level among people.
- 2) Understand the consumption level in current times
- 3) Analyse if this change in consumption will persist even after pandemic.

#### **Research Methodology:**

The analysis would be descriptive in nature. The random sampling method was adopted and primary data was collected by interacting with people who have come out to buy essentials for their family in the market. The data collection happened in the month of June in second and third week of June 2020. It is a phase where Unlocking of Market happened in a gradual way. A structured non- disguised question set was prepared and then author spoke to people in the market in a random manner to collect data and fill in it google form parallelly. The author spoke to around 100 people over the course of 15 days in order to understand consumer behaviour changes taking place. Along with it, the google form was also circulated to social media to capture the response from urban crowds as well, also to have proper randomness in data to remove biases as much as possible. From among the respondents, a majority of them belong to Bundelkhand region of Uttar Pradesh.

The questionnaire contained details on pre-COVID priority, current priority and current safety measures they are taking and if they are going to continue with their hygiene behaviour once the pandemic lessens. It also emphasizes on techniques of safety one is using during COVID phase. The questions were of the binary form, which speaks whether a consumer is inclined towards a service or products completely or not. The responses also seek any future changes in terms safety if provided, will a consumer might want to buy for his safety. Further, the responses were converted into numeric form for further statistical analysis.

The software used for the data analysis was SPSS. The recorded responses were analysed

using t-test, paired t-test technique and one-way ANOVA.

**Data Analysis and Findings:**

The questionnaire had 31 questions to analyse and understand consumer sentiment changes if any due to effect of pandemic. Each question tries to understand impact on the result. When sample is analysed following is observed:

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Female	19	18.1	18.1	18.1
Male	86	81.9	81.9	100.0
Total	105	100.0	100.0	

Table 1

The table above (Table 1) gives the demographic and population segmentation of the sample data. The data size 105 which are perfectly random in terms of selection and around 86 (82%) male constitute the data. 19 females form 18.1% of dataset.

The age wise division (Table 2) of the sample clearly shows most of the people are below 40 and are more in the earning phase or about to start a job in a year. The convenience sampling method is core reason of age group being very concentrated but it is coincidentally equally distributed among the people in job age group. 52 respondents belong to 25 years or less and who are more likely to enter workforce in a year or two. 52 respondents belong to age group of 26-40 (49.5%) who are actually earning and understand to manage finance in their lives.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Handwash	40	38.1	38.1	38.1
Sanitizer	8	7.6	7.6	45.7
Soap	1	1.0	1.0	46.7
Combination	56	53.3	53.3	100.0
Total	105	100.0	100.0	

Table 3

Table 3, shows which sanitization techniques masses are opting for as to keep themselves safe from the contamination. Around 53.3% people have opted for combination of sanitization technique, which is followed by handwash, sanitizer and then soap. One key understanding from it, people are avoiding soap as cleaning agent because of the contact issues.

Expense analysis and its relations with expense on health and hygiene:

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 25 or less	52	49.5	49.5	49.5
26-40	52	49.5	49.5	99.0
41-60	1	1.0	1.0	100.0
Total	105	100.0	100.0	

	Sum of Squares	df	Mean Square	F	Sig.	95% Confidence Interval of the Difference	
						Lower	Upper
expense_last_2_months	22.534	400	2.824	100	.492	-.258	1.451
expense_last_2_months	1.793	11837	.150	256	.615	-.058	.674

Table 4

The table 4 above shows the result of relation between the variable higher expense during COVID-19 and cleaning or sanitizing habits on a regular basis. The null hypothesis stated, there is no significant relation with the increased expense and cleaning by an individual and alternate hypothesis being vice versa. The analysis clearly indicates significance value is less than 0.05, which clearly states we fail to reject the Null hypothesis. So, it is clear just the increasing in sanitizing is one of the reasons for higher expenses during last two months (May, June 2020).

To understand the consumption pattern, analysis of each sanitizing agent is studied:

Sanitizer Uses Chart:

Handwash Uses Chart:

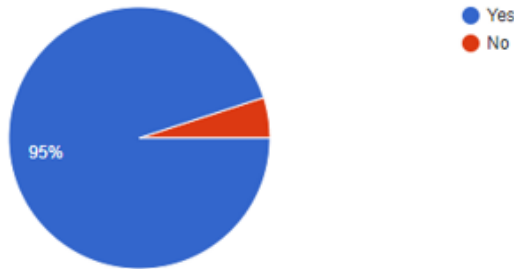


Chart 1

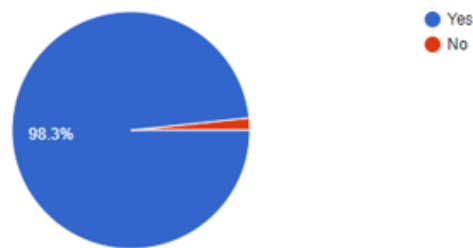


Chart 2

Soap Uses Chart:

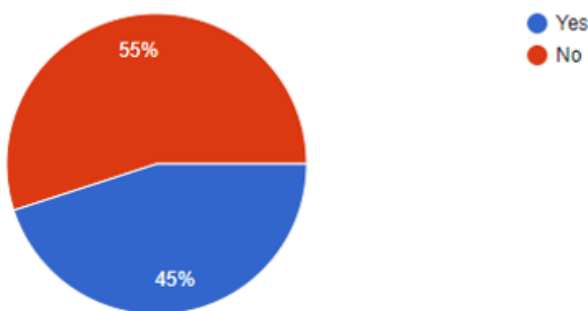


Chart 3

The above charts (Chart 1, Chart 2 and Chart 3) shows the trend of uses of handwash, sanitizer and soap. The uses for the soap have gone down but the uses of sanitizer have grown much more than decline which supports the increased expense in last 2 months i.e. May, June 2020. One key trait to understand in terms

of consumer behaviour is masses are moving towards sanitizing product which can be used contactless or could be portable which increases convenience of uses of product.

Understanding Consumer behaviour in terms of point of purchase:

The upsurge of COVID has restricted people in their homes. Earlier, people went for shopping groceries either from supermarket or nearby grocery stores. People also had convenience of purchasing things online through various grocery selling stores like amazon pantry, Flipkart, Grofers, Big Basket, etc. To understand the impact of purchase point behaviour a variable(pre-Covid) stored data of purchase point pre-Covid , a second variable (during Covid) stored data for purchase point during the crisis and third variable ( post-covid) stored data of consumer understanding and thought process about how would they prefer to buy their grocery ahead in time. There were 3 options given in each question i.e. E-commerce, Nearby grocery store/ Supermarket and Combination of both. One-way Anova was used to understand the pattern.

Test of Homogeneity of Variances

	Levene Statistic	df1	df2	Sig.
during_buying	.267	2	98	.766
post_buying	9.459	2	98	.000

Pre-Covid purchase behaviour was taken as an independent variable and rest two as dependent variable. When compares in terms of homogeneity one can say that there is no statistical difference in the means of pre and during COVID purchase behaviour but when pre and post buying behaviour is analysed, one can clearly say there is statistical difference between means in pre and post dataset.

		Sum of Squares	Df	Mean Square	F	Sig.
during_buying	Between Groups	8.196	2	4.098	15.078	.000
	Within Groups	26.635	98	.272		
	Total	34.832	100			
post_buying	Between Groups	8.404	2	4.202	9.059	.000
	Within Groups	45.457	98	.464		
	Total	53.861	100			

a dependent variable while clothes wash is an independent variable. Independent t-test is run using these two variables to understand the relationship between them. The response from people were segregated into 3 part i.e. Yes, No and Maybe. For analysis, cut-off for the grouping variable was taken as  $\geq 2$ , i.e. clubbing No and Maybe into one group and Yes into one. The following is the result of the analysis:

		Independent Samples Test							
		Levene's Test for Equality of Variances				t-Test for Equality of Means			
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
							Lower	Upper	
expense_1.0	Equal variances assumed	8.519	.007	1.274	98	.021	.452	-.190	1.14
	Equal variances not assumed			1.231	92.555	.021	.452	-.148	1.05

Moving on, Anova table is examined and following deductions can be made:

- When behaviour between pre and during COVID behaviour is observed a lot of consumer have shifted to different forms of purchase as compared to previous one. We have failed reject null hypothesis which clearly shows a stark shift in consumer behaviour.
- When behaviour or expected behaviour of consumers are observed with respect to pre COVID, again a shift in the pattern is observed. More and more consumers would shift to different form of purchase point even after pandemic subsides.

The understanding in terms of purchase point if we see, more and more people have opted for e-commerce as a source of grocery purchase because of the social distancing norms and also if order to safeguard themselves from infection by going to nearby store. This sharp surge in grocery supply could help e-commerce grow at a speed faster than expect on a permanent basis.

Understanding expense relationship on washing of clothes and predicting consumer sentiment for upcoming time:

To understand a specific behaviour pattern i.e. if the expense on detergent has gone up after lockdown has eased, two variables were used. First variable being if the people wash their clothes(clothes\_wash) as soon as they come back home or they reuse them before a wash. The second variable in the queue is expense on detergent(expense\_1.0) i.e. if the uses of detergent has gone up for them. The expense is

The Levene's test clearly shows the significance level of 2.7% which is below 5% mark, which states the null hypothesis to be rejected i.e. we can clearly say that there is no statistical difference between the means of two groups. Further, when significance level of equal variance not assumed is studied it is 0.001 i.e. 0.1% which is again below 0.05 which means that again we reject the null hypothesis (There is no statistical difference between expense on detergent and clothes being washed after every market visit). So, there is statistical difference in expense on detergent and clothes being washed after every visit. To have further understanding, Correlation between these two variables were studied.

Correlations			clothes_wash	expense_1.0
			1	0
clothes_wash	Pearson Correlation		1	.267**
	Sig. (2-tailed)			.007
	N		101	101
expense_1.0	Pearson Correlation		.267**	1
	Sig. (2-tailed)		.007	
	N		101	101

\*\* Correlation is significant at the 0.01 level (2-tailed).

The correlation table clearly states that two variables have weak correlation between them. So, to conclude, it can be said there is difference in the expense after unlock on detergents usage.

Understanding the impact of new Product line which is anti-viral:

With the virus hitting people across the globe, the apparel industry has to revamp its offerings to people. People are becoming more oriented towards clothes which are anti-bacterial and anti-viral. So, to understand the if people really looking for such offering and the price, they are willing to pay for its questionnaire had four questions and following results were obtained:

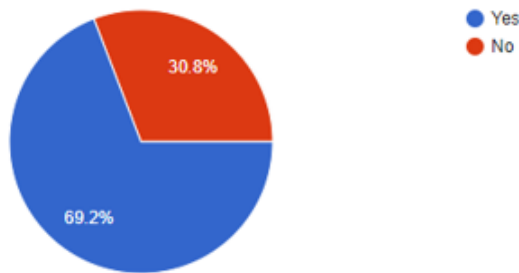


Chart 4

The chart- 4 shows the people who are interested in buying clothes which are antiviral in nature. The apparel companies can take this as an **opportunity** and bring out products which have anti-viral coating in it. The consumer sentiment can also be understood with the price point are willing to pay for the product.

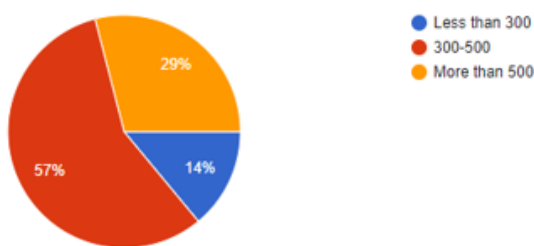


Chart 5

The Chart 5 shows the price point a consumer a willing to pay. Around 57% consumer want a product in mid-range product which provides them with the intended security. 29% people are more concerned and they would pay even in the higher amount bracket to keep themselves safe. Only 14% of the people are looking for an apparel which is below 300 rupees. So, this is one of the new consumer aspect one can look into post pandemic as

more and more consumers are looking into these kind of clothing lines.

The home sanitization is also a new behaviour that has come into light due to this COVID. So, how effective a spray sanitizing product would be also to look for. The following analysis presents the potential of this product range for FMCG companies which are into it.

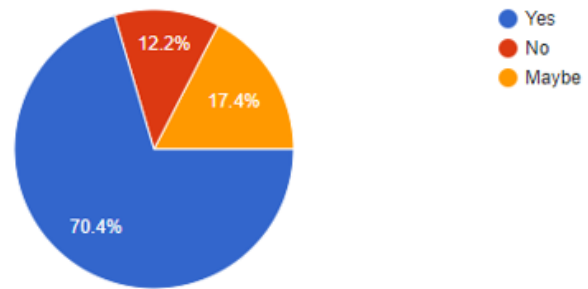


Chart 6

The Chart 6 shows the interest of people for a spray to disinfect their cloths and make their clothes anti-viral. Around 70% of the consumers are willing to buy a product of this attribute which they could use to sanitize their furniture, doors, mattress etc. Now, this creates an opportunity for the companies to create a product which could be used for sanitizing everything at our place. Thus, working on such a product gaps could be a possible way companies must look for and try come out as a leader. The price a customer is willing to pay also help in deciding if it is viable for the company. The analysis shows what is customer expectation with respect to price point for a consumer.

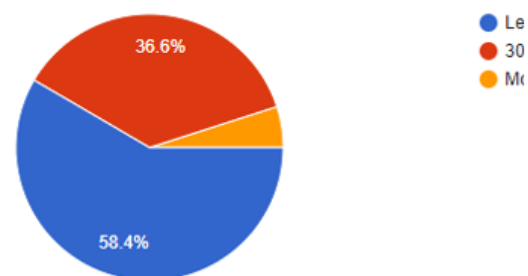


Chart 7

So, majority of people i.e. 59% are willing to pay less than 300 for a spray which can disinfect their home while 37% are comfortable in paying out more than 300 but lesser than 500. Only a little around 7% people are comfortable to pay more than 500. This consumer behaviour could be incorporated while offering a product line.

**Health Insurance Analysis:**

According to report published by EY, around 20% of Indians have Health insurance. The analysis done in the survey shows that people are becoming more health oriented and trying to take up newer health insurance as to keep their family safe and protected from any additional financial burden due to COVID-19.

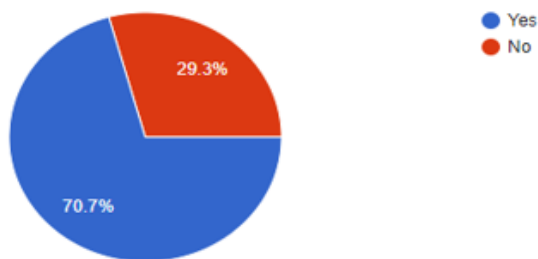


Chart 8

The graph (Chart 8) above shows that 70.7% percent of the people have health insurance plan for their family and themselves. This number is rising as the awareness is increasing. As an individual one tries to ensure well-being of family and health insurance is one of them. Only around 30% of the sample does not have health insurance. When we see the rise in Health insurance during COVID 19, it has shown tremendous growth of 20% as stated by The Hindu. So, the clear indication from it there has been an increase in spending in healthcare insurance division.

**Analysis of Consumer behaviour Post Covid and its impact on different hygiene sector:**

The consumer responses were recorded to understand if any segment of health and hygiene where they are looking to prune out expenses as the COVID passes and things

comes to normal as it is imperative for one to shift to different sector as priority shifts. Following results were obtained:

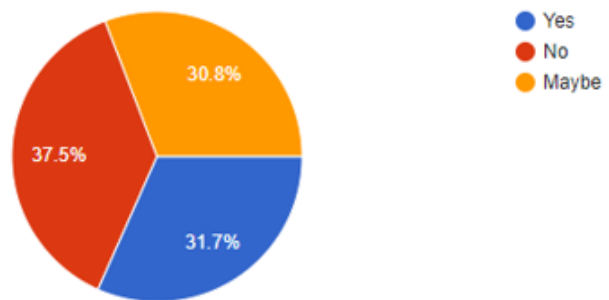


Chart 9

The result was mixed. Consumers were unsure of if the expenses are going to come down. About 31.7% were certain of reduction in expenses as the pandemic subsides. 37.5% people were of the view that these new things have become part of their life and it will continue to form a portion of their budget permanently. 30.8% people are not sure if they would continue to spend at par with current budget plan they have.

The further analysis reveals if they feel which sector the pruning would happen would be-

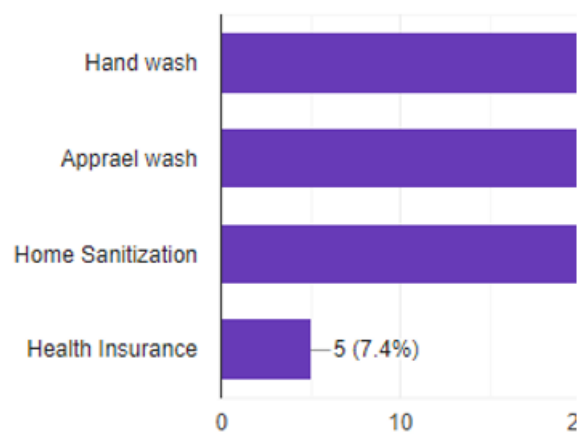


Chart 10

Of the people who said yes, around 41% of people are of the view that handwash usage would come down, 47.1% people are of the view apprael washes expense would come down, 66.2% of the consumer believe their hand sanitization usages would come down and



just 7.4% people believe they would shift to lower plans in Health insurance.

### **Discussions:**

The COVID-19 has impacted some sectors of business heavily whereas some sections are mildly affected. The changes happening the society, around all of us will change the way how existing models were working. The businesses have to rethink their strategies, so it does not affect their top and bottom line while maintaining the social distancing norm. With the fear of spread of virus, people are reluctant to go to far market and hence companies might have to rejig their distribution channels to reach to interiors throughout the country. FMCG companies have been looking for newer RTM models so as to deliver their product at the least transport cost along with optimisation of number of partners involved. This model of business will substitute the wholesalers in the General Trade. Companies are tying up with different e-commerce players which work on the hub and spoke model and through franchise-based model sell products of multiple companies to deepest part of the country. They transport the product from hub to smaller hubs and to the retailers. Transport is also done on the sharing basis rather than owning the whole fleet, thereby lowering the cost. This way of distribution network is upcoming and would be followed by the company down the time. This will help companies to substitute the gaps between market demand in a region to supply a distributor provides. Also, with the changing consumer behaviour as shown in the analysis and finding, it is visible the scope of health and hygiene companies in gaining market share is huge. If the correct market strategy is implemented along with impeccable product quality, it is likely company would maintain its growth even in the pandemic. As shown in the findings, due to fear of contracting virus, people are reluctant to go out and purchase commodities and services so they are looking for more and more services and products to be delivered to their home and that too with contactless mechanism. This demand mode will have to be incorporated in nearby grocery store if they want to sustain. The nearby stores need to upgrade their working style to be ahead of e-commerce player more than ever. They

need to build good connection with people, earn their loyalty along with the extra service without improving the overall cost. If they are successful in doing this, there is high chance of maintaining or even improving the bottom line overall.

This study was done in the month of June, which marked the period of Unlock 1.0 and Unlock 2.0. The economy was totally down with most of sectors under lockdown for almost 2 months. Business especially manufacturing sectors and informal sectors was on their knees. With the unlock different sectors were restarting the work and trying to boost demand their various credit policies. The government is also looking to bring in some businesses who are moving out of China due to lots of distrust throughout the world especially the manufacturing units to India which would increase the employment opportunities for skilled and semi-skilled workers. The increase in manufacturing segment will be a boost for the economy as it has huge potential in terms of its contribution to GDP at present state. The service sector especially the retail which provides one of the largest employments to people in the country is facing a lot of difficulties even after lockdown is lifted. People are reluctant to visit malls, buying clothes, buy luxury items, gold jewellery, visit to theatres, etc.

In order to find a solution to revive the business atmosphere, government can look for increasing spending from its coffers by borrowing. This amount must be transferred to lowest strata of society as they have the potential to consume more and save less as compared to middle and upper class of society. Along with it, corporate and government must join hands and form policies in such a way which does well to boost demand and thereby rebuild economy. The government must give importance to becoming self-sufficient in the long run so the country would not face such problem in the future. The confidence in consumer sentiment for the weaker segment can only be generated by government through above strategies. With the increase in online purchases as shown by study above, government can relook at the e-commerce policies and also create a portal which should be free of cost or at the minimal charge where

sellers can sell their product which will deepen e-commerce in India and also give government a stronghold in the retail segments. The government can definitely enter in it through Public- Private Partnerships.

### Conclusion and Recommendations:

The paper shows various changes in the consumer behaviour are happening due to the pandemic Coronavirus and possible consumption changes and priority to different business segment after the situation return to normal. The significant rise in health and hygiene products buying clearly signifies that people are becoming more cautious about the health of own and people around them. People are worried about their jobs due to uncertainty and thereby consuming what is strictly essential. The increased rise in one sector and conservatism approach by the masses in other sectors have led to decline in the others. The companies must align their offerings, create offers which could be effective and bring back demand sentiment in consumers. The firms must reengineer their supply chain and clear out the bottlenecks if any and also

advertisement needs to revamped in order to create a pull. The companies can also look to development of new product as per need which could boost their top line.

### Limitation of the Study:

- 1) The sample size taken may not represent the whole population truly especially skipping people from rural or deepest part of the country.
- 2) Sampling method was Convenience based sampling which has its own limitations.
- 3) The result obtained from the analysis are subject to different types biases of person analysing the results.
- 4) Cost constraint along with time constraint are also one of the limiting factors to refinement of the study and analysis.
- 5) The results are only conclusion from primary data analysis and is not corroborated with secondary data of any sort due to constraints.

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## TO STUDY THE IMPACT OF CONSUMERS' COMMITMENT TO THE BRAND ON THEIR RESPONSE TO REBRANDING IN INDIAN LIGHTING SECTOR

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### ABSTRACT

*Purpose: To study the impact of consumers' commitment to the brand on their response to rebranding in Indian lighting sector. Design/methodology/approach – It is a quantitative research backed with secondary research involving sample respondents selected from the population of decision makers in a household. The tool used will be Discriminant analysis, having a dependent variable (Consumer response to rebranding) and an independent variable Brand commitment consisting of 4 items: loyalty, first choice, price premium and brand switching). Findings – There is significant impact of consumer loyalty, first choice, brand availability and ability to pay price premium for a lighting brand on his/her adoption towards a new brand identity. Practical implications –Brands attain a foothold in the market by gaining more customers who are committed to the brand and refrain from switching brands in normal circumstances. For a well established brand with a lot of committed consumers, attempts to revamp brand identity in the form of brand elements such as name change, logo redesign, aesthetic appeal etc can affect customers differently depending on how strongly they are committed to the brand. The following study attempts at making the firms in the lighting domain aware of the positive and negative consequences of redefining their brand identity on their most committed consumers. Originality/value – As per the literature review, it is evident that very few studies have been conducted to access the effect that rebranding has on committed consumers, especially in the lighting domain. However, a study by Henderson and Cote (1998) has been followed to examine customer response to logo redesign.*

**Keywords:** Rebranding, Brand commitment, Brand Identity, Name change, Logo redesign, Brand elements, Customer loyalty, Lighting

### Introduction

Lighting- Indian scenario: Lighting or Illumination is the conscious use of light for practical effects. Illumination can be achieved by either natural light sources (Daylighting by capturing daylight using Windows, light shelves, skylights etc) or artificial light sources (lamps, light fixtures etc). Out of the various Artificial lighting technologies available today, the Light Emitting Diode (LED) is one of the most energy efficient and rapidly growing light source. Within less than a couple of years, the LED has surpassed all conventional light sources like Metal Halide lamp, CFL (Compact Fluorescent Lamp), IL (Incandescent lamp), high pressure sodium lamp and FL(Fluorescent lamp) in all major sectors of lighting applications such as residential, commercial, building & offices, hospitality, retail, roads & highways, sports complexes etc. Various companies sell residential lights in India with slight differences in their product offerings. A few popular brands involve Philips, Osram, Syska, Wipro, Havells, Surya, Crompton, Bajaj

etc. Choosing a residential light thus might appear very simple, but as all the other products, this market too is driven by a lot of other factors such as price, brand name, longevity, wattage, color, brightness, resemblance to existing bulb, warrantee, energy efficiency, advertisements etc. Some research scholars have also found the relevance of individual level factors such as educational qualification, demographics, family income, gender etc in determining an Indian consumer's intention towards buying a residential light for his/her home. Brand identity is the visible elements of a brand, such as name, logo, design and color that identify and distinguish the brand in consumers' minds (Investopedia).Major purpose of building a brand identity is to cultivate an expected image in the minds of consumers. It includes:

- Choosing an appropriate brand name
- Designing its logo
- Using catchy shapes, colors and other visual elements in products and promotions
- Crafting the language of advertisements
- Training employees based on pre-defined guidelines to engage with

customers Brand image is outcome of these efforts, positive or negative. One important similarity between successful brands is that their brand identity and brand image are closely aligned to each other. The result of a negative brand image may be soaring financial results. In the same way, a positive brand image may result in consistent sales and successful product roll-outs. Companies increasingly undergo corporate rebranding with the objective of enhancing brand relevance and improving operational efficiency (Sonenshein 2010; Vallaster and Lindgreen 2011; Melewar et al. 2012). Brand elements may also be changed for a variety of other reasons (Speath, 1990) such as change in logo due to change in brand name, due to a change in service emphasis, to update brand identity and positioning, to keep in pace with changing market conditions or simply for novelty purposes (Walsh, 2005). However, corporate rebranding is risky, as it requires considerable investment, without any promise of yielding successful results (Amujo and Otubanjo 2012; Shetty 2011). It can backfire in a way that it might not be adopted by the consumers positively. In 2003, Apple Computer announced a change in the color of its logo from red to brushed silver. This announcement saw petitions from more than 200 people against the recoloring of the logo (Kahney, 2003). On the other hand, Walmart redesigned its logo in 2010 but this move did not attract resistance. Similarly, Pepsi was able to change its logo in 2001 with little rebellion. Some examples of change in brand name include Marathon changing its name to Snickers, Raider to Twix, Anderson Consulting to Accenture, Kentucky Fried Chicken to KFC, Datsun to Nissan, Lucky and GoldStar Co. to LG Electronics, Backrub to Google and so on. Recently, an Indian company named UrbanClap changed its name to Urban Company in order to expand its operations globally with a universal appeal. Talking about Indian lighting domain, a multinational company, Philips Lighting changed its name to Signify. All these attempts have seen varying customer responses. From the above examples, a major marketing dilemma arises as to how a slight change in a brand element is seen differently by consumers. Lighting industry in

India is characterized by innovative technologies, less number of market players, low consumer loyalty and high price sensitivity. However with the advent of LED lighting, which is still at a nascent stage, Indian lighting market is expected to reach \$1.75 billion by 2020. This has been made possible through the combined effort of the companies as well as the government. At a time of this exponential boom in the sector, the case of a traditional player (also the major player by customer base) changing its brand name becomes an important matter of discussion. It has been seen that more committed consumers are more likely to resist information that seems to attack the brand they are committed to (Ahluwalia, Unnava, and Burnkrant 2000). Hence, the more strongly a consumer is committed to a brand, because of defense motivation, the more likely is he/she to resist news that undermines the essence of the brand in order to protect the brand since it defines his/her self-esteem. Hence, any changes in the brand elements potentially change the meaning of the brand in the eyes of the consumer. This indirectly affects the brand equity. Following this, it can be assumed that acceptance or rejection of redesigned brand elements is related to the commitment of a consumer towards that brand.

Lighting Industry and customer buying behavior: Customer buying behavior refers to the actions taken by consumers before buying a product or service. This process may include consulting both online as well as offline methods such as engaging with social media posts, exploring search engines; consulting family & friends respectively. This process holds prime importance for the brands since it gives them a head start to focus their marketing strategies to successfully influence the consumers. There are four types of buyers: Analytical buyer, Amiable buyer, Driver buyer and Expressive buyer. An analytical buyer is motivated by information and logic. He/she evaluates and compares various competitor brands and products before making an informed decision. An amiable buyer is motivated by the happiness of people around him/her. He/she is a slow decision maker and with every decision he/she is concerned about how people around them will be affected by

that decision. A driver buyer is the trendsetter and values personal appearance rather than relationships while making buying decisions. An expressive buyer is the one who values relationships, else he/she feels isolated. Hence they expect a good treatment. There are mainly four factors that influence consumers' buying behaviours, i.e. cultural, personal, social and psychological. Cultural factors include location, religious beliefs and associations. Personal factors include values, beliefs, age, marital status, morals etc. Social factors involve a person's environment that impacts his/her way of looking at products. Psychological factors include the state of mind of a person when he/she gets to know about a product/service and the feeling the person gets not just for the product but also for the brand as a whole. Before delving deeper into the factors affecting consumer buying behavior, it is important to understand the key influencer in this category. The primary research indicated that 50.3% respondents decide the product to be bought themselves, without any interference of others. 25.1% respondents buy an residential lights after discussing with their family members. It is important to point that a major chunk (24.6%) of respondents listen to the advice of various influencers while buying a residential light for their homes. Out of these, a whopping 14.4% go with the advice of the shopkeeper selling residential lights to them, 8.7% buy residential lights as suggested by their electricians and the remaining 1.5% take the advice of their interior designers. When asked about the factors influencing the respondents' choice of residential lights, a number of factors came up such as price of light, brand name, life (longevity), wattage, color of light (warm/cold color temperature), brightness of light, resemblance to the existing lighting product, warranty, exchange value, power consumption etc. This is in line with the factors determined in previous studies (Jaafar, Sulaiman, Moghavvemi, Tajudeen, Dehdar, 2020)(Ghoshal, 2018)(Gerhardsson, Laike, Johansson, 2018). The major factors that most respondents preferred were longevity(64.6%), brand name(59.5%), price(59%), wattage(56.4%), brightness(46.7%), color(27.7%) and resemblance to existing

product (13.3%). The remaining factors were selected by a minority of respondents. Brand commitment in residential lighting segment: Brand commitment refers to the psychological links between customers and brands. Brand commitment is affected by past experience, usage, brand reputation, functionality and recommendations from online and offline sources. In this research, in order to understand the brand commitment of consumers of residential lights, brand reputation has been measured by evaluating top of mind awareness, i.e. the brand that comes to mind when thinking about residential lights; past experience has been measured by looking at the brand they would prefer for their homes and promotion effectiveness have been measured by looking at the advertisement attractiveness. Through secondary research, it was noticed that Indian consumers use either branded or nonbranded residential lights depending on the application. The major brands which drive this industry included Philips Lighting(Signify), Havells, Crompton, Syska, Wipro, Bajaj, Osram, Surya, Panasonic, Halonix, Orient and Eesl. Therefore, the interview was designed keeping these brands in mind. 1. Brand reputation: It was observed that Philips lighting was at the top-of-mind for 70.8% of the respondents, Syska for 54.9%, Havells for 41.5%, Bajaj for 27.2%, Surya for 26.7%, Wipro for 17.9%, Crompton for 12.8% Panasonic for 8.7%, Halonix for 4.1%, and Osram for 2.1%. 4% of the respondents stated that other brands came to their mind when thinking of LED bulbs. This clearly showed that Philips and Syska were the two brands that captured the most awareness among consumers. 2. Past experience: Based on past experience of using LED bulbs, It was found that 67.7% of the respondents would prefer Philips LED bulbs for their homes again, 41% chose Syska, 31.3% Havwells, 19.5% Surya, 19% Bajaj, 17.4% Wipro, 8.7% Crompton, 6.2% Panasonic, 3.1% halonix, 1.5% osram and 2% chose other brands. At the same time, there were 14 respondents (7.2%) for whom brand did not matter which shows that they would buy a branded LED bulb but are not concerned about any particular brand as long as their requirements are fulfilled. 3. Promotion effectiveness: When asked about the brands

whose advertisements were the most appealing, 65.6% of the respondents could recall Syska, 32.3% Philips, 22.6% Havells, 14.4% Bajaj, 13.3% Surya, 7.7% Wipro, 6.2% Crompton, 5.1% Panasonic, 1.5% Osram, 1% Halonix. However a huge chunk of respondents (12.8%) could not remember the advertisements of any of the above mentioned brands. Hence, it was concluded that the brand perception of Philips and Syska was the best as compared to all the other brands on the basis of past experience, brand reputation and brand communication. This study has been conducted on Indian consumers who have a preferred brand in the lighting domain that they consider the most while buying lights for their homes, also known as residential lights. The study is limited to the B2C space of residential lighting and does not take into account the B2B customers.

### Literature Review

Daly and Molony (2004) bifurcated rebranding into three categories, namely, minor changes, intermediate changes and complete change. Minor changes are also known as evolutionary changes and complete change means a revolutionary change. Minor changes account for changes in aesthetics and positioning but the change is so gradual that it is almost inconspicuous for the outside stakeholders (Muzellec & Lambkin 2006). It may include revitalizing the brand, minor face lifts, changing slogan or logo of the brand (Daly and Moloney 2004; Stuart and Muzellec 2004). Intermediate changes refer to changes in brand communication and customer service operations to achieve repositioning of the original brand name. Revolutionary or complete change accounts for a more perceptible change that redefines the company's aesthetics and positioning (Muzellec & Lambkin 2006). It means changing the brand name, logo and slogan simultaneously which may be followed by changing the corporate values for the stakeholders to connect with the new brand identity (Stuart and Muzellec 2004; Lomax and Mador 2006). Revolutionary change is the most visible to all customers and is the most expensive to execute. Hence, given the expense involved in undertaking a revolutionary

change, it will be beneficial for the firms to know which type of customers will react to this change positively and which type will react negatively. None of the previous researches have scrutinized this question till now. However, some research papers have tried to explore the effect of change in brand name, brand logo redesign, slogan change and color change on underlying brand commitment, but they have not been able to explore the effect of brand commitment on acceptance on change in brand aesthetics by customers. Brand aesthetics and brand commitment Brand commitment is defined as "an enduring desire to maintain a valued relationship with the brand" (Moorman and Zaltman, 1992, p. 316). Brand commitment is a time consuming process and develops over the years (Keller, 2005). Brand name: According to Muzellec and Lambkin (2006), the decision to change the brand name may be very risky and may damage the brand equity, as a result of reduced consumers' trust in the brand and weak brand relationship (Holbrook and Chaudhuri, 2002). Brand loyalty is seriously endangered when a brand name change is accompanied by change in product tag line and visual packaging (Fosse Gomez and Pauwels-Delassus, 2012). Brand logo: Brand logos, as visual aids, activate brand associations in the consumers' minds (Keller, 2005). Hence consumers associate logos differently as per their level of commitment to the brand. Michael F. Walsh (2007) argues that logo redesign results in a more negative brand attitude in the case of more committed consumers as compared to the consumers weakly committed to the brand. It is also stated that strongly committed consumers view logo redesign as a threat to their bond with the brand (Ahluwalia et al., 2000; Fournier, 1998) and as hampering their brand connections (Escalas and Bettman, 2003). Conversely, the response of weakly committed consumers is seen to be positive, rather more welcoming since they view this change as novel (Kohli and Suri, 2002). More precisely, the more the change in the logo of the brand, the more positively it is viewed by weakly committed consumers (Walsh, 2010). Furthermore, it was found that both brand name and brand logo prove to be the most risky and expensive to change. Therefore, both from theoretical and empirical

perspective, brand name and brand logo are the two key elements of brand aesthetics. Interestingly, industry practitioners also view brand name and logo as the riskiest and most expensive brand elements if they undergo change. 7 top management executives were interviewed from 7 lighting companies in India namely, Signify, Syska, Havells, Bajaj, Surya, Wipro and Crompton. All interviewees indicated that brand name and logo carry the highest risk of undergoing change. This helped me verify that brand name and logo were indeed the key elements of revolutionary change worth investigating. Thus from the perspective of change, I decided to examine these particular elements- brand name and brand logo as the measure of revolutionary change in brand aesthetics. Loyalty is a key element in sustaining stable demand and sales flows over time (Aaker, 1991; Iglesias et al, 2011). Therefore, it is extremely important to determine if, in the case of brand name and logo change, consumers' loyalty can be transferred towards a competitor brand. A longitudinal study of Philips lighting changing its name to Signify (2018) and still managing to stay the market leader, highlights the importance of communication (information), with the goal of ensuring that the consumer is aware of the brand substitution. Therefore, by being informed regarding the brand substitution and knowing that the product will stay the same, consumers should transfer their trust to the new brand, which they recognise as a simple replacement for the original brand. Moreover, the fact that they are informed regarding the brand name change might preserve the emotional bond consumers have built up with the brand (Pauwels-Delassus and Fosse Gomez, 2012). Those same authors suggest that by extensively informing the consumers about the brand name change, companies can manage to efficiently transfer brand associations along with the product's quality, and thus preserve the consumers' trust towards the product and consequently towards the new brand. Therefore, I suggest that committed consumers of lighting brand receive the new brand name and logo positively, whereas non-committed consumers receive the new brand and name negatively.

## Research Methodology

In order to explore the research objectives, both primary and secondary data have been collected and analyzed. The secondary research was conducted by extensively searching for articles, journals, academic databases and the like concerning consumer behavior, commitment towards brands and response towards new brand identity. This provided the basis for the compilation of primary research.

Primary research was conducted in two phases in order to understand the customer's perception towards buying residential lights for their homes. The first phase included interviewing 10 consumers by asking them open ended questions with the intention of extracting additional information specific to the lighting domain out of the target group. The second phase was carried out to determine the factors affecting consumers' commitment towards the brand. Data was collected using a structured questionnaire and the sample included decision makers in households. To ensure the reliability of responses, a sample of 173 respondents spread across gender, age, demographics, family income, type of accommodation etc was chosen. Information was presented using tables, bar graphs, frequency tables and pie charts etc.

Define SPSS (Statistical Package for Social Sciences) was used to analyze the data gathered for quantitative analysis. The review of literature clearly indicated that not much research has been done in this domain, so an exploratory research has been conducted. Further, the hypothesis testing was performed using discriminant analysis.

### A. Data Collection

Data was collected using primary research. The sample involved respondents who played an important role in decision making of the purchase of lights in their households ranging from 24 to 68 year olds, hailing from tier 1, 2 and 3 cities in India, having a family income of INR 90,000 and above and staying in rented as well as self-owned houses. A Google form was made available to the prospective lot from the target group through online mediums like e-mail, social media etc. The interviews/ interactions were conducted through phone calls.



## B. Data Analysis

Phase 1: This section provides an overview of respondents' backgrounds and preparation of a discussion guide for the respondents to fetch elaborate information about lighting brands in India. Around 10 consumers of lights were contacted through telephone and video calls whose responses were recorded for framing the questionnaire. This gave a deeper knowledge about consumers' perceptions about brands in the lighting domain.

Background: It has been observed that the respondents had the following characteristics:

Age: There was a fair participation of decision makers from all age groups, with 37% of the respondents falling in the age group of 50 years and above, 29% between 20 and 29 years, 28% between 40 and 49 years and the remaining 6% between 30 and 39 years. Gender: Out of the 173 participants, 74.9% were males and 25.1% were females. City: Respondents hailed from various cities, further bifurcated into Tier 1, Tier 2 and Tier 3 as per the classification of Indian cities. It was found that 41% of the respondents belonged to a tier 1 city, 20% belonged to a tier 2 city and the remaining 39% belonged to a tier 3 city. Family Income: The respondents had diverse family incomes ranging from INR 90,000 pa to more than INR 30 lac pa. Out of these, 10% belonged to rich class, 32% belonged to upper middle class, 40% belonged to middle class and the remaining 18% belonged to lower middle class.

Phase 2: The objective of phase 2 of the analysis was to understand the effect of brand commitment on consumers' response towards new brand name and logo. The topic of the research takes into account 2 variables, namely, Commitment to the brand and response to new brand name & logo, hence making it a bi-variate analysis. In order to understand the brand commitment of a customer, 4 parameters or items were considered, namely, Loyalty, First choice, Availability and Price premium. (Moreo, Bonney, Herd ; 2011) • Brand loyalty: I consider myself to be loyal to Brand X • First choice: Brand X would be my first choice. • Availability: I would not buy other brands if Brand X is available at the store. • Price premium: I am willing to pay a higher price for Brand X than I would for other brand.

These four factors have been used to formulate the hypotheses:

- **Hypothesis 1:**

H0: There is no significant impact of consumer loyalty for a lighting brand on his/her adoption towards a new brand identity.

H1: There is a significant impact of consumer loyalty for a lighting brand on his/her adoption towards a new brand identity.

- **Hypothesis 2:**

H0: There is no significant impact of first chosen brand on a consumer's adoption towards a new brand identity of that brand.

H1: There is a significant impact of first chosen brand on a consumer's adoption towards a new brand identity of that brand.

- **Hypothesis 3:**

H0: There is no significant impact of availability of competitor lighting brands on a consumer's adoption towards a new brand identity of his/her preferred brand.

H1: There is a significant impact of availability of competitor lighting brands on a consumer's adoption towards a new brand identity of his/her preferred brand.

- **Hypothesis 4:**

H0: There is no significant impact of price premium paid for a lighting brand on a consumer's adoption towards a new brand identity.

H1: There is a significant impact of price premium paid for a lighting brand on a consumer's adoption towards a new brand identity.

## RESULT AND ANALYSIS

Discriminant Analysis: To perform the Discriminant analysis, 4 items were taken as Independent variables, namely, Loyalty, First choice, Price premium and Availability.

The questionnaire consisted of a five point likert scale for response to each of these variables. The dependent variable was adoption of new brand identity by consumers. This variable was of nominal type and recorded responses in the form of 'Yes' or 'No', coded as '1' and '0' respectively. This data was subject to ordering, categorizing, manipulating and summarizing (Achola, 2007), before conducting a discriminant analysis on it. This was done using SPSS with the objective to

understand the effect of all these variables on adoption of new brand identity. Out of the 173 responses collected, 138 responses were taken as analysis sample and the remaining 35 as validation sample. This was done to ensure a ratio of 80:20 between analysis and validation sample.

Fig. 1. Group Statistics

Will the brand of your choice still be your most preferred brand if it changes its name or logo?	Mean	Std. Deviation	Valid N (listwise)	
			Unweighted	Weighted
NO				
I consider myself to be loyal to the brand of my choice (Loyalty)	2.47	1.191	32	32.000
This brand would be my first choice (First Choice)	2.81	1.120	32	32.000
I would not buy other brands if the brand of my choice is available at the store (Availability)	2.78	.975	32	32.000
I am willing to pay a higher price for a light of the brand of my choice, than I would for other brand (Price Premium)	2.38	1.238	32	32.000
YES				
I consider myself to be loyal to the brand of my choice (Loyalty)	3.16	1.079	106	106.000
This brand would be my first choice (First Choice)	3.62	1.009	106	106.000
I would not buy other brands if the brand of my choice is available at the store (Availability)	3.34	1.154	106	106.000
I am willing to pay a higher price for a light of the brand of my choice, than I would for other brand (Price Premium)	3.19	1.088	106	106.000
Total				
I consider myself to be loyal to the brand of my choice (Loyalty)	3.00	1.140	138	138.000
This brand would be my first choice (First Choice)	3.43	1.087	138	138.000
I would not buy other brands if the brand of my choice is available at the store (Availability)	3.21	1.136	138	138.000
I am willing to pay a higher price for a light of the brand of my choice, than I would for other brand (Price Premium)	3.00	1.171	138	138.000

The mean scores suggest that for all the independent variables, i.e., loyalty, first choice, availability and price premium, there is significant difference between the mean scores in the two categories, positive adoption of new brand identity and negative adoption of new brand identity. Hence, it can be deduced that all these 4 factors are discriminating, with 'First choice' and 'Price premium' being the most discriminating. So, it is evident that there is a positive outlook of respondents for whom the preference of the brand will not change with a change in brand identity towards all four factors, i.e., loyalty, first choice, availability and price premium, as compared to the respondents for whom the preference will change with change in brand identity.

Fig. 2. Tests of Equality and group means

	Wilks'				
	Lambda	F	df1	df2	Sig.
I consider myself to be loyal to the brand of my choice (Loyalty)	.934	9.619	1	136	.002
This brand would be my first choice (First Choice)	.900	15.050	1	136	.000
I would not buy other brands if the brand of my choice is available at the store (Availability)	.957	6.158	1	136	.014
I am willing to pay a higher price for a light of the brand of my choice, than I would for other brand (Price Premium)	.913	12.888	1	136	.000

The above table provides the effect of each of the independent variables and the dependent variable. This is done by looking at the Sig. values.

- Variable 1 (Loyalty): Sig value=0.002, which is less than 0.05, hence we reject the null hypothesis that there is no significant impact of consumer loyalty for a lighting brand on his/her adoption of a new brand identity. Thus, the alternate hypothesis, i.e., there is a significant impact of consumer loyalty for a lighting brand on his/her adoption of a new brand identity, is accepted. Hence it can be concluded that loyalty has a significant impact on the adoption of new brand identity in case of a lighting brand.
- Variable 2 (First choice): Sig value=0.000, which is less than 0.05. Hence we reject the null hypothesis that there is no significant impact of first chosen brand on a consumer's adoption towards a new brand identity of that brand. Thus, the alternate hypothesis, i.e., there is a significant impact of first chosen brand on a consumer's adoption towards a new brand identity of that brand, is accepted. Hence it can be concluded that first choice has a significant impact on the adoption of new brand identity in case of a lighting brand.
- Variable 3 (Availability): Sig value=0.014, which is less than 0.05. Hence we reject the null hypothesis that there is no significant impact of availability of the chosen lighting brand on a consumer's adoption towards a new brand identity of his/her preferred brand. Thus, the alternate hypothesis, i.e., There is no significant impact of availability of the chosen

lighting brand on a consumer’s adoption towards a new brand identity of his/her preferred brand, is accepted. Hence it can be concluded that availability of preferred brand has a significant impact on the adoption of new brand identity in case of a lighting brand.

• Variable 4 (Price premium): Sig value=0.000, which is less than 0.05. Hence we reject the null hypothesis that there is no significant impact of price premium paid for a lighting brand on a consumer’s adoption towards a new brand identity. Thus, the alternate hypothesis, i.e., There is a significant impact of price premium paid for a lighting brand on a consumer’s adoption towards a new brand identity, is accepted. Hence it can be concluded that price premium has a significant impact on the adoption of new brand identity in case of a lighting brand.

Fig. 3. Pooled within groups matrices

	I consider myself to be loyal to the brand of my choice (Loyalty)	This brand would be my first choice (First Choice)	I would not buy other brands if the brand of my choice is available at the store (Availability)	I am willing to pay a higher price for a light of the brand of my choice, than I would for other brand (Price Premium)
Correlation	1.000	.605	.391	.368
I consider myself to be loyal to the brand of my choice (Loyalty)		.605	.422	.289
This brand would be my first choice (First Choice)			1.000	.515
I would not buy other brands if the brand of my choice is available at the store (Availability)				1.000
I am willing to pay a higher price for a light of the brand of my choice, than I would for other brand (Price Premium)				

This table shows the correlation between independent variables. We see that none of the independent variable have the correlation value of more than 0.7 with each other, hence we can deduce that there is no significantly high correlation between them. This makes us rule out the possibility of any multi-co linearity in this model.

Fig. 4. Eigenvalues

Function	Eigen value	% of Variance	Cumulative %	Canonical Correlation
1	.161*	100.0	100.0	.372

In this table, the value of canonical correlation is 0.372 and its square is 0.138. This shows

that 13.8% variance is shown between the groups of adopters and non-adopters.

Fig. 5. Wilk’s Lambda

Test of Function(s)	Wilks’ Lambda	Chi-square	df	Sig.
1	.861	19.982	4	.001

Here the sig. value is 0.001 and the value of Wilks’ lambda is 0.861, which is closer to 1 as compared to 0, therefore, group means are not different.

Fig. 6. Structure matrix

	Function 1
This brand would be my first choice (First Choice)	.830
I am willing to pay a higher price for a light of the brand of my choice, than I would for other brand (Price Premium)	.768
I consider myself to be loyal to the brand of my choice (Loyalty)	.663
I would not buy other brands if the brand of my choice is available at the store (Availability)	.531

This table gives individual correlations of all independent variable with the discriminant model. They are also known as Discriminant loadings. It shows that all factors have high correlations with the discriminant function.

Fig. 7. Canonical Discriminant Function Coefficients

	Function 1
I consider myself to be loyal to the brand of my choice (Loyalty)	.083
This brand would be my first choice (First Choice)	.614
I would not buy other brands if the brand of my choice is available at the store (Availability)	-.069
I am willing to pay a higher price for a light of the brand of my choice, than I would for other brand (Price Premium)	.525
(Constant)	-3.710

Unstandardized coefficients

The above table provides unstandardized discriminant coefficients for the independent variables and also the value of constant (intercept). This can be used to build the discriminant function, stated as follows:

$$D = 0.083 * \text{Loyalty} + 0.614 * \text{First Choice} - 0.069 * \text{Availability} + 0.525 * \text{Price Premium} -$$

3.710. D refers to the discriminant score which denotes the impact of factors of brand commitment on adoption of new brand identity.

The above table also shows that ‘First choice’ is the most impactful followed by ‘Price premium’, while ‘Loyalty’ and ‘Availability’ are less impactful.

Fig. 8. Functions at group centroids

Will the brand of your choice still be your most preferred brand if it changes its name or logo?	Function
NO	-.725
YES	.219

The above table gives the group centroids, i.e., the mean of all discriminant scores for each of the respondent groups, namely, the adopters of new brand identity while not changing their preference of the brand and non-adopters of new brand identity who will change their brand preference due to change in brand identity.

Fig. 9. Classification Results

		Will the brand of your choice still be your most preferred brand if it changes its name or logo?	Predicted Group Membership		Total
			NO	YES	
Original	Count	NO	22	10	32
		YES	27	79	106
	%	NO	68.8	31.3	100.0
		YES	25.5	74.5	100.0
Cross-validated <sup>b</sup>	Count	NO	22	10	32
		YES	36	70	106
	%	NO	68.8	31.3	100.0
		YES	34.0	66.0	100.0

a. 73.2% of original grouped cases correctly classified  
 b. 66.7% of cross-validated grouped cases correctly classified.

The above table of classification results is also famously known as confusion table. It gives the Hit ratio. Hit ratio in turn denotes the correctness of the developed discriminant model in predicting the impact of brand commitment on the adoption of new brand identity in the lighting domain. Analyzing the confusion table shows that the hit ratio for non-adopters is 68.8% and for adopters is 25.5%. The combined hit ratio is coming out to be 73.2%. This implies that the discriminant analysis is able to discriminate between adopters and non-adopters based on the 4 given factors. This in turn implies that the model is good for the intended purpose.

**Conclusion And Recommendations**

Consumers of the lighting sector show differing behavior as compared to consumers of other products. They are found to be less aware of brand elements and instead are driven by the product. Through the primary research, it has been seen that out of the respondents surveyed, around 60% display brand loyalty and prefer the same brand time and again. Other 30% do not show brand loyalty towards one brand, but switch brands as per availability and product price. The remaining 10% said they use branded or unbranded products and are indifferent towards brands in this domain. These 90% of the consumers when asked to fill the questionnaire keeping in mind their most preferred brand, showed shocking results. In all the previous studies conducted to understand the relationship between brand commitment and adoption of brand logos showed that more the brand commitment, harder it is for the consumers to adapt to the change in brand logo. Similar was the case with other brand elements. However, these studies were not generalized to all kinds of consumers and domains. These studies also did not specify the perceptions of consumers in sectors where brands are still trying to gain better brand commitment. In this study, the results prove that more committed consumers adopt better to the change in brand elements since they prioritize product offering more than the brand element, which they do not pay much attention to anyway. Another reason for this perception is the number of brands present in the market. Since the lighting market in India is dominated by a few brands, consumers have little choice. In such a case, change in brand name, logo or slogan does not impact their choice to a great extent.

**Limitations And Future Prospects**

While looking for past research papers, databases, analyses etc, it was found that not much work has been done to understand how consumers perceive changes in brand identity or brand elements such as logos, brand name, brand slogan etc. More so, when it comes to understanding the perceptions of already committed consumers. Firstly, it was also found that there is very little research work available on the lighting industry in India, especially when it comes to accessing

consumer perceptions, due to which there was a scarcity of industry specific insights. This acted as a bottle neck in the research work since it was difficult to find an appropriate start point. Lack of knowledge also hindered benchmarking with past studies to evaluate the validity of results. Secondly, there are a few limitations faced during the course of the study. Due to a wide spread portfolio of lighting industries and consumers spread across age, occupation, geography, house ownership, income level etc, it was difficult to maintain the focus of the study. Lighting companies operate in both B2B as well as B2C segments, with a wide variety of product offerings, depending on specific needs. Hence brand loyalty is also subject to change from one situation to another. While on one hand, more brand loyalty is seen in residential lighting segment, less loyalty is seen in case of B2B since it is driven by price. Although this study is focused on residential sector, but does not generalize the results to the whole lighting domain in India. Thirdly, respondents were not able to relate with the situation of change of

brand elements in the lighting domain since they had not encountered any such real life situation. Many consumers were not even aware of the name change of one of the leading lighting brands in India due to lack of advertisements and promotions in this domain. Some respondents even exclaimed that they had never paid attention to brand elements of lighting brands other than their names, which made this situation even more hypothetical. As a way forward, brands should focus on educating the consumers about their respective brands to build a stronger brand commitment through rigorous promotions. Also, researchers should conduct deeper studies and analyses to understand consumer perceptions in this domain and access factors to improve brand loyalty, marketing strategies and consumer purchase intent, so that these basics can give other researchers in this domain a head start for their work.

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## IMPACT OF COVID-19 ON TOURISM SECTOR: A STUDY OF CONSUMER BEHAVIOR

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### ABSTRACT

*Purpose – This paper attempts to assess the behavioral change of consumers towards tourism and how the industry has to shift to new normal conditions after and during COVID-19 being one of a kind event in decades there will be huge shift in tourism sector and tourists too.*

- *Design/Methodology/Approach – the study aims to create the qualitative research through online survey in it asking questions in order to gauge the beliefs, perceptions, behavior, attitude and opinion of the consumer on the tourism sector. The majority of people to be surveyed would be Business Professionals and students (around 150-200). Subsequently a qualitative research would be done on the interviews to find the consensus about what changes consumer wants from the tourism industry.*

- *Findings – Consumers are facing worst health crisis in decades this may create a shift in their behavior about how the 'new tourists' requirements for safe and sound tourism would be. Study will also reveal how consumer would change their mind-set to new kind of questions like availability of.*

- *Practical implications – The study analyses the change the Tourism sector have to embrace after this pandemic and its effectiveness to lure in more tourists to their places.*

- *Originality/value – The study is original in nature and it researches on business professionals and tourists used to go several places and study their behavioral shifts. This is beneficial for various tourism agencies, tourists, hotel and resort chains across the world as it includes how they have to change owing to the changing environment*

**Keywords:** *Tourism, Behavior Shift, Tourist preference and Health Crisis*

### Introduction

Tourism has become the important part of so many economies in the world. It is so important that many of the country's major sources of income are dependent on tourism, travel and leisure sector. Tourism industry which is eternally the part of service sector has become the important source for several economies. In the world tourism conference in 1980 happened in Manila where the manila declaration was done in it the tourism's importance is regarded as "an activity essential to the life of nations because of its direct effects on the social, cultural, educational, and economic sectors of national societies, and on their international relations."(United Nations World Trade Organisation, January 2019) [1]. Travel and tourism are important because it also acts as an escape from our stressful and hectic life, it can also be seen as an educational opportunity by which we get to learn various cultures through experiencing different parts of the world.

Tourism as a sector is very important for many of the developing as well as developed nations, as it brings a huge amount of income for local economy in the way of purchasing and selling of goods and services done by the outbound and inbound tourists. Around \$1.8 Trillion of revenue is generated worldwide courtesy to international tourism taking place all around the world (United Nations World Trade Organization, January 2019) [1]. All of these facts make tourism a sunshine sector. In 2019 according to the World Trade Organization, tourism accounted for around 32% of world's trade and services it was also seen as an invisible exporter of 6.4% of goods and services and now to around 7% goods and services in 2018, it also brings with it a large number of revenue as a form of payments of good and services being carried out by tourists (WTO, 2019) [2]. It is also responsible for generating millions organized as well as unorganized businesses like hotel chains, street vendor shops, local textiles, handlooms, etc. which is ultimately responsible for creating employment opportunities for all kinds of people.

All this made tourism a golden egg for hospitality industries (like hotels, motels, restaurants, themed locations etc.) and transport services worldwide (such as air travel, luxury ships and ferries, domestic trains and cabs); lodging (includes bunk bed hostels, paying guest rooms, rooms like Airbnb and Oyo, roadside restrooms and renting places); and not limited to entertainment places (such as amusement parks, designer restaurants, shopping markets, music arenas and drama or opera theatres). This is in addition to the souvenir's brought back by tourists which enables it to be a booming industry.

Tourism in terms of Indian perspective is very significant for our economy and it is developing rapidly. According to the world travel and tourism council it is fairly estimated that it has generated total revenues around ₹16.75 lakh crores (US\$239 billion) or 9.19% of India's GDP in 2018 which also helped in creating around 43 million jobs and various business houses, which accounts 8% of its total work. It is also estimated that it may develop at a Year on Year rate of 6.9% to around ₹32 lakh crores (US\$440 billion) by 2028 which would be around 9.9% of India's total GDP (World Travel and Tourism Council, 2019) [3]. Due to low cost medical facilities India's medical tourism is also booming also in 2015 India's clinical tourism industry was worth 3 Billion Dollars and poised to hit 8 Billion dollars in 2020. In 2017, 457,000 foreign patients came to India to look for clinical treatment. The medical tourism in India is estimated to be worth \$9 Billion by the end of 2020 [4] [3]

More than 12 million outside travelers visited India in 2019 contrasted to 8.89 million of every 2016, looking forward to the development of around 45 % (World Travel and Tourism Council, 2019) [4] [4]. Local visitors from all the states and also our associated union territories are around 1,986.35 million of in 2019, an increase of around 14.5% from 2018. In 2019, Tamil Nadu, Maharashtra and Uttar Pradesh were the most well-known states among voyagers in these states the most important come out to be Maharashtra. Delhi, Mumbai, Chennai, Agra and Jaipur are amongst the five most visited urban areas of India by remote voyagers in the year 2019. India is poised to become the most

popular destination all around the world, in a report by a UK based market research 7 major cities in India are among the most visited places all around the world, they are; Delhi(11th Rank), Mumbai (14th Rank), Agra(26th Rank), Chennai(36th Rank), Jaipur(34th Rank), Kolkata(76th Rank), Bengaluru(100th Rank) these ranking indicate that India progressing less and bound in world tourism [4].

India as discussed earlier has shown massive development in tourism sector as in a report by World Economic Forum Indian Sub-continent has improved a lot by 25% in among the nations placed in the report. In its India was placed 34th out of 140 nations by and large (Travel and Tourism Competitiveness Index, 2019). The travel Industry of India Inc. in the report positioned 13th out of 140 countries in value seriousness. With reference to the report India has the great air travel (33rd Rank), considering nation is in the phase of advancement, and building ground and port framework (28th Rank). The nation likewise is rated higher on common assets (fourteenth rank), and social business-related travel and social assets (Ranked eighth). Nonetheless, some portions of our travel industry system remain to some degree immature. By universal correlation and low ATM infiltration, the country has numerous accommodations per capita. The World Tourism Organization detailed that travel industry receipts from India ranked seventeenth amongst all the tourism friendly countries during 2012, and seventh among Asian and Pacific nations [2].

Tourism Ministry is developing regional plans for event turning and travel industry development which would increase the state-wide tourism. In tandem, the government advises and engages with various stakeholders working in the division including various focal services / organizations, state governments, association regions and agents in the private segment. Intentional attempts are increasing constantly in an attempt to strengthen tourism & travel in India. Ministry of travel and tourism with the constant support of state and national government are structuring to increase the scope of travel and tourism industry. The government is working with different stakeholder in the industry including private



and associate sectors to provide seamless experience to tourists these stakeholders are also provided counselling from the government to increase their businesses. Purposeful work is done at ground level efforts by people and government are being made to advance the travel industry. Village tourism, medical tourism, rustic tourism, adventure tourism, village tourism and eco-tourism are being developed in our country. Ministry of Tourism's the Incredible India campaign is also focused on steady growth of India's travel and tourism industry [5].

### **The CoronaScare**

After March 2020 when the lockdown has started after the Coronavirus (COVID-19) pandemic we saw severe impact on tourism industry while many restaurants are walking on sharp sword and hotels in tourist places shutdown due to lack of tourists. Moreover, there is a chance that there will be the major shift in tourist's behavior after this pandemic end or the fear subsides which may become 'the new normal' for the industry. These researches suggest some important facts related to the consumer behavior that would affect the tourism industry and would become the mainstay in the industry. Through this research we would find the shift in consumer patterns within the industry after the COVID-19 pandemic gets over. We have seen massive shifts in industries related to tourism sector after COVID-19 pandemic, be it, use of masks, usage of hand sanitizers, proper social distancing norms to be followed, at each and every place. In restaurants and cafes, we are seeing a sea change in partner restaurants like, no contact delivery, regular temperature checks for workers, sterilized seal packaging being used, servers wearing mask, etc. All these things may be not be sufficient but are somewhat successful in attracting customers to the places where these norms are being followed religiously [6].

The coronavirus pandemic may bring a devastating hit to the local travel and tourism industry, particularly when the legislature is suppressing foreign travelers to come visit India by imposing travel restriction and suspending visas, with monetary effect being evaluated to run into crores of rupees. "As

indicated by industry chamber CII, this is the one of the most noticeably terrible emergencies at any point to hit the Indian the travel industry affecting all its geological portions - inbound, outbound and residential, practically all travel industry verticals - recreation, experience, legacy, MICE, journey, corporate and specialty fragments. The entire the travel industry esteem chain across inns, trip specialists, visit activities, goals, eateries, family amusement scenes and air, land and ocean transportation have been hit. In an effect evaluation of the coronavirus pandemic", as told by CII Tourism Committee they also said that, "inbound remote the travel industry of over USD 28 billion in esteem terms represents a normal 60-65 % between October to March" (Confederation of Indian Industries, 2017) [5]. "As the updates on the infection fired getting from November, the level of scratch-offs fired going up in this portion exponentially and is arriving at a pinnacle of just about 80 percent now in March in numerous Indian areas. The incentive in danger from this portion will be in products of a huge number of crores." the Confederation of Indian Industries evaluation report said. While India suspending or banning all the foreign visas, the chamber said the effect "will be more terrible". It further stated, "The forward appointments for the inbound period of October 2020-March 2021 which ought to have begun picking are completely quieted. These are giving exceptionally debilitating indications with retractions of significant worldwide travel bazaars which are commercial centres for contracting for the following season." Further scope of benefits from foreign tourists and also from NRI fragment may hamper the growth of tourism markets, which represent more than 60 % of mid-year inbound visits. "Except if the movement of the infection stops, nearly the whole incentive for the rest of 2020 season is in danger," the report included. Anarock Property Consultants Chairman Anuj Puri said in an interview that, "India's accommodation area might be affected initiated by declaration of a worldwide pandemic, and the mounting quantities of affirmed coronavirus cases in the nation". Also, "The retraction of visas for outsiders just as the solid guidance gave to Indians to cease from superfluous travel will

have a checked impact. This is the most agitating medicinal services emergency as of late and inn appointments will go south," he included.

If Indians were encouraged in abstaining those from pointless travelling, according to a Confederation of Indian Industry report, just about 25 million or more Indians are assessed to travel outside the country in 2019 and there were around 1.8 billion household vacationers coming to our country. The Christmas period of Indians - those going inside the nation and outside is overwhelming in April to December. "The December Christmas period of 2019 endured an expected shot of just about 40-50%, the Christmas period of April to July 2020 is probably going to endure a humongous shot which could be as high as 80-100 %, except if there are certain updates on the movement of infection diminishing," the Confederation's appraisal report said that, "There are propelled abrogation and exceptionally decreased forward booking pipelines for the Christmas season. Just corporates are flying and that excessively just on exceptionally fundamental same day travel. The greater parts of the MNCs are prompting video conferencing and teleconferences, decreasing travelling", it included (Confederation of Indian Industries, 2017) [5].

Therefore, this research paper aims to determine what behavior Tourists will follow after a massive turn of events like COVID-19 as before we have seen various on-site business tours as well as leisure tours, but towards these the perception of tourists both business and normal might change. Taking into account the required safety measures and risks associated with the tourist place where the person(s) is going. This research aims to bring out the behavioral impact of Covid-19 on tourists, their perception in the areas where it started at the earliest, etc.

The following are the objectives of the research:

1. To find the changes impacting the behavior of the tourists
2. To determine what changes, we can expect from the consumer side, i.e. tourists
3. To evaluate consumer behaviour in response to going places like airports malls, etc.

4. To determine how businesses have to adjust to the 'New Normal', what would tourists want from these businesses

The paper outline follows a structured pattern: the next section provides a summary of the key topics discussed by prior literature, followed by a section describing and illustrating the conceptual model and the hypotheses of study. The methods of analysis and the analytical findings are then discussed. Followed by observation and results, these are addressed in great detail taking into account its theoretical contribution and practical implications. The final segment discusses conclusions taken, limitations and potential for the future.

### Literature Review

As crisis occurs the preparedness of the people goes up significantly, a similar crisis management plan for tourism sector is the need of the hour. The sector needs to know the tourist's perception their desires and their behaviour towards the crisis. This paper explores the effects of avian influenza on worldwide and Asian the travel industry utilizing board information strategies. Both static and dynamic fixed impacts board information models are received to appraise the effects of this irresistible illness. The experimental outcomes from static and dynamic fixed impacts board information models are reliable and show that the quantity of influenced poultry flare-ups impacts affects the universal the travel industry of worldwide and Asian influenced nations. The high death rate among people, the capability of a worldwide influenza pandemic and a few media furor with promotion and hypothesis may antagonistically influence the pictures of these contaminated goals as a sheltered traveler goal. As seen the Asian travel industry was the worst hit and the pandemics' harm to it was purposefully genuine, it is incited by ineffectual lockdown in various Asian contaminated countries. What's more, Asia was the first to be influenced locale and the zone contaminated most truly by avian influenza, both in people and in poultry. Since the likely dangers and harm emerging from avian influenza and the ensuing pandemic fluare a lot more noteworthy than for past infections, the

need to avoid potential risk in case of a flare-up of avian influenza and pandemic flu warrants further consideration and activity in demonstrating and overseeing worldwide the travel industry request and hazard [7].

The significance of the goal picture held by potential sightseers is generally recognized given its effect on the vacationer's choice procedure and at last goal decision (Gartner 1993). The downturn in guest numbers following a heart-breaking occasion gives expanding proof of this. Following the 2004 Tsunami, traveler appearances to Phuket diminished by 50.4% (Zeppel & Beaumont, 2012) [8]; guest numbers to Victoria declined essentially following the Black Saturday bushfires ; while Christchurch, NZ encountered lost 1 million visitor evenings in the year following the 2011 quake (Carlville, 2012). The worldwide accessibility and frequently sentimental inclusion by the media can quickly prompt the arrangement of negative observations and it is these discernments (which may not reflect reality) that can possibly discourage sightseers from visiting the goal [8]. The administration of such recognitions speaks to the greatest test for the travel industry goal advertisers (DMO's) and one potential clarification for this is little is referred to or comprehended with respect to the exact reasons why vacationers decide to avoid fiasco inclined zones (significantly after the impending risk has since a long time ago passed) and for those that decide to visit in any case, what rouses them to do as such. The accompanying contextual investigation presents a preview of the conduct reactions and resulting inspirations driving the vacationer's choice to make a trip to or maintain a strategic distance from a goal struck by fiasco [9].

Tourist destinations need to be mindful of their susceptibility to emergencies and disasters, whether they are man-made or not. Disaster recovery plans will be incorporated both nationally and operationally into all tourism businesses and operating plans. However, given the obvious dangers, when a disaster occurs, many tourism organizations and companies are not well prepared, and rely instead on ad hoc responses (Mair, Ritchie, & Walters, 2016). Research to help tourist

destinations decide how best to recover is fairly limited, and highly specific in many cases [11]. Literature is therefore being established in this area (Prideaux, Coghlan, & Falco-Mammone, 2008) [12] and research is beginning to show that these ad hoc interventions, especially as regards marketing, can be counterproductive and, in some cases, do more harm than good.

The TRA (Theory of Reasoned Action) and TPB (Theory of Planned Behaviour) are important to understand specifics of human behaviour [13]. The Model Goal of Directed Behaviour (MGB) in relation with TRA and TPB (Perugini, 2001) [14] is used to determine the exact relation between MGB with TRA and TPB. This paper also suggests that in order to comprehend behaviour more efficiently we need to inculcate social, motivational and affective and habitual processes. For habitual process the way people behaved in past is considered important as a means for research which can be the important aspect for human decisions. With respect to motivational process the most important factor for decision was suggested to be desire intention of the travellers. For affective process the important factor necessary to find the TPB is anticipated affective response to specific behaviour is recommended as an important variable in the process (Perugini, 2001). Ultimately if we want to understand human behaviour and perception we need to have in MGB desires, positive and negative anticipatory emotions and past behaviors as a part of original variables of TPB. In order to accommodate the decision making and tourists perception we have added the added Non-Pharmaceutical intervention and perception of people against this disease in the original framework to find the solution. It is because to find the deeper intention among the tourists (Taylor, 2007) [14] we need to include extra variable in the extended MGB [7].

### **Research Methodology**

The research paper aims to find the behavioural shift that is bound to happen in the tourist's behavior due to the COVID-19 pandemic and what it aims to find that is mainly related what and how tourist's intention would be changed after this massive outbreak which has turned upside down the entire world encompassing everyone from students to big businessman.

So, in this research paper we have designed the methodology in order to find what customers want from the tourism businesses after the pandemic. We have had also asked question to determine pre and post intention of consumer's weather how many times were they traveling pre pandemic vs. how many times they would travel after the pandemic.

For all the above stated research we have decided to go for confirmatory research through which we want to find various interventions that affect the consumers (tourists). For this through secondary research we tried to test out various factors that intervene when pandemic of this sort takes place.

#### **Sampling Method:**

Stratified random sampling is used for this research as there were two sets of people with whom the research questionnaire was shared, they were Business Employees & Student these were selected as through secondary research we found that they form significant portion of travelling people almost at around 70% (International Journal of Tourism, 2018). Through this method I was able to reach out to a total of 168 people out of which 52 are Business employees and 116 are students also out of 168 participants 51 are female and rest 117 are female. I have tried to keep it in accordance to population.

#### **Data collection method:**

For data collection online survey was floated to these people on LinkedIn and college handles in this questionnaire 31 questions were as starting from profession age and 29 questions were related to research questions. They are as follows:

#### **Frequency of travel behaviour (FOT)**

- Frequency of traveling inbound as well as outbound before the pandemic has started for last 12 months before corona started?
- Number of times you wish to travel internationally /nationally in the coming months and there after every year?

#### **Perceived Safe Experience (PSE) Highly disagree (1)/highly agree (7)**

- P1 I think airports have adequate measures for safe travel experience  
 P2 I believe proper hygiene is important in tourist places  
 P3 I believe self-dispensing hand sanitizing station will be available at restaurants and shops  
 P4 I believe proper temperature checks taken of workers and tourists at shops would be taken

#### **Perception of COVID-19 (PI)**

##### **Highly disagree (1)/highly agree (7)**

- A1 It is dangerous to travel because of Coronavirus COVID-19  
 A2 Coronavirus COVID-19 is a very frightening disease.  
 A3 Coronavirus COVID-19 is more dangerous as there is no vaccine available  
 A4 I have enough information about Coronavirus COVID-19  
 A5 I am afraid of Coronavirus COVID-19

#### **Non-pharmaceutical interventions for Coronavirus (COVID-19) (NPI)**

##### **Highly disagree (1)/highly agree (7)**

- D1 I will check the information of on Coronavirus (COVID-19) by visiting the website of the Indian Ministry of Foreign Affairs or WTO before traveling.  
 D2 I will read and check precautions about Coronavirus (COVID-19) through doctors or health centers before traveling.  
 D3 I will keep hand sanitizer and mask kit ready before going to travel.  
 D4 I will get the information about local medical facilities for preparing for an emergency because of Coronavirus (COVID-19) before traveling.  
 D5 I will frequently wash my hands while traveling and restrain from touching my eyes, nose, and mouth while traveling.  
 D6 I will cover my mouth and nose with a mask when sneezing while traveling.  
 D7 I will keep away from those who have the symptoms of Coronavirus (COVID-19) while traveling.  
 D8 I will restrain from meeting people for a while after traveling.  
 D9 I will carefully keep an eye on my health condition after traveling.

**Behavioral intention (BI)**  
**Highly disagree (1)/highly agree (7)**

E1 I wish to be stress free so I want to travel

E2 I will certainly invest time and money to travel in the near future.

E3 I am willing to travel because COVID isn't so deadly.

E4 I intend to travel because it is delightful.

E5 I want to go out as I have been inside for too much time.

E6 If only it is necessary, I would make an effort to travel in the near future

E7 In future, I would prefer online meets rather than personal

All the questions were qualitative in nature, except for the first 2 questions, for all the other questions the 7-point Likert scale was used to determine the answers given by the respective respondents. A total of 168 participants filled up this survey.

**Tools Used:**

To determine the qualitative factors on the 27 questions a general factor analysis is conducted to find what factor are involved in decision making by consumers post and during COVID pandemic, the main reason for choosing factor analysis as a method of testing the data is that. For 2 qualitative questions the frequency of travelling pre and post COVID we took the paired T-test to test the hypothesis that there will be a drop in frequency of travelling by the same set of people pre and post COVID.

**Results**

After conducting proper survey, we conducted factor analysis and paired T-test for two test datum. We get the following results after paired t-test analysis which was carried out to determine the intention to travel after pandemic and how thee travel would increase/decrease after the pandemic;

Paired Samples Statistics

	Mean	N	Std. Deviation	Std. Error Mean
Pair 1 FREQ_BEFORE	5.10	168	2.577	.199
FREQ_AFTER	2.41	168	1.909	.153

Paired Samples Correlations

	N	Correlation	Sig.
Pair 1 FREQ_BEFORE & FREQ_AFTER	168	.700	.001

Paired Samples Test

	Paired Differences					t
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		
				Lower	Upper	
Pair 1 FREQ_BEFORE-FREQ_AFTER	2.690	3.224	.249	2.199	3.182	10.816

For this we have created a null hypothesis;  
 H0- There is no significant difference between means of travelling before and after pandemic  
 H1- There is a significant difference between means of travelling before and after pandemic;

After applying 2 tailed Paired T-test we get the above stated results which can be interpreted as,

Under the table Paired Sample Correlation, we see that there is significant correlation among the before and after datum and its Significance value (sig.) is also less than 0.05 which means that we can comfortably day that they both are highly correlated.

Coming under Paired Samples Test we see that Sig (2-Tailed) is 0.001 which is less than 0.05 confidences which means that we can comfortably reject the null hypotheses (H0) and can select the alternate hypotheses (H1).

Now this means for our test is that, there will be a significant reduction in no of trips per year of a traveler after the pandemic, which would be around 3 trips after which were 5 trips before pandemic.

We also conducted factor analysis on our data for behaviour analysis where we want to find the intention among the travellers which would affect their behaviour in while travelling during and after the pandemic, looking what changes would we see in behaviour of the tourists, for factor analysis 27 questions were asked and results were found to be the following;

In factor analysis to check the significance and veracity of data we first have to check table under KMO and Bartlett’s Test,

**KMO and Bartlett’s Test**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.781
Bartlett’s Test of Sphericity	Approx. Chi-Square	2442.300
	df	300
	Sig.	.000

Here we saw the Kaiser-Meyer-Olkin measure of sampling adequacy to be 0.781(78.1%), which is far greater than the 50% threshold which means that our sample size is adequate to conduct the analysis. Moreover the Sig. value of our data is 0.000 which is lesser than 5% which means that our data is adequately significant to conduct the factor analysis.

Secondly, we see under Communalities under the Extraction column we see that all the questions asked were having good extraction values above 0.6 which means for all the components at least 60% of variance can be explained using data set.

Now let’s see under the table named Total Variance Explained, we see that 7 components have Eigen values to be greater than 1 which means that only those factor components are selected which have Eigen values greater than 1 here there are 7 factors and after loading data.

**Communalities**

	Initial	Extraction
D1	1.000	.607
D2	1.000	.825
D3	1.000	.751
D4	1.000	.746
D5	1.000	.646
D6	1.000	.636
D7	1.000	.385
D8	1.000	.730
D9	1.000	.744
P1	1.000	.609
P2	1.000	.883
P3	1.000	.884
P4	1.000	.718
A1	1.000	.789
A2	1.000	.813
A3	1.000	.852
A4	1.000	.852
A5	1.000	.813
E1	1.000	.750
E2	1.000	.471
E3	1.000	.792
E4	1.000	.753
E5	1.000	.787
E6	1.000	.760
E7	1.000	.780

Extraction Method: Principal Component Analysis.

**Total Variance Explained**

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.726	22.906	22.906	5.726	22.906	22.906	3.553	14.211	14.211
2	3.942	15.766	38.672	3.942	15.766	38.672	3.157	12.626	26.838
3	2.638	10.550	49.223	2.638	10.550	49.223	2.964	11.858	38.695
4	1.908	7.632	56.855	1.908	7.632	56.855	2.815	11.258	49.954
5	1.638	6.552	63.407	1.638	6.552	63.407	2.581	10.246	60.199
6	1.292	5.169	68.576	1.292	5.169	68.576	1.660	6.640	66.839
7	1.224	4.897	73.473	1.224	4.897	73.473	1.659	6.634	73.473
8	.892	3.568	77.041						
9	.661	2.644	79.686						
10	.643	2.573	82.258						
11	.588	2.271	84.530						
12	.485	1.939	86.468						
13	.454	1.816	88.284						
14	.408	1.631	89.915						
15	.372	1.488	91.403						
16	.337	1.346	92.749						
17	.325	1.298	94.047						
18	.278	1.113	95.160						
19	.246	.986	96.145						
20	.213	.854	96.999						
21	.192	.769	97.768						
22	.177	.706	98.474						
23	.165	.659	99.133						
24	.149	.597	99.730						
25	.068	.270	100.000						

Extraction Method: Principal Component Analysis.

Cumulative Variance column under total variance we found that by using these 7 factors we can deduce 73.473% of variance in the data set, which is quite good.

Looking at the Rotated Component Matrix now we have deduced following results;

Components D1, D2, D3 and D4 are more correlated with Factor 3 their factor loadings as seen in the table are, .759, .882, .850 & .848 which means that all the factors are significantly correlated. The question asked for these components were, these questions were related to Governmental Non-Pharmaceutical Intervention while travelling which essentially

means what information government is giving to travellers while travelling inbound or outbound.

Rotated Component Matrix<sup>a</sup>

	Component						
	1	2	3	4	5	6	7
D1			.759				
D2			.882				
D3			.850				
D4			.848				
D5				.757			
D6				.673			
D7				.535			
D8				.815			
D9				.775			
P1		.752					
P2		.916					
P3		.910					
P4		.797					
A1					.871		
A2					.842		
A3					.885		
A4						.895	
A5						.818	
E1	.844						
E2	.627						
E3	.873						
E4	.785						
E5	.845						
E6							.805
E7							.861

Extraction Method: Principal Component Analysis.  
 Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 5 iterations.

Component D5, D6, D7, D8 and D9 have factor loadings of 0.75, 0.67, 0.53, 0.81 and 0.77 which means that all these components/questions are related to Factor 4 after the analysis and these factors are also significantly correlated, the factor after looking at the questions can be described as Personal Non Pharmaceutical Intervention which means

that using personal protection is a component that is found essential for the travellers.

Component P1, P2, P3 and P4 have factor loadings of 0.75, 0.92, 0.91 and 0.80 respectively which essentially means that all these components/questions are significantly correlated to Factor 2. After reading these questions we found that this factor is related to Perceived Safe experience During Travelling at airports, train-stations etc. and also while traveling.

Component A1, A2 and A3 have factor loadings of 0.87, 0.84 and 0.89 respectively which means that all these components/questions are significantly correlated to Factor 5. After reading the questions we found that this behavioural factor is related to Family's/relatives Perception of COVID-19.

Component A4 & A5 have factor loadings of 0.90 and 0.81 respectively which essentially means that all these components/questions are significantly correlated to Factor 6. After reading the questions we found that this behavioural factor is related to Personal Perception of COVID-19.

Component E1, E2, E3, E4 and E5 have factor loadings of 0.84, 0.63, 0.87, 0.78 and 0.85 respectively which essentially means that all these components/questions are significantly correlated to Factor 1 after thoroughly reading the questions we found that these factors are related to Behavioural Intention to travel in present conditions.

Components E6 and E7 have factor loadings of 0.81 and 0.86 respectively which essentially means that all these components/questions are significantly correlated to Factor 7 after thoroughly reading the questions we found that these factors are related to Behavioural Intention to travel in future.

### Conclusion

From the above-mentioned results, we could conclude that there will be several behavioural changes that would appear that haven't existed before these pandemics these factors are to be kept in mind by several business houses that are related to travel and tourism industry. These factors are important to be kept in mind by the business houses as they will determine that how good their business is going to be

after the pandemic and during the course of pandemic. After conducting research there are several behavioural factors that came into our eye that will have importance for the tourists while travelling abroad and inside our own country. These factors determine the behavioural aspects of how travel and tourism would look like by getting into the shoes of the consumers. There were 7 major and 4 four umbrella factors which were related to the travel and tourism these are as follows; 4 umbrella factors includes, perceived safe experience, Non pharmaceutical interventions, perception of COVID-19 and Behavioural intention out of these they were 7 factors found out, viz , Behavioural Intention to travel in future, behavioural intention to travel in present conditions when pandemic is on-going, tourist's self-perception of how dangerous is COVI-19 meaning if it is more or less deadly, others relatives and family members perception of COVID-19 regarding their travel, perceived safe experience of travelling, personal non pharmaceutical intervention while and as on the tour weather having masks, sanitizers, infrared thermometers makes tourists believe they are safe to travel, governmental and businesses related non- pharmaceutical interventions this factor was related to how governmental advisory and businesses preparedness regarding social distancing norms would play a vital role in selecting and going to the tourist spots and various hotels. Through these mentioned factors we are sure that business have to change for good keeping in mind what tourists want from them also they need to make sure they continuously gauge their consumers behaviour what they want

new? And how can they change? And this would help them in their bottom lines?

One more part of this research was to determine as the no of trips would increase or decrease after or when the fear part of pandemic would have subsided we have hypothesised that there would be no change or the no of trips would increase after the pandemic, but to our astonishment we found that there was reduced intention among tourists to travel, and these were mostly Indian tourists travelling to other countries and business travellers who frequently travel or those who mostly travel abroad.

### Limitations

Although we tried to reach every aspect of consumer behaviour there are several limitations and more scope of research that can be conducted on this sector. Firstly, due to limited interaction the one on one interviews which would add more taste to research was not done which reduced the real insights what we could have gotten, other is that the research revolves around the consumer preferences only and not on how travel and tourism businesses more if it were on both it would have two sides of perspective but this was not possible due to COVID-19 as most of the hotels were closed for doing research which would have added more depth in doing the research. Other limitation of our research are the segments of participants which participated in the research as there were only two types of travellers taken into consideration, business employees and students if it was increased to more segments it would have given more crispier analysis.

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**FRAUDS IN DIGITAL ADVERTISING AND METHODS FOR ITS PREVENTION AND DETECTION – A LITERATURE REVIEW****Pranav Sahasrabuddhe<sup>1</sup>, Chetan Dhemre<sup>2</sup>, Gurudas Nulkar<sup>3</sup>**<sup>1,2,3</sup>Symbiosis Centre for Management and Human Resource Development, SCMHRD,  
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<sup>1</sup>[pranav\\_sahasrabuddhe@scmhrd.edu](mailto:pranav_sahasrabuddhe@scmhrd.edu), <sup>2</sup>[chetan\\_dhemre@scmhrd.edu](mailto:chetan_dhemre@scmhrd.edu), <sup>3</sup>[gurudas\\_nulkar@scmhrd.edu](mailto:gurudas_nulkar@scmhrd.edu)**ABSTRACT**

*Purpose:* The purpose of this study is to conduct exploratory research about fraud in digital advertisements (Ad frauds) and investigate its effects on the business. The paper also aims at identifying various methods of detection and prevention of ad frauds.

*Research Methodology:* The research is carried by studying the existing literature, scholarly articles, vendor documents and reports. The key approach is to compile the knowledge to understand ad frauds and approaches to classify and deal with them.

*Findings:* The study finds different approaches which are needed to counter different types of ad frauds, required strategies and action plans.

*Value:* The paper attempts to understand ad frauds, its effect on business and roles of fraudsters, anti-fraud service providers, international organizations, and companies involved in the digital advertisement sector in shaping the current scenario of dealing with frauds. The paper also serves as a guide to students and professionals on the topic of ad frauds.

**Keywords:** digital ads, ad frauds, click baits, bots, ad security, malware, fake traffic, fake impressions

**Introduction**

Online advertising has been a hot topic since its beginning in the late twentieth century. Brands got a new channel to reach out to potential buyers and increase their visibility. When digital advertising was still new, the players treated it just like the traditional print media advertising. The advertiser and publisher would set up a meeting and case by case details of transactions were determined. The process was personal relationship-driven [1].

As the internet advanced and the market grew manifolds, this became impractical. Technological advancement also gave rise to targeting particular audience segments. In order to streamline the processes, automated systems like ad servers came into usage and the transactions lost its personal touch.

Newer channels apart from websites like social media, video, and mobile (apps) became equally popular. Online advertising is important for the entire media industry because of its influence. Advancement in web and data collection techniques has had a major impact on the digital economy [2].

As the market became diverse and complicated, it attracted significant

investments. This opened doors for cybercriminals into digital ad spaces. This exploited the advertisers and publishers and siphoned off huge chunks of revenues [3].

This paper gathers more information about digital ad frauds and provides initial guidelines for anyone who wishes to operate within the digital ads ecosystem. In this world of data driven decision making, many managers, marketers and businesses are short of information about ad frauds, and in turn end up spending more on digital advertisements. Many papers are technical based while many others are advertisement brochures. This paper aims to fill the gap and create a structured information handbook for executives to help in their policy and decision making process.

**Methodology – Selection Of Literature**

The selection criteria for papers to review was established to satisfy the objective of the paper and is aligned with the scope.

The advent and development of ad frauds is linked with improvement in the technology that delivers advertisement. The methods to create fraud and detect them have changed over the years. Hence, relative old papers and articles

which offer basic or indistinct information have not been included in the review process. As this review document aims to provide necessary guidance for decision making, articles that deal with best practices, identifiers of fraud, and dealing with frauds have been chosen. Likewise, the articles that deal with the back end technological aspects of creating, delivering, identifying and eliminating frauds have not been considered.

The sources from which the articles were searched were Google Scholar, Scopus, news/case articles referring the AdTech service packages offered to counter ad frauds and company websites.

**OverviewOfTheLiteratureReviewed**

The literature considered for review can be classified into three broad categories – published research articles by researchers, studies conducted by technology and consulting companies in digital ad ecosystem, and product documents by vendors. In general, the scholarly articles focus on the advent of ad frauds, types and identifiers. These research papers and study documents are important from the point of view of understanding the basic subject, and for further research pertaining to fraudulent practices.

The product documents explain the particular problems and solutions offered by the vendors. They provide latest technological solutions and trends along with some cases to have better understanding. These company published documents are good wealth of information, but are primarily created to lure a potential customer and hence we must not completely rely on the information provided without any confirmation of the same.

Some important literature reviewed are given here –

**Table I. Some Reference Articles**

Author(s) / Company	Title and Year	Type	Key Points
Stone-Gross, B., Stevens, R., Zarras, A., Kemmerer, R., Kruegel, C., & Vigna, G.	Understanding fraudulent activities in online ad exchanges (2011)	Scholarly Article	History and advent of digital ad fraud, Defences against frauds through ad exchange.
Adform	What Is Ad Fraud and How Can It Be Prevented? (2019)	White Paper	Advent, business effects, impact, and classification of ad frauds.
Sizmek	Fraud in Digital Advertising (2014)	Product Document	Bot frauds, Malicious and substandard frauds.
Yuan, S., Abidin, A. Z., Sloan, M., & Wang, J.	Internet advertising: An interplay among advertisers, online publishers, ad exchanges and web users (2012)	Scholarly Article	History and advancement in digital advertising.
Choozle	Fraud Prevention, Brand Safety, & Viewability (2018)	Product Document	Viewability fraud and general guidelines
Interactive Advertising Bureau	Traffic Fraud: Best Practices for Reducing Risk to Exposure Released (2013)	White Paper	Advancement in frauds, impacts, delivery, and solution to fraud, and general guidelines.
Xu, H., Liu, D., Koehl, A., Wang, H., & Stavrou, A.	Click fraud detection on the advertiser side (2014)	Scholarly Article	Click fraud effects on advertisers
Which50 and Adobe	AdTech and MarTech - A Guide for the Modern IT Pro	White Paper	Ad exchanges and advent of Programmatic advertising
Cybage	Proactive Campaign Monitoring Against Ad Frauds and Performance Anomalies	White Paper	Establishing proactive policies

**Literature Review**

Following is the well-structured literature review in terms of advent, impact and types of ad frauds, followed by how to deal with it in terms of prevention and detection.

**A. Digital Advertisements Ecosystem**

Digital advertising is a buyer-seller relationship. The buyers are the advertisers who buy ad spots and sellers are the publishers who sell their available ad spots. The aim is to promote brands on internet-powered channels like websites and apps. Brands get visibility across internet and its plethora of services. To facilitate this trade-off, many other entities

came together and created a marketplace. These are the demand side facilitators and supply-side facilitators. Intermediaries like ad networks and trading desks came to being and helped facilitate the deals to earn through commissions [4]. So getting a deal became a broker process that aims to maximize its profits from all parties [5].

Nowadays for better targeting of users, ads can be customized using a web user's browsing behavior, interests, and geographic location. The user data is gathered through cookies, analyzed and the ad is served based on the company strategy. To meet the huge demand and manage complex relationships between ad spot buyers and ad inventory sellers, 'ad exchanges' are employed [5].

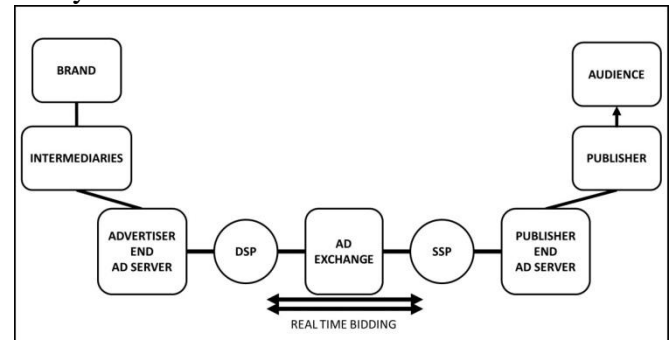
Ad exchange is simply a marketplace to facilitate buying and selling spots for digital advertising. The ad exchange is run in an automated, real-time fashion where the publishers make ad spaces available for advertisers [4]. In that split second, the highest bid is considered as the winner of the auction and displays advert for the particular user, by using any personal information collected [6]. Like any orthodox marketplace, the dynamics of demand and supply decide the price – here it is based on CPM. CPM - 'cost per mille' - is nothing but cost per thousand impressions.

The bidding mechanism of ad exchange is known as 'programmatic'. Programmatic Advertising is considered as a novel and data-driven technique in online advertising. This new technology sparked rapid growth in display and video advertising. Programmatic has the high potential to guarantee both - targeting of right audience and allocation of right ads - on a real time basis [7].

As the technology advanced, Programmatic Advertising evolved the digital advertisements to a fine-grained and 'customer moment' buying model, for better allocation of company resources. The most used form of programmatic is real-time bidding (RTB) auctions [8]. Probably the most important development with the advent of programmatic is less human intervention and negotiation between the parties while closing a deal. A software program automatically completes the sale of advertisement resources.

The global spending on digital ads was around USD 273 billion in 2018, roughly 43.5% of all advertising expenditure. This number is huge, therefore we know how digital channels for advertising are truly thriving [9].

With so many positives in this field, something is making the digital ad industry suffer. Advanced technology, lesser human interference and a huge rise in the digital advertising industry attracted criminal minds and gave rise to fraudulent practices in this ecosystem.



**Fig. 1. Block diagram of the programmatic advertising ecosystem, based on 'AdTech and MarTech A Guide for the Modern IT Pro' by Which50 and Adobe.**

## **B. Adfrauds – Definition, historyandcurrentscenario**

Ad fraud is defined as the practice of deliberately driving ad impressions having no potential of being shown to an individual. Ad Fraud is a crime because it is deliberately designed to rob advertisers by stealing from their advertising spend [10].

The question arises is 'why ad fraud exists in the first place?' Ad fraud, like its cousin malicious software, exists for money. As the internet became widely adopted and commercial power of the internet became known, organized crime networks arose [11] and they employed sophisticated programmers to develop malware, spams, and phishing.

Especially when huge amounts of money are involved and changing hands frequently, fraudsters take advantage and hide in the crowd. We therefore often find out high fraud rates at the end of a month, quarter, etc. when budgets are expended [12].

Ad fraud originated from spams [11]. Spams provided initial monetization opportunities from bots. 'Bots' are small programs made to mimic human behavior, so are difficult to

detect as they operate from genuine user computers. These bots drive robotic traffic by performing many human-like activities on the internet. 'Botnets' are the groups of such bots hosted on many different unsuspecting computers [13]. Many bots can simulate online engagement, but they do not generate real e-commerce conversions by buying goods or services [3].

Eradicating bots is easier said than done because bots are software codes that use computers of regular people. The botnet operators can easily jump from one server to another if detected [12].

As the internet advanced, search engine marketing (SEM) also developed, and, lack of awareness and knowledge created an ideal situation for click fraud. As new channels like video or mobile emerged, they became new breeding grounds for fraudulent practices [13]. When we broadly say 'ad fraud', we refer to issues of ad viewability, brand safety, and bot fraud. Publishers with ill intent and cyber criminals try to exploit any one of these areas to siphon off revenues from advertising spend [9].

### C. Who is affected by Ad Frauds?

All the parties involved in the digital ad ecosystem are affected by the presence of fraudulent activities [1]. Advertisers lose money when their ads are shown to bots or are not properly visible. This affects their ad campaign and the marketing objective will not be fulfilled.

Ad tech vendors are impacted as they spend huge amounts of money each year on increasing bandwidth, lost bids and countering attacks. This becomes a major added cost of doing business.

Publishers lose money because the fraudsters are causing CPM prices to be artificially lowered by crowding ad exchanges with cheap and illegitimate ad placements.

### D. Impact of Digital Ad Frauds

The biggest impact of ad fraud is the wastage of advertising spend. There are many other usually overlooked costs like continued investment in low quality-high fraud traffic sources, wastage of valuable time in investigations of fraudulent sources and damaging the overall campaign performance.

Apart from monetary losses, the digital media gets maligned and naturally, the companies look elsewhere for marketing their products or services. The performance data with the companies gets contaminated and analysis is undermined. Also strategizing business without reliable data becomes difficult. As the frauds grow in numbers, the value of legitimate publishers decreases [3].

The precise impact of ad frauds is difficult to measure as there is no fixed definition of ad fraud. Evidently, fraud is 20-35% of all ad impressions. This value varies as per the type, format and location of ad. Also, ad frauds share some traits with some other internet frauds. So the industry estimates drastically vary on the financial impact of ad frauds - from 6 to 42 billion losses in 2019 [1].

Another problem is that the earnings through fraudulent practices are not disclosed. So the difference between publishers' income and advertisers' expenditure is used to approximate the value of losses to frauds. Now with prices of ads varying on a real-time basis on multiple factors, this task gets even more complicated [1].

Logically, rather than spending time on finding the exact volume of fraud, we must stop the practice itself. But this is easier said than done. Because of advancements in technology and the focus of fraudsters to remain incognito, the ad fraud landscape keeps on changing very often, even on weekly basis [14].

Ad frauds were estimated to be around 6 billion USD in 2015, with bot traffic more than 50% [11], with the numbers growing each year. Apart from this, annually 5 billion USD are spent to counter frauds. Another estimate states that fraudulent practices are around a third of all paid impressions [13] all while ad spends are expected to grow to \$250B by 2018 [11].

### E. Types of Advertising Frauds

The complex technology and its usage means that there are multiple types of frauds. We must understand each type of fraud to effectively deal with them. Classification can be done based on either technology used, how it affects businesses or the basic principle of fraudulent activity.

A simplified way is to classify ad fraud into three fundamental categories: Fake Traffic,

Fake Supply, and Fake Data with a variety of techniques used for each [1].

1) Fake Traffic: Fraudsters falsely inflate the number of visits and engagements on any website. This action increases 'impressions' which increases revenue in a CPI or CPM model. Fake traffic can be created by -

- Human traffic impersonation: This includes tactics like Bots or Click Farms. Bots are used to mimic human behaviour. 'Click Farms' are a group of humans who are paid to interact with advertisements, websites, or videos to drive up the traffic. The ad network pays the publisher for the undetected fraud, but it charges advertisers even more. So, In click fraud, both the entities - publisher and ad network - benefit while only advertisers are victims if the deal is as per the pay-per-click model [15].

- Invalid human activity: Here ad activity happens in the background while a user is surfing on web. Method used to create such fraud is 'Ad Stacking', where multiple layers of ads are stacked one over the other as single ad placement, but only the topmost one is actually visible. The user, therefore, does not see any other ad, but the advertiser has to pay as it counts as a 'view' in the system [16].

Another technique is 'Pixel Stuffing' where the ad is placed, but it is so small that any human viewer cannot notice an advert on the screen. Still, the brand ends up paying for this 'ad' [16].

- Hijacking: Fraudsters take control of a user's device (or browser, app). It is then modified to perform a certain task like loading a page or clicking a link that will create ad requests. This generates fake traffic.

2) Fake Supply: Fake supply occurs when advertisers bid on illegitimate ad placements considering that they are genuine. Different techniques that fraudsters employ to create fake traffic are [1] -

- Domain Spoofing: A genuine website URL is substituted with a fake one at the moment of a bid and the ad is delivered on a different location.

- Cross-Domain Embedding: A fraudster connects two websites through an iFrame - one having high traffic but low-quality content and other one having low traffic but desired content. Advertisers pay higher for the desired site and reporting will show that it was the

case, but in reality, the advertiser is tricked as the ad is placed on the different, undesired site.

- Custom Browsers: Fake websites are created which are unreachable to human users, which then send an ad request falsely representing a genuine site.

- Ad Injection: A website is hacked and ads are injected without consent of the publisher [17]. This combined with ad stacking can cause higher amounts of fraud.

3) Fake Data: The ad campaign data is manipulated as it reaches the buyer system. The fraudsters then show faked metrics like more impressions or visits and high viewability that is related to performance. In the case of fake data, there is no case of risking brand safety or affecting ad viewability. It is just getting wrong campaign data at the advertiser's end [1].

Another way to classify ad frauds is according to its underlying technology. By this logic, frauds can be classified as frauds which are malicious and frauds that are substandard in placements [13].

'Malicious fraud' can be then be termed as per its technology

- Bots or Botnets: Bots are used for targeting certain websites at times by overloading its servers such that it reaches the point of failure [13]. Bot fraud provides criminals with the best earnings potential with low risk and efforts. Botnet systems are controlled by criminals known as "command and control operators", who drive the fraud activities [11]. Ad frauds will grow in volume as cybercriminals have access to better tech. Nonetheless, bot fraud presents the greatest threat [9].

- Ghost Sites: Ghost sites are real and genuine websites with real content but are stolen from a legitimate publisher for defrauding the advertisers. Ghost sites actively participate in ad exchanges for RTB.

- Ad Stacking: Ad stacking became used more with a newer format of ads and channels like video or mobile, using tricks like auto muting videos.

- Adware: Adware is installed on a device to serve ads to users and boost ad consumption. This does not use bots but is harmful to users and advertisers.

'Sub-standard placements' trick the advertisers and web users as the ad is not served as per requirements. Examples of this type of fraud are 'Autoplay' videos that increase video impressions, placing ads 'below-the-fold', and even playing videos while keeping it mute by default [13].

Yet another way of classifying ads is by the effect it causes to the businesses. This brings us to Ad viewability fraud and Brand safety [9].

- Ad Viewability: From the marketing point of view, how viewable the ad is on a page or app matters a lot. When an ad is purposely placed where it will not garner enough views it is a fraud. Pixel stuffing and Ad stacking among others cause a lack of visibility [18].
- Brand safety: Ad spot must aligns with brand reputation. Brand safety is affected if the ad placement is next to violent/graphic content or even an irrelevant context. Proper content, terms, and context must be ensured. When an ad is deliberately placed on undesirable sites, it is a fraud [19].

#### **F. How Ad Frauds Are Set-Up and Delivered**

Traffic fraud runs in an organised manner, fooling both buyers and sellers. The fraudsters corrupting the digital ads ecosystem also usually engage in some other criminal activity. So when we ignore traffic fraud they also gain momentum in other criminal activities [3].

The first step is infiltrating legitimate systems. Bots usually ply in legitimate systems and get unnoticed. Some ways by which fraudsters infiltrate genuine systems include asking users to install some toolbars in their browsers, bundling certain hidden applications while downloading files, inserting code snippets, using malicious code, or using genuine web pages as fronts for their fake businesses [3]. An installed malware has access to personal information, which can create a 'crowdsourced' feel for publishers after simulations [11].

On successful infiltration, bots try to generate fake traffic. The main objective of setting up ad fraud is to generate profits. Like any greedy illegal businesses, ad fraud criminals show a common theme to go for high-profit margins. The fake traffic, even if small in volume

compared to actual traffic, causes significant diversion of advertising budgets [3].

The basic ways by which fraudsters make money include [11]:

- Spam and traffic: Selling spams to advertisers and selling cheap traffic to publishers who want to broaden their ad inventory.
- Pirate Site Generation: Cheating advertisers by selling their robotic inventory and displaying ads on fake sites through an ad exchange.
- Conversions: Fake clicks and conversions on PPC or CPC campaigns.
- Other methods: Being part of a legitimate network that pools inventory for buyers - like any ad networks which remains unaware of the fraud, infecting legitimate sites with bot code and creating network out of it - a botnet – which then generates revenue-generating traffic and making ad calls that have ad stacking or pixel stuffing techniques [3].

#### **G. How to Deal with Ad Frauds**

Frauds and crimes have a deteriorating effect on any industry. All affected parties like advertisers, publishers, and different vendors must have plans and mechanisms to deal with ad fraud and cybercrime. The prerequisite to come up with an action plan is understanding our vulnerability and accepting that any entity can be a victim of fraudulent practices.

Guidelines for prevention and detection of ad frauds can be based on its fundamental classification – fake traffic, fake supply, and fake data [1].

The solution to fake traffic lies in advanced technology. Innovation is a continuous process. As fraudsters adapt to the latest technology, so should the ad ecosystem players. Technology that can detect and understand different fraud techniques can help in countering fake traffic [1], [20].

The solution to fake supply lies in diligently adopting the Industry Standards. The initiative of 'ads.txt' from Interactive Advertising Bureau (IAB) Tech Lab to launch a text file that ad buyers can see on a website for the list of authorized ad inventory sellers has been quite successful. Such a transparency driven initiative could have prevented huge frauds in the past. Other similar initiatives like app-

ads.txt and ads.cert by IAB provided further vigilance. Using these features, buyers can check the validity of a seller to offer particular ad spots [1].

The solution to fake data is taking responsibility for your campaign metrics and other data. To avoid data tampering, marketers must define the KPIs, measure the results on a timely basis, and analyse them. If something looks strange, it must be questioned until we get satisfactory answers. Only by such monitoring, marketers can know how the ad campaign actually performs.

Many AdTech and MarTech providers provide fraud detection software solutions for different purposes. These include tackling ghost sites and bad placements by eradicating it from reports so that advertisers do not end up paying for that [13]. For video ads, different types of metrics and mechanisms are set up so that advertisers understand the campaign scenario.

Solutions providers analyse the traffic patterns of the websites and distinguish regular and abnormal behaviours to identify suspicious activities. Later on, these are checked across data sets in public and private domains to identify fraud sources.

Some other solutions have 'network-wide blocklists' which can be linked with the Demand Side Platforms (DSP) from the advertiser. In particular campaigns, 'internal blocklists' can be used to detect frauds and improve viewability [21]. Companies should build their own set of whitelists and blocklists while also using third party lists.

As the scope of programmatic advertising grows beyond simple display or video ad placements to audio, radio, and TV ad placements, the role of ad exchange becomes vital. The ad exchange is at the heart of the bidding process and also it is the focus of criminal activities. The known defenses against ad frauds through ad exchange are [5]:

- **Signature-based Detection:** This method uses static rules to distinguish between genuine and fraud sources of traffic. One example would be of the second click from double clicks on an ad creative to be considered invalid. When some malicious patterns are known or can be deduced, this method is highly beneficial.

- **Anomaly-based Detection:** This involves using past data and find sudden changes in traffic patterns. This method is useful for identifying misbehaving publishers and instances when fraudsters change the type of attack on the campaign.

- **Reverse Spidering (Auditing):** This is a practice of ad networks, ad exchanges, or advertisers to audit the referring sites by crawling the HTTP Referer. The reverse spiders look for any potentially illegitimate content.

- **Bluff Ads:** Ad network serves bluff ads to a publisher only to detect any fraudulent activity. These ads are designed to be bland that no human would want to click on it and when it attracts attention, fraud is a natural conclusion.

- **Web Site Popularity and Page Rankings:** Impressions rating of a publisher can be checked against known, trusted website rankings. If the publisher shows more traffic than the ranking, it is indicative of fraud.

- **Performance-based Pricing:** This type of pricing does not pay on impressions but on how much return on investment (ROI) an advertiser gets from a publisher. CPC and CPA are examples of performance-based pricing. Publishers are therefore bound to give measurable benefits to the advertisers, thereby reducing impression frauds [5].

Strategic approaches and checklists must be in place so that any misstep leading to fraud is avoided. These include checking the ethics of partners and having the right tools at discretion whenever required. Listed below are some decision-making guidelines which help in preventing bot frauds [20], [3], [22].

#### **H. Action Plan for All Stakeholders**

- As the issue hurts everyone, a blame game may not help. Firms must therefore create allies and not adversaries in the fight against bot fraud. Advertisers, intermediate agencies, and publishers must all work together to reduce bot fraud.

- Detection of bot fraud does not indicate that the intermediary or publisher is at fault. Reasoning and collective effort only can help in resolving such issues.

- Approving third-party traffic validation technology in the system helps eliminate known fraud causing bots. Publishers and



intermediaries must allow such action and advertisers should actively use it.

- Policy and procedures can be defined for advertisers to deploy any of their tools and software while buying ads.
- Supporting the Trustworthy Accountability Group (TAG) which is created to eradicate any digital advertising fraud, malware, ad-supported piracy, and other deficiencies in the ecosystem. All vendors are expected to comply with TAG's quality assurance guidelines.

### I. Action Plan for Buyers

- Set goals in terms of impressions, KPIs, and other measurable metrics, before buying any ad inventory. Accommodation for fraud can be done in the goals itself. This way the advertiser may be better at monitoring the campaign.
- Goals should be documented clearly at the time of the deal. This way the buyers only pay for what was expected out of the deal and publishers cannot loot them later on.
- Some results that may be too good to be true may actually be that way. Being aware and requesting transparency whenever in doubt reduces the risk, especially in the case of sourced traffic.
- If buyers have an option of rejecting any sourced traffic and running their advertising only on a publisher's organic site traffic, it should be tried and tested.
- Measuring end results is always the best way to judge a campaign. As bots cannot buy any products or engage like humans, this is a way to measure and improve campaigns. Purchases, subscriptions, verifiable brand survey results, validated panels are the measures that indicate human interaction; whereas measures that bots can fake are Ad views, clicks, CTR, video completes, cookie attribution.
- Selective and periodic monitoring like once a month or only on a channel at a time leaves loopholes for fraudsters to manoeuvre. Relentless monitoring is always preferred.
- One of the strategies to evade bots is applying day-parting. Bot frauds are higher from midnight to early morning hence not running campaigns at those times is effective.
- Making and updating blocklists should be diligently followed.

- Older browsers are prone to bot attacks. Reducing older browsers' impressions and buys for older browsers will therefore help.
- The allocation of a certain budget for security helps in reducing losses due to fraud. For advertisers, it is crucial that they align with partners having good intentions. Ensuring the publisher is trustworthy and not pro-fraud is a prerequisite to any business deal. Some ways in which advertiser can judge the quality of publisher and websites are –
- The publisher should have their audience measured by independent vendors to spot anomalies.
- Bad site quality does not imply traffic fraud, and high quality does not ensure that they cannot be targeted by fraudsters. Screening every site for fraud can help in decision making and save buyers from fraud losses.
- Websites must have proven methodologies to differentiate between bots and humans that engage with their content.
- Autoplay video ads that are susceptible to fraud have different metrics in place that differentiate actual ad engagement with fraud.
- Each publisher should be able to provide information on established approaches of counter-fraud measures.
- Large volumes of traffic and poor placements should be investigated for cybercrime and real time traffic monitoring should be in practice.
- Unusually large traffic volumes and placements which perform poorly should be investigated for malicious virus activity. Real time monitoring of website traffic patterns would allow us to recognize anomalies resulting from malware.

### J. Challenges in Fraud Prevention and the Rising Importance of Security

There are ad frauds techniques and then there are techniques to counter them. There is always the competition of who has better technique, technology, and intelligence between the two - fraudsters and those who counter them. Because of their swift flexibility and cash at disposal, fraudsters are always at advantage. This section deals with the prevalent challenges in tackling ad frauds and why we must give more importance to this issue.

Considering only mobile ad fraud, 'Adjust' found that fraud rates almost doubled in 2017 and 2018. 'eMarketer' predicted mobile ad spending to rise by 20% in 2018 and reach more than USD 75 billion in the US alone. With more than 7% rejection in paid installs as per Adjust, the sheer volume of fraud is gigantic up to USD 4.9 billion.

Frauds are rising even as we counter them simply because traffic fraud is not at all easy to detect [3]. Bots initially thrived on large data serves and behaved in a linear, predictive manner, easier to detect. The solutions provided by the vendors to block spams and malware were successful [11]. Thereon, cunning criminals improved bots to become parasites in any simple computer system. This development made the detection process exponentially difficult. Reports indicate that this type of fraud is growing more in recent years [9].

Distinguishing fraud from normal human activity is difficult just by looking at the data. As we improve our tech-driven and data-driven practices, so do the criminals. So we end up as police trying to catch a thief forever [1].

Sometimes click baits are used to inflate publishers' own impressions on websites or videos. Purchasing traffic is acceptable, but fraudsters take advantage and make their dirty move [3].

But the efforts taken by counter-fraud activists must be regarded as well. There has been significant improvement in the measures taken by companies and the solutions offered by AdTech vendors. Nonetheless, looking at the prevalent costs of fraud and potential costs, and with the competitive business scenario that advertisers face, it will be even more difficult to counter frauds [9].

Cybercriminals are fast, flexible and alter the bot algorithms frequently to camouflage as genuine internet users. Even if we are a step ahead on technology front it is hard to pinpoint who is responsible for a certain ad fraud [9]. It could be SSP or DSP or any other entity.

As the influence of programmatic advertising grows, fraudsters have started to target channels other than display ads [1]. Increased complexity and fragmentation of the underlying technology makes it harder for the platforms to tackle frauds. Channels like video,

audio, and social media are seeing tremendous growth in frauds. Even worse is when fraudsters merge two fraud techniques for different channels into one [1].

Due to competitive environment marketing teams are under pressure to deliver better results from every campaign. So they are lured to cheaper deals on the ad ecosystem, and without thoroughly scrutinizing them, the brands buy the deals [1]. This is not really careless action because of high pressure and that counter fraud measures are already set up. But these are 'cure' mechanisms while what we need are 'preventive' actions. The hasty nature of business is also a challenge in fraud prevention.

All stakeholders must understand their vulnerabilities. Knowledge is key to prevent ad frauds. Reading regularly published studies to update ourselves is crucial. Many of the reports released are from companies offering solutions to tackle fraud. There can be some intent to hide, devalue, or exaggerate some numbers to keep their business running. Hence, advertisers need awareness of underlying technology and techniques to be able to make wise decisions when opting for solutions [13]. Advertisers must also understand that by even reducing the fraud, they get higher conversion rates this might make them pay higher CPM for fraud-less impression offering sites [1].

### Remarks

As we all benefit from the world of digital marketing, we also have to face issues while using it. Frauds have shaken the world of digital marketing and everyone who is part of the ecosystem. We can be optimistic about the MarTech and AdTech systems to evolve enough to counter the fraudulent practices, but as a small part of the system, it is also the responsibility of every individual, working in the advertiser company, any facilitator firm or publisher company, to be alert.

To protect the investments and making most out of the digital ad technology, we must be vigilant at every step. Advanced technology could be an asset or tool which empowers us, but it is the knowledge required to wield that power which is crucial in fending off ad fraud attacks.

There is no way to completely eliminate frauds, but we can manage and reduce the threat in a better way. Vigilance and updating, upgrading are the keys to success.

Anyone in the system is vulnerable to the frauds. So instead of resorting to a blame game, all the players must work collectively as a team to be safe from ad frauds.

### Conclusion

This literature review attempts to gather useful information in terms of reasons and types of frauds, and methods and policies to deal with it. The paper sequentially takes the reader from the advent of digital advertising to current scenario in the ad ecosystem. This is presented

in systematic way to emphasise on the issue of ad frauds which is neglected at times in the business world. The impact, importance and necessity to focus on the issue of fraudulent practices is rightly explained.

This document can serve as good study resource for researchers to carry further studies and companies to establish policies to prevent frauds and develop measures to tackle ad frauds.

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**FINANCIAL FEASIBILITY OF OFFSHORE WIND POWER PROJECTS****Prachee Muzumdar**

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**ABSTRACT**

*"India has a coastline of about 7600km with a total offshore wind energy potential of 302GW at a hub height of 100metres, India's struggle to harness this potential still continues. Understanding the commissioning cycle of the offshore wind power plant paved the way towards a deeper research. The key observation of the research is technology and operational expertise required is available, while support from the government and the confidence of the developers is needed, to set the plans in motion. To understand this lag and seek the attention of the developers towards investing into the offshore wind power generation, gap-analysis in terms of government policies and incentives driving the offshore wind power generation market in India was carried out. The paper also examined financial instruments/framework to understand the financial feasibility of offshore wind power generation in India with respect to the countries which have been successfully doing it. Suggestions in terms of government policies like tax benefits, tariff structure etc. are proposed as possible solutions to bridge the analysed gap.*

**Keywords:** *Offshore wind power, financial feasibility, commissioning cycle, financial framework.*

**Introduction**

The growth of the onshore wind power generation in India is remarkable as it reaches a milestone of 37+ GW as on March 31, 2020. This also exhibits the success of the policies and the regulations adopted by the government over a period. Onshore wind power generation has the potential to meet the increasing energy demands with significantly less carbon output than conventional sources of energy. The valuable land resources required for generation of electricity through onshore wind power generation projects are gradually becoming a major constraint. Generation of electricity via Offshore wind power projects offers a cogent alternative in such a scenario. Absence of any obstruction in the sea /waters offers much better quality of wind and its more efficient conversion of wind energy to electrical energy.

Offshore wind power generation is a rapidly maturing technology that will play a significant role in shaping the future global energy scenario. The global offshore wind energy scenario holds 0.3% share in the global energy demand. This scenario is set to expand significantly over the next two decades, at 13% per year in the current existing policy scenario. Countries like Korea and India are taking their first steps in the offshore business while Canada and Japan have started laying the

groundwork for the development. Of offshore wind power generation projects.

India has a coastline of almost 7500 Km which has a huge wind energy potential. The studies conducted by NIWE (National Institute of Wind Energy) shows a potential of 70 GW on the coasts of Gujrat and Tamil Nadu. Embryonic assessment done by NIWE within the range of identified zones recommends 36 Giga Watt of offshore wind energy potential exists off the coasts of Gujarat specifically. Further, almost 35 GW of offshore wind energy potential exists off the coasts of the state of Tamil Nadu. Ministry set a target of 5 Giga Watt of offshore wind power installations by 2022 and 30 Giga Watt by 2030, which has been issued to give confidence to the project developers in the Indian renewable energy market.

There exists a lack of definition in terms of regulations, financing, feed-in tariffs and most importantly infrastructure in this domain which makes the whole offshore wind power generation in India a difficult scenario for the developers and the government itself.

**Literature Review**

Offshore is the rapidly maturing renewable energy technology which has shown great advancements since the beginning of its operation. As of 2018, offshore wind power

supplied 0.3% of the global electricity demand. Nevertheless, development in terms of technology and infrastructure in the near years has paved a way for larger wind turbines, higher generation capacity and most importantly cost reductions. European countries bordering the North Seas have led the offshore wind industry with robust policy support from the Government helped the EU reach a capacity of 20 Giga Watt offshore wind capacity by the end of 2018.

In particular, the innovative advancements of the most recent ten years, have prompted noteworthy cost reductions that have showed in ongoing tendering and bidding costs. Offshore wind power generation encourages enormous scope in renewable energy sending with amazingly low degrees of land use. This is a direct result of the convolution of the innovative technological advancements and project management, the scratching marine condition, and the related significant expense of introducing wind turbines in profound waters. In any case, with due mitigation measures set up, this is set to change.

India started its journey towards offshore wind power back in 2015 and has been steadily progressing. While the progress should be paced up, a deeper study in terms of commissioning cycle, infrastructure and costs associated is much needed. Regulations and policy benefits from the government shall play a very important role in deployment of offshore wind power generation technology in India. India has a goal of installing 5 MW by 2022 at Gujrat coast. Nevertheless, this shall be solved with assurance of adopting of robust solutions in terms of installation systems, grid connectivity, power evacuation and O&M to ensure an efficiency in generation and overall commissioning cycle. This can be resolved by two main aspects. Firstly, by looking into a developer's perspective of the risks and secondly, by looking into the government regulations, policies and incentives towards investments in offshore wind power generation. This would help in analysing the gap and proposing significant solutions to help bridge the gap which would lead India towards larger investments and hence progressing and contributing in the global offshore wind power.

## Research Methodology

As the data required for the research is available in public domain, no primary data collection was needed and the data required was available in the secondary. The data for the existing Offshore wind power plants across the globe will be collected and out of that relevant information for the analysis will be collated. Along with this existing government policies and financial structures would be assessed so as to understand the extent to which offshore wind power generation would be profitable to the developers in India. The website of Ministry of New and Renewable Energy (MNRE) gives information about wind power scenario in India. Also, there are reports issued by International Renewable energy agency (IRENA) to help understand the global scenario of offshore wind power generation.

## Findings and Analysis

### A. Commissioning Cycle

Offshore wind energy faces challenges such that it slows its growth in established and emerging markets. Onshore grid infrastructure plays a major role in success of offshore-wind power generation.

Construction and installation of an offshore wind power plant is a fascinating journey. But due to strenuous nature of the offshore environment, pre-commissioning and construction of the offshore power projects becomes more tedious. The commissioning phase amongst all is probably the most anticipated part of an offshore wind power generation plant. Along with this, it is also the most important factor determining the success and cost effectiveness of the whole project. And this can be ensured by a proper in-depth planning where one needs to dive deep into the nook and corner of the environmental and ecological aspects during the pre-feasibility, micro-siting and feasibility studies.

There are some significant achievements – beginning from the preliminary elements are engaged with planning of the seabed to steadily proceeding onward to achieve significant errands, for example installing the foundations, the transformer platform, accommodation platform etc. The one stage that takes such offshore activities closer to finish and gives a green sign to commissioning of the turbines

which is start of commercial operations of the wind power project. The exhilaration around this stage is reasonable as it is a declaration of the group's endeavors and devotion. The entirety of this must be shown for a period of 15-30 months, the standard time period for development work for an offshore wind power project highlighting more than 100 turbines. Great planning and great arrangement of the dispatching, includes through the pre-commissioning is the way which helps us ensure a quick flow of power to ensure a swift and smooth operations of offshore wind power project and make sure that power is pumped into the grid as early as possible. The logistics are troublesome with a necessity to bring close by quickly the important specialists and material.

### B. Vessels for Installation

Offshore windfarm installation presents technical challenges and also from a perspective of risk and costs. Due to the huge size of offshore wind power generation structures like the Wind Turbine Generator (WTG) and the Offshore Sub-Station (OSS,) there is a need to deploy some of the most dynamic and equipped vessels for installation that have the hook height and lift capacity which is apt for the wind turbines. For the installation of offshore wind turbines the most important installation vessels utilized are categorised as:

Heavy Lift Vessel — An HVL is a heavy lift crane vessel which uses dynamic siting as opposed to a securing framework to hold its situation during installation. What makes them unique in relation to traditional heavy-obligation carriers is their capacity to deal with loads that would some way or another have undermined the structural integrity of a ship. They perform these troublesome errands by utilizing inventive procedures in building and ship design plan. Extensively sorting heavy lifting vessels (HLVs), they are of four primary classes

- open deck cargo ships
- semi-submersible vessels
- project cargo carriers
- dock ships

These various classes of vessels utilize broadly differentiating strategies in lifting their huge burdens.

Jack Up vessel — A Jack-Up rig is a dynamic stage which comprises of a buoyant frame fitted with numerous mobile/movable legs, which are equipped well for elevating the frame over the outside of the sea. The buoyant hull empowers transportation of the unit and all connected apparatus to an ideal location. When this vessel is set up, it jacks/fixes its legs to the necessary height above the surface of the sea supported by the sea bed.



Cable Laying Vessel – when the business of offshore wind power started, the offshore wind farms would in general be shielded 'close to shore' condition and shallow water, and therefore carousels and cable lay hardware with straightforward anchored barges were used as per the requirements. As the wind turbine generators have moved further offshore and turned out to be more uncovered, more complex cable laying vessels are required. Cable lengths required would now be able to be almost 100 kilometres, and bigger reason constructed cable laying vessels with coordinated merry go rounds are needed to convey these any longer cable lengths securely. The new age CLVs can be used for multiple purposes: they can lay, survey and trench the cable utilizing a well-coordinated integrated framework; with an average dead weight of about 9000Te, 120 meters vessel length and 28m beam length, these vessels can lay long and heavy cables.



Figure-3 Cable Laying Vessel

### C. Offshore Support Vessels

Offshore Support Vessels can offer an alternate scope of administrations and some may have medical support facilities and firefighting arrangements, yet ordinarily they are less specific and task use may not demand a degree of Dynamic Positioning excess. Essentially these vessels are utilized as:

- Supply Vessels (for example- Crew Change/ Transportation Barges);
- Survey Vessel.
- Construction Support (Rock Dumping Vessel, Trenching Vessel, Anchor Handling Tug);

The commissioning activities should be composed to ensure smooth, safe and right finish. It is of paramount importance that the Contractor builds up a coordination program between the installation teams and the commissioning teams for all elements/components associated with the wind turbine generators, array cables and OSS's. As a feature of building up a detailed program for installation and commissioning, the Contractor should build up an interface schedule which will distinguish various key hold points. These hold points will distinguish handover points between the diverse installation and commissioning teams for the OSS, array cables and WTGs. This will assist with ensuring safe handover of the assets and limit access to plant when going through commissioning. The interface schedule will encourage any covering activities, such as installing the turbine tower and the commissioning of the array cable on the same string. This can decrease the foreseen timescales associated with the commissioning of an array. Also, coordination of these

activities is vital to limit risk and oversee safe working of the operations.



Figure-5 Installation of

Safety and health especially in the offshore wind power environment is vital, hence, sufficient provisions should be made to ensure that staff/ personnel/ labour don't approach any equipment or plant which is "live" unless they are authorized to do as such as a major aspect of the process of commissioning. For instance, the creating of control or allowing documentation associated with "hot" commissioning activities takes its own time to finish. When the WTG is hot commissioned, at that point its phase of availability and reliability begins. In accordance with maker's recommendations, at that point WTG must stay accessible and work for at least 360 hours, before it goes through its test of availability and reliability. When this test is finished, at that point the WTG is accessible for power generation. Another important factor in the commissioning phase is the OSS. Ultimate commissioning of the OSS can be relied upon a definitive conveyance date of export cable. When the OSS foundation has been installed, there will be an interface with includes cable pulling operations that should be co-ordinated with either the CLV/ HLV, such that general



schedule of delivery is not compromised. The one stage that takes such offshore activities closer to finish and gives a green sign to commissioning of the turbines which is start of commercial operations of the wind power project.

#### D. Asset Management and the Decommissioning Phase

The goal of the promoters or the investors of **windfarms** is to attain the optimum return from their investment, complying to all the specifications and safety measure. In order to achieve this goal, management need to adopt a approach which they customized according to the need of each component of the project. This type of approach can ensure the promoters that they have deployed their resources in the best way possible and the result which they will achieve will be optimum result. This approach help to identify all the risk and make management ready with the plan on dealing with the risk concerned with each asset.



Figure-6 Typical lifecycle of an offshore wind power

#### E. Pre-operations

Before entering into the operational phase of a windfarm, there are many decision that has to be taken by the promoters. If they want they can include this windfarm project into a broader portfolio of their asset. They have to design and implement the operation and maintenance strategy and other systems which can utilized the existing infrastructure in a much effective manner and also have to appoint skilled staff for the project life cycle. Also the transition phase from construction to operation need to be handle carefully so that every residual and technical risk is identified and can make plans to tackle it.

#### F. Operation and Maintenance

The large chunk of the total operating expenditure comes from the cost incur due to O&M. there are many components of O&M like routine maintenance, major repairs,

logistics, searching for fault, warehousing, managing spare-parts etc. when O&M strategy is design the management need to make sure appropriate planning and priority while estimating/considering optimum balance of precaution and after defect maintenance. They also need to consider all the repair contingencies, strategy to manage spare-parts. Simultaneously, they also have to decide on the delivery strategy and procuring service of OEM or recruiting a in house team for that matter. Irrespective of the strategy decided, it is the responsibility of the promoter to look after the asset management, safety measures being followed, managing any warranties and guarantees, forecasting power(energy) demand and managing the local stakeholders. In a nutshell, for management desire to achieve an optimum balance of asset utilization and revenue, the strategy for O&M should be change time to time depending on the various conditions of the plant and external commercial environment.

Like all the power plant, also the offshore windfarm is under 24 hours surveillance so that its performance can be managed and the team can immediately react to the alarms. Such activity is normally carried out from control room. There are two teams in such project. A team make plans and manage the O&M from back office known as onshore team whereas another team known as offshore team execute the plans. Proper maintenance of the windfarm is one of the major factor is achieving the optimum outcome. A project of windfarm is a combination of many of the individual asset such as a strategy which is cost effective in O&M, Inspection/Maintenance based on the risk assessed and the application of various strategy for monitoring the output. The management is needed to assess each plant component and prepare a maintenance package for it. This package will be based on type of problem that component can faced, and the impact of the failure of that component. The main desire should be to reduced the impact on the plant due to failure of any of the component. Moreover O&M schedule also include regular service of plant. Replacing the major components from time to time and any safety inspection or any other inspection required by the concerned authority. It also

include monitoring of the performance and any logistics and repair work if required.

There as now advanced technology available for surveying and monitoring the sub-sea components lie scour protection, route of the cable and foundation. Specialist Remotely Operated Vehicles (ROV) is one of that example. Such kind of technology can help to minimise the requirement of human diver.

While the plant is in the operational phase the management need to take various environmental surveys of the aquatic life. This is even necessary condition form the relevant authority. In the initial period of operational phase, characterized as a warranty period, it is the duty of the turbine supplier to look after the service and proper performance of the turbine and deliver the contractual obligation. In this period the duty of the promoter is to monitor the performance, perform the contractual obligation, claims warranties and guarantees as and where needed and maintain the construction of the plant. When the project reaches at its mid-life, management get the opportunity to assess and analyse the performance of the assets with respect to the investment which was done originally and can update the plan/strategy on managing the asset for the other half of its life, including life extension. This can be done by effective strategy for O&M, improving the reliability of various components or increasing the output. There should be an implementation of the proper technical activities in order to efficiently plan, develop and execute any changes if needed in the asset. Throughout the life cycle, management has access to all the data, using data in a systematic manner can help them understand the performance of the asset and wear and tear conditions of various areas of plant. Through such data, an effective maintenance schedule can be prepared and can be include in the budget allocation and operational business process. A proper use of such data can be very useful in taking major decision for plant.



Figure-7 Operation and Maintenance and Lifecycle extension of a offshore wind power

### G. Life extension

The useful life of such offshore wind power plant is generally 20-25 years. On this basis, technical design, commercial factors like cost of operation, cost of connecting to the grid, PPA and the legal arrangement is made. The design is carried in out with some conservatism like the life of the plant can be more or less in respect of the assume life of the power plant. By generating the power over a longer lifetime of asset utilizing all or elements of existing asset, bring the opportunity to deliver a

“Lower-levelized-Cost-of-energy”. Extending the life of the asset comes with an option to defer the decommissioning cost of the plant. If management decide to extend the life of asset than they have to consider that the leases, consents and wayleaves remains intact beyond the design-life and also assess from the business point of view regarding the extension of the asset life, like increase in the cost due to obsolete technique, necessary asset integration and any other risk that come with the extension of asset. If we consider an offshore hydrocarbon sector, then extending the asset useful life is routine. Windfarm a relatively new sector, in this many project are on the border of completing their life, and a similar life extension method can be used on those projects. The technical choice available with the promoters include the used of historical data to re-evaluate the project from all the angle. Irrespective of the strategy adopted for extension, management need to make sure that acceptable levels of integrity and reliability could be achieved. Such activities/strategies are planned in advance of the end of the useful lifetime of the plant. Ideally this is done during a mid review period.

### **I. Decommissioning**

The useful life of such offshore wind power plant is generally 20-25 years. When the offshore windfarm has reached its useful life and the promoter or the management decide not to go for life extension instead take up the action of decommissioning the project than it should be undertaken complying all the safety measures and with minimum possible cost. Decommissioning should be considered at a concept design stage and should be include in a whole life cycle activities and cost. It is basically the reverse engineering of the installation, which require a skill set of oil and gas industry for specific activities such as removing structure which is under the water. The overall decommissioning phase of the project involves dismantling of major elements and sub-components. Most important portion of this phase of decommissioning is neutral in the sense of environment of removal of offshore structure and sub-structure.

### **J. International Best Practices**

Due to rapid innovation in technology and around 150 new offshore projects coming around the world, the global offshore wind market seen an average growth of nearly 30% per year from 2010 and 2018. Europe has taken the lead in technology innovation, the major players in this is United Kingdom, Germany and Denmark, but in terms of adding capacity china has been the leader in 2018. For the research and gap analysis for India, three countries namely Germany, UK and the US is referred. The reasons for are stated below-

1. Germany has shown a tremendous progress in terms of small scale wind power generation which can be looked up to, as India is at the start of setting the foot right into the business.

2. United Kingdom is the world leader in the field of offshore wind power generation and its graph of commissioning of the offshore wind power plants shows that the growth was highly planned and strategized.

3. The US has a gross resource potential of 10800GW of offshore capacity and started its journey in 2016 when the first offshore wind power plant was commissioned at Rhode Island. Since then there has been a phenomenal growth which is inspiring enough for India in terms of government policies, ease of funding etc.

Germany, due to constant progress in technology and targeted legislation from last 10 years has today achieved a leadership position in offshore wind energy. They have encouraged small enterprise to developed windfarms in geographically dispersed areas, and that has been a biggest game changer for the country. Generally, individuals or co-operative programmes owned the majority of windfarm. By involving large number of micro and macro investors, contribution to a wider public support to such projects has increase. The another contributing factor was farmer's interest as they provided their lands as collateral for development costs and thus developing a whole new financing market for wind projects. The positive view for such projects were developed within the society because most of the jobs, in early phase, came from small and medium sized enterprise and regions which are not economically so developed.

A German government owned development bank named KfW Bankengruppe has been supporting green projects. They have made special provision for offshore wind power generation projects within a 12 nautical mile zone or GERMAN EXCLUSIVE ECONOMIC ZONE (EEZ). Project financing is available for up to 10 offshore wind power generation parks in various ways as mentioned-

- Syndicates of banks if formed who grants direct loan (maximum EURO 400 million per project) finance packages comprising loans from KfW on-lent through a bank
- Direct loans up to 70 percent of total debt required per project and the limit set was EUR700 million per project
- Loans for financing unprecedented additional costs (maximum limit set is EUR100 million per project)

□ Eligibility: all projects coming up in German EEZ or within the range of 12 nautical mile zone of North sea and Baltic sea. Maximum allocated is EURO 5 billion. Tenure of loan decide is up to twenty years with moratorium up to 3 years. In the year 2013, KfW granted a credit volume of EUR194 million, but in 2014 they made no commitments citing the reasons of delayed investment activities.

□ The Incentive program initiated by KfW for business enterprises encouraging them to invest in energy efficiency measures are granted by means of charging low interest rates and incentives like repayment bonus and are available in numerous ways such as Production process: For investing, modernization techniques as well as reinvestment measures of minimum of 10 percent, by comparing it to historical energy consumption data.

Germany's vision: Germany has a target of 6.5GW till 2020 and more than double to 15GW by 2030, which is mostly

- Fixed statutory payment: –Basic payment was decided at ct3.90/kWh – initial payment was increased to ct15.4/kWh during initial 12 years after commissioning. In acceleration model, if the offshore wind farm has started the operation before 31/12/2019, operator can select an increased initial payment

of a certain eligible amount for 8 years (example- extension is depended on location with a extra payment of ct15.4/kWh for extra period)

- Degression model: – for the Basic model: annually ct0.5/ kWh as of 1 January 2018, ct1.0/ kWh as of 1 January 2020, and ct0.5/kWh as of 1 January 2021.
- Acceleration model: ct1.0/kWh as of 1 January 2018 p.a. (in 2019 degression will be suspended).
- Transmission system operator support the grid connection from offshore sub-station to onshore substation.

In Unites States of America, the offshore wind developers can claim the investment tax credit due to the special provision made in section 48 (ITC) in lieu of PTC. Investment tax credit is considered as a percentage against the eligible portions of cost of the facility. Looking the previous data 30% of the eligible cost were claimed as credit of tax. By performing an economic analysis for each project expert says that ITC will be more beneficial than the PTC because of the high cost per installed capacity of offshore wind projects. Policy makers are trying to phase down the ITC to the level of PTC from credit equal to 30% of the eligible investments. To aligned to this policy, the construction of project which were deemed to start in 2017, ITC set was 24%, whereas for 2018 ITC will be 18% and for 2019 the investment tax credit will be 12%

There are various method described below through which the basis of tangible asset is recovered through several months. This calculation is done for the purpose of calculating tax. The commonly used method is Modified Accelerated Cost Recovery System known as MACRS, generally this method accelerated the depreciation in the early age of the asset. Wind energy asset that is located in the area which comes under the jurisdiction of united states can use this method to depreciated by MACRS by 5 years, in case such asset is eligible for investment tax credit. than that can also be provided to such project. If the conditions required for MACRS method the asset can be depreciated for its class life which can be anywhere between 15-25 years.

These are the international practices adopted by countries like United States and Gemany which

helped them grow in the field of offshore wind power generation.

US started its offshore journey in 2016 with its first offshore generation at Block Island wind farm at the coast of Rhode Island and with its government policies attracting developers and private players it has become one of the key competitors in the offshore wind market.

United Kingdom has a set a ambitious target of sourcing 15% of electricity from renewables sources by 2020 and by the end of 2050 they have decided to reduced the carbon emission by 80% considering 1990 as base year. But as of today electricity generated from renewable source is costly than the electricity generated through fossil fuels, thus there is no encouragement to invest in renewable.

Government is providing support through various scheme to make environment friendly power more financially feasible. But all of above, the generator are better able to recover cost when the market price of such energy increase. This is the main reason government introducing Renewables Obligation and Feed-In tariff for the small and medium scale power generation, because such policy has the ability to provide better financial support at the cost of consumers.

To further make a situation win-win for the consumer and producers, government has set out plans in energy act 2013, that they will introduce new scheme which will incentivise low carbon generation, which includes nuclear power plant as well as captive power plants and its storage and renewable. This will ensure better value of money for consumers. This new scheme will be called as Contract for Difference Feed in Tariff. This new scheme is specially design or providing revenue surety to power generators.

Also in this scheme there is a provision for subsidy, subsidy will be provided incase of the revenue target not met by the amount that is receive by the generators by selling a unit of electricity and a pre-determined strike price. This strike price can be different for different technology but the main aim of this strike price is truly representing the cost of investment in different kind of technologies available in the sector. When the generator receives less amount from market than the strike price, they get a top up amount from government, vice-

vera when generator receive more than the strike price than the generator has to pay the surplus money back to government. Due to this scheme government has provided a shield to all the generators and has ensure that they will not suffer financially.

Renewables Obligation (RO) scheme: According to this scheme the suppliers of electricity has to supply a specific percentage of electricity from renewables source of energy. The generator of renewable energy will receive/accept Renewable Obligation Certificate (ROCs) for each MWh of power generated. This certificate is tradeable regardless of the electricity generated, through this they can earn premium to the wholesale electricity price.

#### IV. Gap Analysis

The three countries described as an example of best practices to set their foot right in the business makes one thing clear that, the initial support from the government in terms of funding, ease of repayment, some level of subsidies, tariff factors and incentives in terms of land allocation etc. make a major bunch of factors in attracting new developers and achieving the goals set by the government in terms of capacity of installation and carbon emission reduction.

India being a newbie at this business of offshore, needs to come up with ease of funding policies so as to start the business in first place. Secondly, the competitive tariff market in India could have a different vertical for offshore wind power generation tariff as the whole life cycle cost is so much dynamic than other forms of energy generation. Also, government could come up with schemes like “5, 10, 20 years of repayment with upto.... free start-up years” which could help in promoting the offshore wind power generation. A proper land acquisition and ease of micro-siting regulations to be proposed so as to give a clear list of facilities and charges levied on the developer.

#### Conclusion

Output in such power plant are variable because the production of energy depends on the wind flow at that time which is varying practically at all time. Variable output and high on average capacity factors put such power

plant in the category of “variable baseload” technology. During the observation and data collection it was found that offshore wind project tends to produce more amount of energy during winter and less during summer in the countries like Europe, US and china. Whereas in countries like India the data shows that the maximum production will be achieve in monsoon season that is from June to September when compared to the rest of the year. There is one thing constant in all cases, it is the seasonal profile of offshore power plant complementary to solar PV, which is exactly opposite, producing more in summers and less in winter in Europe, America and China and for India the production is minimum in monsoon season comparing it with the other time of the year



Figure-7 comparison of offshore wind and solar PV capacity

Business simulation indicate that recent offshore project will generate the same amount of electricity per unit capacity as it is generated in some random dispatchable generations and also will have the capacity factors at par with the conventional gas fired power plants in regions like china, Europe, Korea and India. In Europe the capacity factors is above 45% which is believed to be more than the 2018 average of the Europe’s coal fired power plants.

India needs robust structure of policies and regulations in order to be good and profitable in offshore sector. However, India needs a strong grid connectivity and power pumping efficiency so as to pump the power from offshore substation to onshore substation and further into the grid. A stable integrated grid with quicker troubleshoot mechanisms would be a probable solution to the grid network issue. India lags a lot to be in a competitive domain as other leading countries like UK, Germany, Belgium are. It is a long way to go, and good support from government can be the best way to pave the way towards the success in the offshore wind energy generation sector.

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## INDIAN AUTOMOBILE SECTOR: EVOLUTION AND GROWTH IN THE RECENT PAST

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### ABSTRACT

Over the last 20 years India's automobile sector has emerged as one of the largest in the world, both in terms of sales volume and production. In 2018, India became the fourth largest automobile market in the world. The automobile industry contributes nearly 7.5 percent of India's GDP and also accounts for 49% in the country's manufacturing GDP, so it's very important to analyze this sector which plays such a crucial role in India's growing economy. Government has introduced various norms, policies and guidelines like Bharat Stage, 100% FDI, Automotive mission plan 2016-26 and many more to boost this sector's growth. In the Year 2019 Indian Automobile sector witnessed the worst phase of this sector, which was contributed by multiple factors like liquidity crunch, changing norms & regulations, increasing preference for shared economy, inadequate infrastructure and many more. Using the descriptive methods, evolution and growth of Indian automotive sector in the recent past was examined. Also, the current status, reasons for the slowdown and the role of government policies were carefully analyzed. In addition, attention was given on the likely future of Indian Automobile sector. This analysis can help to form a foundation to deduce solutions to the upcoming challenges for this sector.

**Keywords:** Indian Automobile sector, Growth, Slowdown, Current status

### Introduction

The Indian automobile market is one of the major contributors to the country's growing economy. Among the other sectors, the automotive sector in India is the most dynamic and it is expected that in the coming years India will not just develop as a huge domestic market for automotive manufacturers, but also as a significant connection in the global automotive chain. The automobile sector of India manufactures a wide segment of vehicles like passenger cars, commercial vehicles, utility vehicles, bikes, three-wheelers and tractors. After wake of delicensing the industry in the year 1991, this sector has been witnessing strong growth rates, the time at which major economic reforms took place in the country. It is expected that this sector will grow at a CAGR of 3.05 % during 2016-2026.

In 2019 India witnessed the worst slowdown till now in the automobile sector amid the slow economy. According to the Society of Indian Automobile Manufacturers, around 3.5 lakh employment have been lost and more than one million are at a risk due to shutdowns of plants and bankruptcy of dealers and component makers.

The Government of India encourages 100% foreign Direct investment in this sector not only this they are also making favorable policies and plans for Automobile sector as government wants to reduce imports, increase exports. Government is also promoting use of biofuels such as bio-CNG, biodiesel and second-generation biofuels, for which the automotive industry has come together to reduce carbon footprint in the country.

According to a Report published by McKinsey on their website, they stated that India will emerge as the third largest market in the passenger vehicle segment by 2021. But with the continuous increase in the fuel prices and also government trying to put efforts in reducing carbon footprints, these for sure will hinder the growth of this sector and hence it presents a lot of ambiguity about the future of this industry.

### Literature Review

According a report that was published by KPMG (Becker), it says that the Indian automobile is ready to begin an exciting phase of growth. A lot of action points are also mentioned in this report that will give the automakers some ideas how to take advantage of the emerging scenarios in this sector. Another report by Velury Vijay Bhasker says

that Indian Automobile market is one of the largest in the world and a key driver of the India’s economy. Also, it has mentioned that with the increase in the participation of foreign companies in the Indian market, it will significantly result in increase in amount of employment. Another paper by Mahipat Ranawat and Rajnish Tiwari have discussed about the evolution of Indian automobile sector from its beginning to the present day and the roles of different government policies contributing to the growth of this sector. Dhole 2013 & Shinde both of them in their respective journals have talked about how Indian automobile sector is a stimulating part of the economy and doing its deep analysis can give us some insights into the future scenario and the upcoming opportunities in this sector. They have also mentioned about how this sector has been a financial strength to the country in the past years and also the past trends of this sector. Another Report by Sarita Devi has mentioned the importance of online marketing of Automobiles mainly through Social Media. This report has tried to establish a relation between social media marketing and sales growth. According to a report by Dr Tapasya Jhulka, she mentioned that automobile sector plays a very significant role in India’s economy. This sector is directly and indirectly linked with various other sectors of the economy and hence its contribution to the economy is much bigger. The research and study of this sector that being undertaken will also work on the same areas of this sector and will try to affirm the study made by other researchers.

**Research Methodology**

This analysis is based upon the secondary data gathered from various research papers, reports,

websites, newspapers and organizational databases. We have used Descriptive method for this analysis as this research paper mainly aims to identify trends, Characteristics, Behavior of the Indian automobile sector. Beside this tables and charts are used to analyze the data. To begin with, it was proposed to examine the evolution and growth of Indian automobile sector over the years. To assess the current status of automobile sector. Further, attempts will be made to understand the main reasons behind the slowdown in this industry and the role of government policies in this sector which facilitates its growth. In addition, attention will be given on the likely future of Indian Automobile sector in the country.

**Evolution Of Indian Automobile Sector In The Recent Past**

In the last decade, Indian automobile sector has shown a remarkable growth in terms of sales rate and production volume. In the past years nearly all the major companies have their presence here. India has now become a prominent center for all automobile makers around the world to establish their manufacturing plants for domestic and international markets. India in 2009 rose to fourth largest exporter of passenger cars behind Japan, South Korea and Thailand. While in 2010, India crossed its earlier year's performance to turn into the third biggest exporter of cars in Asia. But the greatest accomplishment that came for the Indian automobile market was in 2011 when it turned into the 6th biggest nation globally in terms of production. Between 2010-2012, the growth rate for auto sector was around 26%.

**TABLE-I Production, sales and exports in automobile sector from 2010-2019**

Quarter		2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020
Production	Commercial	760,735	929,136	832,649	699,035	698,298	782,814	810,253	895,448	1,112,176	752,022
	Passenger	2,982,772	3,146,069	3,231,058	3,087,973	3,221,419	3,413,859	3,801,670	40,10,373	4,028,471	3,434,013



Domestic Sales	Commercial	684,905	809,499	793,211	632,851	614,498	685,704	714,082	856,916	10,07,311	717,688
	Passenger	2,501,542	2,629,839	2,665,015	2,503,509	2,601,236	2,789,678	3,047,582	3,288,581	3,377,389	2,773,575
Exports	Commercial	74,043	92,258	80,027	77,050	86,939	101,689	1,08,271	96,865	99,933	60,713
	Passenger	444,236	508,783	559,414	596,142	621,341	653,889	7,58,727	7,48,366	6,76,192	6,77,311

Source: SIAM (Society of Indian Automobile Manufacturers)

However, in the year 2012 & 2013 the growth rate was quite sluggish and it was around 12%. The growth rate nearly fell down to half of the previous years. The main reasons contributing to this downfall was high ownership cost which includes excise duty, increasing fuel costs, cost of registration, road tax and slow income growth of Rural areas. Talking about 2014, the growth of Indian Automobile Sector was due to the increased sales rate in two-wheeler segment and not because of the passenger or commercial vehicle segment as prevailing high interest rates at that time and a stammering manufacturing industry kept a check on demand. Year 2014 didn't show any rising growth rates rather it was a year of stagnation, which was a positive sign as decline that happened in the last few years stopped. During this year Government tried to boost the sector's growth by reducing excise duty but still customers were not willing to invest in the vehicle due to high car interest rates. However, in 2015 this sector started to show little recovery. In between the period January-November of 2015, there was 3 % rise in the overall automobile exports. Some of the major positive factors contributing to this growth was decrease in the fuel prices and softening of the interest rates. During the financial year April 2015 – March 2016, it showed a tremendous sale in the domestic market (passenger and commercial vehicles) with 3.48 million units sold and 8.1% year-over-year increase. The main factor behind this were strong economic growth in the country, aggressive marketing strategies by every companies for the introduction of new cars in the market and decreasing fuel prices. After sailing smoothly

in the past years, 2016 turned out to be a roller coaster ride for the automobile industry. After a lot of discussions and debates, finally Union Cabinet approved the motor vehicles bill 2016 that proposes stringent laws and hefty penalties for road and vehicular safety. In 2016 Government with his Auto Mission Plan (AMP) 2016-26 laid down its vision of making India first in production or sale of bikes, three-wheelers, small cars and buses; and third in passenger vehicles and heavy vehicles globally. In 2017, Government announced GST (Goods & Services Tax) to be implemented in every sector of India. This proved to be a positive step for the automobile sector as automobile manufacturers will have to pay reduced taxes and directly or indirectly customers will be benefited by this. Before GST, multiple taxes such as VAT, sales tax, road tax, registration duty, etc. were imposed. All of these taxes were incorporated within GST for the automotive sector. Not only this, GST has overall reduced the transportation cost across pan India. It has, in fact, reduced the price of automobiles across the country when compared to the prices before GST.

In May 2017, NITI Aayog laid out the vision for changing the mobility in the country, by proposing specific and actionable solutions for the roadblocks in the automotive sector and leading India towards becoming a leader in the advanced mobility.

In starting of 2018, Government launched the new National Electric Mobility Program which will focus on building infrastructure and policies that will facilitate electric vehicles in the country. This program aims to have more than 30% e- vehicles on road by 2030.

So, summing up the journey of automobile sector in India from 2016 to 2018, The three major shocks that shattered the India's overall economy and also to some extent impacted the

automobile sector of India. The first quake came as a demonetization in November, 2016. The second came in July 2017 with the implementation of Goods and Services Tax (GST) and the last one was the NBFC crisis in August 2018. Although these events caused some serious repercussion on the automotive sector, but it didn't end here, it was then the liquidity crisis followed by the IL&FS debacle brought a huge slowdown in the industry. In 2017-2018, the average annual production was about 29 million vehicles, with this India became the sixth largest producer of automobiles globally that year. Out of 29 million, 4 million vehicles were exported.

After Paris agreement, India has pledged to reduce its carbon footprints. Subsequently for fulfilling this agenda, various state governments are encouraging investment in electric vehicle not only this they are providing incentives to attract EV's manufacturing in their states. Karnataka among the other states became the first to introduce Electric Vehicle policy in 2017. Many other states like Maharashtra, Andhra Pradesh, Telangana, Uttar Pradesh and Uttarakhand are following the footprints of Karnataka's and drafting policies to support India's vision to have 100% Electric Vehicles on road by 2030.

The year 2019 was perhaps the hardest year for the automotive sector in India with huge drop in the sales of cars in all segment. This sector in India has begun to show an enormous downfall in the market following a period of expanding growth. Government in this year announced about transition from BS IV to directly BS VI leaving the intermediate stage. The decline in the automobile sales are a mere indicator of how the economy of a country is performing, and particularly the purchasing capacity of the consumers. Overall, the auto industry sold 2,001,097 units during April 2019. In the same period last year (2018), it had sold 2,380,2945 units.

Already India was facing a slowdown in this sector in 2019, but with the onset of Covid-19, it contributed to this slowdown, With the continuous lockdowns in the country, the sale of automobiles was heavily impacted. In the first quarter of the fiscal year 2019-20, There was a steep decrease in sales rate of cars that

was around 23 %, whereas passenger segment sale rate has plunged to 18 %.

But India has come a long way since 2000, Today, the three prominent regions where the majority of the Indian car industries are packed are in south, west and north. In the south, Chennai is the hub for manufacturing. In west Mumbai and Pune belt are the locations for manufacturing industries. And in the northern side, NCR region has a good share as far as concentration of manufacturing facilities are concerned.

### **ReasonsForSlowdownInThisSector**

The year 2019 was perhaps the hardest year for the automotive sector in India with huge drop in the sales of cars in all segment. This sector showed an enormous downfall in the market following a period of expanding growth. Sale of Passenger vehicle dove by 17.98 % between April to November 2019 over a similar period a year ago in 2018, according to the Society of Indian Automobile Manufacturers (SIAM). Overall, the auto industry sold 2,001,097 units during April 2019 and in the same period last year (2018), it had sold 2,380,2945 units. In the present situation, the passenger vehicle segment is worst affected and its sales came down by 24 % and SUV by 5 %, for the commercial vehicles the decline rate was 10 %. In the first quarter of the fiscal year 2019-20, There was a steep decrease in sales rate of cars that was around 23 %, whereas passenger segment sale rate has plunged to 18 %. This was the most terrible quarterly performance since the 3rd quarter of the year 2000-01. This decline in sale rate brought enormous financial loss to many automobile companies.

There are different variables which added to the slowdown in vehicle industry, which are recorded below

A. Lack of Proper Road Infrastructure – This is one of the major factors which affect the sale of the automobiles because people are more likely not buy two-wheeler or four-wheeler in the areas which don't have a proper road infrastructure. Poor road connectivity from their place and bad road conditions causes decline in the interest for buying automobiles.

B. Decrease in the spending power of the consumer- With the dropping economy of the country and recession, people will tend not to

spend on the things which are not of utter importance for them and automobile comes under that.

C. Unavoidable weather conditions in monsoon- In monsoons, Roads fill with pits which causes problems and uncomfortable driving. So, People where road conditions are bad tend to rely more on public or shared transport.

D. Lack of promotion and advertisement of electric vehicle- With the increasing fuel prices, there is a decline in the demand for the automobiles. So, to cope up this, Government is trying to encourage the ownership for electric vehicles but due to lack of proper advertisement and information among people, they are not well aware of these e- vehicles.

E. Liquidity Crunch- Liquidity Crisis in NBFC's has severely hit the automobile sector. As in rural areas, half of the financing is done through NBFC's for automobiles. Automobile demand in rural areas has dropped significantly due to unavailability of fund in NBFC's.

F. BS-VI norms- With the announcement of BS VI implementation, the demand for vehicle decreased significantly as people are now more willing to buy BS VI standard vehicle and hence waiting for the upgraded cars to be launched in the market. This also caused the inventory piling up of BS IV vehicles.

G. High Maintenance and purchase costs – With high servicing and maintenance cost, people are more inclined toward other mode of transportation.

H. Shared Economy (Ola/Uber) – With the introduction of Shared economy like Ola/Uber, the demand pattern for automobiles has changed drastically. The car sales have been plunged by 30%. People now prefer more of Ola/Uber because of easy availability and comfortability.

I. Merging of various rules and regulations leading to increase in costs and therefore impacting affordability.

J. Lack of automobile information among the rural population.

The above discussed factors have made a huge impact on industry growth. Many Automobile dealerships have closed their shops already because of the very low sales rate in the past and also firms are confronting the stumbling

block to meet the business target. This situation is also going to affect company's new recruitment and development plan.

Almost all the major OEMs have already begun to work on their product's upgradation to meet the new BS-VI norms and standards and this for sure will put immense pressure on the manufacturers.

Talking about year 2020, The major car manufacturers like Maruti Suzuki, Tata Motors, Honda, Toyota and Hyundai have also accounted a declining sale rate for the first quarter of Fiscal Year 2020. Nissan has also faced a de growth of 50%. There is also a steep downfall of 18 % in the first quarter of Financial Year 2020 in the passenger vehicle segment. In the domestic market, commercial vehicle's sale rate came down by 10 percent.

India has a lot of potential in the automotive market to become a world leader. In the current living trend, if we compare India with other countries, 18 out of 1,000 Indians own a car whereas in the U.S.A about 800 out of 1000 and in the EU car ownership is nearly 500 out of 1000. So from these numbers we can see that in spite of India's population is far more than all these countries, still India is far behind in terms of number of people owning car here.

The main reason behind the weakening in the automobile sector is due to the absence of development of infrastructure, the cost and amount required today to expense and finally space and time required for the usage of the vehicle and reach the destination on time.

However, even after this much of loss, the fundamentals and core of the automobile sector is still strong. India is gradually yet consistently emerging as the powerhouse in the automotive industry but there are many factors which are still pulling our country back from making forward move.

### **RoleOfGovernmentPoliciesInThisSector**

The percentage of automobile exports has climbed impressively in the past couple of years. Every year passenger car segment is registering a whooping sale of around a million units. The government policies on Indian automotive sector has been designed in such a way to facilitate in the development of the country's automobiles industry.

Indian Government has not paid much attention to this sector before 1990's. Though,

this behavior was reformed in the year 1990's. Numerous policies were introduced in 1991. Liberal policies that came in place during this phase, proved to be advantageous for the car sector. Economic measures, relaxation in Tax and various regulations and foreign exchange resulted in remarkable progress in the automotive industry. A decrease in the level of levies forced on the exports and an adjustment in the financial standards and strategies resulted into a significant job in the development of the car division moreover.

Before the mid 1990's, this sector mainly contained domestic organizations. In 1996 the market in India was opened to other countries to invest. Worldwide companies like Volvo Ford, Hyundai, Toyota and Daimler Chrysler, GM Honda were in this way, ready to advance into the vehicle market of India. Further the automobile emissions standards given by the government in the previous years guaranteed that the Indian manufactured vehicles will meet up to global standards.

Government of India reduced levies imposed on vehicle exports. The government excluded criteria for minimum capital venture from new entrants. The new policies that were put in place also favored decrease in excise duty for small automobiles and vehicles with low emissions of carbon and multi utility vehicles. To facilitate proper harmony between domestic market and global trade, tariff's policy will be checked on a regular basis. For the investment of more than 500 crore, there was a proposal to provide relaxation in terms of tax tariff. The government has recently decided to create an infrastructure which will encourage one stop leeway for all sort of proposition for foreign investment in this sector. This will likewise incorporate all domestic clearance framework for a similar reason.

There is a plan to impose 100 % tax deduction on export profits. To boost up set up of new manufacturing and industrial holdings, government has planned for a reduction in import duty for these

The government is also encouraging state governments to make sure that there is a continuous power supply to the automotive manufacturing units and also providing them the preferred plots of land. The auto policies of the government include promotion of

automobiles which run on other energy resources. Plans are being made to facilitate extensive research development in this sector and designing facilities that would influence modernization in the car business.

The norms that are implemented by the Indian government for the improvement of the automotive sector, has prompted the attraction huge number of ventures from foreign companies. India is likewise turning into a most preferred location for outsourcing worldwide car organizations like Mitsubishi, Hyundai, Ford, Toyota and so

in order to meet global standards in safety and quality, the Government of India has begun to work towards the establishment of vehicle testing facilities and crash test labs in various parts the country which will enable customers to assess the fuel efficiency and safety standard of their vehicles. The plan also includes establishment of seven testing facilities across various cities such as Pune, Chennai,

Bengaluru where every vehicle will be provided a star rating according to their fuel efficiency and safety. To have more safer cars in Government will set up the Bharat National Car Assessment Program which will make European car safety features compulsory in India's cars., car manufacturers will have to compulsorily display their star ratings.

Below are some of the plans and initiatives taken by government of India to facilitate growth and development of Automobile Industry:

#### **A. Automotive Mission Plan 2016-2026 (AMP 2026)**

This plan traces the direction for the development of the automobile industry in India, including the way to be followed for distinct guidelines and arrangements that will facilitate research, innovation reusing of car vehicles and so forth. It also aims to make India first in production or sale of bikes, three-wheelers, small cars and buses; and third in passenger vehicles and heavy vehicles globally. The Automobile sector is among the top drivers of the manufacturing sector and this plan along with Make in India scheme aims to expand exports of vehicles by 5 times. The growth in passenger vehicles segment, is expected to triple

9.4 million units per year by 2026. It aims at generating 65 million additional jobs and to contribute over 12 % to India's GDP and generate USD 300 billion revenue by 2026.

### **B. Draft National Policy 2019**

This policy is drafted by Department of heavy industries for the overall growth of the car market. This policy aims to implement a long-term map for emission norms past BS VI and supplement this with the worldwide standards by 2028. The policy is expecting to increase the exports to 35- 40% of the total yield and to make India stand among the main automobile export hubs globally. Under this policy they have a plan to Rollout Corporate Average Fuel Efficiency (CAFÉ) standards till 2025. There has been a proposal for the Fast track adoption of Bharat New Vehicle Safety Assessment Program. Implementation of various standards like AIS and BIS for the safety of critical parts.

### **C. National Automotive Testing and R&D Infrastructure Project (NATRIP)**

NATRIP Implementation Society (NATIS), an independent body has been established by the Ministry of Heavy Industries & Public Enterprises, for the functioning of NATRIP. The total cost of setting up this project is SD 573 million to facilitate the growing industries in adoption and implementing global Performance standards. The main motive of NATRIP, will be collaborating India's IT & electronics sector with the automotive engineering sector. Focus will be given in facilitating product development solutions and low-cost manufacturing. Under this program 7 test centers will be established for the test facilities.

D.

### **National Electric Mobility Mission Plan 2020 (NEMMP)**

The national electric mobility mission plan 2020 (NEMMP) initiative will try to meet up to the consumer expectation regarding price and performance, this will require introduction of affordable and competent xEVs i.e. hybrid and electric vehicles. Some of the additional objectives of NEMMP 2020 includes. Development of domestic manufacturing capabilities, infrastructure and technology. It is

expected that India will be emerged as a leader in the bike

segment and four-wheeler segment of xEV globally by 2020 but due to existing Covid-19 pandemic, may be other couple of years will be required to reach this position of leader. Total sales are expected as 6-7 million units for hybrid and electric vehicles, this is going to help India's car industry to become a global manufacturing leadership in xEV and thus helping the country to meet its national energy security goals. The main ambition of this project was to reach 6 Million electric & hybrid vehicles annually on the road by 2020. A collective cost of USD 2.15 billion is estimated for this scheme, which also includes association from various industries.

### **E. Green Urban Transport Scheme (GUTS) 2017**

Private sectors are providing huge assistance to this scheme along with the help from the central and state governments. This is a 7-year mission with a cumulative cost of 10.76 USD billion. This project also encourages the promotion of other various important aspects of this automobile industry like Motorized Transport, public bike sharing, and many more. This scheme focuses on reducing carbon footprints by encouraging sustainable public transportation system in urban regions. 103 urban areas have been recognized for the first phase of the scheme. These urban areas are the either capital of the states or have a populace of 0.5 million or more

### **Future Of Indian Automobile Sector**

With the current growth it is expected that India will arise as the world's third-largest passenger vehicle marketplace by 2021. India took about seven years to rise their yearly production of three million to reach four million vehicles. Though it is expected that the next landmark of 5 million can be reached within 5 years, But clearly reaching that milestone will totally rest on the today's pace of fiscal growth taking place in the country, with an anticipated yearly GDP growth rate of 7 % in 2020, expansion of urban areas, increase in the number of the consumers and supportive protocols and strategies. The Indian Automotive industry was already stressed in

the Financial Year 20 even before the prevailing Covid-19 catastrophe. The sector recorded a total downfall in growth of approximately 18%. This condition was deteriorated more by the prevailing coronavirus pandemic and the current lockdowns all over the world. Financial Year 20 and Financial Year 21 is going to be very challenging for the Indian automobile industry due to slow growth rate of India's economy, negative consumer sentiment, BS-VI transition, liquidity crunch, potential bankruptcies and many more other factors.

If we look into Chinese automotive market, we can see that there is a considerable change in the purchasing behaviour of the consumers after the lockdown and the same pattern will be followed in India. After this pandemic, Consumer will give high priority to individual health, cleanliness and hygiene during travel. In the recent years we have seen how shared mobility has taken the market because of its easy availability but post pandemic, the scenario is going to change, Shared mobility will take a backseat as people will prefer personal mobility more due to health concerns. With the prevailing covid-19 situations, the gloomy sentiments of consumers will increase aversion towards higher optional spending like purchasing new vehicles, so in the coming three to six months, there is a high possibility of people demanding for used vehicles. Existing market models like Service based models pay-as-you-go and rentals might also see sudden growth from consumers. Lately we have seen several OEMs switched to digital mode of doing business in the country and launched online channels for sales purpose to virtually connect with their customers which shows a new way of running the business. This idea truly has changed the face of business.

Because of domestic and worldwide exposure, Indian automobile suppliers may have to witness numerous hurdles going forward. Suppliers are expected to face some serious monetary and operational problems over the other side of value chain, Due to low domestic sales of vehicles this will result in reduced revenues and low utilisation of the existing capacity. Because of the prevailing lockdowns in Europe and North America this is going to put both import and export limitations. India

will face a huge impact of disruption taking place in supply chain globally which will last until the end of Q2 Financial Year 21.

Rapid urbanization means that in our country there will be more than 500 million people will be residing in the cities by 2030 this will probably lead to the increase in the demand of personal mobility. Increase in the earnings of consumers will have a significant role as it is expected that around 60 million families could possibly come in the consuming class defined by households having total family incomes more than \$8,000 per year by 2025. More individuals will enter the workforce at the same time. Due to increased entry of young generation and womenfolk in the job market, participation could reach to 67 percent in 2020, raising the demand for mobility.

In coming years, macroeconomics and demographics will possibly shift more towards the growth of passenger-vehicle segment. Hatchback and Mini Cars has a total share of about 50 %. This has made the mini cars segment a centerpiece for the car industry. These segments are expected to dominate their position in the coming years, But also new segments such as compact SUVs, sedans, and luxury vehicles are also going to play a major role in the growth of the overall sector. The World Economic Forum has given a rank of 30th to India on the global manufacturing index, which assesses more than 100 countries on the basis of their manufacturing capabilities of. The government's initiative of Make in India has played a very crucial role in uplifting country's position globally. In last three to four years, it has enhanced considerably on nine parameters out of ten for ease of doing business.

The automobile sector in India is braced by numerous important factors such as easy accessibility of low-cost skilled labour, well equipped R&D centres and low-cost steel production. This automobile sector also offers a good number of opportunities in domestic & foreign investment and also provides employment to both skilled and unskilled labour as well.

By 2026, it is expected that Indian automobile industry that will also include component manufacturing is expected to reach US\$ 251.4-282.8 billion.

Due to prevailing condition of Covid-19 Pandemic, automotive demand will get highly impacted in Financial Year21. At this phase of time levels of vehicle penetration are quite low and the demand is expected to rebound only in Financial Year22 positively. Companies who will use this prevailing situation as an opportunity to rewire and restructure, will emerge as winners. Companies will also require greater circumstantial leadership and creativity to deftly navigate the crisis. They have to restructure their every plan to suit the current circumstance and make benefit out of it.

The prevailing Covid-19 pandemic and the lockdowns has put a hard brake on the growth of the Indian automotive sector. With the onset of coronavirus, there will be a drop of around 80-100 percent in physical visits to showrooms, people will rely more on online purchasing. Contactless digital transactions are expected more by customers in the coming days, during this time of crisis digitization has emerged as an important key to sail through this critical time. It is empowering automotive retail and better after-sales, and enabling more meaningful customer engagement. However, this does not infer a doomsday scenario for the car industry. Even during this time of Covid-19, The people of our country are still optimistic about purchasing a car, but how they will buy or by which mode they will purchase will be totally different.

By 2021 it is expected that India's increasing middle-class segments will have nearly 900million people and this will open up various new windows for businesses. The middle- class segment of our society still wants to invest their money in a car so because of their aspiration India will get a lot of benefits from this advancement in the automobile sector. With the spread of economic prosperity across different demographics, Indians will no longer consider mobility as a luxurious thing rather it will become a necessity for them.

### **ConclusionAndRecommendation**

From reading various research papers and analyzing the past and current situation of this sector of India, it was observed that automobile industry of India is among one of the major contributors to the economy. It is also being

observed that India's automobile market has seen a growth in the Eco- Friendly vehicles which are mainly run on alternative fuels having advanced technologies. Few popular hybrid cars include Chevrolet Volt, Toyota Prius etc.

The Commercial Vehicles segment altogether have seen a growth of 17.55% in April- March 2019 and in between April-March of 2019 the overall automobile exports grew by 14.50%. The automobile sector is expected to reach \$135 billion by 2020 and \$300 bn by 2026.

Numerous aspects like growing exports, increased spending power of the consumers, new product launches and easy accessibility to financial modes have caused a significant increase in the number of sale units in the automobile industry. Because of the present growth this sector is witnessing, it will become a favorable hub for investment by major foreign companies in automotive industry. Presently India stands at second largest manufacturer of two wheelers. India's automotive market in Asia stands at fourth largest passenger car market not only this automobile sector of India is largest in motor cycle manufacture.

The high-speed upgradation happening in infrastructural field which mainly includes road, port, power and world class facilities for testing, availability of well-equipped manpower and various policies to market equitable competition has made Indian automobile sector more aggressive for growth globally.

As far as performance of Indian automotive sector is concerned, it was revealed that the Indian government has taken several initiatives and various policies with an objective to boost the Indian automobile sector, Some of the policies and initiatives by the government of India to flourish the growth of Automobile industry includes Phased manufacturing program, Modernization program, Auto policy 2002, Automotive Mission Plan 2006-2016, National Automotive Testing and Research & Development Infrastructure Project (NATRIP). Government is also encouraging and advertising the electric vehicles in the country, not only this a lot of incentives are also being offered. Electric vehicles will not only solve the problem of increasing pollution

but will also help in meeting the energy demands of growing population.

Government should set up Automotive Training Institute and National level Automotive Institute for training on automobile at International Training Institutes in the country to better facilitate growth in the sector. It is needed to adopt a collaborative approach for training, facilitate online training manuals and focus on enhancing practical experience to enhance the skill sets of manufacturers and dealerships

The Government of India should also pay more attention towards exports of small cars, two and three wheelers, multi- utility vehicles and vehicle components that brings required foreign currencies to India. Government should increase their spending for the creation of more jobs and for the growth of manufacturing sectors. Government as well as the automobile companies should take specific measures for expansion of domestic market and also, they should use their core competencies to overcome this tough economic time Another step which can be taken by automobile companies can be acquisitions or merging, as main motive of acquiring businesses during the difficult economic downturn times, seems to be a more of a interdepend able strategy of the companies. Strategic merging or acquisitions of automotive firms boost the confidence of the lost markets and assist them in experiencing a new business life in a given period of time through collective efforts.

Increase in digital advertising and marketing can help automobile companies to showcase their products to the customers during economic crisis and helps them to overcome this situation as well. The Automobile companies have to re-evaluate the marketing plan. The automotive companies have to come out with latest and innovative products and ideas to gain competitive advantage over other companies in the industry. Also, Automobile companies must work in order to improve their whole process starting from manufacturing to the point the car reach to the customers. Even they should focus a lot in after sale services. Because most of the customers face problem in this. Companies must implement their strategies quickly in the market than their competitors in this crucial time of economic

downfall. They should take this as prime concern and focus on the development of the highly demanding product which will cater the needs of their customers. With the onset of the Covid- 19, people are turning more towards the digital world for fulfilling their needs. Dealership should take advantage of this situation and try to expand their visibility on the digital world. More Digital campaigning should be done. They should try to reconsider their end-to-end operations and sales processes by using digital technologies and analytical tool, like forecasting tools, to optimize cost and increase customer satisfaction Index. Also, the industry should focus more on products that brings most of the revenues and expand after sales activities, customer services. There is a need to again define various customer segments to get a better understanding of the needs of the customers. This is not a one-time effort and will require continuous reviews of annual strategies.

With the positive steps taken by the Indian Government in alliance with the Indian automotive Industry, auto makers around the world consider India a preferable location for manufacture & design. The government should continue to encourage manufacturing and purchasing of electric vehicles because e-vehicles are going to be the future of global market because of increasing dependency on the fuels. This will not only cater the energy security concern of the country but will also reduce the carbon footprints. The demand of vehicles in the Urban areas are highly impacted by the inflation and car loan interest rates, to avoid possible defaults that can occur in future, for this bank will have to constrict eligibility criteria for car loans. The demand of cars is highly impacted by the negative sentiments in the economy or by the stringent eligibility criteria. Government should look upon this corner also. In the analysis it was found that some of the consumers don't want to own a car because of the poor road infrastructure. So, Government should try to improve the infrastructure because it is one of the major reasons for not buying vehicles.

### **Limitations**

This paper has tried to incorporate every detail related to the current status of automobile



sector but it doesn't provide analysis of change in the current status of this sector due to Covid-19 Pandemic. As some of the data were taken from reliable websites after doing a lot of validations but still there is a possibility of having little discrepancies when compared with other data sources. Not every government initiative taken for this sector has been included, the ones which are quite important

for the automobile industry and are contributing a great amount to the growth were mentioned here. As future is highly unpredictable, so any data related to the likely future of automobile sector is taken from reliable sources. But these data are subject to change with changing situations.

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**ANALYSIS OF COOLING ON PHOTOVOLTAIC MODULE: A REVIEW****Sudhanshu Maurya<sup>1</sup>, Suyash Binod<sup>2</sup> Rakesh Kumar Maurya<sup>3\*</sup>, Reena Pant<sup>4</sup>****Utkarsh Singh<sup>5</sup>**<sup>1</sup>Department of Electrical Engineering, JSS Academy of Technical Education,  
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**ABSTRACT**

As the solar energy is in increasing demand phase, so there is always a different talk takes place on either of the topics related to it. One of the significant topics is the impact of cooling system on the photovoltaic (PV) module. This paper covers the various aspects or the impact of cooling, in a sense how it helps in efficiency improvement by decreasing the operating temperature of photovoltaic module hence increasing the power output. This paper also shows the various techniques involved that helps in cooling the PV module such as evaporation of water, using blower, etc. As the PV technology is brimming with new innovations and ideas, the cost analysis is also an important aspect to be kept in mind, so this review also covers the mentioned topic. As the efficiency of PV module is dependent on various factors, one of the important factors is the material of the semiconductor. So, the material contrast is also drawn in this paper. This review signifies the small yet an important part of the cooling system which will help the curious minds to understand the just of it.

**Keywords:** Photovoltaic Module, Cooling, Efficiency improvement, Operating Temperature, PV/Thermal**Introduction**

In the current scenario where the demand and need of the renewable energy is at its peak, as the conventional sources are depleting or will be depleted [17]. It is not just the depletion which concerns the topic but to find something better or much cleaner than the existing technology which is causing lot of problem for the earth and the people living on it such as the problem of global warming, depletion of ozone layer, pollution, etc [7] [13]. And the most discussed alternative of such conventional sources is the solar energy harvesting. It is clean, renewable, and a prime source of energy for many living organisms. But as it has such a good merit to us and environment, it has some observable demerits. So, this paper focuses on one of the aspects of solar energy, the effect of cooling on the PV module. As the conversion goes, the solar energy is converted into electrical energy and the rest is the heat generated, this is the typical operation of a PV cell [17]. The ideal conversion rate of the electrical energy ranges to 15%, and the heat generated is neither absorbed or typically used anywhere which in turns increase the

temperature of the PV module [2]. So, in order to negate this, many cooling systems were introduced. As the efficiency of the PV module is dependent on three factors namely, the intensity of the solar radiation flux, the quality of the semiconductors and the operating temperature of the PV module [17]. So, the enough amount of cooling can increase the efficiency of the PV module [12]. And as for the material goes, the right material is equally helpful in achieving the better performance of the system. This review will also be discussing the material change and its impact on cooling mechanism. And so, the method of applying the cooling technique is showcased and compared so as to the better understanding of the topic. The techniques mainly could be classified in air-based cooling system, liquid based cooling system and the heat pipe-based cooling system [17]. The better technique can be drawn or concluded if the understanding of the existing method is kept in mind. Through this paper, the observer or the drawn to the topic person can get the better picture of the cooling systems.

## Methods Of Cooling

In accordance of the way or the PV technology used or on some other factors, choosing right cooling method is imperative. The cooling method hence can be classified in two categories:

1. Passive cooling method
2. Active cooling method

### 2.1 Passive Cooling Method

In this cooling method the main idea is to transfer the heat generated into the environment without the use of any devices. Passive cooling mainly extracts the heat from the operating point and dissipates it into the surroundings. It can be easily done by the use of some conductive metals or if the complexity is required it can then be done by phase change material (PCM), or by involving the heat sinks pipe or the heat spreader for the natural circulation of the heat [14] [17]. This type of cooling may not result in the substantial increase in power output [8]. But it is mostly considered in comparison to the active cooling method when it comes to the cost and reliability [14] [17]. Also, a novel passive cooling method can be favored more than the heat sinks or PCM as it is light weighted and requires no connection to the other sources [8].

### 2.2 Active Cooling Method

As for the active cooling method, it is just the opposite of the passive cooling method. In active cooling method, the heat is extracted by the use of some external devices such as fans and pumps. It does consume more power than the passive cooling method, it is usually used when there are some other benefits are involved or when there is enough efficiency than the power consumed. The other motives can be the harvesting of that extracted heat and utilizing it somewhere as heating water, etc. Active cooling method is costly in comparison but it is more effective than the passive cooling method [17].

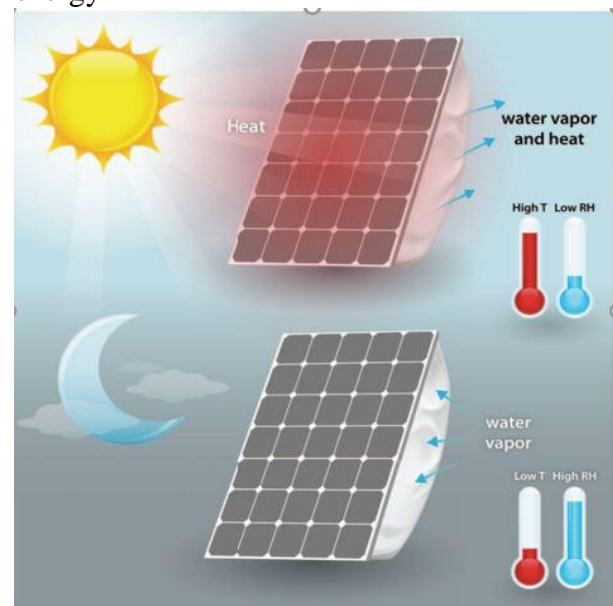
### Effect of Material Change

In a Si based PV module, around 25% of total radiation energy is used and the rest is wasted as heat energy which leads to rise in the operating temperature of PV module decreasing efficiency. Phase change material

(PCM) cooling technique is used for high storing of energy and thus reducing the increase in temperature of PV module preventing loss of efficiency and degradation of PV panel. Phase change material limits the temperature of PV cell under constant solar irradiation and preventing overheating of PV panel by absorbing excessive heat [4]. The high operating temperature can be also reduced by integrating a layer of desiccant on the surface of PV panel. Desiccant absorbs the moisture at night when the temperature of PV module is moderate and thus reducing the operating temperature during day while the PV panel is working by cooling the surface of PV panel by evaporation of water stored in desiccants, thus reducing temperature and increase the power conversion efficiency and the improve the lifespan of PV panel [8].

## Methods of Temperature Control

Earth receives a lot of solar radiation from the Sun. The radiation of the Sun is absorbed by the PV cells and converted into Electrical energy

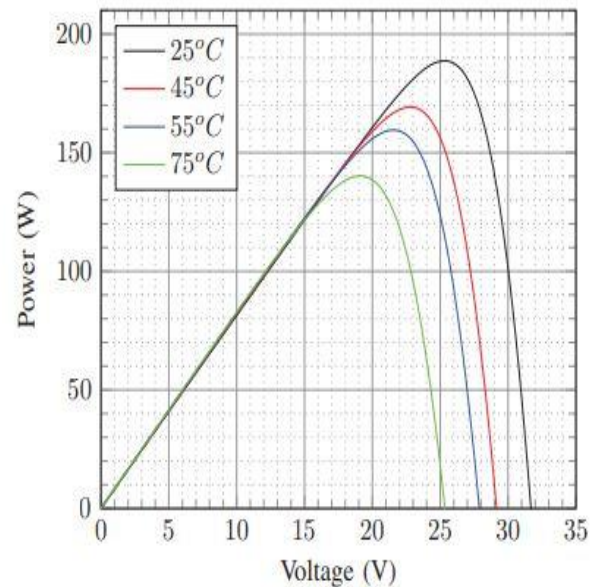


**Fig.1. Use of desiccant to absorb water at night and then evaporating water during day for reduction of operating temperature [8].** Though, High radiation increases the energy rate but the high local temperature decreases the efficiency and the output power of the PV panel. Efficiency and output power are linearly dependent upon operating temperature of PV module. The PV module conversion efficiency or the amount of energy converted into useful electrical energy is highly affected by the

environmental changes (namely Temperature and radiation variations). Thus, the limiting or controlling of temperature of the PV module is very necessary for maximum efficiency and output power. Several devices and techniques allow to minimize this effect and thus maximizing the efficiency. Maximum power point tracking (MPPT), a specific electronics circuit with different operating algorithm is used to maximize the efficiency. MPPT helps in tracking the accuracy, speed and oscillation around the peak power of the PV. Various techniques of cooling can be applied on PV module like air blower (forcing air flow), evaporation, solar collector [16]. An effective way of increasing the efficiency and decreasing the temperature is to combine the MPPT, temperature and the PV cooling technique together rather than using it separately. The cooling technique uses different inputs based on coolant used to configure the channel of heat [3][6].

### Efficiency Improvement

The efficiency of the output power depends linearly on operating temperature of PV panel. The operating temperature of PV panel should be kept in the range of Standard Test Condition (STC) [1]. As, the temperature of the PV module increases the reverse saturation current increases, reducing Open circuit voltage ( $V_{oc}$ ), further decreasing Fill factor which in turn, decreases the efficiency of the PV panel.  $V_{oc}$  and  $I_{sc}$  are highly affected by variation in temperature [5]. Cooling of the PV panel increases the efficiency of the system. Hybrid system consisting of PV/T (photovoltaic and thermal together) are used to overcome the problem of temperature and thus increasing the efficiency of the system [9]. Passive cooling fins are used to enhance conventional heat transfer from back of PV module water. Water is widely used as coolant with any power requirement whereas active cooling requires additional power [1]. Air is also used to reduce operating temperature of solar panel by transferring the heat to it [10]. Thermoelectric (TEC) and Thermoelectric Generation are used to extract heat from PV panel of hybrid car [16]. Thus, there is gain in efficiency. Thus, the efficiency is increased by cooling.



**Fig.2. Relation between Photovoltaic power and operating temperature [9]**

### Types Of Cooling

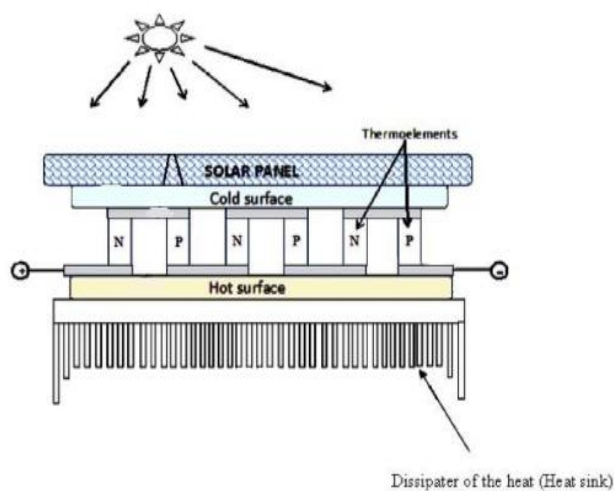
As discussed previously about the cooling method which was classified as the active and passive cooling, there are few techniques which have been practiced under these methods. There are always some innovative techniques derived in order to achieve a goal of better and better performance. Researchers and many organizations involve themselves in deep learning or the discovery of such techniques. Such techniques are to be discussed here, not all of it but some important ones.

Usually, these techniques deal with aspects involving air, liquid or material [17]. These are the base of various foundation of different techniques. One of the techniques is using a non-imaging concentrator, its main purpose is to decrease the cost of electricity produced. In this technique as compared to the flat-plate PV system, the efficiency and power output is enhanced [11]. Some techniques involve the DC fans and conductive metals such as aluminum as a cooling medium which is also helpful in the temperature control [7]. Some techniques involve the non-physical approach such as using a novel cylindrical tube PCM matrix. It not only decreases the thermal temperature but also the physical stress on the PV module [13].

There is another cooling technique which involves the thermoelectric cooling (TEC), it works on the Peltier effect. It is usually the direct conversion of the temperature variance

to electric variance and vice versa. The Peltier effect is the absorption of heat per unit time at the junction to balance the chemical potential of the two material, when the electric current flows through the junction connecting those materials [12].

Another known technique is using PCM which comes under the passive cooling method, it is a material which has the high storing capacity and increase the cycle lifespan of any devices. It mainly absorbs a large amount of heat due to high heat of fusion which results in the constant operating temperature resulting in a better performance [5].



**Fig. 3. PV cooling using TEC**

The liquid or air in a sense extract heat from the PV module and hence results in cooling. If in a liquid, considering the water, what it does is absorb heat from the panel and when the temperature rises, it evaporates taking the excessive heat that was affecting the performance of the module, there are some coolants which could also be considered as the hybrid thermal collector [4][8]. Hence, many more techniques can be incorporated into the objective of cooling and could be enhanced by the use of right optimization techniques.

### Cost Analysis

The dependence of performance of PV panel on temperature is observed from Short circuit current ( $I_{sc}$ ), Open circuit voltage ( $V_{oc}$ ), Fill factor, efficiency [5]. About 80% of the incoming radiation from sun is dissipated as heat which causes self-heating of PV panel and thus increasing 20°C-40°C temperature of PV panel leading to decrease in efficiency,

decrease in life span of PV module and thus reducing its output power. The efficiency of crystalline Si module drops ~ 0.45% for every 1°C rise in temperature. The degradation rate of PV panel in hotter countries is ~1.5% per year which is 8 times the degradation of PV panel in colder countries where the rate is ~0.2% per year. The more is the degradation rate earlier the PV module will get destroyed leading to untimely replacement of PV panel and thus increasing the cost of maintenance, installation of solar energy. The two fundamental reasons for self-heating of PV are Sub-bandgap absorption and imperfect thermal radiation of the surrounding. The optical redesign of solar modules is done by implementing selective spectral cooling and radiative cooling that reduces the temperature of the module and thereby, increasing the efficiency of PV panel [18]. Evaporative cooler can also be used with the solar panel to reduce the temperature and thus increasing the life span of the PV panel. The effectiveness of cooling is directly proportional to the rate of evaporation. As, the temperature reduces the PV panel is exposed to less heat, decreasing the degradation rate of PV panel which increases the life span of the PV panel. Thus, reducing the payback time of the investment and renewable solar energy generation cost effective [15].

### Conclusion

As it is seen that the efficiency of the PV module increases with the decrease in the operating temperature and output power if the PV module increases. It is also concluded that phase change material technique is used to store high energy which would have otherwise increase the operating temperature of the PV module and hence, degraded the PV panel reducing its life span. As the degradation rate of PV module is reduced payback of investment can be achieved. As for the method considering the cooling, Passive method of cooling is considered over active method of cooling as it does have any power supply requirement and thus, give more boost in efficiency.

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**BRAND LOYALTY ACROSS DIFFERENT PRODUCT CATEGORIES”****Ritu Raj**

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**ABSTRACT**

*Competition, rise in consumer disposable income and increase in information exposure to consumer has made brand loyalty a key of success in present business world. With the increasing competition in the market space, it is becoming a challenge for organization to lure consumer. This paper explores consumer behaviour across different product category. The main purpose of the paper is to figure out in which product segment consumer shows loyalty to the product and which are the segment where loyalty is less seen which has not been done before. We also tried to identify factors which affect the consumer purchase decision the most in each of the product category. The product category under consideration are household electronics items, personal electronics items, automobile sector, medicine, hospital, jewellery, grocery, cosmetics and apparels and accessories. We identified that product categories like Bank and Financial Services, automobiles the loyalty is more as compared to categories like groceries and fashion. It was also found that Ratings and review is the most influential factor in purchase decision across most of the categories. The paper will help the marketers to priorities their marketing expenses on loyalty programmes and advertisements.*

**Keywords:** Brand Loyalty, Brand Stickiness, Consumer Behaviour, Purchase Behaviour

**Introduction**

The introduction of the product in the new or in the existing markets required a lot of market research and consumer behaviour study related to the product category. With a lot of options available to consumer, they are easy being to get distracted to some new product. The reason may be anything right from good offers to recommendation from friends or family. The challenge for existing brand is to continuously acquire new consumer new consumer and at the same time retain their existing consumer. The bigger task for the new player in the marketplace is to attract new consumer and make them loyal to their brand. It is a continuous process. Consumers show different behaviour with respect to different product. Therefore, it is very important to know the consumer characteristics relevant to the product or segment in which a brand is operating. There are few segments where consumer tend to stick to a particular for a longer duration of time while there are also few categories where companies struggle for consumer strategy. The brand needs to decide where to spend more, in retention of consumer or acquisition of consumer. This is why the concept of brand loyalty or brand stickiness have become more important than ever.

The American Marketing Association defines brand loyalty as “the situation in which a consumer generally buys the same manufacturer-originated product or service repeatedly over time rather than buying from multiple suppliers within the category” or “the degree to which a consumer consistently purchases the same brand within a product class”. Trying to define the term, David A. Aaker considers that brand loyalty “reflects how likely a customer will be to switch to another brand, especially when that brand makes a change in price, product features, its communication or distribution programmes” [1]

But the point to understand is that the consumer propensity to stick to a brand or switch frequently varies from product to product and industry to industry. Based on the level of involvement and that of perceived differences between brands there are four types of purchase behaviour shown by consumers [2] When consumers are buying an expensive product complex buying behaviour is encountered. While in the dissonance buying behaviour consumer involvement is generally higher perhaps due to high purchases and less frequency in purchase. Habitual buying behaviour is depicted by consumers in the product where the involvement is low and there



is very less difference among brands. Contrary to it when there is a significant difference between brands consumer tend to show variety seeking buying behaviour.

In an interview, Charles Duhigg, mentioned "Most of the successful marketing campaigns are habits-creating campaigns. Yes, desires are at the centre of all of the decisions that we make about goods and use, and all the marketers' wonderful things tend to influence them. There are also different demographic factors such as age, gender, income, culture etc which can be used to find the consumer relation with brands. Consumers are often unaware of what affects their purchasing behaviour, and the "Buyers Black Box" strategy aims to effectively overcome this. There are many factors such as place, price, economic, demographic which enter the Buyer's Black Box where buyers' decision-making mechanism, influenced by the characteristics of buyers, activates and eventually becomes a series of measurable buyer responses where buyers' buying attitudes, expectations and buying behaviour ultimately plays a role. This black-box model can be viewed as a tool that lets customers make a choice about brand selection and shopping sites based on their purchasing power, buying behaviour, etc.

Also due to so much of noise around consumer with increasing competition, it is very much important for a brand to understand the key factors which impact the consumer buying decision. It is also important to understand that as the consumer buying journey is different for different product category so is the key factor impacting their purchase decision. Factors like word of mouth from friends and families, ratings and reviews, advertisements, endorsement by a celebrity affects consumer differently across different product segment.

The objective of the research paper is following:

- 1) To identify the consumer stickiness to a brand across different product category
- 2) To identify the relationship between demographic variables such as age, gender and income and brand loyalty
- 3) To identify the factor which most affect the consumer purchase decision across different product category

## Methodology

To proceed with the research, we focus on both the primary as well as the secondary research. The secondary research comprises of literature review of the relevant paper after which key factor was identified which impact consumer purchase behaviour. The paper we focus on was primarily on the concept of brand loyalty and factors affecting consumer behaviour in the context of loyalty. We further deep dived into papers which have studied the impact of demographical variable such as age, gender and income on the consumer behaviour. We also explored the literature which have tried to figure out the changing behaviour according to different product categories or industry. Finally, we have studied papers related to the factors influencing the consumer purchase decision. After going through all the relevant literatures, we formulated our 4 hypotheses. Subsequently a primary survey was conducted to find out the consumer loyalty across product category and the factors which most affect their purchase decision in order to establish the relevancy of our hypothesis. This was done through different segments selling products or services to get a clear understanding of most observed patterns in evolving customer behaviour and latent patterns found.

## Literature Review

In the past, the idea of brand loyalty was explored extensively in many literatures. [3] introduced a brand loyalty conceptual framework that covers the broad spectrum of brand loyalty based on a model effects hierarchy of cognitive, affective, behavioural purpose and repeat purchasing behaviour. A definition integrating this multidimensional construct has been given [4] as: "a deeply held commitment to rebuy or patronize a preferred product/service consistently in the future, thereby causing repetitive same-brand or same brand-set purchasing, despite situational influences and marketing efforts having the potential to cause switching behaviour."

The primary and pivotal category determination of items was crucially carried out on an understanding derived from several papers' articles pertaining to the purchase

behaviour of diverse items. Items that are incorporated comprise categories ranging from moo inclusion items - tall category items. A think about on customer conduct of tall association (HIPS) [5] that essentially comprised electrical machines, electronic items, automobiles, goes on to display that the purchase pattern of such items shares a considerable amount of positive correlation with the salaries and social class of individuals. In addition, it also goes on to state that there could be a possible cognitive association when it comes to purchase of tall items. This goes on to bring out an important fact that audits all tall association items are inclined to such a point that the buyer makes a conscious purchase. Such an act essentially gives the needed impetus to marketers in order to create fitting choices in order to utilize their promoting assets like TV advertisements, computerised advertisements and audits admirably to advance details. This led to postulations of the below hypothesis:

H1: Age is not a significant factor in determining the consumer brand loyalty

It's no surprise that demographics — especially age and stage of life — play a role in determining an individual's shopping personality. Our customer loyalty research suggests that as consumers pass through different stages of their lives, their purchasing personality traits evolve over time. This may depend on the conditions posed at every stage of life, such as starting a family or getting close to retirement. According to a report in customer communication group, the factors which drive loyalty vary from age group to age group. For example, consumers aged 13 to 44 were more likely to list the Unique Product Selection as a driver of loyalty. Consumers aged 13 to 24, meanwhile, were three times more likely to list Status as a significant loyalty force. A new research from Gyro: HSR reveals that people at various points of their lives display brand loyalty for different reasons. For example, while younger consumers would be motivated more by tangible incentives, older customers will prefer to have their custom personally recognized.

There has not been a lot of available literature which can examine the relation between the

consumer age and his loyalty towards a particular brand across the product categories. According to [6], age is very closely associated with the loyalty. More mature age groups (35 yrs. and above) display significantly more loyal behaviour than their younger counterparts. Also, it was found that the motives for sticking to a particular brand has different motives for the older consumers. But contrary to it, according [7] says that computerized media's impact on buy choice isn't subordinate on consumer's age. The article states that "Although the millennial era has the notoriety for being computerized our think about appears that they really like visiting the stores rather than shopping online in spite of the fact that the measurably critical distinction isn't found." Such contradictory view brings us to the hypothesis that age is not a significant factor in determining the consumer brand loyalty.

H2: Gender is a significant factor in determining the consumer brand loyalty

Do the consumer behaviour change with gender when it comes to brand loyalty? We will also try to find the relation between gender and brand loyalty. The tendency of an individual to stick to a brand or continuously switch brand also depends on gender to gender. In fact, the behaviour varies from one product category to other. According to a recent study by Media CT, which was conducted among 4400 men and women in the United States of America, United Kingdom, China and Brazil, men tends to stick to a brand more in the apparels, automobiles, financial services, home electronics and smartphones and tablets than women. While women describe themselves to be more brand loyal in beauty and household supplies. While this indicates that men are more likely to be brand loyal overall (self-reportedly!), the category-dependent nature implies that a different sample of categories might have returned a different result.

As has been stated in [8], the fairer section of society is more sensitive to price and loyalty schemes than their counterpart. The study identifies gender differences in purchase behaviour, price sensitive and purchase habits. According to [9] there is a good difference between male and female in the frequency with which product under different product

categories like apparels and accessories, hardware, computer software, cosmetics items etc were purchased on impulse. The brand loyalty intentions (BLI) of men and women are governed by different factors. The male consumer's BLI is influenced by engagement in social-media based brand community while female consumer's BLI is influenced by brand trust. All the views bring us to the hypothesis that gender is a significant factor in determining brand loyalty [10].

H3: The consumer brand loyalty varies with the income group of the consumer

There are no much researches which analyse income and its impact on consumer loyalty. According to [11] income of consumer influence the tendency of the consumer behaviour. There is also a difference between the income respondents who are under-averaged and above-average. Respondents with under-average income consider the price to be a very important loyalty determinant, while those respondents with average and above-average income consider the nature of the commodity to be a significant determinant of loyalties. The consumer behaviour changes with the income level of the consumer. According to [12] there is a significant difference in the level of brand loyalty amongst cell phone users depending on their income. Though the effect of income on stickiness is less but still it is noteworthy. A survey conducted in Croatia also confirmed that the customer loyalty or his tendency to seek variety depends significantly on the income of the consumer. According to a report published by customer communication group, consumer income do affects the primary brand loyalty. For example, lower income consumers — those with household incomes below \$50,000 — are more likely to list the lowest price as a primary loyalty factor than the general population and particularly the more affluent consumers. Consumers with household incomes below \$25,000 are more likely to report equal treatment and 1/2 times more likely to name caregivers as key factors driving their loyalty.

When revenue declines, brand loyalty usually decreases in relative importance compared with quality. It is not easy for consumers to make a

choice based on brand loyalty at the lowest income levels they are so sensitive to price point that they must prioritize that first. Research (from C.K. Prahalad) suggests that customers at the bottom of the pyramid are generally aware of the brands and would show an increased preference for "innovative" products that reach their price point. Additionally, while income levels may correlate directly with brand loyalty, the effect on adoption is not as clear-cut as that. Keeping in mind all the views we can come to the hypothesis that brand loyalty varies with the income group of consumers.

H4: Reviews and Ratings are the most influential factor when it comes to affecting consumer purchase decision.

Consumers are smarter than ever these days, and they realize they have a wide array of options as global e-commerce has evolved dramatically. Converting them thus is more difficult because customers aren't so quick to fall for gimmicky marketing ploys. So, the whole things boil down to understanding which factor influence your consumer the most.

Consumers are becoming increasingly less optimistic in businesses and the media. They are no longer easily swayed by flashy commercials and hollow promises of advertising. Consumers then turn to one another for quality suggestions, feedback and brand exploration. According to a report in total retail ninety-one per cent of customers said they trust random web users almost as much as they trust personal advice. That's why 82 per cent of customers read reviews online before buying a product. A study commissioned by Australia Post and created, conducted and analysed by the Research Unit of the Australian Customer, Retail and Services (ACRS) within the Marketing Department of Monash Business School found that only four advertisement channels (websites, personalized direct mail, TV ads and catalogues and flyers) had an impact of up to 92 percent of a customer purchasing decision.

Online consumer reviews, recommendations for products and services and peer opinions play a very important role in the decision-making process for customers. The various product reviews online, and Recommendation

platforms differ in purpose, function and features. The analysis confirms extremely popular feedback consumers considering making a purchase. Digital checkout checks impact customer buying decisions only when customers rely on the feedback online high enough when they make a purchase decision. Consumers depend on feedback based on format and influenced by its evaluation apps and online analysis system planning [13]. Communication through Word of Mouth (WOM) is a non-commercial, informal dialog between customers about a product, brand or service. The Compelling effect of for the following reasons [14] WOM has: (1) WOM's knowledge is viewed as being more trusted than deliberately provided since most WOM's are from relatives, friends and third parties one more trust; (2) Word of mouth is a two way communication which helps clear consumers doubt (3) We trust words from someone who have already used the product (4) Because word of mouth is one to one conversation and can be instantaneous it can provide more full and appropriate information in response to the inquiries. All the views bring us to the conclusion that rating and reviews affect the consumer purchase decision the most.

H5: Brand Loyalty of a consumer varies with product categories.

Each product or service belongs to a category of product, generally defined by the shared characteristics of the direct competitors within it. Toothpaste is one type of products. Network software is one category of products. In reality, so are hospitals or institutions of education. So how do product categories affect consumer loyalty towards a brand? Three considerations are at stake: effect and choice. And those in turn should have an impact on how you keep your loyalty brand and market.

#### **Category effect:**

As customers we connect with hundreds of types of items every day. Others are few but have major implications – for example, our hospital, our car or our tax accountant. Some of the products are costly purchase and also have a significant effect on our life. Consumer involvement in the purchase of such goods is very high. Consumers refrain from experimenting and switching brands in such

segment. At the same time there are few products such as salt, apparels etc which do not have a very large effect on consumer's life. Consumer are little liberal and open to experiment and try out new things in such category. If the consumer is not very satisfied with the product he can easily switch to the next brand which is not possible in the latter case.

#### **Category Choice:**

The amount of choice available to consumer also impact the consumer loyalty when it comes to product category. If a product category has many options to offer a consumer, it is easier for customers to trial and switch which in turn lessen the loyalty.

According to [15], the relation between product categories and brand loyalty was found to involve aspects of product involvement for each of the product concerned. Keeping in view of the above-mentioned facts we come to the hypothesis that loyalty of a consumer varies with change in the product categories.

#### **Data Collection**

##### **Primary Research:**

The primary research was conducted to get the detail insight about the behaviour of consumer when it comes to brand loyalty across product categories such as personal electronics, cosmetics, groceries, Jewellery, medicine, hospitals etc. The medium of the survey was online through google form. The questionnaire was designed in a way to figure out the consumer behaviour on the basis of demography such as age, gender and income across different product categories. The sampling technique used was a combination of snowball and convenience sampling. The sample size of the survey was 78 people both men and women. The population was divided into 5 age groups comprising of 18-24 yrs., 25-30 yrs., 31-36 yrs., 37-43 yrs. and above 44 yrs. The income range of the consumers were also divided into 5 range groups.

##### **DATA:**

Following questions were asked to the respondents in the online google form:

##### **Demographic:**

- 1) Respondents age
- 2) Respondents gender

3) Income-range

**Behavioural:**

1) Product Category in which consumers prefer to stick with a brand while purchasing

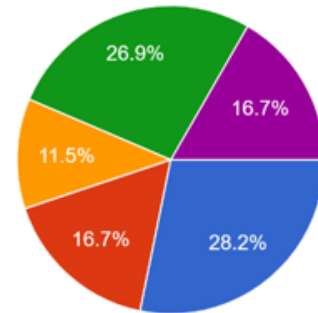
2) Product Category in which they prefer to try out different brands while purchasing

**Psychographic:**

1) Most influential factor which affect their purchase decision for each product categories

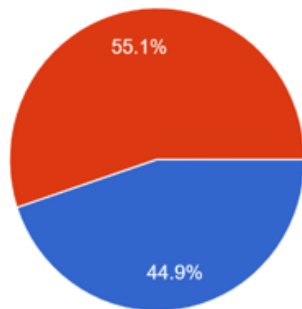
Income Range per annum (yearly)

78 responses



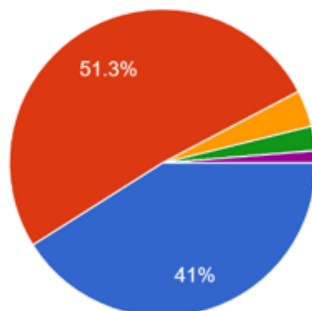
Gender

78 responses



Age

78 responses

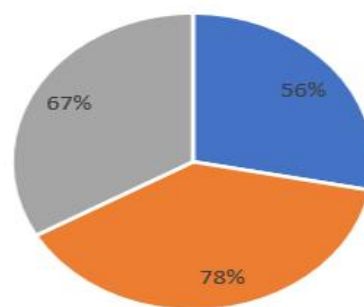


**Data Analysis**

H1: Age is not a significant factor in determining the consumer brand loyalty

To discover whether age plays a role in determining whether the person will stick to a brand or keep on changing respondents were asked about their age group and also their tendency to switch brand. The result clearly points that as the age increases the tendency of the person to stick with brands increases. People doesn't like to experiment much with their choice. From our study, it was found that 78% of respondent in the age group of 25-30 years stick to a brand as compared to 56 % in the age group of 18-24 years. Therefore, it rejects our hypothesis that age is not a significant factor in determining brand loyalty.

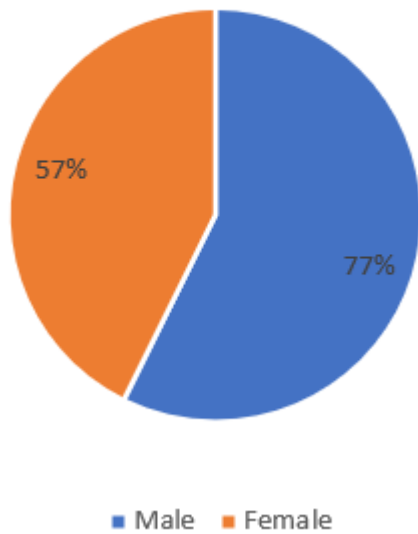
Age & Brand Loyalty



■ 18-24 yr ■ 25-30 yr ■ 31 & above

H2: Gender is a significant factor in determining the consumer brand loyalty

## Gender & Brand Loyalty

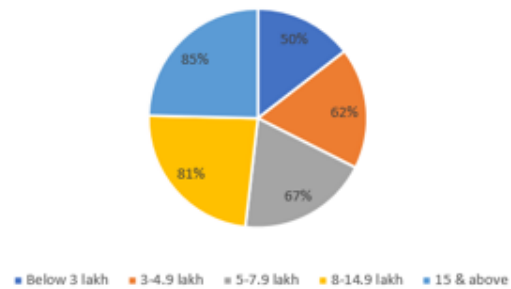


The data was collected from all the 78 respondents regarding their gender and their tendency to stick to one particular brand. It was found that male seems to be more loyal to as compared to their counterpart. According to our survey, about 77 % of male said that they tend to stick to one particular brand rather than seeking different brands. About 57 % of women said they prefer to buy products of one particular brand. So, we can say women are very open to switching their brands while making purchase. Hence, we accept our hypothesis that gender is a significant factor in determining the consumer brand loyalty.

H3: The consumer brand loyalty varies with the income group of the consumer

While going through various literature we come to the view that brand loyalty of consumer varies with the income of the consumer. The result was verified in our findings too. According to our survey, as the income of the consumer increases the consumer are more brand loyal. 85 % of the respondents with income above 15 lakhs said they tend to stick to one brand while only 50% of consumer with income below 3 lakhs prefer to stick to a company. This trend shows a gradual increase as we move upward in the income range.

## Income & Brand Loyalty



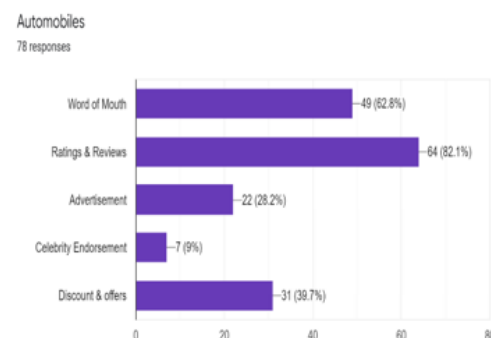
H4: Reviews and Ratings are the most influential factor when it comes to affecting consumer purchase decision.

To identify the most influential factor which impact the consumer purchase decision, all 78 respondents were asked to choose from below five options:

- 1) Word of mouth from friends and family
- 2) Ratings & Reviews on E-commerce platforms
- 3) Advertisements
- 4) Celebrity Endorsement
- 5) Discounts & Offers

The consumers were given multiple choice option where they could select more than one option from the above where applicable. Respondents were asked to choose from the above option for each product categories individually.

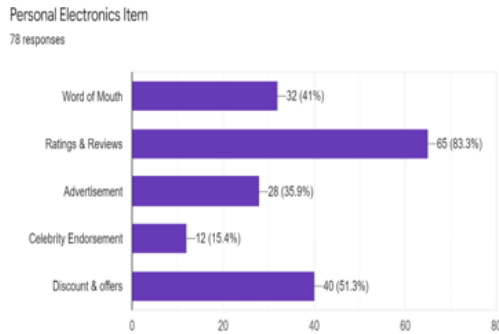
## Automobiles



In the automobiles segment, when the consumer was asked to choose the factor which most affect the purchase decision, about 82 per cent of the people choose ratings and reviews on the various platforms as there most influential factor. The second most influential factor was Word of Mouth from friends and

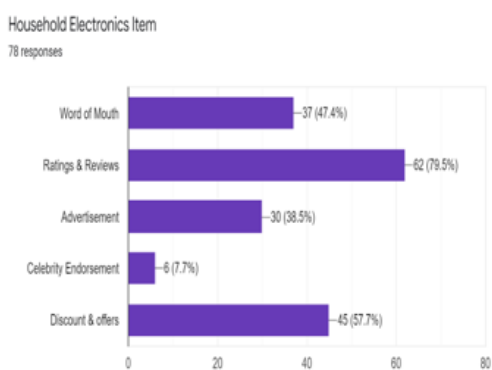
families with 63% of the respondents choosing it. Celebrity Endorsement emerges as the least influential factor in the segment. About 40 per cent of the consumer feels discount and offers as one of the significant factors.

Personal Electronics Item



Personal Electronics Items comprises of mobiles, tablets, laptop etc and as expected Ratings and reviews emerges as the most influential factor for this segment too with 84% of consumer choosing it. With 51 per cent discount and offers comes out to be the second most important factor followed by word of mouth with 41% people choosing WoM. Celebrity Endorsement again is the least influential factor among all for consumers.

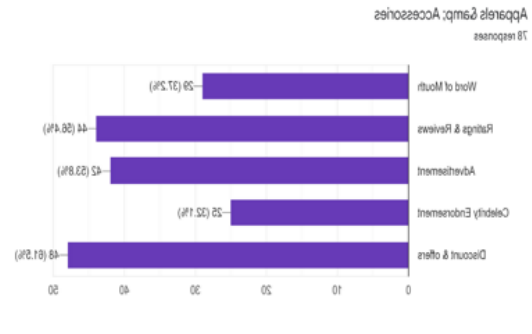
Household Electronics Item



In the household electronics item, with 80 per cent of people choose ratings and reviews as their most important factor. Discounts and offers was 2nd with 58% of people choosing it. In the household electronics items Advertisement and word of mouth do play a

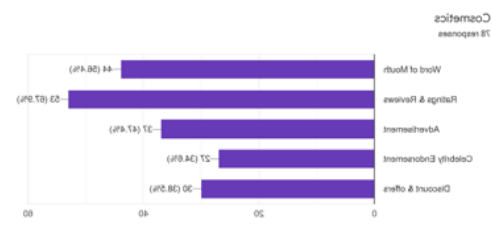
very important role in influencing the buying decision.

Apparels and Accessories



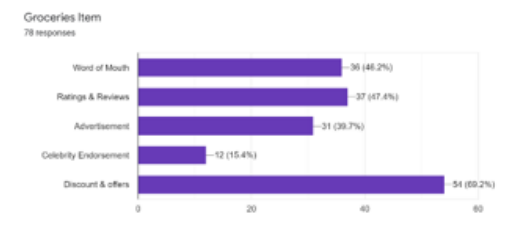
When it comes to apparels and accessories discounts and offers emerges out as the most influencing factor followed by advertisement and ratings and reviews with 54 % and 57% respectively. The importance of word of mouth and celebrity endorsement also cannot be ignored.

Cosmetics



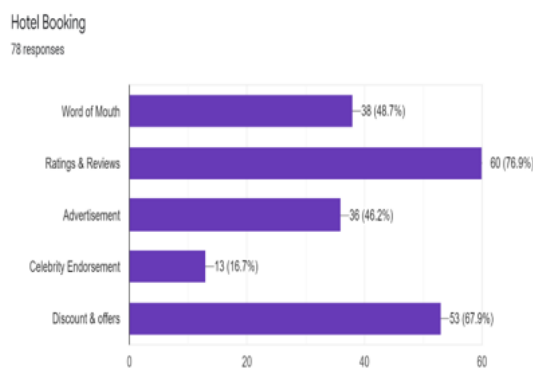
In the cosmetics segment, when the consumer was asked to choose the factor which most affect the purchase decision, about 68 per cent of the people choose ratings and reviews on the various platforms as there most influential factor. The second most influential factor was Word of Mouth from friends and families with 57% of the respondents choosing it. Celebrity Endorsement emerges as the least influential factor in the segment. About 48 per cent of the consumer feels advertisement as one of the significant factors followed by celebrity endorsement with 35 %.

**Groceries Item:**



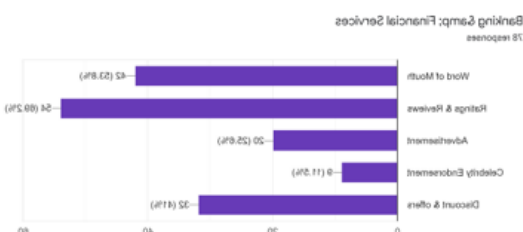
70% of the respondent choose discounts as there most important factor followed by ratings and reviews and word of mouth with 48 per cent and 46 per cent respectively. Celebrity Endorsement doesn't affect the purchase decision.

**Hotel Booking:**



When it comes to hotel booking ratings and reviews of the hotel emerges out as the most influencing factor followed by discount and offers and word of mouth with 68 % and 49% respectively. About 48% of the consumer also get influenced by advertisements. Celebrity endorsement has much effect on consumer.

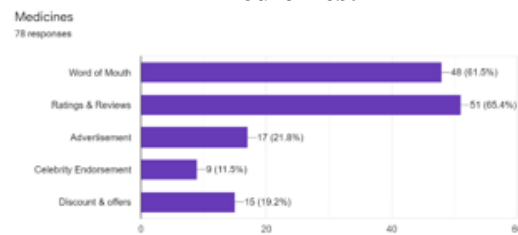
**Banking & Financial Services:**



In the banking and financial services, with 70 per cent of people choose ratings and reviews as there most important factor. Word of Mouth

was 2nd with 54% of people choosing it followed by discount and offers with 41% of respondents choosing it.

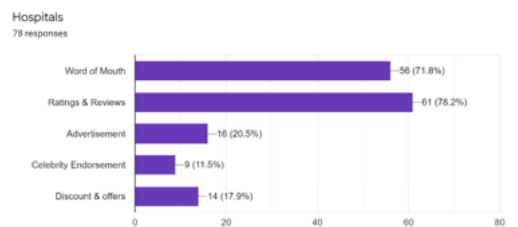
**Medicines:**



Since medicine is very essential item so as expected, ratings and reviews and word of mouth emerges as the two most important factor for most consumers with 65% and 62 % people choosing it. Advertisements, Celebrity Endorsement and Discount and offers doesn't have any influence.

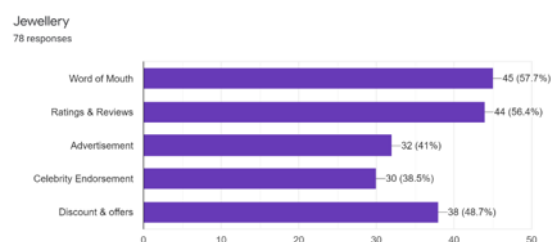
**Hospitals:**

Since hospitals are also is a life saver for consumer so as expected, ratings and reviews and word of mouth emerges as the two most important factor for most consumers with 79% and 72 % people choosing it. Advertisements, Celebrity Endorsement and Discount and offers doesn't have any influence.



**Jewellery:**

When it comes to purchase of jewellery, there is no any factor which stands out in terms of influencing the consumer. Each factor play an important role in influencing the consumer.



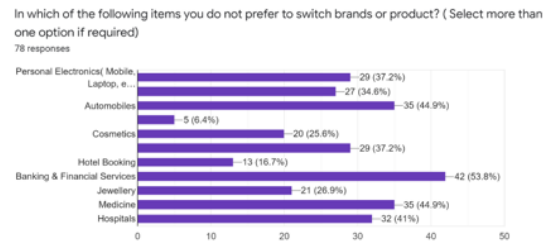
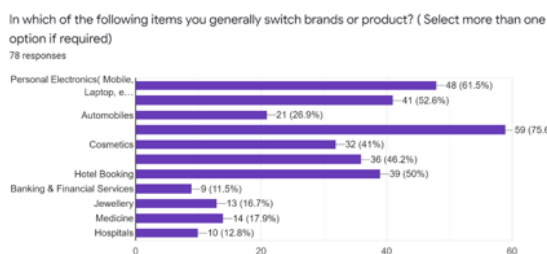


The following table summarises the most influencing factors on the consumer buying decision

Product Category	Most Influential Factor	Percentage
Personal Electronics	R & R	84 %
Household Electronics	R & R	80 %
Automobiles Industry	R & R	82 %
Apparels and Accessories (Fashion)	Discounts & Offers	62 %
Cosmetics	R & R	68 %
Groceries Item	Discounts & Offers	69 %
Medicine	R & R	65 %
Hotel Booking	R & R	77 %
Hospitals	R & R	78 %
Banking & Finance Services	R & R	69 %
Jewellery	Word of Mouth	58 %

As we can see from the above table that ratings and reviews are the most influencing factor for most of the consumer in 8 out of the total 11 product categories. Meanwhile discounts and offers is the most important factor in 2 product categories while word of mouth in just one. Hence, we can say that ratings and reviews is the most influencing factor when consumer purchase a product.

H5: Brand Loyalty of a consumer varies with product categories.



Product Category	Frequency (%)	Switch Tendency(%)
Personal Electronics	37	62
Household Electronics	35	53
Automobiles	45	27
Cosmetics	26	41
Apparels and accessories	6	76
Hotel Booking	17	50
Hospitals	41	13
Jewellery	27	17
Bank and Financial Services	54	11
Groceries	37	47
Medicine	45	18

As we can see in the above table loyalty is very high in Banking and financial Services, medicine, hospitals and Automobiles. If we closely analyse these categories, we can understand that these are the product or services which either cost high or are very essential in nature. So, for these types of product or service categories the consumer doesn't want to experiment with the brand or company. The risk-taking ability of consumer is very low in these segments. On the other

hand, in the product categories such as personal electronics, household electronics, cosmetics, apparels and accessories, hotel booking and groceries most consumers tend to switch the brands. These are the segments which are either frequently bought or have low investment. Apparels and accessories (fashion) is the segment where 76 % of the respondents said that they switch their brands frequently. Hence, we can say that brand loyalty also varies with the type of products we are dealing in.

### **Conclusion**

Out of the 5-hypothesis defined earlier, 4 were proved to be true. It was found that brand loyalty still is relevant across the industry. But the consumer behaviour towards experimenting with brands varies with product categories. We saw that product which includes large investment or is essential to consumers example automobiles, hospitals etc tend to enjoy the loyalty while products segment where the purchase is frequent and the investment is low struggle for consumer loyalty. Marketing agencies should first analyse the consumer behaviour for their category and then should go for framing loyalty program for their products.

It was also found that brand loyalty also varies with demographic variable such as age, gender and income. Male prefers to stick to a brand while their counterpart is not as loyalist. Consumer with more age group such as greater than 25 yrs. exhibit loyalty while making a purchase while their younger counterpart switches brand frequently. Income of consumer also helps a brand to predict the loyalty of its consumer. In our study it was found that the consumers with higher income shows more loyalty towards a brand while making a purchase.

Through the research we also tried to explore the factors which most influence the consumer purchase decision. We observed that the factors

also change with change in the products we are dealing with. It was found that ratings and reviews are the most influencing factor for most of the consumer in 8 out of the total 11 product categories. Meanwhile discounts and offers is the most important factor in 2 product categories while word of mouth in just one. This clearly signifies the rise in the importance of ratings and reviews across the platforms. Consumers now have become more informed and with the increase in penetration of internet and mobile, all the information are there on their fingertip.

Marketers shall find this study useful in better understanding their categories from the perspective of brand loyalty. It will also help managers to clearly define their target group according to their segment. For example, it can be inferred from the study that brands in categories such as fashion or groceries shall spend more on consumer acquisition as the loyalty in the segment is low. Also they should try to increase their SKUs, product varieties in the segment in order to woo the consumer. Contrary to this, companies dealing in automobiles, Bank and Financial Services should increase their expense more for loyalty programmes.

### **Limitations and Future Scope**

The study covers only limited product category and also the factors which influence the consumer purchase decision under study was limited. It is highly recommended that the future study shall increase the scope of the study. The future researcher should increase the number of attributes which can affect consumer purchase decision. They shall also increase the number of product categories and services in order to do more detailed and comprehensive research. There is also a scope for looking deeper into the relationship between the demographic variables and brand loyalty.

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## ROLE OF URBAN LOCAL BODIES IN FOSTERING CHARGING INFRASTRUCTURE FOR ELECTRIC MOBILITY IN TIER-2 & TIER-3 CITIES

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### ABSTRACT

*Urban Local Bodies (ULBs) plays a significant role in development of a city. The 74th Constitutional Amendment Act, 1992, gave constitutional status to ULBs under Article 243 and added XII Schedule to the Constitution of India. The impact created by them reaches to every nooks and corners of a city and on different classes of the society. The transition to electric mobility can, thus, be accelerated with the support from ULBs. By 2030, the government plans to turn 30% of its conventional vehicle into electric ones. This study tries to find the role ULBs can play in setting up charging infrastructure in Tier II and Tier II cities.*

*We analyzed several central and state policies to examine the role assigned to ULBs in electric mobility transition. The study brought out the policy gaps existing in current electric mobility framework with respect to urban local bodies. The recommendation of this study would help to bridge the policy gap and provides ways and means by which ULBs can contribute towards development of charging infrastructure. The ULBs based model would help in faster adoption and acceptance of electric mobility along with ensuring sustained profitability of charging stations.*

**Keywords:** *Electric Vehicles, Charging Infrastructure, Urban Local Bodies, Policies*

### Introduction

The advent of electric vehicles began in early 19th Century but it took almost another century to reach the scale as it is today. Electric mobility transition is imperative due to factors such as reducing carbon emissions, reducing dependence of fossil fuels etc. This in-turn makes charging infrastructure an important tool for fighting climate change and ensuring sustainable development. The global EV stock reached 7.2 million units in 2019 which is an increase of 63% from the 2014 levels (IEA, 2020).

In India, the number of charging stations have quadrupled in last one year. From 352 charging stations in 2018 to over 1800 in 2019. This is due to Central and State government's impetus to the charging infrastructure sector as well due to the potential of growth in this sector. Central government made important policies since the start of the decade.

The 74th Constitutional Amendment Act brought about changes in the constitution and brought about changes in the governance by adding the Urban Local Bodies (ULBs). This amendment gave constitutional status to ULBs and brought about democratic decentralization in governance (Parliament, 1992). Article

243ZD and Article 243ZE (Clause 3[a(I)]) provide for integrated development of infrastructure and environmental conservation. Both these aspects can be addressed by promoting charging infrastructure for electrical vehicles with the help of urban local bodies.

The financial viability of charging station depends upon the location, availability of power load, capacity utilization and electricity tariffs. The major cost component of power installation includes cost of power, capital expenditure and O&M expenditure. This is where urban local bodies (ULBs) can play an important role. They can become partners in the development of charging infrastructure and facilitate obtaining requirements like land, finding right location, routes, operation and maintenance etc. It would also help the ULBs to bolster their finances and revenue.

The various break-up of electricity tariff (for LT and HT) along with fixed charges vary from state to state and can lead to skewed development of the sector on the whole. ULBs can bridge this gap especially for Tier II and Tier II towns by improving feasibility through non- tariff revenue generation. Developments in charging infrastructure and technology has accelerated growth of electric vehicles.

Improvements in battery life and usage coupled with increased charging options has reduced range anxiety. With estimated compound annual growth rate of 41.2% during the period 2019-25, India would be one of the fastest growing market for charging infrastructure.

Countries like Norway, Denmark and Netherland have taken a lead in terms of percentage of EV vehicles out of the total stock whereas China's have staggering numbers in terms of EVs, charging stations and companies involved in the EV ecosystems. Countries such as Paraguay and Chile have also embarked on path of electric mobility and are progressing rapidly. Proper policy initiatives have proven to be a catalyst for growth in charging infrastructure. In majority of these countries, the policy initiatives have some components which has direct bearing of the role of ULBs. The global south is playing the catching up game to their counter-parts.

### Literature Review

According to the report on the history of electric vehicles by Idaho national laboratory (Laboratory, 2016), early electric cars found its place in the world market due to the need for local mobility around cities. They were very useful for small trips around the city especially for office goers and women. However, the report failed to mention the early local governments contribution in laying out electrical infrastructure. Robert Anderson was one of the first few people who conceived the idea of electric vehicle in the early Seventeenth century. Thomas Parker invented one of the early practical electrical in British at around 1884. Car manufacturers soon began experimenting with early electric. One such example was P1 car developed by Ferdinand Porsche in 1892. Some early day advantages of electric cars were low odour as compared to gasoline-based cars, easy to start, no need for gear and small city expanse. However, the scenario changed after 1920s as Model-T's mass production began along with expanding cities, invention of electric starter, trade over long distances and discovery of Texas oil. By 1930, the number of electric cars dwindled.

Oil shock of 1970s gave a fillip to the electric vehicles. The main aim of companies

producing and operating EVs was to reduce dependency on imported fuel oil. Models like Batronic electric truck, Electrica sedan, CitiCar, EVcort and Mars II etc came into picture (Energy, n.d.). Even US Postal Service started using some electric trucks. This phase was short-lived as prices of oil reduced. The decade of 1990s saw re-emergence of EVs. This was due to concern for climate change and various legislation adopted by states post-Rio summit. The "Big Three" carmakers i.e. Ford, Chrysler and General motors got into the fray of producing EVs. This brought a significant change in development and distribution of EVs and inspired various other automobile manufacturers (Mcfadden, 2020). Most of this development remained oblivious to the link between local bodies and their role in EV adoption. However, it was only after 2011 when the current era of EVs dawned along with associated charging infrastructure. Companies like TESLA and Mitsubishi completely changed the EV market through technology disruption.

Evolution and development of charging infrastructure generally outpaced by developments in electric vehicles. General Electric was the first company to introduce street charging points called "Electrant" in New York City in early 20th century. Electric vehicles could also be charged at a location of dealer, and batteries could be removed and charged separately. By 1950s, the advances in space technology resulted in improvements in batteries and charging choices.

The year 1997 was a landmark event in development of charging infrastructure. It is the year when Toyota launched Prius in the market. The idea of an electric car with supported by a charging infrastructure became a reality. Toyota Prius' popularity incepted the idea of a unconventional vehicle in people. In 2006, Tesla launched Roadster that could travel up to 322 km on a single charge. This was also a watershed moment for the evolution of charging infrastructure.

From 2006 onwards, hybrid and electric vehicles gained traction which resulted in big auto brands entering the fray. Reduction in the cost of of electric vehicles due to technological breakthroughs in battery technology has

increased the attractiveness of EVs. People now see electric cars as viable option. It is believed that electric cars would achieve price parity with conventional cars by 2025. In future, major car manufactures would join the EV bandwagon to offset the reduction in revenue that might occur due to low attractiveness of ICE cars (al., 2019).

The modern electric vehicle supply equipment (EVSE) are efficient and easy to install. The skillset required to install, operate, maintain and repair these units are also reasonably low and can be imparted to people with basic high-school level knowledge. This creates an opportunity for creating a dedicated workforce for electric mobility sector. Urban local bodies can be an ideal place for deployment of local skilled workforce. It would create a link between local community and electric mobility infrastructure.

The developments in charging infrastructure has gone beyond residential charging to a multitude of charging option, the development of crucial as the demand and mindset about charging continue to shift. Innovation in charging technology would make charging options more user friendly and cheap.

Electric mobility has become imperative for all major economies due to the looming dangers caused due to greenhouse gas emissions such as climate change, rise in sea levels, increase in instances of outbreak of zoonotic diseases like COVID-19 etc. It would also help in reducing the consumption of fossil fuel and especially for high energy demand countries like India which spend a significant amount of GDP on oil imports.

It has been acknowledged that the transition to electric mobility can cut-down harmful emissions of greenhouse gases. The magnitude of those reductions depends critically on the technology to produce the electricity. A 2009 study done by Hadley and Tsvetkova revealed that the extent of impact of electric mobility transition significantly depend upon the kind of technology being used for energy generation. According to IEA report (2008), electric vehicles are 4 times more efficient than conventional vehicles.

Another advantage of the electrical vehicle is that it improves air quality (as electricity

generating plants are typically located a long way away) and noise levels. As 2010 Greenpeace report suggests that if the rise in electricity demand coincides with reduction in consumption, it might improve the efficiency of electricity generating plants.

Electric vehicles cause less noise pollution as compared to fuel-based vehicles. This leads to improvement in quality of life of citizens. However, it can cause land pollution due to unplanned or unscientific disposal of batteries and other electrical equipment. Recycling of wastes generated in EV ecosystem and be a possible revenue source of urban local bodies which deal with city level solid waste management (Leon, 2020).

Government of India since the start of this decade has made several initiatives to facilitate electric mobility transition. This transition would not only come through private EVs but mostly from electric public transport system like electric buses, fleet vehicles, shared vehicles etc. Charging infrastructure is a vital element in this transition. Optimum density of charging station is important as well as the grid and power infrastructure. Most of these schemes and programs are focused on improving electric vehicle ecosystem by creating demand through fiscal incentives. Along with the central government, state governments too have brought out important and much necessary policies.

Some of the stakeholders in electric mobility transitions are (Institute, 2019):

I. Government - District administration, Urban development authorities, Municipal agency, traffic police, DISCOMs, state transport operators

II. Non-government – Domain experts of electric mobility, OEMs, trade union members, RWAs members, academia/research institutes etc.

Delicensing of charging infrastructure was a important step in direction of electric mobility as it allowed private players into charging infrastructure domain. It is expected that charging infrastructure market would be dominated by small fragmented players and hence central government came out with standardized protocols. Government of India

through its guidelines (Ministry of Power, 2019) mandated following requirements for setting up of Public Charging Infrastructure (PCI):

1. Exclusive transformer; 33/11 KV line/cables with associated equipment including line termination etc, if required.
2. Appropriate civil works, cabling and electrical works ensuring safety, Adequate space for charging and entry/exit of vehicles.
3. Public Charging Station shall have, any one or more chargers or any combination of chargers from the table given below in one or more electric kiosk/boards
4. Charging stations for electric 2Ws and 3Ws shall be free to install any charger.
5. Option for remote booking using ICT solutions. Such online information to EV owners should also include information regarding location, types and numbers of chargers installed/available, service chargers for EV charging etc.

Urban local bodies can play significant role in EV ecosystem from the stage of planning to recycling of electric vehicle wastes. The role in charging system would add impetus to the growth story on electric mobility in India.

### Research Methodology

This research paper made an attempt to review the current Central policy and State policies to evaluate the current scenario of charging infrastructure and the role of ULBs in their development. We delved into the areas of possible interplays between urban local bodies and other stakeholders in charging infrastructure domain. We analysed the various policies and guidelines brought out by the Central and State governments and its relevant to the synergy between charging infrastructure and ULBs.

The total cost of setting up and running of charging stations was estimated. It included cost component of different type of chargers available in Indian markets. The various components like cost of power, capital expenditure and operational expenditure was compared. This helped in getting insight into the cost economics of charging stations and

brought out its significance in terms of profitability with respect to a ULB based model of charging station.

The policy is the bed rock on which the growth of any particular sector lies on and flourish. It acts as an enabler and provides roadmap for growth. Policy making in India is the prerogative of the executive. It consults with various stakeholders and lays out the desired policy to provide a strong base.

Some of the vital characteristics of any mobility solutions are accessible, affordable, fast, safe and inclusive. It ensures that the quality of life of citizen improves along with their productivity. The current stage of India's growth presents an opportunity to leapfrog in technological aspect of mobility. Electric mobility is one such areas where India has tremendous potential for growth. It would not only add value to Indian economy but would help achieving Paris Agreement commitments. Charging infrastructure is crucial component of EV ecosystem and its linkage with local bodies can provide a sound base for further growth in this sector.

### Policies of Central Government

#### A. Alternate Fuels for Surface Transportation program(2010)

- It aided research and development projects on electric vehicles.
- Financial Incentives provided were about Rs 950 million
- 20% discount on the electric vehicles (at ex-showroom price)

#### B. National Electric Mobility Mission Plan (2013)

- Proposed \$6-7 Billion Investment
- Target of 6 million EVs on road
- Fuel savings in tune of 2.5 million tonnes

#### C. Faster Adoption and Manufacturing of (Hybrid &) and Electric Vehicles (FAME)

- FAME I (2015-2018): Rs 875 cr. outlay, incentives (20% of Vehicle), support in R&D

- FAME II (2019-2023): Total outlay of Rs 10,000 Cr., Rs 40 Cr. for charging infrastructure, wider subsidy scope

#### **D. Guidelines and standards for Charging Infrastructure**

- Issued in December, 2018 (Revised in October 2019) by Ministry of Power
- Objectives:
  - Affordable, safe, reliable and accessible charging stations
  - Promote affordable tariff chargeable from EV owners and charging station operators
  - Promote and encourage small entrepreneurs
  - Create market of EV charging business
  - Facilitate EV charging system adoption
- Guidelines (An overview):
  - Private charging at residence and official spaces allowed
  - Setting-up of public charging station de-licenced
  - Provides technical requirements of public charging infrastructure (PCI)
  - PCI requirements for long-range EVs and Heavy duty EVs
  - Entails guidelines related to location of PCIs
  - Creation of Database of PCIs by CEA, Tariff for electricity, Surcharges
  - Priority, implementation and selection of agency for PCI rollout

#### **E. National Mission on Transformative Mobility and Storage:**

- It was launched in 2019 with aims to promote electric mobility and encourage manufacturing of related components like batteries, charging station equipments etc through phased manufacturing program (PMP)
- Its prime focus areas include R&D, production of EV components, specifications, communication and testing standards, demand and supply side incentives, regulatory framework and research & development.
- It aims to leverage economics of scale and market size of India to create an EV industry which is competitive in global markets.

#### **F. Amendments in Model Building Code 2016 and URDPFI Guidelines 2014**

- These amendments were made in February 2019 to promote use of electric vehicles in urban areas.
- It added Clause 10.4 in the MBBL 2016 with the intention to promote electric mobility in urban area. According to the amendment, 20% of all parking spaces (residential and commercial) are to be provided for EV charging infrastructure.
- It also fixed a ceiling on the cost the energy operator can charge i.e. not more than 15% of average cost of power supply.
- Amendments to URDPFI guidelines were made in Section 8.4.7 under chapter 8 dealing with infrastructure development.
- It provides for a public charging station at every 25 km highways and inter-city roads and one fast charging station at every 100 kms.
- In regional level Industrial zone or SEZ, land shall be reserved for a public charging station within a grid of 10 km × 10 km of the designated areas.

#### **State Policies**

India is a Union of States. Mechanical propelled vehicles and Electricity are part of Concurrent List (Entry 35 and 38 respectively) whereas Industries are under State List (Entry 24). These entries allow State Governments to make policies and laws with respect to EV and charging infrastructure. Around 10 states like Bihar, Uttarakhand, Delhi/NCR, Madhya Pradesh, Karnataka, Kerala, Maharashtra, Andhra Pradesh, UP and Telangana have issued their final or draft electric vehicle policies till date. The policies spell-out various demand and supply incentives along with various provisions made for charging infrastructure and other ancillary activities.

State Electricity Regulatory Commissions (SERCs) of around 12 states have issued tariffs orders for EV charging stations. It includes Madhya Pradesh, Chhattisgarh, Delhi, Uttar Pradesh, Haryana, Jharkhand, Karnataka, Andhra Pradesh, Maharashtra, Punjab, Telangana and Gujarat. Electricity tariff for EVs in Chandigarh were issued by Joint Electricity Regulatory Commission for Union Territories.



### **Andhra Pradesh EV Policy (Industries and Commerce Department, 2018)**

The electric vehicle policy of Andhra Pradesh aims to create an EV system that can attract USD \$7 Billion in total investment. It seeks to employ 60,000 people in electric mobility sector. It aims for develop Andhra Pradesh as the manufacturing hub of energy storage solutions. It provides for converting cent percent of its public buses in electric ones by 2024.

It policy seeks to provide grants and venture funds for R&D, incubators and Start-ups working in electric mobility domain especially on electric power trains and electronics. It also aims to create a Smart Mobility Corporation which would oversee the development of futuristic transport.

Urban Local Bodies setting-up charging stations in Andhra Pradesh can get capital subsidy of 25% (with ceilings) and waived-off SGST.

### **Bihar EV Policy 2019 (Draft) (Department of Industries)**

The policy aims at achieving dual target of increasing manufacturing output as well as attracting private investment in the state. Electric mobility provides an excellent opportunity for both. The policy also seeks to end the scourge of manual paddling of rickshaws and create better avenues for shared e-rickshaws. The policy prescribes setting up of a public charging station at every 50 km, on either sides, on state and national highway. It has a target of Rs.

2,500 Crore in investment and create employment in the state.

With respect to ULBs, the policy states that modifications will be made in various rules to set- up common public charging stations in parks, residential & parking areas etc.

### **Karnataka EV Policy 2017 (Commerce and Industries Department, 2017)**

Karnataka was the first state to formulated its Electric mobility policy in 2017. The policy aims to be the pioneer state in creating an electric vehicles ecosystem that can generate over fifty thousand jobs and attract USD \$ 4 billion in investments. It provides supply and

demand side incentives like loans, SGST waiver, capital subsidy etc. State that is home to IT hub of India also wishes to be a leader in electric mobility sector.

Karnataka aims to provide charging stations and battery swapping infrastructure at every 50 kms (on both sides) on its highway and inter-city roads. Urban local bodies like Bruhat Bengaluru Mahanagara Palike (BBMP) are to set-up charging stations in the specific location in the city.

### **Kerala EV Policy 2018 (Transport Department G. o., 2018)**

The EV policy plans to develop skilled workforce for electric mobility domain. The policy targets a 2 lakh 2Ws and 3Ws, 1,000 goods carriers, 3,000 buses and 100 ferries to be run on electric power.

The policy prioritizes manufacturing of electric vehicles along with strengthening of charging infrastructure value chain. It is one of the rare states in India where the demarcation between rural and urban areas are almost negligible. The policy plans to put in place charging infrastructure to encourage adoption of electric vehicles. The Kerala model of Panchayati Raj Institutions can be instrumental in promoting charging infrastructure.

### **Maharashtra EV Policy 2018 (Industry, 2018)**

Maharashtra's electric vehicle policy aims to leverage its manufacturing capabilities to become a major player in export of electric vehicle components, battery and charging equipments. It targets 5 Lakh EVs in the state and seeks investment in electric vehicle component manufacturing, battery manufacturing and charging station equipment manufacturing. It incentivises electric buses and buyers private electric vehicles.

Various laws governing local bodies and public spaces such as parking of commercial buildings, residential properties and playgrounds etc will be modified to set-up charging stations.

### **Madhya Pradesh EV Policy (Urban Development and Housing Department, 2019)**

The policy aims to promote electric mobility and reduce emissions of polluting and

greenhouse gases. It seeks to make 25% public vehicles electric by 2026.

It provides measures to facilitate manufacturing of electric vehicles and related components. EVs. It provides for supply and demand side incentives like free parking, free road tax, reduced vehicle registration, financial aid from the Dedicated Urban Transport Fund for electric buses.

The policy provides for modification of urban bye-laws to set-up charging and battery swapping stations. Non-tariff revenue generation will be generated through advertisements, parking surcharge on conventional vehicles at public run parking. Additional finances will be raised by using Electric Mobility Bonds issued by ULBs.

#### **Delhi/NCREV Policy**

**(Transport Department G. o., 2018)**

In view of dealing with its problems with pollution, the Delhi's EV policy was released with emissions reduction targets in sight. It aims to make a quarter of all new vehicle registrations to be electric by 2023. Adoption of 2Ws, 3Ws, public buses and taxis will be encouraged in view on congestion issues in Delhi. It plans to convert half of public buses into electric ones by 2023.

To ensure proper development of charging infrastructure the tariff rates have been set favourably. It aims to setup a public charging infrastructure at every 3 Km of its road.

It is aiming to develop Delhi as a recycling hub for electric vehicle ecosystem. It seeks to follow an 'Urban Mining' model where it can extract rare materials from old batteries and other EV ecosystem equipment and encourage manufacturers to add value to them.

#### **Tamil Nadu EV Policy (Nadu, 2019)**

With the target of attracting Rs. 500 Billion in investment in electric vehicle manufacturing, the policy attempts to create an enabling electric vehicle ecosystem in the state and creating new jobs. The policy aims to provide favourable power tariff and power load capacity to boost charging infrastructure. The policy aims to generate employment and nurture innovation. The policy also provides for an EV Venture Fund to create Start-ups ecosystem in electric mobility sector.

#### **Telangana (Government, 2018)**

Telangana's EV policy aims bring in \$3 Billion worth of investment and generate jobs for 50,000 people by 2022 through electric mobility and manufacturing activities. The policy provides to improve charging infrastructure by aggregating demand and supply side incentives.

It aims to convert a significant part of its public buses into electric. It provides for creation of skilled manpower that could be employment in the manufacturing hubs dedicated to electric vehicle production.

Highway linking important cities like Bengaluru, Mumbai and Chennai, and some others would be equipped with charging stations at every 50 km on both sides.

#### **Uttar Pradesh EV Policy (Pradesh, 2019)**

The policy encourages electric mobility transition through setting up 2 lakh charging stations by 2024 and increasing the number of electric vehicles on the road to 10 lakhs by 2030. A dedicated policy implementation unit will be set up in Industries Department to monitor the development of electric mobility sector in the State.

Capital interest subsidy, subsidy on charging infrastructure loans, industrial quality subsidy, stamp duty exemption, SGST reimbursement etc. for EV manufacturing units. Private EV parks would be set-up to boost manufacturing. It also has a single window approval system.

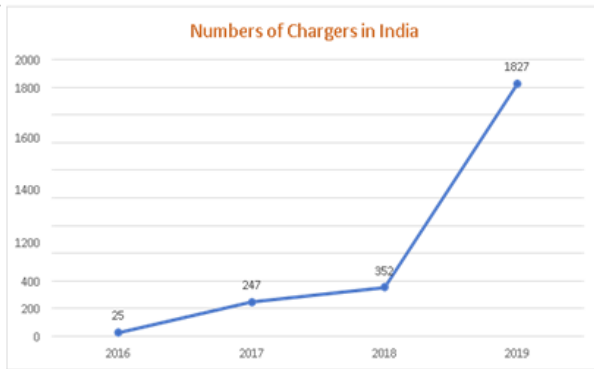
#### **Uttarakhand EV Policy (Department of Micro, 2018)**

Clean environment and conducive environment for manufacturing of EVs are twin objectives of the electric vehicle policy of Uttarakhand. The policy aims to introduce 500 electric buses and more would be added in future. The government would provide term loan to MSMEs in tune of Rs 500 million. The policy also provides for 30-50% subsidy on GST on manufacturing of EV equipment.

#### **Result And Analysis**

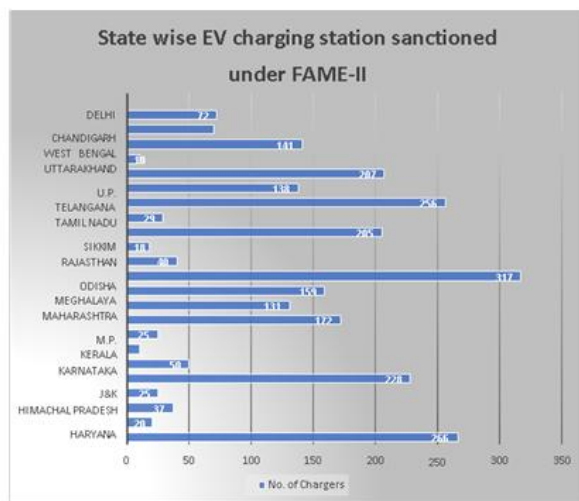
The charging infrastructure is set to grow by leaps and bounds in India. Government of India has set a target of 30% electrification of all vehicles by 2030. The number of players in EV ecosystem is increases as is the demand for

electric vehicles. The numbers of charging stations are increasing with every passing year.



**Figure: Growth of chargers (Fast and Slow) in India [Source: Global EV outlook 2020]**

This growth is the outcome of Central and state governments push for electric mobility in last decade. There is a growing concern regarding environmental issues like pollution and climate change. This has resulted into demand of electric vehicles due to environmentally conscious consumers. The FAME scheme gave a significant push to the development of EV ecosystem. State government also followed suit with state policies (some in draft stage) and tariffs for charging stations. Around 12 states have made policies and set tariffs through SERCs. The technology advancement in the charging infrastructure has found way into Indian markets.



Ministry of Power came out with guidelines which mandated certain technological requirements and standards for setting-up of charging station. Stakeholders are also looking into futuristic technologies which can reduce charging time along with financial gains. Around 2,636 charging stations would be installed under the FAME India scheme. This

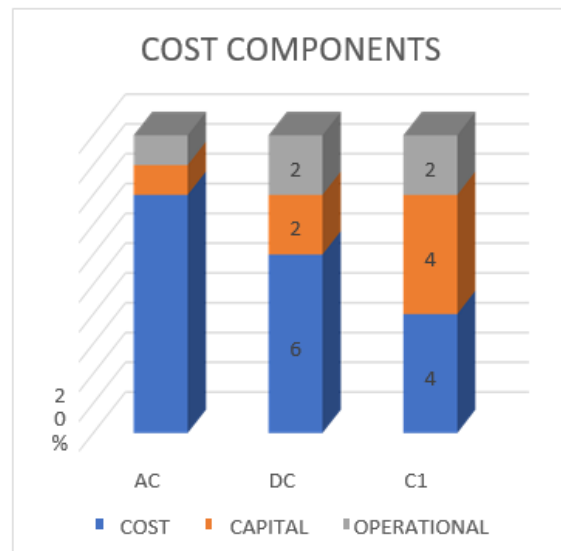
would encourage original OEMs to launch new products in coming years. About 1,633 among the total will be fast charging stations whereas the remaining will slow charging stations. About 14,000 chargers will be installed across the selected cities.

The above figure showcases the spread of demand for charging infrastructure. Most of states that have high numbers of already installed charging stations or planned to install them are located in the southern and western part of India (with the exception of Delhi). This pattern is similar to the normal trend of growth. However, this also coincides with the well developed Panchayati Raj Institutions in these areas with Kerala leading the lot and emerging as champion of grassroot governance. A well-developed local governance system has direct correlation with the development of the area.

### COST ECONOMICS OF CHARGING STATION

For any entity willing to setup charging station, the cost economics of the unit is vital. It is one of the major factors determining its viability. There are three components in the cost of any charging station:

1. COST OF POWER
2. CAPITAL EXPENDITURE
3. OPERATIONAL EXPENDITURE



**Figure: Comparison between cost of different types of chargers**

Cost of Power	Capital Expenditure	Operational Expenditure
Charges as approved by SERC	EVSE unit cost	Annual maintenance cost
Additional surcharges and duties	Civil works	Operational cost of CMS and mobile App
Cost of power losses from converting AC to DC	Cost of Auxiliary equipment	Cost of Insurance
Taxes levies by Govt.	Power connection cost Cost of Charger Management Systems (CMS)	Gateway charges Land rentals  Cost of facility management services, marketing and awareness etc

The cost of different types of chargers vary from Rs. 1 lakh to Rs 40 lakh. The prices of various chargers available in Indian market is given in the table below:

Charger type	Approx cost (Rs.)	Power output (KW)	Rated voltage
Combined Charging System (CCS)	15,00,000	50	200-750 V
CHArge de Move (CHAdeMO)	15,00,000	50	200 - 500 V
Type-2 AC	1,25,000	22	380 - 415 V
Bharat DC001	2,40,000	15	48V
Bharat AC001*	70,000	10	230V

From the point of cost economics of installing and operating a public charging station, operational expenses which includes land rentals, annual maintenance cost, cost of facility management services, marketing and awareness etc constitute 10-20% of the total cost of installation depending upon the type of charger to be installed. This is where urban local bodies can play a significant part by reducing cost of these expenses. It can be done either through partnership with energy operator (private players, DISCOMS, Public utilities etc) or by installing charging infrastructure on its own. This assumes more significance in Tier II and Tier III cities which are of less attractive to private or public entities due to low margins in profit. Urban local bodies can fill these places and create a market and platform for growth and adoption of electric vehicles.

An example of this can be seen in a recent partnership agreement between EESL and Urban Local Bodies of Hyderabad, Noida, Jaipur, Ahmedabad and Chennai. A similar model of agreement can be reached with other

Urban bodies of Tier II and Tier III towns (Vaid, 2020).

Revenue growth of Urban local bodies in India has lagged behind in comparison to overall growth. Schemes such as JNNURM and AMRUT have not been able to push the revenue reforms suggested by several Finance Commissions. In fact, ironically while the population of Indian cities is growing, ULB revenue is decreasing. According to a ICRIER report, which is based on data from 37 municipal corporations, the total municipal revenue has declined from 0.49% of GDP in 2012-13 to 0.45% in 2017-18. These corporations' own source revenue has also dropped from 0.33% of GDP in 2012-13 to 0.23% in 2017-18.

To address the reduction of revenues of ULBs, there is need to evolve new revenue streams. Charging infrastructure can be an answer to one such problem. It is a win-win situation for the ULBs, partners and users. It would not only ensure sustainable profitability of charging stations but would also help in augmenting the revenues of urban local bodies which in-turn would help in better financial health. It can also act as a game-changer in terms of increasing the involvement of private sector into municipal affairs which can help in improving the efficiency of ULBs. It would help in upgrading the skillset of municipal officers and can lead to capacity building of municipal staff on the whole. It can help ULBs in gaining much more independence along with improved quality of life of its citizen

### Recommendations And Conclusion

The 74th Constitutional Amendment Act, 1992, added the 12th Schedule to the constitution through Article 243W. It includes urban planning, regulation of land-use and construction of building, planning, provisions of urban amenities and facilities such as parks, gardens, playground, parking lots etc under the ambit of Urban local bodies.

However, many of them come under voluntary actions of states. This has led to many states depriving ULBs of vital urban functions and services. In case of charging infrastructure as well there is ample ground of coordination and partnership between the state government and

local bodies. Some of our recommendations are as follows:

- a) Department of Urban development of the state should be made the nodal authority for development of charging infrastructure. This has been done in Madhya Pradesh and is found to be very effective.
- b) District planning Committee, under Article 243ZD, and Committee for Metropolitan Planning, under Art 243ZE, must have member with technical expertise. This position must be filled with person with right set of skill and expertise which can include experts of E-mobility domain.
- c) Different financial models can be used to improve viability of small charging stations for 2Ws and 3Ws depending upon location and power load availability.
- d) Urban local bodies can raise capital through Electric Mobility bonds. The raised capital can then be used for setting-up charging stations with or without partner entities.
- e) In Tier III cities, ULBs can tie-up with DISCOMs or power utilities to setup charging stations.
- f) TIER II cities can adopt “feebate” concept where conventional vehicles are charged a fee to provide waiver or rebate to electric vehicle. This can be done by through different parking fee etc
- g) Urban local bodies can be a key player in circular economy and can develop “urban mining model” through recycling of EV components. A similar plan is undergoing in Delhi.

Urban local bodies can play a very significant role in development and growth of charging infrastructure in India especially in Tier II and Tier III. There is a need to create right policy and political will to include ULBs in India charging infrastructure story.

### Limitations

Along with all the promising opportunities between ULBs and charging infrastructure there are several limitations as well. These

limitations are of different nature and are as follows:

- a) The power and function of ULBs are limited in majority of states due to vested interests.
- b) Capacity of already under-staffed and over-burdened ULBs is abysmally low and their involvement in charging infrastructure might reduce their efficiency. This might lead to wastage of resource and capital.
- c) Most Town plans and Master plans lack inclusion of charging infrastructure in their plans. This is a limitation as well as an opportunity.
- d) Low penetration of EVs, personal mobility and micro-mobility transport solutions
- e) The data related to local transportation and needs of mobility users are missing which causes problem in assessing the financial viability of charging station especially in Tier II and Tier III cities.
- f) Lack of specialized cadre of municipal personnel and officer in many states which reduced administrative efficiencies of ULBs and can be detrimental for any financial endeavour in form of charging stations.
- g) Consumer behaviour and price sensitivity of Indian buyers
- h) Widespread corruption and negligence

Notwithstanding all the limitation mentioned above, the charging infrastructure is set to grow in India and ULBs would have a major role in India electric mobility transition. It offers a leapfrogging opportunity in terms of modern mobility technology. In the new normal that would emerge after COVID-19 pandemic subsides, India could opt for a decarbonized growth. The coming decade will be decade of ones who reinvent themselves and innovate. Hopefully, the future of Indian mobility would be electric!

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## ROLE OF MENTORING IN SUSTENANCE AND SCALABILITY OF SOCIAL STARTUPS DURING GLOBAL CRISIS IN INDIA: A SPECIAL REFERENCE TO MAHARASHTRA STATE

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### ABSTRACT

*Purpose:* Economy of India was growing at steady rate of 6.5% annually till the year 2019. Starting from the month of January 2020, the whole world started witnessing the effect on Covid -19 virus. In just span of 6 months, the virus has impacted over 1.85 Crore people globally and 7 Lakhs deaths (John Hopkins report). In India, close to 20 Lakhs are infected and with over 40,000 deaths due to Covid pandemic. Further, Maharashtra state has been the most effected state in India with close to 25% of the total infected cases. Since, Maharashtra state contributes close to 15% of India's GDP (as per Directorate of Economics and Statistics, Government of Maharashtra), the impact of Covid on the state and country has been immense. The study has taken in the light of participation of Social Start ups spread across Maharashtra state (Mumbai) who have taken initiative of supporting with innovative solution during the pandemic. The greatest challenge is to stabilize, survival and growth of startups with the right mentoring and guidance.

*Research Design* The research is grounded on primary source of information. The perpetrators are the social startup entrepreneurs in Maharashtra state concentrating Mumbai and Pune region. We have considered one hundred samples for the study. The sample is randomly taken from the study area. Structured questionnaire on Likert 5 scale was distributed among the startup community through the help of document sent across through Email. For analyzing the data, we have used statistical tools with the help if IBM-SPSS application. The statistical tools which are used to analysis are descriptive analysis, Anova and Factor analysis.

*Scope and limitation* The study is restricted to only Mumbai city of Maharashtra. India is a Hub of social startups. As Covid-19 is spreading rapidly across the country, mentoring to social startups are indeed important and need of the hour. Similar work can be conducted to other parts of country.

*Finding* We have observed during the study that the startups were actively involved in the contribution for both survival and scaling. Government is boosting and simulating the MSME's, with social startups not qualifying for any support. There is a huge support and hand holding as mentor to startups in connecting them with potential clients and funding.

*1. Practical implication:* During the study it was observed that mentoring at the right time especially during global crisis can lead to survival of social startups. Further, this could lead to long term success and also impacting the society.

*2. Originality /value:* The global financial crisis has thrown lots of new challenges to all the social startups and at this juncture mentoring plays a vital and prime role for survival and sustenance.

**Keywords:** Mentoring, Scaling Social startups and global crisis

### Introduction

Startup eco-system in India: Narendra Modi, India's Prime Minister, in his Independence Day discourse, on August fifteenth of 2015, proclaimed a movement called Startup India [1]. The activity strategy of the proclaimed inventiveness rest on the associated three supports:

1. Improvement and Handholding.
2. Financial Aid and Inducements.
3. Collaboration between academia and Development centers.

Extra territory of center identifying with the activity was towards disposing of prohibitive State Administration strategies inside the space, for example, License Raj Act, Plot Agreements, Pitches from Abroad Investment, and Ecological Sanctions. All

matters concerning to social startups are assigned to Department for Promotion of Industry and Internal Trade (DPIIT) under Industry and Commerce Ministry [2].

A component that is initiated in India, which was started under Ten years back, and has a yearly turnover not as much as INR Hundred Crore (US\$14 million), is characterized as a startup [3]. Government has just propelled the I-MADE program, under this movement, [4], for empowering business visionaries of India to shape a Ten lakh (One million) Cellphone application start-ups, and the plan of MUDRA Bank (Pradhan Mantri Mudra Yojana), is a creativity which purposes to offer smaller scale money, low-financing cost credits to business people from low financial foundations. Introductory investment

of rupees 20,000 crore has been assigned for this scheme [5].

In 1991, India started its economy. \$ 275 billion was the GDP (at current prices) in 1991, it stayed still at \$ 2.25 trillion in 2017. Innovation related organizations have created from small pay in 1991 to \$ 175 billion of every 2017. With 270% improvement in 6 years, 26000+ new organizations and USD 90 billion worth made India third greatest start up eco-system on the planet [6].

Before Covid-19 pandemic, it was assessed constantly 2025, India will be second greatest start-up eco-system with 100,000 start-ups, hiring 3.25 million experts and stock capitalization of \$ 500 billion. The innovation business ecosystem was ready for exponential advance. Yet, the pandemic has made devastation in the general economy and all the more so in the social startup environment [7]. Nasscom review, [8] indicated, 70 percent of startups have under a quarter of a year of money runaway and around 40 percent of startups have either briefly closed down or are nearly shutting.

**Role of mentoring:** For the general biological system containing investment, holy messenger reserve, hatcheries and quickening agents must be steady. According to Deborah Gage's Harvard Business School study [9], seventy five percent of the endeavor upheld innovation organizations fall flat. Considering my twenty years of experience as a business visionary and working intimately with more 50 social new companies, business people, hatcheries and quickening agents, training is a noteworthy fragment and which could incite achievement of undertakings. A coach assumes a significant job in pioneering advancement of a discrete and aides business people from origination of business to item advancement and business improvement [10]. While numerous entrepreneurs keep on searching for their optimal coaches, several are confronted with difficulties in accepting what is in store while approaching such individuals. Maximum entrepreneurs search for any of the three: money, systems and hands-on preparation, when others keep on being hazy of the suggestions—both monetarily and authoritatively. NEN, National Entrepreneurship Network [11] supports

entrepreneurs with ascertaining tutors tells "Tutoring is loaded up with a great deal of anxiety and confusions. What is coaching? [12]. It includes posing parcel of inquiries. Is it individual training? What would it be advisable for him to do? What would it be a good idea for me to give toward the finish of the deal? It is a component of time, spot and setting... "In the examination proposition, employment of tutoring and its impact on the achievement of the undertaking is being thought of.

### Literature Review

Numerous researchers [13-16] have learnt challenges with the pertinence of Western business enterprise typologies in non-Western settings. Subsequently, this paper [13] "makes a stride back" by revealing what applies rather than what doesn't make a difference. In the first place, this paper researches what the exhibition of resource business visionaries in Tanzania's casual economy comprises of. Second, it examines which segment and social components foresee that exhibition. In light of a writing survey and a pre-study, a fundamental report with polls was finished by 152 casual food merchants — that is, "resource business people", in southern Tanzania. Next, connection, factor, unwavering quality and relapse examinations were performed to test the speculations. In view of a factor examination, a qualification is made between fundamental execution and propelled execution. The outcomes show that cutting-edge execution is decidedly impacted by understanding and age; yet various variables, for example, the resource business visionary's sex, training and backing from family, have no impact.

The objections of a startup are to toil for oneself and to sort job to others which permits package of firmness and penitence [17]. Massive people with eminent level of center pay meeting, educated young people with specific base, IT controller, adaptable passageway and high web are a little of the drivers those who have flung open entryways to spread startup base in India. Events like 'Make-in-India' and other management strategies, helped new businesses with various individuals entering the scuffle. To launch an undertaking is an overall organized and



restrained activity with expected thought of components (exterior and core) which might influence the undertaking's legitimacy. Assumption at the back of the endeavor, advertise magnitude, benefit goals and income is a portion of the significant variables that should be unmistakably characterized before setting out on an excursion.

Cooperation, time, and tirelessness forms the significant components which decide pioneering achievement. Arrangement, administration guidelines and accessibility of money at different phases of development might be a portion of the difficulties for new businesses. Indeed, history is loaded with instances of new companies which started with large ballyhoo yet finished as clammy stunts inside a limited capacity to focus time because of different reasons. The paper looks at scarcely any contests and disputes that a startup in India requires and open entryways which a nation could provide to an existing biological system. Watchwords: Entrepreneur, Employment, Finance, 'Make-in-India', Startup Thrusting another undertaking—irrespective of whether it is a tech start-up, an initiative within a huge corporation or a trifling business—has unfailingly been a hit-or-miss proposition [18]. As specified by the decades-old formula, one composes a business scheme, pitch it to investors, collect a group, introduce a product, and start selling as hard as could sensibly be normal. Similarly, some place in this grouping of occasions, you will likely sustain a fatal setback. The probabilities are not with you: As new examination by Deborah Gage of Harvard Business School shows [9], 75% of all start-ups come up short. Heretofore, starting late a critical countervailing power has risen, one that could make the route toward initiation an association more secure. It is a method named as lean beginning up, it helps experimentation over luxurious plan, customer contribution over intuition, and iterative mien over moderate “big design up front” growth. Despite the fact that the methodology is just a few years old, its theories—such as “minimum viable product” and “pivoting”—has instantly bloomed in the world of start-up [19], business colleges have just started altering their instructive plans to train the startups.

The slender development of the startup has not vanished absolutely customary, notwithstanding, and we directly can't detect its full impact. From numerous facts, it is mostly where the enormous data improvement was five years back—containing essentially of a far and wide articulation that isn't yet sketchily appreciated, whose recommendations associations are fundamentally beginning to understand [20-25]. Notwithstanding, they are turning the time tested method of objective about business enterprise on its head, as its practices spread. New missions of various kinds are trying to improve their chances of achievement by observing its norms of bombarding brisk and reliably learning. Additionally, thoughtlessly of the way of thinking's name, in the drawn out a portion of its incomparable settlements may have been gotten by the goliath associations that grasp it.

#### **Objective:**

1. To identify the survival strategies employed by social startups during Covid-19
2. To know the technique adopted by social startups to stay connected during the shutdown
3. To study the best practices and strategies for maintaining trade continuity by social startups

#### **Scope And Limitation:**

The study is restricted to only Mumbai city of Maharashtra. India is a Hub of MSME's. With the scope of the current government policy towards entrepreneurs, we can find even the startups. As Covid-19 is spreading rapidly across the country, the startups have to take a vital role for assisting the general public at large [26]. There are greater challenges to these startups and required to be stabilized, survival and constant growth for which appropriate mentoring and guidance is necessity.

#### **Research Methodology**

The investigation depends on principal source of data. The information is gathered social startup entrepreneurs from Mumbai and Pune Cities. We have considered fifty samples for the study. The sample is randomly taken from the study area. Structured questionnaire was distributed among the student community through the help of document sent across through Email. For analyzing the data, we have

used statistical tools with the help of IBM-SPSS application.

### Analysis And Discussion

**Table 1.1**  
**Survival Strategies Employed Startups**  
**During Covid-19 Lockdown**

During the testing periods, startup entrepreneurs have adjusted to new arrangement of guidelines and are aware of the subsequent angles to reduce chances and to endure the stoppage brought about by the impact of COVID19

	Factors	Mean Scores	Cronbach's Alpha 0.70 to 0.95	Accept if Mean above 2.5 & Alpha above 0.70
1.	Tracking expenses against the revenue status	3.75	0.8	Accept
2.	Checking the feasibility of the business model	3.71	0.745	Accept
3.	Plan policies for next 3 months/ 9 months/ 18 months	2.17	<b>0.624</b>	<b>Reject</b>
4.	Be patient in securing investments	2.63	0.707	Accept
5.	Tracking expenses against the revenue status	2.96	0.759	Accept

Source: Sample Survey

Assent the elements if Cronbach's Alpha 0.70 to 0.95 [27], From the above factor one of the rejected is Plan policies for next 3 months/ 9 months/ 18 months with a Cronbach's Alpha below 0.70 (0.624)

**Table 1.2**  
**Few Guidelines To Stay Associated And**  
**Afloat During The Shutdown**

S.no	Mean	Factors	Skewness	Std. Error	Computed Value	Accept Below $\pm 2.58$
1.	4.07	Communicate transparently with your customers	0.261	0.257	0.335907	Accept
2.	3.67	Maintaining healthy relationship with contracted parties	0.351	0.777	0.457031	Accept
3.	4.15	Managing employees & related optimization	0.281	0.768	0.473862	Accept
4.	2.33	Keep Your Team Engaged	<b>1.991</b>	<b>0.293</b>	<b>2.889695</b>	<b>Reject</b>
5.	4.80	Communication to stakeholders	0.581	0.689	0.843251	Accept

Source: Sample Survey

Some of the factors which have highly influenced are communicate transparently with your customers are the computed value is below 2.58 and nearing to zero.

**Table 1.3**  
**Best Practices And Plans For Maintaining**  
**Trade Continuity By Startups And Maintain**  
**Open Lines Of Communication Internally**  
**And Externally**

BEST PRACTICES AND STRATEGIES		COMMUNICATION INTERNALLY AND EXTERNALLY	
Opinion	Percentage	Opinion	Percentage
Prioritize the health and well-being of your employees, partners, and customers	22%	Encourage proactive communication	23%
Determine what level of access, systems, datasets, and tools workers need to go remote	32%	Ensure visibility	27%
Consider implementing new tools to support remote access to data	28%	Regularly invite and encourage feedback from co-workers and managers	23%
Double Down Digital	18%	Be accessible, responsive and reliable	27%

The best practices and strategies which were highly in practice define what level of entree, structures, gears labors and datasets, require to drive faraway with 32% and under communication internally and EXTERNALLY the factor under practice will ensure visibility and be accessible, responsive and reliable with 27%.

### Conclusion:

The basic name of crown infection pandemic is Covid-19 which was exceptionally sudden. There were no such updates on such pandemic for practically most recent 2 decades. As per BBC future forecast [28] there can be crores of comparative infections like Covid 19 which are inconspicuous in the globe. In India, the legislature has taken a choice of lockdown of the entire nation. Among every Indian state Maharashtra is the most exceedingly awful hit of Covid influenced cases. The investigation has taken in the light of interest of Social Start ups spread across Maharashtra state (Mumbai) who have stepped up to the plate of supporting with imaginative arrangement during the pandemic. The best test is to balance out, endurance and development of new companies with the privilege tutoring and direction. During the study we observed that the factor one of the rejected is Strategy dogmas for succeeding 3 months/ 9 months/ 18 months with a Cronbach's Alpha below 0.70 (0.624). Factors which have highly influenced are Communicate transparently with your customers are the computed value is below 2.58 and nearing to zero. The best practices and strategies which were highly in practice figure out what level of entree, frameworks, datasets, and instruments laborers need to go distant with 32% and under communication internally and EXTERNALLY the factor under practice were ensure visibility and be accessible, responsive and reliable with 27%.

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**SEWAGE TREATMENT PLANT – CHALLENGES OF MAKING PPP SUCCESSFUL****Arjun C A<sup>1</sup>, Rahul Hiremath<sup>2</sup>**<sup>1</sup>Symbiosis Centre for Management and Human Resource Development, SCMHRD, Symbiosis International (Deemed University), SIU

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**ABSTRACT**

— India, which is the 7th largest country, has more than 1.3 Billion people which makes up about 17% of the world's population, second to only China, but contains only 4% of the world's freshwater. India's rivers fulfil most of drinking water requirement. But these rivers are highly polluted. Untreated waste from human settlements and Industries is released into these rivers. This results into serious health issues and causes adverse impact on agriculture productivity. The capacity of infrastructure for treating sewage water is highly insufficient. It has been mostly created and maintained by Govt. sector. Due to paucity of funds and maintenance capabilities the govt. is trying to enhance the investment from private sector. Despite many efforts there has not been desirable progress in enhancing private sector participation. The purpose of the research is to analyze the issues that impedes the progress of private investment. The study will be based on information and data to be gathered on demand for treatment capacities, Govt. initiatives and the progress so far, current situation and experiences of projects developed by private sector, available research articles, global experiences and also some primary data to be collected from professionals practicing in this field. The research will enable bringing out areas requiring immediate improvements

**Keywords:** Sewage Treatment Plant, PPP, Infrastructure, Water Sanitation

**Introduction**

India is one of the wealthiest countries in the world and I'm not speaking about GDP or the number of billionaires but about its natural wealth and beauty. India is so vast and diverse that people call it a subcontinent. It has rich heritage, history, thick forests, deserts, mountain ranges, etc. There are hardly few countries in the world that is as diverse as ours. We have inherited this wealth from our ancestors who has looked after it with care and devotion but we have taken these wealth and benefits for granted and is helping to destroy it. One of the most important natural resource we have is water and we are slowly witnessing the destruction of it.

India has always been blessed with water, we have 100s of small and large rivers. We are home to large rivers like Ganga, Indus, Brahmaputra which was the foundation for our great civilization. These rivers provide drinking water to more than 1.3 Billion people which is 17% of the world's population even though we only have 4% of the world water. Urbanization has helped in making India a modern country and has helped in uplifting the society but this has come at a great cost. We

have been continuously destroying the rivers and water resources without any concern. The water shortage in Chennai helped in creating awareness but this is not enough, we need concrete actions.

Sewage or waste water treatment in India is in a very bad condition. We don't have proper management for treating waste water but before taking about management we need to understand that we don't have proper infrastructure for treating these water. There has been a lot of talk for waste water management for more than 30 years, even our honorable Prime Minister Narendra Modi, in his first term, promised to clean Ganga by 5 years but even now there hasn't been much improvement in the situation. At present, India only has enough treatment plants to treat 30% of total waste water which is still a figure which most experts don't believe in. Delhi and Mumbai, which are the two most polluting cities in the world, has capacity to treat only half of the sewage it produces. As most of the population lives in water stressed areas, the importance of recycling and reusing water need not be explained but the government, even now, hasn't given due consideration to it. If the government ignores the sector too long, the

situation will be irreversible. According to a report by EY on sanitation, every US\$1 invested in sanitation generates US\$4.3 in economic returns. This shows that here is a viable business plan in the field and the benefits are immense, only if the government and the society acts.

There is a need to completely overhaul the sector and to achieve the targets, there is a need for more cooperation with private sector. The current situation is enough for government to understand that government centric approach is ill suited for such a sector and there is need for higher participation from private. The government already does projects on sanitation with private sector but we have seen that these project face various challenges. These challenges are complex and most of them are due to current policy framework which needs to be changed for the success of future Public Private Partnerships. In this paper, I will be studying the domestic challenges of the PPP projects on sanitation and wastewater treatment which will help me in recommending necessary solution to them.

### **Literature Review**

In this paper, we will be mostly studying about various challenges faced by the sewerage sector and how to effectively challenges these problems so as to make them attractive to more private participation in PPP model. The trend of PPP projects is a recent one and the success has prompted greater participation from the private sector as the potential for the sector is immense. As there is enough support from private players, we still have to reform the existing policy framework to give more incentives for the sector so that they can thrive in future. Even though the state of toilets in India has improved greatly, there still exists various problems which needs to be tackled as soon as possible for greater efficiency. The situation has greatly improved but the most of the sewerage dumped in rivers across India is not treated and this has caused many health problems for the people.

From past examples, we have seen that the state cannot do this alone and there need private participation for making the wastewater treatment plants a success. For example, the cleaning of Ganga has been a topic from the

time of Rajv Gandhi and even now there hasn't been much improvements in the levels of pollution in Ganga. The water of Ganga is toxic and the situation is becoming so dire that it will become reversible if the present trend continues. As a UN member, we are bound to do everything to achieve the Sustainable Development Goals (SDGs) and some of them are related to clean drinking water and proper sanitation. If we need to achieve these goals, the participation of private players is imperative. The present conditions of the sector are dismal and the private players face various challenges which needs to be tackled for more investments in the sector. Recent studies have shown that investing in sanitation sector will provide you with 4x returns but most people will not venture into the sector even though the returns are attractive. This is because of the stigma associated with dealing wastes and other items but recent global changes and support have swayed the opinion in big way and with the help of newer technologies and innovation the sector is promising. To make India achieve the SDGs and to provide better service and benefits to the public, we need to increase greater PPP penetration in such sanitation projects. For that we have to tackle the challenges in the sector.

### **Research Methodology**

PPP is Public Private Partnership and as governments are part of this model, the data of such projects are always available in public domain. The only hard part is to access them but several studies and research papers have been published regarding them. The government of India (GoI) publishes economic surveys and collaborates with international development organizations like world bank and ADB to study the shortcoming in the sector and to provide solutions. Most of the data needed was obtained from various research papers and reports from World Bank and Asian Development Bank as these organizations have expert knowledge regarding this issue. They have experienced various projects on sewage on PPP model across different countries. The lessons learnt from these projects have been properly stored and written in various papers and reports and is freely available. The challenges to PPP in Indian Sewerage sector is

an old topic which had caused headaches for various policy makers. To tackle these problems, various private organizations like FICCI has conducted research papers and reports to study about these and to propose solutions which is available in Internet. Most of the data is from various papers and reports of reputed organizations and from government sources. Most of the data is from secondary sources as there has been already many studies done in this topic.

### Results and Analysis

Overview of Urban Sewerage Sector in India  
Urbanization in India is rapidly increasing and according to World Bank, it will reach 40% by 2030 from the current 30% which is a significant number as we will be the most populated country in the world by that time. India, like most countries is seeing huge drop in available drinking water and with more than half of the waste water not treated the challenges faced by the urban sewerage sector are severe and if we don't take drastic measures now, the situation will be irreversible. In the report on Indian Urban Infrastructure Services by an Expert committee, the data shows us that 4861 cities does not have any sort of sewerage network which is a significant number when considering that assessed 5161 cities in total. Most major cities like Delhi, Mumbai, Hyderabad and Bangalore doesn't even treat more than half of its sewerage and more than half of the households doesn't even have access to sewerage network. Recently, there has been significant improvements in this sector due to various government schemes but even now there is tens of millions of Indians who defecate openly. Open defecation is the cause of many diseases and the without proper sewerage access, these habits will continue and will cause various health problems to people. For instance, the Ganges plains is home to more than 300 million people and 220 cities or towns which produces more than 8000 million liters of waste each day and in this, less than 1/3rd of it is actually treated and the rest is directly dumped to the river.

In my opinion, the numbers quoted in various studies and research is wrong as it overstates these figures. Most of Indian cities or towns

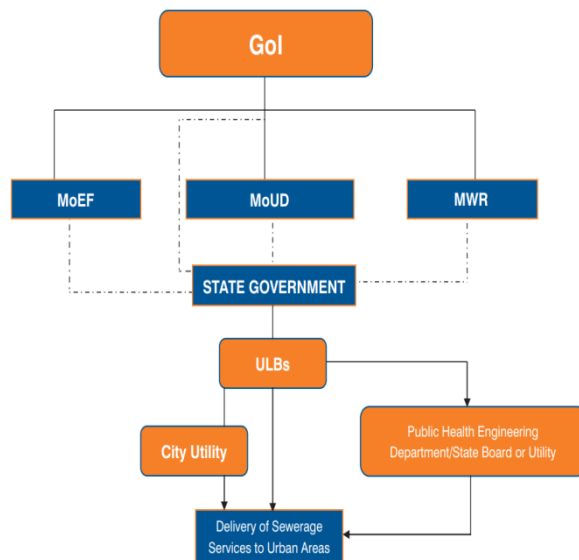
doesn't have proper infrastructure to dispose of sewerage and even those cities which have such doesn't properly does it and operates below the capacity. Most of the operators doesn't see much profit from these ventures and are plagued by tough standards which they should comply. Combined with various health standards they should comply and lack of returns from these ventures, the confidence of private players is decreasing towards the sanitation sector. After 2014, there has been significant interest to provide toilet facilities to the public and there has been moderate success in this plan but the key defect in this plan is that while creating such toilet facilities, they have missed the opportunity to link this sewerage network with wastewater treatment plants. If this had been successfully factored in to the policy, then the treated water could be reused and could be provided to people or agriculture. Numerous researchers commissioned by the Ministry of Urban Development has shown that more than 90% of household n urban localities have proper toilet facilities but less than 1/3rd of them is properly handled and disposed in a manner which is safe to the societies in the below table, data from the expert committee on Infrastructure services are shown and we can see that there is a huge gap in the system. We have to act now to reduce the health problems we will have to face in the future.

City Size Class	Network (%)	Treatment (%)
Class IA	53	53
Class IB	44	53
Class IC	64	77
Class II	84	88
Class III	90	96
Class IV	100	100

Source: Report on Indian Urban Infrastructure and Services by The High Powered Expert Committee (HPEC), March 2011.

### Chart 1

Institutional Structure for the sewage sector is show in the below chart



**Chart 2**

### Private Participation in Sanitation Projects

Almost all project in this sector which has private participation is done through PPP model. Organizations like World Bank and ADB have been supporting India by providing loans and grants for Infrastructure projects for long time and they have always stressed in private participation in the projects. Due to these organizations, PPPs have been the most preferred mode in various Infrastructure projects.

Urban services have always been in the domain of state and with the help of urban bodies, they provide the necessary services to the society but as we have seen or learned from past experiences, most of them doesn't have proper financial strength or efficiency in providing these basic services. Due to these problems of the local bodies and with the help of World Bank and ADB, we have been experimenting with private player in providing these services, especially in water sanitation and sewerage treatment, in PPP model. WB and ADB has learned from past experiences that by forming a partnership with private player will help in bringing much needed funds and will also provide greater efficiency and accountability. That is why they have been stressing local bodies to form PPPs and even though it has caused various controversies, the model has seen much success in India and this trend is also catching up in various sectors also.

The participation of private players in water projects in PPP model started in 1990s and mostly in southern India but these big projects

were scrapped due to various problems in pricing and lack of political will. Due to these failures of large PPP projects on water supply, the local bodies with the help of World Bank has now focusing on increased private participation in maintaining and operating the projects. These initiatives were hugely successful and now more than half of all such projects are run on Operation and Maintenance model. These projects don't need much capital, less than quarter of total project cost in some cases, and this has led to higher participation from private players.

Even though the situation of PPPs in such projects has improved but comparing with total investments in infrastructure, the level investment in water and sanitation is still very small. There are various reasons for the very low level of participation from private players in PPP model in this sector. The main reason is due to hostility from public in private participation in water projects as it has always been in the domain of state and people are afraid of change. Due to the hostility from public, most leaders will hesitate in granting private participation as doing so will result in decreasing votes in the election.

What most leaders don't understand is that by not taking action, they are slowing down the creation of projects in PPP model and project development. The role of leaders is to act for people in good faith and even though most of them know that higher PPP penetration will result in better services to the people, most of them will shy away from acting and will only care about their political image. After the success of few projects in PPP model, many more of them started to emulate them but if they have acted before they could have made a difference. Recently, in a study by EY it says that for every 1 dollar invested in sanitation, we get a return of 4.3 dollar and more than 4 billion people doesn't have proper access to sanitation in the world. This has shown that these PPP projects can be highly lucrative but to properly utilize them, there is a need for higher political will.

### Financing Sewerage Projects

In our country, more than half of the sanitation projects are facing financial difficulties as the current tariffs of users does not meet the cost of operation and maintenance of these projects.



As financing such projects through bank loans or bonds is very difficult and is not attractive, most of them are financed by a mix of loans and grants from agencies like World Bank, ADB and Government agencies where most of these loans are secured by government. Some of the sources for financing water sanitation projects are shown in the below table.

These projects are successfully developed in PPP model with most of government financial support is in the form of Viability Gap Funding (VGF) or through various government schemes. Government schemes like JnNURM and other agencies provide annuities to cover the operating expenses.

### Challenges to Wastewater Treatment with Private Sector Participation

#### Types of PPPs

In PPPs, the main categories are: (i) Design, Build and Operate (DBO) which is an Engineering Procurement and Construction model combined with Operation and Maintenance and they usually last for 5-10 years. (ii) the second one is concessions in, in which all the tasks associated with the project like designs, construction, expenditure, O&M, etc. are done by the private sector. These can also be called BOT and after the period where they receive concessions, they will return it to appropriate authority.

#### The Challenges faced by the Sector

1) **The Quality of Project, Data and Bid Process:** The challenges of the PPP projects begins from the very 1st stage that is the stage where the stakeholders decide the design, measurements and the bidding process. Most of the failures in a project is due to poor design and this will ultimately result in a bad project which is unsustainable and needs to be scrapped or changed. These poor designs will lead to a very large hole in the financials of private players as the large costs related to operation and maintenance will be due to bad data and the quality of waste produced. These projects are designed at a short time and as such these projects will be plagued by problems from start and examples of such projects can be seen in cities like Calcutta, Varanasi etc. The concerned authorities should also give as much as time to private players to study the bid and to prepare a proper bid. This

will also result in more interest from private sector and will also allow them to properly assess the realities and if there is a concern regarding the data or situation, they can change the bid so as to have a clean and efficient bidding process which is fair to everyone. If we assign more time to design a proper project, we will get a proper project which will benefit everyone.

2) **Sewage Quality:** The waste in the sewerage network consist of various types of waste from households to industries and it takes various types of process to treat them which means that “one for all approach” doesn’t work here. The waste from industries will consist of heavy chemicals which will need much complicated treatment process than waste from households. If the operator doesn’t factor into these types of sewerage, the, it will lead to more difficulty in later stages as they will be fined or contract may be cancelled in dire situations. To limit these difficulties, it is imperative that the stakeholders should properly study the types of waste in the sewerage network and work that data in the project.

3) **Low Potential in Recycled Water:** India is already in top 10 water stressed countries in the world and is heading to water shortages as seen in Chennai in 2019 and various data has shown that the available drinking water and ground water is shrinking at a faster pace. Due to these reasons, it is very impotent for us to recycle water and recycling should be given priority as soon as possible. There is a high potential for recycling water from sewerage and if properly treated it can also be used for drinking. Even though there is limitless potential for recycling water, there hasn’t been much development in this area as there is no policy to encourage the use of recycled water. These recycled water is cheap and could most of user needs but without proper support, it cannot be used in every city. Currently only few urban bodies use such type of water recycling methods to meet their needs and if we have to tackle the upcoming challenge of water scarcity, we need to give higher priority and support to mainstream this idea.

4) **Lack of User Charges:** Indian cities and society has been used to get everything of free cost and when they hear that they have to pay

for sewerage treatment, they become hostile to this idea. These societies are short sighted and will wait till the situation becomes so worse, like in Bangalore, to take action. As most of them doesn't have any history of pricing waste water and if there is a charge, there will be social and political backlash. Due to these reasons, the private players are hesitant to venture into this sector (PPP-BOT User Charge) and even if they agree to this model, there will always be opposition to increase of tariff. As directly asking them to pay for the services is hard, some states like Gujarat has started to levy a tax on property to meet the expenses. User charges, if agreed, can only barely meet the Operation and Maintenance costs which is highly unattractive for private players as they can't service other costs like interest on loans, etc.

5) Risk of High Transactional Cost: Almost all PPPs face this issue with the exception of BOT end user PPPs. These models of PPPs have a higher risk of transactional payment

a) DBOs: In this type of PPP, there is a higher risk of transactional payment of Operation and Maintenance cost from the local bodies. These types of PPPs don't get much financing help from development agencies like ADB and World Bank or Federal government. Sometimes in a EPC model, there is significant delay in payment from government or local bodies.

b) BOT End-User PPP: These PPP model is the best example for low risk as the people are the operators. Even then there will be some kind of risk associated with them such as sudden changes in operating conditions which can lead to losses. If not properly managed, even these types of projects can face higher payment risks.

c) BOT Third-Party PPP (Annuity): Annuity payments are always riddled with payment risks no matter the sector. In this type of model, the government or local bodies will not pay annuity in some cases and there will be significant delays and the private players will have to bear the consequences. This risk is majorly seen in financially weaker cities or urban bodies.

d) BOT Third-Party PPP (User Charge): In this type, there will always be delay of

payment from some consumers which will impact your overall revenue. Some users will never pay and you will have to take drastic measures but will result in social or political backlash. To mitigate these, some state governments have levied sewerage tax on properties but even that will only meet Operation and Maintenance charges.

6) High Demand Risk: In this type, there is always a huge risk of revenue loss, especially for BOT PPP (User Charges) from lack of demand for treated water for the public. To mitigate these risks, some private players have made contracts with state or local bodies where they have to pay the private players a certain amount if they can meet the quota of treated water. This will increase investor confidence and will lead to much higher participation as the risk is partly transferred to the state side.

7) Unfair Contracts: India is famous for lack of contract enforcement and as most states have high expectation from private players with lesser incentives. This will lead to an unsustainable relationship where there will always be conflict from both parties. There is always the trust issue as in most of state and local bodies doesn't have much trust in private players. Indian contracts are very rigid and doesn't leave room for compromises and conflict resolution and some of the main problems in the sector is shown below.

a) KPI is too unrealistic: Often contracts expect too much from private players with very less incentives for them. Different KPIs which have very high expectations are too to be achieved in very less time frame. In almost cases, these can't be achieved when compared to the ground situations. These unrealistic expectations will reduce the attractiveness of projects

b) Changing the Scope Frequently: These project designers will understand in mid project that there is need for changes as some of the KPIs are too unrealistic. These frequent changes of scope will cause greater delay in the completion of project. This can be avoided when at the time of contract development, the stakeholders take enough time to study the realities which is fair to everyone.

c) No Rebasing Clause: There is no provision in the contract which allows a relook at certain provisions like scope, performance standards, capex and operating expenditure requirements, adjustment Inflation, regulatory and tax reform, etc., which may change over a 20-30-year cycle as underlying assumptions about population rates, geographical distribution, consumption requirements, taxation, inflation, etc. can vary considerably from the forecasts;

d) Poor Due for not paying Penalties: Contracts often do not have provisions with clear disincentives for non-payment of duties such as: granting the right to withdraw or escape from service provision; obligation to retain significant security reserves or financial assurances that can be used to recover duties;

e) Operator has to pay higher Fines: The contract will be made in such a way that the expectations will be too high and penalties levied on operator for not meeting will be very high. These penalties will be too high and biased against the operator and will also have to bear the liabilities in case there are accidents.

f) Specified Technology: Most state or local bodies will stress technologies which are proven and has been used in minimum 4 projects and will not give much thoughts on newer and better technologies. This acts as a deterrent for global companies which are looking at innovation.

g) Attractiveness of Contract: Most lenders or banks will always think twice when investing in water sanitation projects as most of these are failures or riddles with various problems. They will also be party to liabilities in case of accidents which reduces the attractiveness of the project.

8) Limited Consultations with the Public: These projects, when designed will most probably will not take into account of the views of the people. As these projects are for the people financed by taxes from people, there is a higher priority in consulting with them when constructing and water sanitation projects. Lack of public consulting will lead to various problems like public and political backlash. The proposed tariffs will not be agreed by the public and will cause problems for the private sector in later stages. To avoid

all these, there need to be proper consultations with the public regarding projects which directly affect them.

9) Narrow Minded Approach Regarding Funds: The state governments and local bodies view private participation as a form of meeting the needed funds and will not allow more participation of them. This will result in unfair selection of PPP model and flaws in the design. These narrow minded approach will surely lead to conflicts with both the parties will result in various delays which will ultimately affect the public.

10) Lack of Talent or Skills: There needs to be stressed that in India, importance is not given for skills on sanitation or proper education is not present. Only handful institutes teach about these and we would in most cases need foreign consultants to help in project implementations.

11) Land Availability: Metropolitan cities are always congested and these cities are really in need for water sanitation projects but most of them will have difficulties in finding lands for these projects.

### Conclusion

There are numerous examples of PPP projects in water sanitation sector which are mired in diverse reasons for success or failures. There are several reasons for a project to succeed or fail and after analyzing them, we can form a pattern which will help us in solving the challenges of higher PPP penetration in Indian sewerage sector. In this paper, we saw that there several challenges faced by the sector for a successful PPP and if a project encounters some of them, it is bound to face several difficulties in construction or management of project. Due to various external factors like economic downturn and COVID-19, it will be difficult for private players to finance projects on sewerage treatment. We have seen that giving grants to developers for these projects is more helpful than financing it through loans. Various government schemes are introduced for helping in providing drinking water to all by 2022 and the private sector can leverage on this by providing drinking water from recycling treated water. There are several innovations taking place in sanitation field and the government and private players need to

work together to make the project incorporate these ideas so that ultimately the people is benefited.

There is also need for more public consultations when dealing with such projects as the public knows best what they need and without such consultations, it is guaranteed that the project will face some kind of difficulties in the future. We have seen that existing contract framework is ineffective and there is a need for proper framework in dealing with conflicts and resolutions which will ultimately help the general public. These contracts have to be

made fair and be changed to accept all stakeholders so that we can properly utilize the resources and to reduce the delays. There is a need for proper communication to reduce the risks associated with economics and politics. The most important point all stakeholders should understand is that infrastructure projects are not just physical structure and serves a purpose where the benefits must be passes to consumers in a sustainable manner..

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## ALVEOLAR BONE MORPHOLOGY AROUND CENTRAL INCISORS: A STUDY BY CBCT ANALYSIS

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### ABSTRACT

*Objectives:* To evaluate alveolar crest height and thickness, besides thicknesses of alveolar bone (buccal & lingual plates thicknesses, alveolar ridge thicknesses) surrounding central incisors at multiple sites and levels, in an attempt to find a correlation between them and the following factors: Gender, age, shape of central incisor, shape of dental arch, buccolingual inclination of central incisor, effective length of the premaxilla (ELP in upper arch), length of the mental protuberance (LMP in lower arch).

*Materials and Methods:* Our study conducted with a sample of 264 teeth/subjects (132 mandibular & 132 maxillary central incisors) from 66 patients of both genders (33 females & 33 males) of different ages (from 12 to 38 years), and prepared under perspective of Cone-beam Computed Tomography. CBCT scanning was performed using VATECH (Model: PaX-i 3D, Republic of Korea). We used "Ez3D plus" program to generate the reconstructed images, as well as, to take the digital measurements.

*Results:* Presence of statistically significant differences between many measured alveolar bone sites according to the differences of studied factors and correlation between some sites of alveolar bone surrounding the central incisors and gender, age, buccolingual inclination, and with the effective length of the premaxilla (in maxilla) or length of the mental protuberance (in mandible).

*Conclusion:* Alveolar bone of mandibular central incisors may be more likely to develop bone complications than of maxillary central incisors due to orthodontic movements. The importance of diagnosis of incisors position and the status of alveolar bone, as well as good planning of orthodontics treatment with other specialties.

**Keywords:** Alveolar bone, CBCT, Central incisors, Cone-beam computed tomography, Orthodontic treatment

### Introduction

Alveolar bone forms an envelope surrounding the teeth and restricts orthodontic movements [1]. Studies indicate that the region of anterior teeth is linked with a risk factor during orthodontic treatment [2] – [6], which may be associated with the possibility of progression of gingival recession and roots exposure as a tissue response to inappropriate planning of orthodontic treatment, which is likely caused by excessive orthodontic forces [7], or as a result of moving the tooth away from the center of alveolar bone towards the cortical bone plates [1], [8]. Alveolar bone is also directly associated with treatments such as implants [9], [10], and orthodontic mini-implants [11], [12]. From here comes the importance of studying the morphology of alveolar bone surrounding maxillary and mandibular central incisors and its correlation with various factors that will be discussed in our study.

The objectives of alveolar bone dimensions' studies have varied in locations and directions,

in upper and lower dental arch, and in anterior and posterior regions, of which were predictive or evaluative of alveolar condition before and after various treatments, such as extractions [13]–[16], implants [9], [10], mini-implants as skeletal anchorage in the context of orthodontic treatment [11], [12], or even study the association with various factors [17]–[24].

H. Sheerah. et al. [17], and J. Ma. et al. [25], found no significant differences between alveolar bone height & thickness of right and left central incisors.

According to the level of alveolar crest apically from Cementoenamel junction, J. Kois [26], [27], classified the alveolar crest as high (<3 mm), normal (3 mm), Low (>3 mm).

Jati, et al. [28], mentioned that incisors (especially mandibular) are correlating with a risk factor of the decreased thickness of buccal plate. Whereas, G. Vasconcelos, et al. [29], found that with orthodontic treatment, mandibular central incisors are more likely to develop gingival recessions.

M. Cassetta, et al. [12], evaluated alveolar cortical bone thickness in both jaws and found that thicknesses were thicker in adults than in adolescents, in mandible than in maxilla, on the oral side than buccal side, and increasing of thickness from crest towards the base of alveolar bone.

Outcomes of the previous studies reported thinning of buccal alveolar bone of maxillary incisors, as the study by J. Gakonyo, et al. [10], observed mainly thin thickness of buccal bone less than 1 mm, whereas the study by J. Rojo Sanchis, et al. [13], found all measured thicknesses were less than 1 mm.

About gender and alveolar bone, findings of previous studies mentioned that the buccal alveolar crest height of anterior maxillary teeth, in males was greater than in females [17], [13]. Whereas a study of alveolar bone thickness of mandibular incisors mentioned that no significant differences were between males and females [24], whereas another study in maxillary incisors [19], found an association between alveolar bone thickness and gender. In general, many studies confirmed a greater thickness of alveolar bone in males than in females [12], [13], [17], [30].

Increasing patient's age correlated with more likely of greater alveolar crest height of maxillary anterior teeth [17]. whereas, other Authors reported that patients older than 50 years showed a greater alveolar crest height [13].

Studies have disagreed about an association between age and maxillary buccal plates of alveolar bone. H. Sheerah, et al. [17], observed no correlation, in contrast, J. Gakonyo, et al. [10], found that with age increasing, the thicknesses decreased, in addition to what J. Rojo Sanchis, et al. [13], mentioned about some thinner significant sites of maxillary buccal plates, which were in patients older than 50 years. Whilst another reported an association between patients' age and alveolar ridge width [19].

S. Chaturvedi, et al. [31], studied the relationship between dental arch shape and alveolar bone plate thicknesses in mandible, they mentioned a significant influence of the dental arch shape on the thickness of buccal and lingual alveolar plates.

A study by A. Linjawi [19], reported an association between the buccolingual inclination of central incisors in maxilla and alveolar bone thickness, whereas, the results of two studies by Yu-lou Tian, et al., assured that in the maxilla was a statistically significant difference only at the apical level, and found that with palatal inclination (retroclined maxillary central incisors), less alveolar bone support, especially at this level [22], on the other hand, in mandible, there were in both sides buccal and labial, statistically significant differences and with proclined mandibular incisor, the lingual bone thickness was decreased [23].

## Materials and methods

### Subjects

Initially, we collected 308 CBCT cases from three sources of patients' records in Volgograd, Russia: Regional Clinical Dental Polyclinic, Children's Clinical Dental Polyclinic No. 2, and dental-lux x-ray clinic. We kept patients' data confidential by giving every case a random number.

Then, we selected 66 CBCT patients' cases, which meet the following conditions:

- a- Inclusion criteria: 1- Age (12 - 38) years old.
- 2- Include both jaws completely.
- b- Exclusion criteria: 1- Orthodontic treatment.
- 2- Severe tooth rotations.
- 3- Moderate / Severe Crowding.
- 4- Missing and eruption incisors disorders.
- 5- Periodontal disease.
- 6- Bone diseases (cyst or tumor in the anterior region).
- 7- Teeth with short roots or existing root resorption.
- 8- Dental restoration extending to CEJ (Cemento-Enamel Junction).

Final distribution of cases is as follows

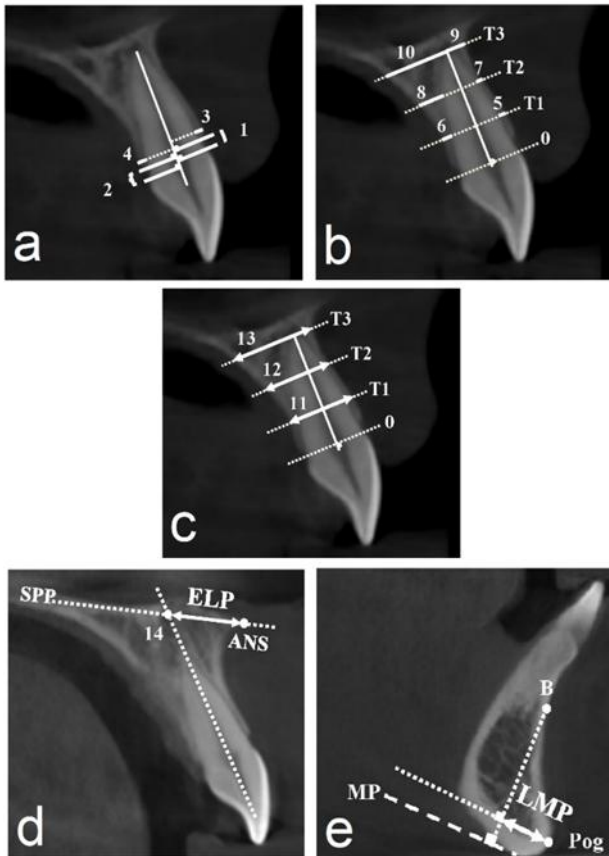
We studied central incisors in each case, and thus each case represents 4 study subjects, so the distribution of 66 CBCT cases / 264 subjects, is as follows:

- by age group: 30 adolescents (12-17 years old, 120 subjects), and 36 adults (18-38 years old, 144 subjects).

- by gender and age group: 30 adolescents (15 females, 60 subjects & 15 males, 60 subjects) and 36 adults (18 females, 72 subjects & 18 males, 72 subjects).

CBCT scanning was performed using VATECH (Model: PaX-i 3D, Republic of Korea). We used "Ez3D plus" program to

generate the reconstructed images, as well as, to take the digital measurements. We take all measurements on sagittal views as explaining in (Fig. 1 with the definition of all measurements). We evaluated alveolar bone morphology by measuring height and thickness of alveolar crest, alveolar plate thickness and alveolar ridge thickness at each third of the root.



**(Fig. 1 - Measurements Definition)**

Fig (a): - Alveolar crest height: Vertical distance from CEJ to buccal (1) / lingual (2) alveolar crest parallel to long axis of the central incisor. - Alveolar crest thickness: Alveolar plate thickness perpendicular to long axis of central incisor at 0.5 mm apical to buccal (3) / lingual (4) alveolar bone crest.

Fig (b): Alveolar plate thickness: - Buccal (5,7,9) / lingual (6,8,10) alveolar plate thickness perpendicular to the long axis of central incisor at each third of root length from CEJ.

Fig (c): Alveolar ridge thickness: Bucco-lingual thickness (11,12,13) of alveolar ridge perpendicular to the long axis of central incisor at each third of the root length from CEJ.

Fig (d): Effective length of the premaxilla (ELP): Distance between (ANS) anterior nasal

spine and point (14) of the intersection of the long axis of maxillary central incisor & spinal palatal plane (SPP).

Fig (e): Length of the mental protuberance (LMP): Vertical distance between point (Pog) and the column drawn from point (B) at the plane of mandible (MP).

- line (0): representing the beginning of the root and located intermediate between buccal and lingual Cementoenamel junctions, perpendicular to the long axis of central incisor.

- (T1) 1st third of root, (T2) 2nd third of root, (T3) 3rd third of root. - CEJ: indicates Cementoenamel junction.

## Results

### A. Statistical Analysis

We analyzed data with IBM SPSS Statistics, Statistical Package for the Social Sciences (version 26). In the beginning, we conducted descriptive statistics of the studied cases (Tables. I – XII). We used T-Test analysis (Independent Samples Test) to compare the alveolar measurements between left and right maxillary / mandibular central incisors, and found that there is homogeneity in the studied group as there are no statistical and significant differences between means of alveolar measurements between left and right central incisors ( $P > 0.05$ , assuming a level of significance of 95%). Therefore, we evaluated central incisors only as being maxillary or mandibular, without distinguishing between right and left, depending on the factors to be studied.

We evaluated the level of alveolar crest apically from CEJ high (<3 mm), Low (>3 mm) and we founded that was high in all adolescents, whilst it was greater in adults than in adolescents, in adult males than in adolescent females in both maxillary and mandibular central incisors (Tables. I, II, III, IV), and it was low in more than third cases of the lingual alveolar crest of mandibular central incisors in adult males (Table. XIII).

We studied thinning of the cortical bone by distributing it into three groups (thin < 1 mm, medium 1 - 2 mm, ideal > 2 mm) and reached the following (Tables. XIV, XV):

- In buccal aspect: Alveolar crest of mandibular central incisors was thin with a very high ratio in all groups.

In mandible, the thinness at the first third of cortical bone was a higher proportion than in maxilla in all groups.

Bone plate thickness at third 1 in mandible was thin in all adolescents. Ideal thickness of bone plate at third 3 in mandible found in all adolescents, and also in all adult males.

- In lingual aspect: Thin alveolar crest of mandibular central incisors was with more proportion than alveolar crest of maxillary central incisors in all groups, and also with high ratio in adults than in adolescents.

Thin bone plate thickness at third 1 & 2 was a higher proportion in mandible than in maxilla in all groups.

In maxilla, ideal bone plate thickness at third 2 & 3 were in all adolescents and adults.

In mandible, thin bone plate thickness at third 1 was with a very high ratio in adult males (91.7%), and more than 80% in females (adolescents and adults). As well as, a high ratio of thin bone plate thickness at third 2 in adult males than others.

### **B. Statistical Comparison**

We performed T-Test analysis (Independent Samples Test) and ONE-WAY ANOVA analysis on alveolar measurements for statistical comparisons, and the results showed that there were statistical and significant differences between means of measurements of alveolar bone surrounding maxillary and mandibular central incisors ( $P < 0.05$ , at the level of significance of 95%), according to study factors, as follows:

#### **a. Alveolar Bone around Maxillary Central Incisors**

1- Buccal alveolar crest height was greater in: males than females, adults than adolescents, adult males than adolescent males & adult females than adolescent females, with square shape of central incisors than other shapes, and with normal buccolingual inclination type than other types.

2- Lingual alveolar crest height was greater in: adults than adolescents, adult males than adolescent males & adult females than adolescent females, and with square shape of central incisors than other shapes.

3- Buccal alveolar crest thickness was thicker in: adolescents than adults.

4- Lingual alveolar crest thickness was thicker in: adolescents than adults, adolescent males than adult males, adolescent females than adult females, and with rectangular shape of central incisors than other shapes.

5- Buccal plate thickness at third 1 was thicker in: adolescents than adults, adolescent males than adult males & adolescent females than adult females.

6- Buccal plate thickness at third 2 was thicker in: adolescents than adults, adolescent males than adult males & adolescent females than adult females, with labial inclination type than other types, and with ELP > 13 mm.

7- Buccal plate thickness at third 3 was thicker in: adolescents than adults, adolescent males than adult males, with oval shape of central incisors than other shapes, with labial inclination type than other types, and with ELP > 13 mm.

8- Lingual plate thickness at third 1 was thicker in: males than females, adolescents than adults, adolescent males than adult males & adolescent females than adult females, with V-shape than other types of the dental arch shapes, and with lingual inclination type than other types.

9- Lingual plate thickness at third 2 was thicker in: males than females, adolescent males than adult males & adolescent females than adult females, and with the lingual inclination type than other types.

10- Lingual plate thickness at third 3 was thicker in: males than females, and with lingual inclination type than other types.

11- Alveolar ridge thickness at third 1 was thicker in: males than females, adolescents than adults, adolescent males than adult males & adolescent females than adult females, and with V-shape than other types of dental arch shapes.

12- Alveolar ridge thickness at third 2 was thicker in: males than females, adolescents than adults, adolescent males than adult males & adolescent females than adult females, with V-shape than other types of dental arch shapes, and with lingual inclination type than other types.

13- Alveolar ridge thickness at third 3 was thicker in: males than females, adolescent



males than adult males & adolescent females than adult females, with oval shape of central incisors than other shapes, and with lingual inclination type than other types.

**b. Alveolar Bone around Mandibular Central Incisors**

- 1- Buccal alveolar crest height was greater in: adults than adolescents.
- 2- Lingual alveolar crest was greater in: adults than adolescents, adult males than adolescent males & adult females than adolescent females, and with square shape of central incisors than other shapes.
- 3- Buccal alveolar crest was thicker in: males than females, adults than adolescents, adult males than adolescent males & adult females than adolescent females, with square shape of central incisors than other shapes, and with LMP > 9 mm.
- 4- Lingual alveolar crest was thicker in: adolescents than adults.
- 5- Buccal plate thickness at third 1 was thicker in: males than females, adults than adolescents, adult males than adolescent males & adult females than adolescent females, and with LMP > 9 mm.
- 6- Buccal plate thickness at third 2 was thicker in: males than females, adolescent males than adult males & adult females than adolescent females, and with labial inclination type than other types.
- 7- Buccal plate thickness at third 3 was thicker in: adolescent males than adult males & adult

females than adolescent females, with labial inclination type than other types, and with LMP < 6 mm.

- 8- Lingual plate thickness at third 1 was thicker in: males than females, adolescents than adults, adolescent males than adult males & adolescent females than adult females, with oval shape of central incisors than other shapes, and with LMP < 6 mm.
- 9- Lingual plate thickness at third 2 was thicker in: adolescent males than adult males & adolescent females than adult females, with oval shape of central incisors than other shapes, and with LMP < 6 mm.
- 10- Lingual plate thickness at third 3 was thicker with: oval shape of central incisors than other shapes, and with LMP < 6 mm.
- 11- Alveolar ridge thickness at third 1 was thicker in: males than females, adolescent males than adult males & adult females than adolescent females, with the ovoid shape than other types of the dental arch shapes, and with LMP < 6 mm.
- 12- Alveolar ridge thickness at third 2 was thicker in: adolescents than adults, adolescent males than adult males & adult females than adolescent females, with labial inclination type than other types, and with LMP < 6 mm.
- 13- Alveolar ridge thickness at third 3 was thicker in: adolescent males than adult males & adult females than adolescent females, with the labial inclination type than other types, and with LMP < 6 mm.

**Table. I) Descriptive Data for Measured Variables in Maxilla - according to Age Group**

<i>Maxillary Central Incisors</i>		Buccal Alveolar Crest Height	Lingual Alveolar Crest Height	Buccal Alveolar Crest Thickness	Lingual Alveolar Crest Thickness	Buccal Plate Thickness at Third 1	Buccal Plate Thickness at Third 2	Buccal Plate Thickness at Third 3	Lingual Plate at Third 1	Lingual Plate Thickness at Third 2	Lingual Plate Thickness at Third 3	Alveolar Ridge Thickness at Third 1	Alveolar Ridge Thickness at Third 2	Alveolar Ridge Thickness at Third 3
Adolescent	Mean	.982	.823	.860	1.032	.998	1.097	2.862	2.407	4.985	9.287	9.210	10.342	12.148
	SD	.3864	.3022	.1787	.2633	.3165	.5421	1.9007	.7313	1.1947	1.6780	1.2356	1.6000	2.5408
Adults	Mean	1.615	1.128	.785	.921	.855	.821	2.196	2.007	4.589	9.194	8.611	9.718	11.429
	SD	.8153	.3930	.1755	.2258	.2537	.3039	.9899	.7903	1.4816	2.4285	.9442	1.4168	2.0927
Total	Mean	1.327	.989	.819	.971	.920	.946	2.498	2.189	4.769	9.236	8.883	10.002	11.756
	SD	.7265	.3847	.1803	.2488	.2917	.4488	1.5063	.7870	1.3681	2.1134	1.1226	1.5291	2.3260

(Table. II) Descriptive Data for Measured Variables in Maxilla - according to Gender with Age Group

Maxillary Central Incisors		Buccal Alveolar Crest Height	Lingual Alveolar Crest Height	Buccal Alveolar Crest Thickness	Lingual Alveolar Crest Thickness	Buccal Plate Thickness at Third 1	Buccal Plate Thickness at Third 2	Buccal Plate Thickness at Third 3	Lingual Plate at Third 1	Lingual Plate Thickness at Third 2	Lingual Plate Thickness at Third 3	Alveolar Ridge Thickness at Third 1	Alveolar Ridge Thickness at Third 2	Alveolar Ridge Thickness at Third 3	
Females	Adolescent	Mean	.933	.843	.837	.947	.947	.880	2.353	1.997	4.567	8.983	8.673	9.590	11.337
		SD	.3689	.2849	.1159	.2047	.2488	.2538	.9104	.4951	1.2130	1.9221	1.0802	1.2115	1.9411
	Adults	Mean	1.383	1.047	.794	.922	.847	.878	2.353	1.947	4.350	8.642	8.378	9.369	11.072
		SD	.6918	.3342	.1472	.2099	.2818	.3373	1.0090	.6592	1.2063	1.7568	.7376	1.0620	1.4945
Males	Adolescent	Mean	1.030	.803	.883	1.117	1.050	1.313	3.370	2.817	5.403	9.590	9.747	11.093	12.960
		SD	.4036	.3222	.2245	.2902	.3693	.6606	2.4467	.7037	1.0347	1.3578	1.1590	1.6036	2.8290
	Adults	Mean	1.847	1.208	.775	.919	.864	.764	2.039	2.067	4.828	9.747	8.844	10.067	11.786
		SD	.8713	.4338	.2015	.2436	.2257	.2587	.9587	.9084	1.6972	2.8720	1.0734	1.6414	2.5276
Total	Mean	1.327	.989	.819	.971	.920	.946	2.498	2.189	4.769	9.236	8.883	10.002	11.756	
	SD	.7265	.3847	.1803	.2488	.2917	.4488	1.5063	.7870	1.3681	2.1134	1.1226	1.5291	2.3260	

(Table. III) Descriptive Data for Measured Variables in Mandible - according to Age Group

Mandibular Central Incisors		Buccal Alveolar Crest Height	Lingual Alveolar Crest Height	Buccal Alveolar Crest Thickness	Lingual Alveolar Crest Thickness	Buccal Plate Thickness at Third 1	Buccal Plate Thickness at Third 2	Buccal Plate Thickness at Third 3	Lingual Plate at Third 1	Lingual Plate Thickness at Third 2	Lingual Plate Thickness at Third 3	Alveolar Ridge Thickness at Third 1	Alveolar Ridge Thickness at Third 2	Alveolar Ridge Thickness at Third 3
Adolescent	Mean	1.225	1.403	.577	.628	.552	1.508	5.325	.912	1.677	4.387	6.833	7.620	9.707
	SD	.4433	.4954	.1477	.1606	.1214	.7716	1.7276	.3871	.8286	1.4978	.8105	1.3657	2.3520
Adults	Mean	1.915	2.536	.668	.599	.618	1.354	5.160	.667	1.188	3.860	6.721	7.083	9.015
	SD	.7070	.9381	.2020	.1691	.2399	.6891	1.6890	.3440	.5699	1.0376	.6498	.9465	1.8098
Total	Mean	1.602	2.021	.627	.612	.588	1.424	5.235	.778	1.410	4.099	6.772	7.327	9.330
	SD	.6917	.9529	.1845	.1653	.1973	.7290	1.7021	.3829	.7383	1.2897	.7265	1.1821	2.0943

(Table. IV) Descriptive Data for Measured Variables in Mandible - according to Gender with Age Group

Mandibular Central Incisors		Buccal Alveolar Crest Height	Lingual Alveolar Crest Height	Buccal Alveolar Crest Thickness	Lingual Alveolar Crest Thickness	Buccal Plate Thickness at Third 1	Buccal Plate Thickness at Third 2	Buccal Plate Thickness at Third 3	Lingual Plate at Third 1	Lingual Plate Thickness at Third 2	Lingual Plate Thickness at Third 3	Alveolar Ridge Thickness at Third 1	Alveolar Ridge Thickness at Third 2	Alveolar Ridge Thickness at Third 3	
Females	Adolescent	Mean	1.243	1.510	.580	.593	.507	1.057	4.503	.737	1.647	4.503	6.340	6.963	9.007
		SD	.3655	.4788	.1349	.1639	.0980	.4049	1.2341	.3327	.9765	1.8718	.5781	1.0943	2.1947
	Adults	Mean	1.844	2.439	.592	.589	.511	1.472	5.781	.692	1.325	3.906	6.581	7.314	9.678
		SD	.5823	1.0227	.2130	.1469	.1563	.6747	1.8627	.2922	.5944	1.0569	.4361	.9062	1.8647
Males	Adolescent	Mean	1.207	1.297	.573	.663	.597	1.960	6.147	1.087	1.707	4.270	7.327	8.277	10.407
		SD	.5152	.4965	.1617	.1520	.1273	.7907	1.7755	.3617	.6643	1.0161	.7061	1.3056	2.3290
	Adults	Mean	1.986	2.633	.744	.608	.725	1.236	4.539	.642	1.050	3.814	6.861	6.853	8.353
		SD	.8153	.8485	.1594	.1903	.2623	.6925	1.2348	.3916	.5163	1.0307	.7911	.9416	1.5048
Total	Mean	1.602	2.021	.627	.612	.588	1.424	5.235	.778	1.410	4.099	6.772	7.327	9.330	
	SD	.6917	.9529	.1845	.1653	.1973	.7290	1.7021	.3829	.7383	1.2897	.7265	1.1821	2.0943	

(Table. V) Descriptive Data for Measured Variables in Maxilla - according to Shape of Incisors

Maxillary Central Incisors		Buccal Alveolar Crest Height	Lingual Alveolar Crest Height	Buccal Alveolar Crest Thickness	Lingual Alveolar Crest Thickness	Buccal Plate Thickness at Third 1	Buccal Plate Thickness at Third 2	Buccal Plate Thickness at Third 3	Lingual Plate at Third 1	Lingual Plate Thickness at Third 2	Lingual Plate Thickness at Third 3	Alveolar Ridge Thickness at Third 1	Alveolar Ridge Thickness at Third 2	Alveolar Ridge Thickness at Third 3
Square	Mean	1.783	1.188	.737	.842	.800	.821	2.129	1.838	4.313	8.967	8.554	9.592	11.096
	SD	.8014	.3904	.1279	.1248	.2414	.2843	1.0736	.7488	1.3254	2.4868	.9334	1.3755	2.1392
Oval	Mean	.700	.717	.850	.942	.967	1.025	3.542	2.308	4.758	9.267	9.275	10.117	12.808
	SD	.2374	.2657	.1243	.3118	.2146	.2989	1.7122	1.0449	.9346	1.0201	1.7716	1.3908	2.1488
Triangular	Mean	1.435	1.030	.808	.997	.917	1.030	2.678	2.310	5.065	9.633	9.025	10.425	12.378
	SD	.7634	.4262	.1639	.2527	.2949	.6802	2.1271	.8623	1.6171	2.4502	1.1602	1.8091	2.8354
Rectangular	Mean	1.189	.934	.855	1.014	.964	.923	2.305	2.227	4.755	9.062	8.839	9.850	11.370
	SD	.5996	.3288	.2095	.2576	.3142	.2936	.8771	.6527	1.2408	1.8468	.9788	1.3566	1.8666
Total	Mean	1.327	.989	.819	.971	.920	.946	2.498	2.189	4.769	9.236	8.883	10.002	11.756
	SD	.7265	.3847	.1803	.2488	.2917	.4488	1.5063	.7870	1.3681	2.1134	1.1226	1.5291	2.3260

(Table. VI) Descriptive Data for Measured Variables in Mandible - according to Shape of Incisors

Mandibular Central Incisors		Buccal Alveolar Crest Height	Lingual Alveolar Crest Height	Buccal Alveolar Crest Thickness	Lingual Alveolar Crest Thickness	Buccal Plate Thickness at Third 1	Buccal Plate Thickness at Third 2	Buccal Plate Thickness at Third 3	Lingual Plate at Third 1	Lingual Plate Thickness at Third 2	Lingual Plate Thickness at Third 3	Alveolar Ridge Thickness at Third 1	Alveolar Ridge Thickness at Third 2	Alveolar Ridge Thickness at Third 3
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean
Square	Mean	2.029	2.775	.679	.562	.621	1.375	5.113	.646	1.050	3.683	6.921	7.138	8.796
	SD	.8364	1.1520	.1474	.1861	.2105	.5765	1.3437	.2686	.6193	1.0825	.6393	1.0034	1.8277
Oval	Mean	1.125	1.242	.567	.667	.567	1.575	5.633	1.025	1.975	5.158	6.792	7.875	10.792
	SD	.4115	.4981	.2188	.1231	.1497	.6077	1.2816	.4393	.8214	2.3287	.9219	.8281	1.6500
Triangular	Mean	1.568	1.885	.677	.600	.630	1.393	5.167	.745	1.470	4.068	6.620	7.190	9.235
	SD	.5976	.8946	.1732	.1414	.2409	.7654	1.9040	.3366	.5488	.8657	.6178	1.0362	1.9775
Rectangular	Mean	1.545	1.963	.580	.630	.548	1.436	5.250	.805	1.400	4.073	6.812	7.389	9.312
	SD	.6531	.7703	.1872	.1768	.1584	.7942	1.7894	.4214	.8126	1.2385	.7858	1.3821	2.2660
Total	Mean	1.602	2.021	.627	.612	.588	1.424	5.235	.778	1.410	4.099	6.772	7.327	9.330
	SD	.6917	.9529	.1845	.1653	.1973	.7290	1.7021	.3829	.7383	1.2897	.7265	1.1821	2.0943

(Table. VII) Descriptive Data for Measured Variables in Maxilla - according to Shape of Upper Dental Arch

Maxillary Central Incisors		Buccal Alveolar Crest Height	Lingual Alveolar Crest Height	Buccal Alveolar Crest Thickness	Lingual Alveolar Crest Thickness	Buccal Plate Thickness at Third 1	Buccal Plate Thickness at Third 2	Buccal Plate Thickness at Third 3	Lingual Plate at Third 1	Lingual Plate Thickness at Third 2	Lingual Plate Thickness at Third 3	Alveolar Ridge Thickness at Third 1	Alveolar Ridge Thickness at Third 2	Alveolar Ridge Thickness at Third 3
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean
U - Shape	Mean	1.460	1.008	.802	.977	.913	.904	2.460	1.940	4.485	8.925	8.533	9.579	11.388
	SD	.7927	.4375	.1765	.2166	.1852	.2449	.9435	.4984	1.0571	1.5352	.9168	1.1011	1.6046
V - Shape	Mean	1.240	.960	.840	.980	.959	1.040	2.795	2.427	4.980	9.423	9.213	10.395	12.285
	SD	.6782	.3664	.1516	.2594	.3773	.6894	2.2563	.9089	1.4805	2.4118	1.2535	1.8068	3.0697
Ovoid Shape	Mean	1.261	.995	.818	.957	.893	.907	2.270	2.243	4.886	9.407	8.966	10.105	11.677
	SD	.6875	.3444	.2083	.2757	.3007	.3245	1.0888	.8606	1.5322	2.3634	1.1185	1.5758	2.1688
Total	Mean	1.327	.989	.819	.971	.920	.946	2.498	2.189	4.769	9.236	8.883	10.002	11.756
	SD	.7265	.3847	.1803	.2488	.2917	.4488	1.5063	.7870	1.3681	2.1134	1.1226	1.5291	2.3260

(Table. VIII) Descriptive Data for Measured Variables in Mandible - according to Shape of Lower Dental Arch

Mandibular Central Incisors		Buccal Alveolar Crest Height	Lingual Alveolar Crest Height	Buccal Alveolar Crest Thickness	Lingual Alveolar Crest Thickness	Buccal Plate Thickness at Third 1	Buccal Plate Thickness at Third 2	Buccal Plate Thickness at Third 3	Lingual Plate at Third 1	Lingual Plate Thickness at Third 2	Lingual Plate Thickness at Third 3	Alveolar Ridge Thickness at Third 1	Alveolar Ridge Thickness at Third 2	Alveolar Ridge Thickness at Third 3
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean
U - Shape	Mean	1.543	1.944	.639	.628	.546	1.293	5.059	.752	1.404	4.009	6.617	7.141	9.069
	SD	.6353	1.1140	.1857	.1764	.1910	.6115	1.3897	.3452	.8056	1.3540	.6914	1.1286	1.7306
V - Shape	Mean	1.637	2.121	.618	.605	.602	1.525	5.409	.770	1.495	4.341	6.757	7.495	9.745
	SD	.6621	.8309	.1908	.1566	.1912	.8127	1.9539	.4173	.6887	1.2772	.6867	1.2335	2.3095
Ovoid Shape	Mean	1.655	1.955	.618	.591	.655	1.491	5.223	.864	1.209	3.705	7.191	7.359	8.914
	SD	.8959	.8233	.1708	.1630	.2132	.7521	1.7438	.3849	.6768	1.0661	.7776	1.1628	2.2397
Total	Mean	1.602	2.021	.627	.612	.588	1.424	5.235	.778	1.410	4.099	6.772	7.327	9.330
	SD	.6917	.9529	.1845	.1653	.1973	.7290	1.7021	.3829	.7383	1.2897	.7265	1.1821	2.0943

(Table. IX) Descriptive Data for Measured Variables in Maxilla - according to Inclination Type

Maxillary Central Incisors		Buccal Alveolar Crest Height	Lingual Alveolar Crest Height	Buccal Alveolar Crest Thickness	Lingual Alveolar Crest Thickness	Buccal Plate Thickness at Third 1	Buccal Plate Thickness at Third 2	Buccal Plate Thickness at Third 3	Lingual Plate at Third 1	Lingual Plate Thickness at Third 2	Lingual Plate Thickness at Third 3	Alveolar Ridge Thickness at Third 1	Alveolar Ridge Thickness at Third 2	Alveolar Ridge Thickness at Third 3
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean
Labial	Mean	1.134	1.005	.802	.929	.878	1.039	2.932	1.959	4.068	8.207	8.541	9.220	11.141
	SD	.5485	.3193	.1990	.2250	.1851	.3255	1.1228	.5941	.8116	1.1363	1.1081	1.0884	1.4717
Normal	Mean	1.580	1.014	.812	.967	.951	1.031	2.735	2.163	4.635	8.867	8.992	10.122	11.657
	SD	.8451	.4368	.1641	.2657	.2978	.5962	2.0240	.7688	1.0347	1.3806	1.1649	1.5432	2.6426
Lingual	Mean	1.221	.945	.843	1.017	.926	.757	1.800	2.443	5.610	10.671	9.090	10.624	12.471
	SD	.6572	.3833	.1810	.2488	.3630	.2652	.6850	.9069	1.6877	2.7293	1.0321	1.5816	2.4667
Total	Mean	1.327	.989	.819	.971	.920	.946	2.498	2.189	4.769	9.236	8.883	10.002	11.756
	SD	.7265	.3847	.1803	.2488	.2917	.4488	1.5063	.7870	1.3681	2.1134	1.1226	1.5291	2.3260

(Table. X) Descriptive Data for Measured Variables in Mandible - according to Inclination Type

Mandibular Central Incisors		Buccal Alveolar Crest Height	Lingual Alveolar Crest Height	Buccal Alveolar Crest Thickness	Lingual Alveolar Crest Thickness	Buccal Plate Thickness at Third 1	Buccal Plate Thickness at Third 2	Buccal Plate Thickness at Third 3	Lingual Plate at Third 1	Lingual Plate Thickness at Third 2	Lingual Plate Thickness at Third 3	Alveolar Ridge Thickness at Third 1	Alveolar Ridge Thickness at Third 2	Alveolar Ridge Thickness at Third 3
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean
Labial	Mean	1.605	2.111	.613	.603	.580	1.551	5.590	.801	1.366	4.041	6.862	7.498	9.626
	SD	.7286	.9578	.1891	.1534	.1835	.7750	1.7185	.3811	.6569	1.1369	.7253	1.1715	2.0952
Normal	Mean	1.673	1.750	.658	.654	.608	1.142	4.615	.727	1.500	4.277	6.600	7.004	8.892
	SD	.6697	.8486	.1677	.1581	.2331	.4456	1.1804	.2892	.7616	1.4720	.6274	1.0184	1.7868
Lingual	Mean	1.417	1.908	.667	.592	.608	1.042	3.792	.708	1.558	4.167	6.442	6.692	7.958
	SD	.3762	1.0799	.1826	.2539	.2314	.5616	1.4519	.5583	1.2102	1.9616	.8284	1.3208	2.1475
Total	Mean	1.602	2.021	.627	.612	.588	1.424	5.235	.778	1.410	4.099	6.772	7.327	9.330
	SD	.6917	.9529	.1845	.1653	.1973	.7290	1.7021	.3829	.7383	1.2897	.7265	1.1821	2.0943

(Table. XI) Descriptive Data for Measured Variables in Maxilla - according to ELP Type

Maxillary Central Incisors		Buccal Alveolar Crest Height	Lingual Alveolar Crest Height	Buccal Alveolar Crest Thickness	Lingual Alveolar Crest Thickness	Buccal Plate Thickness at Third 1	Buccal Plate Thickness at Third 2	Buccal Plate Thickness at Third 3	Lingual Plate at Third 1	Lingual Plate Thickness at Third 2	Lingual Plate Thickness at Third 3	Alveolar Ridge Thickness at Third 1	Alveolar Ridge Thickness at Third 2	Alveolar Ridge Thickness at Third 3
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean
< 13 mm	Mean	1.299	.962	.811	.983	.889	.858	2.236	2.185	4.900	9.461	8.859	10.058	11.698
	SD	.6850	.3463	.1807	.2555	.2651	.2914	1.0057	.7892	1.4568	2.2956	1.1623	1.5459	2.1624
≥ 13 mm	Mean	1.416	1.075	.844	.934	1.018	1.222	3.319	2.200	4.359	8.534	8.959	9.825	11.938
	SD	.8493	.4819	.1795	.2266	.3495	.6904	2.3326	.7923	.9507	1.1722	1.0019	1.4854	2.8081
Total	Mean	1.327	.989	.819	.971	.920	.946	2.498	2.189	4.769	9.236	8.883	10.002	11.756
	SD	.7265	.3847	.1803	.2488	.2917	.4488	1.5063	.7870	1.3681	2.1134	1.1226	1.5291	2.3260

(Table. XII) Descriptive Data for Measured Variables in Mandible - according to LMP TYPE

Mandibular Central Incisors		Buccal Alveolar Crest Height	Lingual Alveolar Crest Height	Buccal Alveolar Crest Thickness	Lingual Alveolar Crest Thickness	Buccal Plate Thickness at Third 1	Buccal Plate Thickness at Third 2	Buccal Plate Thickness at Third 3	Lingual Plate at Third 1	Lingual Plate Thickness at Third 2	Lingual Plate Thickness at Third 3	Alveolar Ridge Thickness at Third 1	Alveolar Ridge Thickness at Third 2	Alveolar Ridge Thickness at Third 3
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean
< 6 mm	Mean	1.442	1.995	.619	.647	.572	1.551	5.753	.988	1.570	4.472	7.181	7.960	10.219
	SD	.5917	.7400	.1816	.1351	.1709	.7219	1.6607	.3947	.5549	.9919	.6605	.9325	1.9118
= 6-9 mm	Mean	1.570	1.904	.599	.587	.563	1.415	5.072	.688	1.412	4.049	6.506	7.139	9.116
	SD	.6564	.8212	.1813	.1678	.1704	.7976	1.8357	.3373	.8563	1.4885	.6235	1.2600	2.2036
> 9 mm	Mean	2.009	2.427	.727	.623	.695	1.205	4.718	.641	1.091	3.523	6.782	6.664	8.241
	SD	.8372	1.4942	.1723	.2022	.2803	.4359	1.0252	.3305	.5665	.8965	.7932	.7700	1.3358
Total	Mean	1.602	2.021	.627	.612	.588	1.424	5.235	.778	1.410	4.099	6.772	7.327	9.330
	SD	.6917	.9529	.1845	.1653	.1973	.7290	1.7021	.3829	.7383	1.2897	.7265	1.1821	2.0943

Table. XIII) Alveolar Crest Height (High < 3 mm, Low > 3 mm)

		Buccal Alveolar Crest Height		Lingual Alveolar Crest Height	
		(High)	(Low)	(High)	(Low)
Adults	Upper	93.06%	6.94%	100%	-
	Lower	90.28%	9.72%	75%	25%
Females	Adults	Upper	97.22%	2.78%	100%
	Lower	91.66%	8.34%	86.12%	13.88%
Males	Adults	Upper	88.88%	11.2%	100%
	Lower	88.88%	11.2%	63.88%	36.12%

**Table. XIV ) Buccal Alveolar Thickness (Thin < 1 mm, Medium 1 - 2 mm, Ideal > 2 mm)**

		Buccal Alveolar Crest Thickness			Buccal Plate Thickness at Third 1			Buccal Plate Thickness at Third 2			Buccal Plate Thickness at Third 3			
		< 1 mm	1 - 2 mm	> 2 mm	< 1 mm	1 - 2 mm	> 2 mm	< 1 mm	1 - 2 mm	> 2 mm	< 1 mm	1 - 2 mm	> 2 mm	
Adolescent	Upper	75%	25%	-	58.33%	40%	1.67%	45%	51.67%	3.33%	1.67%	30%	68.33%	
	Lower	100%	-	-	100%	-	-	26.67%	46.67%	26.67%	-	-	100%	
Adults	Upper	84.7%	15.3%	-	66.7%	33.3%	-	73.6%	26.4%	-	4.2%	43.1%	52.8%	
	Lower	94.4%	5.6%	-	87.5%	12.5%	-	33.3%	54.2%	12.5%	1.4%	1.4%	97.2%	
Females	Adolescent	Upper	86.7%	13.3%	-	70%	30%	-	70%	30%	-	-	36.7%	63.3%
		Lower	100%	-	-	100%	-	-	46.7%	50%	3.3%	-	-	100%
	Adults	Upper	83.3%	16.7%	-	66.7%	33.3%	-	69.4%	30.6%	-	2.8%	36.1%	61.1%
		Lower	97.2%	2.8%	-	97.2%	2.8%	-	16.7%	66.7%	16.7%	2.8%	2.8%	94.4%
Males	Adolescent	Upper	63.3%	36.7%	-	46.7%	50%	3.3%	20%	73.3%	6.7%	3.3%	23.3%	73.3%
		Lower	100%	-	-	100%	-	-	6.7%	43.3%	50%	-	-	100%
	Adults	Upper	86.1%	13.9%	-	66.7%	33.3%	-	77.8%	22.2%	-	5.6%	50%	44.4%
		Lower	91.7%	8.3%	-	77.8%	22.2%	-	50%	41.7%	8.3%	-	-	100%

**(Table. XV ) Lingual Alveolar Thickness (Thin < 1 mm, Medium 1 - 2 mm, Ideal > 2 mm)**

		Lingual Alveolar Crest Thickness			Lingual Plate at Third 1			Lingual Plate at Third 2			Lingual Plate at Third 3			
		< 1 mm	1 - 2 mm	> 2 mm	< 1 mm	1 - 2 mm	> 2 mm	< 1 mm	1 - 2 mm	> 2 mm	< 1 mm	1 - 2 mm	> 2 mm	
Adolescent	Upper	41.67%	58.33%	-	-	25%	75%	-	-	100%	-	-	100%	
	Lower	98.33%	1.67%	-	58.33%	41.67%	-	15%	50%	35%	-	3.33%	96.67%	
Adults	Upper	61.1%	38.9%	-	-	56.9%	43.1%	-	-	100%	-	-	100%	
	Lower	98.6%	1.4%	-	86.1%	12.5%	1.4%	40.3%	48.6%	11.1%	-	1.4%	98.6%	
Females	Adolescent	Upper	50%	50%	-	-	40%	60%	-	-	100%	-	-	100%
		Lower	96.7%	3.3%	-	83.3%	16.7%	-	23.3%	40%	36.7%	-	6.7%	93.3%
	Adults	Upper	66.7%	33.3%	-	-	55.6%	44.4%	-	-	100%	-	-	100%
		Lower	100%	-	-	80.6%	19.4%	-	27.8%	55.6%	16.7%	-	-	100%
Males	Adolescent	Upper	33.3%	66.7%	-	-	10%	90%	-	-	100%	-	-	100%
		Lower	100%	-	-	33%	66.7%	-	6.7%	60%	33.3%	-	-	100%
	Adults	Upper	55.6%	44.4%	-	-	58.3%	41.7%	-	-	100%	-	-	100%
		Lower	97.2%	2.8%	-	91.7%	5.6%	2.8%	52.8%	41.7%	5.6%	-	2.8%	97.2%

In maxillary central incisors of adults, buccal and lingual alveolar crest was greater than in adolescents, and the same in adult males than adolescent males & adult females than adolescent females. Whereas in mandibular central incisors of adults, buccal and lingual alveolar crest was greater as well as the buccal alveolar crest and buccal plate at third 1 were thicker than in adolescents, and the same in adult males than in adolescent males & in adult females than in adolescent females

In maxillary central incisors of adolescents, buccal and lingual alveolar crest, buccal plate, lingual plate at third 1, and alveolar ridge at third 1 & 2 were thicker than in adults.

Whereas in mandibular central incisors of adolescents, lingual plate at third 1 and alveolar ridge at third 2 were thicker than in

adults. In maxillary central incisors of adolescent males, lingual alveolar crest, buccal plate, lingual plate at third 1 & 2, and alveolar ridge were thicker than in adult males, and the same in adolescent females than in adult females. Whereas in mandibular central incisors of adolescent males, lingual plate at third 1 & 2 was thicker than in adult males, and the same in adolescent females than in adult females.

In mandibular central incisors, we found a difference between adolescents and adults according to gender as follows: buccal plate at third 2, 3 and alveolar ridge were thicker in adolescent males than in adult males, on the contrary, were thicker in adult females than in adolescent females.

With V-shape of upper dental arch, lingual plate at third 1, and alveolar ridge at third 1 & 2

were thicker than other types of dental arch shapes. Whereas with ovoid-shape of lower dental arch, alveolar ridge at third 1 was thicker than other types of dental arch shapes.

In maxillary central incisors, with square shape of incisor - buccal and lingual alveolar crest was greater, with rectangular shape of incisor - lingual alveolar crest was thicker, whereas with oval shape of incisor - buccal plate at third 3 and alveolar ridge at third 3 were thicker than other shapes. Whereas in mandibular central incisors, with square shape of incisor - lingual alveolar crest was greater, as well as buccal alveolar crest was thicker, whereas with oval shape of incisor - lingual plate was thicker than other shapes.

In maxillary central incisors, with normal buccolingual inclination - buccal alveolar crest was greater, with labial inclination - buccal plate at third 2 & 3 was thicker, with lingual inclination - lingual plate and alveolar ridge at third 2 & 3 were thicker, than other buccolingual inclination types. Whereas in mandibular central incisors, with labial inclination - buccal plate at third 2 & 3 and alveolar ridge at third 2 & 3 were thicker than other buccolingual inclination types.

In maxillary central incisors, when ELP > 13 mm - buccal plate at third 2 & 3 was thicker. Whereas in mandibular central incisors, when LMP > 9 mm - buccal alveolar crest and buccal plate at third 1 were thicker, whereas when LMP < 6 mm - the buccal plate at third 3, lingual plate and alveolar ridge were thicker.

### C. Correlations

We studied the existence of a correlation (by Spearman/Pearson Statical Analysis) between alveolar bone morphology of the central incisors, with the variables of: gender, age, shape of central incisors, shape of dental arch (upper/lower), buccolingual inclination of central incisor, effective length of the premaxilla (ELP) in upper arch, length of the mental protuberance (LMP) in lower arch.

#### 1- Correlation of Alveolar Bone Morphology around Maxillary Central Incisors

##### i. Positive Moderate Correlation

Buccal & lingual alveolar crest height (P < .01) with age (years), age groups. Buccal plate thickness at third 1, 2, 3 (P < .01) with ELP.

Lingual plate thickness at third 2, 3 (P < .01) with buccolingual inclination.

##### ii. Positive Weak Correlation

Buccal & lingual alveolar crest height (P < .01) with age groups with gender. Buccal & lingual alveolar crest thickness and lingual plate thickness at third 1 (P < .05) with shape of central incisors. Lingual alveolar crest thickness and alveolar ridge thickness at third 2 (P < .05) with buccolingual inclination. Alveolar ridge thickness at third 2 (P < .05) with age groups with gender.

##### iii. Positive Very Weak Correlation

Alveolar ridge thickness at third 1 (P < .05) with shape of dental arch.

##### iv. Negative Moderate Correlation

Buccal plate thickness at third 1, 2, 3 and lingual plate thickness at third 1 (P < .01) with age (years). Buccal plate thickness at third 3 (P < .01) with buccolingual inclination. Lingual plate thickness at third 3 (P < .01) with ELP.

##### v. Negative Weak Correlation

Lingual alveolar crest thickness, alveolar ridge thickness at third 1, 2, and alveolar ridge thickness at third 3 (P < .01) with age (years). Lingual Alveolar crest thickness, buccal plate thickness at third 2, lingual plate thickness at third 1, 2, and alveolar ridge thickness at third 1, 2 (P < .01) with age groups. Lingual alveolar crest thickness (P < .01) with ELP. Buccal alveolar crest thickness and lingual plate thickness at third 2 (P < .05) with age (years). Buccal plate thickness at third 3 (P < .05) with age groups. Lingual plate thickness at third 2 (P < .05) with ELP.

##### vi. Negative Very Weak Correlation

Buccal alveolar crest thickness and alveolar ridge thickness at third 3 (P < .05) with age groups. Buccal plate thickness at third 2 (P < .05) with buccolingual inclination.

#### 2- Correlation of Alveolar Bone Morphology around Mandibular Central Incisors

##### i. Positive Moderate Correlation

Buccal alveolar crest height (P < .01) with age (years) and LMP. Buccal & lingual alveolar crest height (P < .01) with age groups. Buccal plate thickness at third 2, 3, and alveolar ridge thickness at third 1, 2, 3 (P < .01) with buccolingual inclination.

##### ii. Positive Weak Correlation

Lingual alveolar crest height, buccal alveolar crest thickness, buccal plate thickness at third 1

( $P < .01$ ) with age (years), age groups with gender. Buccal plate thickness at third 1 ( $P < .01$ ) with shape of dental arch, ( $P < .05$ ) with age (years), LMP. Alveolar ridge thickness at third 1 ( $P < .05$ ) with shape of dental arch.

*iii. Positive Very Weak Correlation*

Buccal alveolar crest thickness ( $P < .01$ ) with age (years), ( $P < .05$ ) with LMP.

*iv. Negative Moderate Correlation*

Buccal plate thickness at third 3, lingual plate thickness at third 1, 2, 3, and alveolar ridge thickness at third 1, 2, 3 ( $P < .01$ ) with LMP. Lingual plate thickness at third 1, and alveolar ridge thickness at third 2, 3 ( $P < .01$ ) with age (years).

*v. Negative Weak Correlation*

Lingual plate thickness at third 1, 2 ( $P < .01$ ) with age groups. Lingual plate thickness at third 2 ( $P < .01$ ) with age (years), age groups with gender. Alveolar ridge thickness at third 1 ( $P < .01$ ) with age groups with gender. Lingual plate thickness at third 3 and alveolar ridge thickness at third 2 ( $P < .05$ ) with age groups. Buccal plate thickness at third 2, 3 ( $P < .05$ ) with age (years). Buccal plate thickness at third 2 ( $P < .01$ ) with LMP.

*vi. Negative Very Weak Correlation*

Buccal alveolar crest thickness ( $P < .05$ ) with shape of central incisors.

### Discussion

Outcomes of the current study indicated no significant differences between alveolar bone height and thickness of the right and left central incisors. On the contrary, we found significant differences in the alveolar bone surrounding the central incisors between adults and adolescents according to the site, and most of the alveolar crests were high in all adolescents and in most adults especially in adult females. whereas the alveolar plates were thicker in the maxillary central incisors than in the mandibular central incisors, as well as, they were thicker in the lingual aspect of the maxillary central incisors and in the lingual coronal at thirds 1 & 2 of mandibular central incisors than the buccal sides, and also increased thickness apically from the crest, but except the thickness at the coronal buccal third of mandibular central incisor, which decreased. Within the scope of this study, we can confirm that adults have more risk towards orthodontic

movements, according to our finding that alveolar crest height in adults was greater than in adolescents, and alveolar bone thickness in adults was thinner than in adolescents in all sites except in the coronal third of buccal cortical bone surrounding mandibular central incisors.

***According to the analysis of data obtained, it can be assumed that there is a potential risk:***

- With square shape of incisors: on all parts of alveolar bone around maxillary central incisors, whilst on most sites in mandible.

- According to shape of dental arch: risk of buccal incisors moving, with ovoid shape of upper arch and with U-shape of lower arch. Whilst the risk of lingual incisors moving, with U-shape of upper arch and with ovoid shape of the lower arch.

- With buccal inclination of maxillary central incisors, on the first buccal coronal third and lingual side of alveolar bone. Whilst with lingual inclination of mandibular central incisors, on the first lingual coronal third and buccal apical two-thirds of alveolar bone.

- When ELP less than 13 mm, with buccal maxillary incisors moving.

- When LMP larger than 9 mm generally.

*Critical orthodontic tipping movements*

1- Buccal inclination of mandibular central incisors in adolescents than in adults.

2- Lingual inclination of mandibular central incisors than of maxillary central incisors, at the level of alveolar crest in all groups, but at the first lingual coronal third of alveolar plate in adult males than others, and at the buccal apical level in adult females than others.

*Critical orthodontic movements towards cortical bone*

1- Buccal movements of maxillary central incisors than of mandibular central incisors in all groups.

2- Lingual movements of mandibular central incisors than of maxillary central incisors in all groups, in adults generally, and especially in adult males than others.

### Conclusion

The likelihood of bone complications during orthodontic treatment is greater in mandibular than maxillary central incisors according to our results of studying the morphology of alveolar

bone as follows: Likelihood of bone recession and dehiscence with buccal tipping movements, and all types of lingual movements especially on the lingual surface in adult males. likelihood of fenestration at the buccal apical level of the alveolar bone in adult females with lingual tipping movements. Finally, we recommend the total diagnosis of incisor position and the morphology of surrounded alveolar bone, in addition to, work

jointly with periodontists in the case of thin periodontal tissues. on the other hand, to plan orthodontic treatment carefully in terms of forces and mechanisms applied to the teeth, especially in adult patients, with our confirmation of the importance of treatment at early ages for safer treatment and best outcomes

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**COVID-19 ANXIETY AND SELF-ESTEEM: A STUDY OF HIGH RESILIENT AND LOW RESILIENT PEOPLE****Shalu Bairathi<sup>1</sup>, Monica Sharma<sup>2</sup>**<sup>1</sup>Research Scholar, <sup>2</sup>Assistant Professor Clinical Psychology, Department of Psychology, IIS (deemed to be University), JaipurEmail: <sup>1</sup>shalubairathi@gmail.com, <sup>2</sup>Monica.Sharma@iisuniv.ac.in**ABSTRACT**

COVID-19 has been quickly spreading over the world since December 2019 due to its highly contagious and infectious capacity. It is crucial to emphasise that, while pandemic experiences are frequently unpleasant, their impact on individuals varies so a study was designed to explore the differences if any on Covid-19 Anxiety and Self-Esteem in people with high and low Resilience. A cross-sectional study was conducted on people (above 18 years) residing in Jaipur City. Tools: Connor-Davidson Resiliency Scale-10 (Laura & Stein, 2007), Fear of COVID-19 Scale (Ahorsu et al., 2020), The Rosenberg Self Esteem Scale (Rosenberg, 1965). The data was analysed using SPSS-22 and it was found that the low resilient people were significantly high on Covid-19 Anxiety and significantly low self-esteem and high resilient people showed significantly higher self-esteem and lower Covid-19 anxiety. It can be concluded that while some people struggle with mental health difficulties, others are more resilient and able to go on with their life.

**Keywords:** Covid-19 Anxiety, Resilience, Self-esteem**Introduction**

The World Health Organization (WHO) announced the novel Coronavirus Disease (COVID-19) as universal pandemic on 11 March 2020, [1]. COVID-19 has progressed in widespread transmission, beginning initially in small clusters and later into larger clusters in several countries, culminating in a pandemic [2].

When entire nations are confronted with devastating occurrences, corresponding to the recent one produced by COVID-19, which is detrimental to populations' mental health, and unmanageable medical supplies, raising demand on the entire nation is in a very unfortunate situation. As a result, focusing on mental health is important

Consider swine flu (2009) or SARS (severe acute respiratory syndrome) in 2003 pandemic, in these situations, the research has mostly concentrated on the patients' psychological consequences. Fear of contagious disease, emotions of shame, loneliness, boredom, rage, concern, stress and a sense of ambiguity were all symptoms of the condition [3][4]

It was found that in the 2003 epidemic, each sick and healthy people had been exposed to excessive stress, displaying that the entire society has been affected irrespective of education level. Patients additionally conveyed loneliness and dullness because of the lengthy

isolation [5] and an excessive occurrence of mental suffering [6].

According to data from Chinese studies, the threat of this pandemic may result in mental illnesses such as stress, anxiety, depression, somatization, and behavioural problems with increased alcohol and tobacco use [7].

Few studies research have tested the mental emotional effect of COVID-19 in the initial few weeks of the COVID-19 pandemic and associated lockdown. The initial data have confirmed signs of anxiety, irregular sleep, depression, decrease intellectual well-being, and sufferings and the importance of tracking these aspects. Ahmed and colleagues [8] also addressed the way confinement in the houses was an assault of the COVID-19 pandemic resulting in increased anxiety, sadness, and a worse degree of mental well-being.

It is crucial to emphasise that, while pandemic experiences are frequently unpleasant, their impact on individuals varies. While some people struggle with mental health difficulties, but others are more resilient and able to go on with their life. This emphasises the need of researching that not only just how people suffer as a result of social quarantines, but also how they survive and even thrive in the face of such adversity.

Even under tough circumstances, humans are motivated to flourish rather than just survive [9]. Living "within an ideal range of human

functioning, one that signifies kindness, generativity, development, and resilience". According to Fredrickson & Losada [10], is what it means to flourish, resilience appears to be the result of thriving. Resilience is predicted by happiness. In the literature, these terms "flourishing," "thriving," and "well-being" are used substitutably for clarity [11].

Favourable association have been related to resilience and positive outcomes such as improved physical and emotional health, good habits, less psychopathology, and a lower chance of death[12] Furthermore, Yang and Ma [13] observed how the epidemic's outbreak provoked people's emotional well-being, fear such as the likelihood of contracting the virus and creating relationship issues, can be distressful but with the understanding of the epidemic increases and making sense of the situation, the degree of emotional stability and protective well-being increases

Individuals' assessments of themselves and evaluation of their attitudes and beliefs are basic elements of Self-esteem – may act as a buffer against these negative tendencies. Self-Esteem is founded on deeply ingrained personal values resulting from a specific societal, interpersonal, and cultural environment [14], [15] which according to Pyszczynski & colleagues [16], is strengthened by peer approval and the sense of existence as worthwhile human being with a substantial place in society qualifying to the standards of a specific culture

## Methods

### A. Rationale

COVID-19 has been quickly spreading over the world due to its highly contagious and infectious since December 2019, triggering the present pandemic [1] (World Health Organization [WHO], 2020). To restrict the spread of COVID-19, strong preventive strategies were implemented around the world, like quarantines. Nonetheless, the scope of this epidemic has raised major worries about its short and long-term social and economic effects [17]. As a result, COVID-19 represents a historic threat to human life in all aspects.

Fear of a COVID-19 pandemic also led to damaging and harmful behaviours for the entire humanity (e.g., requesting unnecessary

medical attention, overprotecting against the virus, and hoarding particular products) [18]. Studies have shown that the Covid-19 Pandemic has impacted both professionals and general public alike [19] their mental health negatively resulting in symptoms of stress, depression and anxiety. [20].

To add to the stress of pandemic other negative events like unemployment and financial stressors play a potent role in families already suffering pre-existing financial crisis, health, or other long-lasting stressors [21]. While some experience negative emotions on the other hand some might experience post traumatic growth, where some possess the ability to endure and flourish in the times of adversity [22], [23]. Children coping with disasters and severe adversities are supported by the quality of family relationships. If the family well-being is nurtured, enhanced or even improved during such times, children learn to develop their own resilience.[23].

Emotion-focused conversations about current catastrophic situation within the family and community will allow uncomfortable emotions to be expressed and normalized. Collectively, during this tough period, these orientations will help families accept hope, with resulting resilience and a common sense of family agency. They have the potential to foster hope and excitement for the future by offering a straightforward pathway by which adversities are recast as positive storylines, Moving past oneself and one's current misery.

Strong self-esteem can have a beneficial impact on a person's quality of life, sowing the seeds of optimistic emotions and feelings that eventually contribute to fruitful behaviour. Self-esteem is a mentality of self-acceptance, relating to how we enjoy ourselves and feel positive for ourselves.

As a result of this circumstance, a sensible knowledge of mental health condition is critical for society. From the current literature review, little is known about the repercussions, mental health, and general well-being of the population and how they coped the COVID-19 epidemic when it was at its peak, whereas this study is to understand the population in general and effects of the Covid-19 pandemic and what led to them returning to normal.

Variab les	Groups	Mean	SD	t- value	Sig. level
Covid-19 Anxiety	Low resilience	23.43	9.580	5.953	.000
	High Resilience	16.57	9.884		
Self-Esteem	Low resilience	27.23	4.629	2.732	.008
	High Resilience	34.13	4.345		

**B. Aim**

To explore the differences if any on Covid-19 Anxiety and Self-Esteem in people with high and low Resilience

**C. Hypothesis:**

There will be a significant difference in Resilience, Self-Esteem and Covid-19 Anxiety in people with high and low Resilience

**D. Sample**

The sample consisted of 30 people who scored high on Resilience and 30 people whose scores were low on the Resilience scale from Jaipur City

**Inclusion Criteria:**

Participants who were aged 18 to 65 years old, he/she resides in Jaipur city.

Participant aged less than 18 years old, and participant who does not reside in Jaipur City.

**E. Research Design**

Two group research design was employed.

**F. Tools of the study**

**Connor-Davidson Resiliency Scale-10 (CD-RISC-10)** [24], to measure resiliency in general population, it’s a 10-item scale. The test has adequate test-retest reliability and convergent and divergent validity [25]

**Fear of COVID-19 Scale – (FCV-19S)** [26] is a COVID-19 related fear in the general population, it’s a 7-item scale and It is reliable and valid in assessing anxiety of COVID-19 among the general population[26]

**The Rosenberg Self Esteem Scale** [27] measures global self-esteem in the general population, it’s a 10-item scale. High internal consistency and Convergent validity has been reported[28].

**Results**

**Table 1 Mean, SD and t value of high and low resilient people in Jaipur City**

Result from the table 1. indicate that the 30 low resilient people (M = 23.43, SD = 9.580) compared to the 30 high resilient people (M =16.57, SD = 9.884) the low resilient people demonstrated significantly higher level of covid 19 anxiety, t= 5.953, p = < .01

In case of Covid-19 Anxiety t = 5.953, the value of p is .000 (p < .01), which is less than .01, so we would conclude that there is significant difference between the two groups (high and low Resilience) on Covid-19 Anxiety.

The 30 low resilient people (M = 27.23, SD = 4.629) compared to the 30 high resilient people (M =34.13, SD =4.345) the high resilient people demonstrated significantly better level of self-esteem, t= 2.732, p = < .01

In case of Self-Esteem t = 2.732, the value of p is .008 (P < .01), which is less than .01, so we can conclude that there is significant difference between the mean of the two groups (high and low Resilience) on Self-Esteem

**Discussion**

The present study aimed to Explore Difference if any on Anxiety and Self-Esteem in High and Low Resilient Groups. For this study 60 people both male and female of ages between 18 to 65 years from Jaipur City participated in the study. Data was collected with the help of Google Form and analysed with SPSS-22.

The result of the study is that low resilient people are high on covid-19 anxiety and high resilient people are high on self-esteem as well, resilience is stress-context specific, which is in line with this concept. [29], [30], [31], and the resiliency ratings are influenced by the sample's characteristics [32]. People who are under considerable stress, in particular, score lower than the average population [33], [34]

This study shows that positive sentiments such as curiosity, joy, and satisfaction, as well as

pursuing a daily purpose and having a sense of achievement on a regular basis, are important to stressed persons' capacity to flourish in their current situation. Individuals are able to enjoy their daily lives when such criteria are met [35]. It also provides a sense that life matters, which replaces drained energy from adversity and is necessary for the development of resiliency.

### Conclusion

The present study investigated the difference of Covid-19 Anxiety and Self-Esteem in people who scored low and high on Resilience scale.

A cross-sectional study was done through online Google forms and consent was taken. We found that there was significant difference in the level of resiliency was seen between the two groups. The result showed that low resilient people are high on covid-19 anxiety and high resilient people are high on self-esteem as well, which means that resiliency is an important trait of a person in the times of environmental stress confronted by the pandemic which can cultivate positive emotions and continue to grow as strong human beings.

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## IMPACT OF COVID-19 ON GREEN PRACTICES IN HOSPITALITY SECTOR IN JAIPUR

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### ABSTRACT

*In India, Hospitality, Tourism, and allied sectors are inter-reliant sectors contributing to the country's GDP and developed gradually in the recent past and identified as important sources of revenue generation and creating employment in India. It is observed from the literature that most tourists & guests wish to maintain a comparatively high pattern of consumption and vice versa unsustainable patterns drive exploitation resources & generate waste. This leads to the need for sustainable development and green practices. Globally adoption of green practices in the hospitality sector is rising in the face of the COVID-19 pandemic. Jaipur is a holiday destination for tourists because of its historical, cultural, and natural heritage. The research study deals with the creation of economic opportunities for the local communities. The inference of this study would highlight that Tourism & hospitality sectors should adopt green practices & sustainable business policies that will save the cost and somehow manage the pandemic impact.*

**Keywords:** COVID-19 Pandemic, Sustaining Environment, Green Practices, Tourism, Lockdown, Allied Sector

### Introduction

Over the last 20 years, tourist firms' environmental management has progressively increased in order to determine the most significant drivers, potential advantages, and degree of implementation. As a result, there is a tendency to generalize the impact of environmental laws without identifying how firms are affected differently based on their particular characteristics. This subject's tourism study focused on the size of tourist firms and differentiated between tourism business types. Analyses of the hotel industry have classified hotels into categories.

The COVID-19 epidemic has affected several countries across the world. Lockdown was declared in March 2020 in order to halt the spread of the Indian epidemic. Until last year, the tourism and hospitality sectors played a critical role in Indian GDP growth, including restoring indigenous culture and art, job creation, destination development, and the installation of national integrity. Many countries, including India, rely heavily on these industries to drive economic growth. The pandemic outbreak, notably in Jaipur, has severely harmed the tourist and related industries. The restriction on visitors from other nations, cities, and states was the primary roadblock for tourism, aviation, travel

agencies, and Hospitality. The important component of socializing and travel was prohibited from keeping the epidemic from spreading.

In India, hotel & travel companies function relatively in a free environment. Covid-19 opened the eyes of the travelers and they are conscious of the environment when they visit tourist destinations. Many enterprises in the hospitality sector are following environment-friendly practices (green practices) that have become powerful marketing tools for hotel groups. Because of this issue concept of green hotels and eco-hotel is gaining recognition globally. Travelers and tourists prefer hotels underneath and adopt green practices in the hospital sector to gain a green tag. The Indian hotel industry has now leaped onto the eco-friendly bandwagon on their respective venture. The existing hotels are trying to incorporate green practices. It starts from the construction stage in the hotel, where the features and equipment, along with hotel policies and procedures incorporated, helps save energy, water, and waste. Travelers are anxious to start traveling, whether, by air, hotel stay, or eating out is safe or not after pandemic unlock.

Ecotels, also known as green hotels, are ecologically friendly hotels that improve their environmental framework in order to minimize

or decrease their environmental impact. These hotels have one-of-a-kind natural resource conservation programs and waste reduction, pollution reduction, and sustainability enhancements. These hotels have typically been constructed near woodlands, with hill resorts nicknamed Eco Lodges due to their location. For some days now, several properties have been constructed and erected with an eye toward environmental purity.

Some ecotels are made from recycled or renovated structures that enhance energy and water conservation, reduce waste, include natural landscaping, or employ recovered building materials. Various properties support local environmental or group activities and provide environmental education or field trips. Ecotel hotels are also characteristics of ecologically aware hotels. They adhere to the three "Rs" of conservation - reduce, reuse, and recycle.

### Review of Literature

Scientists in the housing sector have extensively examined the relationship between service qualities and customer pleasure. However, further efforts should strengthen the link between environmentally friendly hotel amenities and visitor pleasure. Customer satisfaction is seen as a vital component in order to maintain a competitive firm. It is also an important indicator in determining a company's performance and financial success. It may be defined as a cognitive process that compares perceived performance to expectations and generates a sense of delight or deceit by contrasting consumer experience with the initial foundation. This factor is critical in determining the impact of green practices on visitor happiness. Robinot and Giannelloni (2010) found that customers rate hotel environmental characteristics as "basic components" that constitute an essential service component. However, other writers feel that this characteristic reflects "facilitating attributes," which may contribute to visitors' excitement. Brunssmith et al. (2015) showed that, while the relationship between green practices and visitor pleasure is weaker in terms of essential features, satisfaction is not lowered if not implemented. In this regard, green features, together with critical attributes

that must be delivered without fail, should be offered to contribute to customer pleasure. Researchers have examined and confirmed the significance of the relationship between green behaviour and happiness in the hotel industry context. On the other hand, others observe that environmentally-friendly qualities diminish the relationship between service quality and customer satisfaction.

There is a lot of debate over the importance of customer loyalty. This structure is defined by Oliver (1997) as "a strong commitment to constantly replace or repatriate a selected product or service in the future, although situational influence and marketing efforts may be able to induce a change of behaviour." Loyalty may be split into two types: loyalty of behaviour and loyalty of attitude. The first is about the time-consuming transaction. The latter refers to an emotional bond. Although there is no general agreement on what causes loyalty, both of these loyalty components should be considered in hospitality research.

Research on consumer behaviour has revealed that customers are one of the most significant motives for hotels to follow green practices (Kularatne et al. 2019) because consumers are increasingly worried about climate change concerns (Juvan & Dolnicar, 2017; Rahman et al., 2012). García-Pozo et al. (2019) have shown in their studies that environmental involvement and, consequently, increased environmental awareness by hotels are very significant to Andalusian customers. On the contrary, some researches have shown that while consumers are aware of environmental problems, they are not all aware of hotel environmental initiatives (Gil-Soto et al., 2019; Wang et al., 2018). In this view, the primary findings of the study carried out by Gil-Soto et al. (2019) show that while clients see green efforts for six things (e.g., energy, water, purchase, trash, site and education, and innovation), they do not see the degree of hotel environmental commitment. In addition, according to Yi et al. (2018), some visitors believe that hotels employ green efforts as a promotional tool or to enhance company performance.

Green practices, according to Han and Kim (2010), have a positive influence on the desire of visiting guests to find efficient strategies to

promote their environmental efforts (Han and Kim, 2010). Other researchers studying consumer-friendly attitudes have discovered that a company's environmental responsibility significantly boosts hotel visitors' inclinations to visit a green hotel and speak out supporting green hotels (Han et al., 2011). Considering the prior discussion, this paper test causes consumers to feel more loyal to green hotels at a hotel with a higher level of dedication to Green Practice. It is commonly acknowledged that a history of customer pleasure is a history of customer loyalty. According to Fen and Lian (2007), the marketer is happy since it is commonly regarded as a critical predictor of repeat purchases, positive word of mouth, and customer loyalty. This beneficial relationship is frequently mentioned in hospitality research. Recent studies show a link between green hotel visitor pleasure and guest loyalty when it comes to adopting sustainable measures in green hotels. Wang et al. (2018) revealed that visitor satisfaction is positively related to their motivation to promote green hotels via Word of Mouth (WOM). According to Martnez Garca de Leaniz's (2015) research, when you are satisfied with the performance of a green hotel, you tend to develop a stronger sense of loyalty towards the green hotel. Guest satisfaction has also shown to be a significant precedent for both WOM and objective review. Martnez Garca de Leaniz (2015) developed the concept of "green loyalty," which he defined as "consumer engagement to repurchase or otherwise continue using a green brand." Guest satisfaction was shown to be an essential factor in determining consumer behavioural intentions in this study. In particular, Martnez Garca de Leaniz (2015) showed that visitor enjoyment has a substantial effect on guest green loyalty. In accordance with these findings, Han and Kim (2010) argued that hotel management's efforts to improve customer satisfaction would influence their post-purchase decision-making processes. Visitor satisfaction was positively connected to customers' propensity to visit a green hotel (Han and Kim, 2010).

In the book, Panda Tapan, Mishra Sitikantha, and Parida Bivaraj (2004) inform that the green practices adopted by the hotel industry can bring positive changes towards sustaining the

environment. Few green practices like 'Recycle, reuse, reduce' have been introduced in the organization policy. Nowadays, hotels post messages in the bathroom requesting guests to reuse recyclable shampoo bottles and offer an optional linen & towel reuse program to multiple night guests. Hotels have installed new shower appliances & bidets that consume less water. Several hotels have a power connection operated with a key card that switches the power off when the guest leaves the room. Hotels have also begun to use a green integrated pest control approach that makes chemical treatment less dependent and environmentally beneficial. In their day-to-day operation, resorts embrace wind and solar energy together with the Sewage Treatment Plant. It enhanced usage of LED lights and the fuzzy logic system for eco-practices.

Chakraborty Kahini (Food & Hospitality World, 2015) writes about home, and there remains a new wing of eco-tourism which promotes the common economy idea and resource protection. It is described as resorts or forest lodges that establish amenities for staying in the middle of a natural environment. It is high time to think of methods to protect the environment in emerging countries like India while appreciating what our country offers.

Karishma S. Kasare (2020) says India is known for its cultural richness, historical landmarks, and a wide range of natural attractions, making it a realistic option for tourists to visit.

Middle East Campaign (2020) notes that coronavirus is widespread and has severe consequences for travel, hotel, and tourist industries, with 1.0 large proportion of individuals seeking journeys with strict hygiene and safety requirements to be taken throughout their stay in the hotel. People are keen to travel and experience new locations so that tourism would bounce back shortly.

Lahiri Keka, in her book, thought that government, local authorities, developers, operators, visitors, and local people are the important actors in the eco-tourism industry since they must be environmentally sensitive and local customs. For that reason, she thought that defined rules would assist in promoting eco-tourism successfully.

**Objectives**

1. To assess the green practices and explore the impact of Lockdown on the hospitality sector in Jaipur.
2. To understand the expectations of tourists and local people post Lockdown from the hospitality sector in Jaipur.

**Research Methodology**

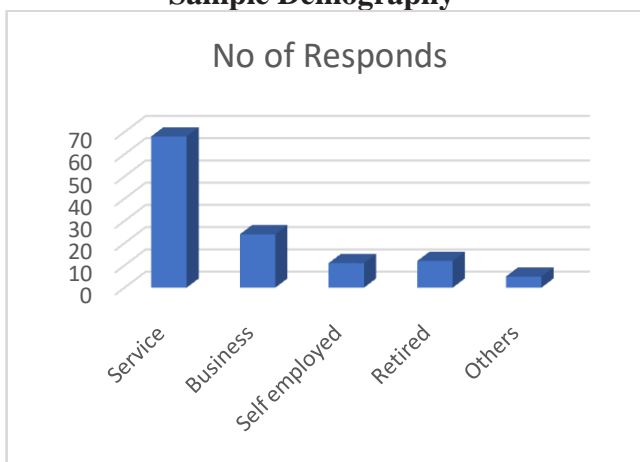
**Primary Data:** In this paper study, a quantitative research approach aimed with a structured questionnaire was developed with the help of literature review & past research done in this field. The questionnaire is circulated by the Simple Random sampling method among Samples from businesses, service, self-employed, students in & around Jaipur city was selected to get feedback on the topic.

**Data:**

The study was based on preliminary information on twelve different hotels. Four (three, four, and five-star) hotels were selected in accordance with hotel quality literature and possible variances in green practices between them. We took ten clients from each hotel. The sample size total is 120. The data were obtained from interviewees in different professions such as business, services, self-employed, retired people, and others on their requirements and preferences after the lockout.

**Data Analysis and Interpretation**

**Sample Demography**



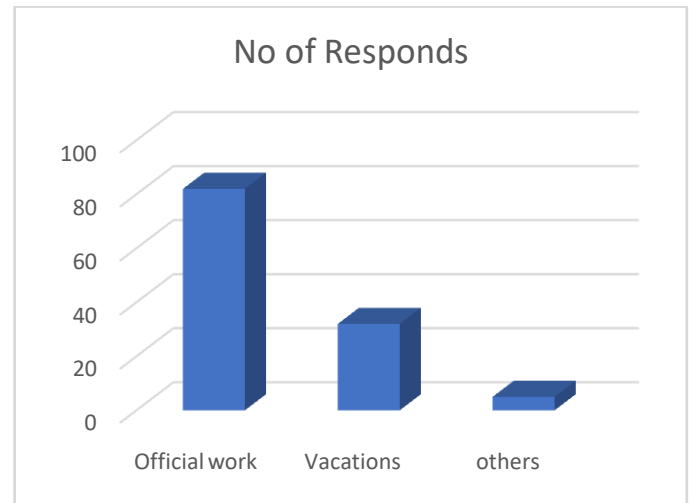
**Figure 1: Sample Demography (Nos)**

**Interpretation:**

During the Lockdown, data shows that visitors

in the hotels were from the services class. The majority, 56.7 percent, belongs to the service class, followed by business class 20 percent, self-employed by 9.1 percent, retired by 10 percent, and others by 4.2 percent respectively.

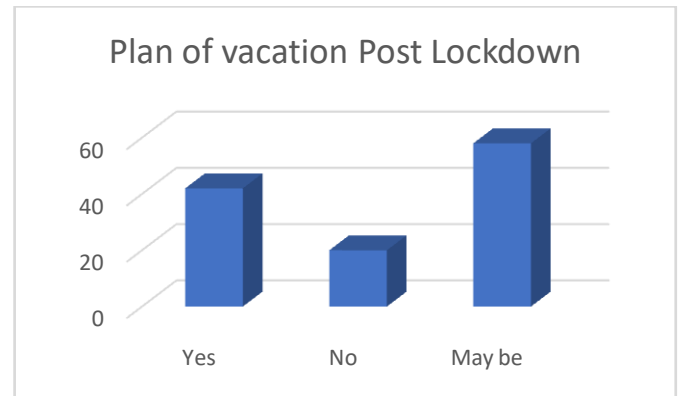
**Reason for Visit:**



**Figure 2: Hotel Visit Reason**

The hotel visit during the post lockdown was official work like meeting, business followed by the vacations, and others like attending wedding parties, etc.

**Plan of Vacation Post Lockdown:**



**Figure 3: Plan of Vacation Post Lockdown**

**Interpretation:**

Data show that travel limitations proceed step by step 35 percent of the people said they wanted to visit the tourism destination after locking down, 48.7 percent didn't know their plans, and 16.7 percent said they would not go for any vacation after Lockdown. Service providers thus have to work on new, standard tactics and make them feel comfortable and safe to travel. Service providers must thus prepare themselves to welcome tourists.

**Hotel Selection Criteria**

Tourists indicated the main factors for

selecting a hotel post-shutdown are hygiene and sanitation, contrasted with other characteristics such as comfort, placement, amenities, and room rate. Hotels need to fulfill the stringent hygienically clean standards requirements to get business.

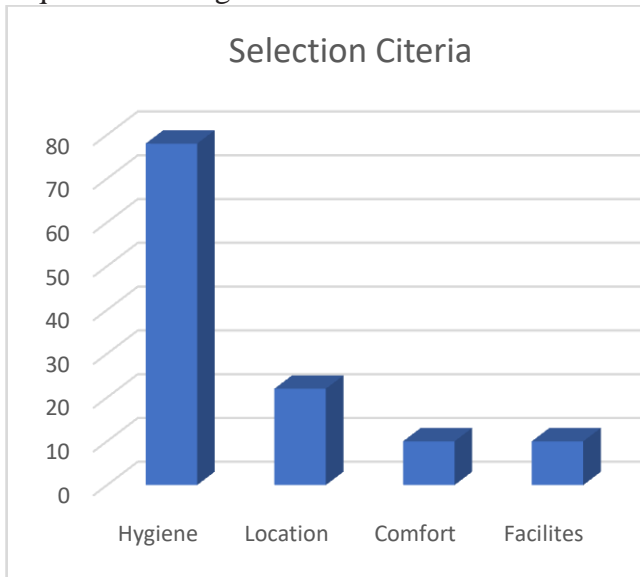


Figure 4: Hotel Selection Criteria

**Hotels Operating with Ministry Guideline Post Lockdown**

As per the WHO, it's essential to sanitize the regularly touched common areas frequently. Many hotels have initiated health & hygiene programs, which help maintain safety and hygienic from a tourist's perspective and feel psychologically safe when they enter the hotel. The Ministry of Tourism, Government of India, has put forth the guideline for operating hotels. All tourists firmly believe that hotels must follow it and it needs an hour. The graph shows the hotels operating with guidelines on a 5-point Likert scale.

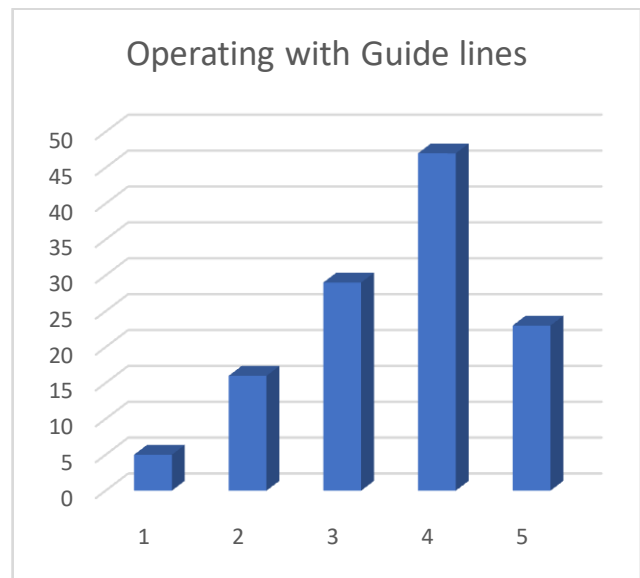


Figure 5: Hotels Operating with Ministry guidelines

**Green Practices In hotels:**

The green hotels are organized around five environmental themes, each of which has received a Globe award. These five categories are referred to as the "cornerstones of environmental responsibility" or simply "globes." The names of these globes are as follows:

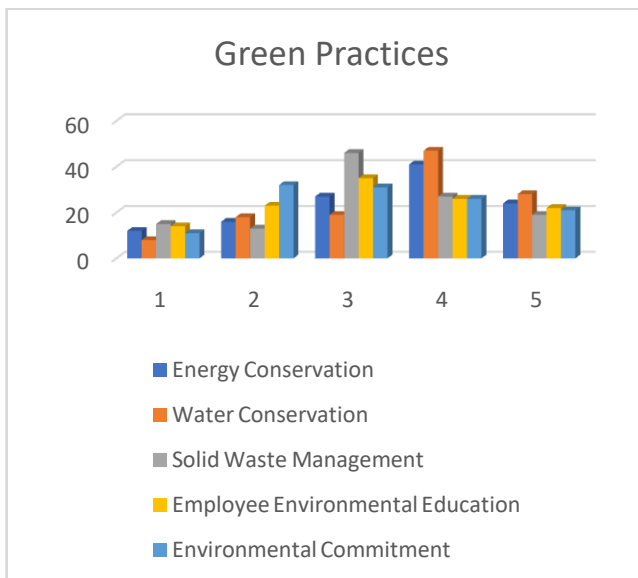
**Energy Conservation:** Needs a systematic framework in order to reduce the hotel's energy use indeed.

**Water Conservation:** Assesses the efficiency with which water is conserved throughout all hotel departments. The quantity of water recycled and utilized is also a big problem.

**Solid waste management:** The hotel must recycle and treat rubbish effectively wherever it is created. All hotel departments must have adequate trash collection, recycling, and disposal procedures in order to be Ecotel accredited.

**Employee Environmental Education:** Evaluates how the hotel's workforce contributes to environmental efforts.

**Environmental Commitment:** The hotel or lodging must demonstrate a formal commitment to environmental conservation and development.



**Figure 6: Green Practices in the Hotel**

### Findings

The study is concluded by accepting the hypothesis that green practices empower the hospitality sector in Jaipur. In conclusion, to the above results of the study, we can summarize as follows:

- The maximum number of visitors post lockdown was due to business or service activities.
- A large number of visitors were not sure that they would go on vacation post lockdown.
- If they are going on vacations, then hygiene will be the highest priority for hotel selection.
- A large number of visitors are agreed that the hotels are operating with the guidelines of the ministry.

- Green practices adopted by the hospitality industry like recycling paper, water, conservation of energy like natural lights, renewable energy, and LED lights, use of CNG, battery-operated vehicles for taking tourists for excursions so that pollution could be controlled.

### Conclusion

COVID19 has a terrible worldwide influence, and in this respect, the hotel sector has to comprehend and prepare concert tactics to synchronise the same thing. A harmonised strategy will speed up the reconstruction process. In monitoring and keeping them together, the government can play a crucial role. As tourist demand falls to cope with losses, unemployment rises, salaries are negotiated, travellers are worried about visiting the country to go, overhead expenses rise, and corrections to prevent crises have to be taken into account. The conservation process begins with awareness of the sustainable environment for the next generation.

Green practices adopted by the hospitality industry will help in the conservation of energy, water. Many players in this industry follow green practices for sustaining the environment, but the percentage is very low compared to its use. Training & awareness towards conservation for staff & guests will help have a separate segment of group traveler towards nature tourism.

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## THE EFFECT OF ONLINE CUSTOMER REVIEWS ON THE BUYING BEHAVIOR OF CONSUMERS RIGHT BEFORE AND AFTER THE MAKING A PURCHASE DECISION OF A PRODUCT ON AN ONLINE E-COMMERCE PLATFORM

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### ABSTRACT

*Online Customer Review (OCR) plays an important role while making a purchase decision of buying a product online on an ecommerce website. In this paper we try to study the effects of online customer reviews on the buying behavior of consumers in two scenarios: (1) while buying a product online ; (2) right before making a purchase decision. It aims to study the buying behavior of a customer; and how good/bad reviews can hamper the sales of in-ear headphones of different brands. With this we also try to find the effect of different numbers of reviews and ratings of the product on the consumer preference. We also try to find out the implications of the OCR on sellers of goods/services.*

**Keywords:** *Online Customer Review (OCR), Consumer Behavior, Marketing, Purchase Decision, Brand Equity, Brand Awareness*

### Introduction

This template, There has been a surge in the users of the internet across India with over 564 million active internet users (Statista.com). This opens up a huge opportunity for different companies to sell their products online since it's the future of buying and selling. Thousands of new products are being added to different websites every day. Consumers are now preferring to buy products online and opt for home deliveries instead of stepping out due to the Covid-19 pandemic. Therefore, it becomes very important for companies and businesses to build an online presence to harness the potential of business which online e-commerce marketplace holds for them. Even the purchase of goods and services in the offline mode attracts the consumers to check the reviews of the product online once, before visiting the market to buy the product. A consumer often tends to find relevant information and genuine customer reviews about the products on the different search engines (Google, Yahoo, Bing, YouTube) to assess the current performance of the product. Therefore, the review and feedback mechanism plays a vital role in products listed online in influencing the buying behavior of future adopters of the product. A company must prompt its existing and new users to post a review of their experience with

the product/ service purchased by them, so that the other potential customers can take advantage of that information and make an informed decision while purchasing the good/service in the future.

With the advent of digital marketing and e-commerce platforms, selling a product/service online has become more popular. The purchase cycle of a customer starts from looking at the advertisement which could be added to the consumers home page through paid inclusion, paid promotion or banner promotions, based on his past search history. The customer then visits the product, either on a single e-commerce website, or compares its price at various e-commerce websites. He then makes a choice of the variant, and checks the final price. After checking the final price, comes one of the most crucial touchpoint which influences the consumer buying decision, which is the "online customer reviews". In this study, I have tried to study how customer reviews change the buying behavior of a customer; and how good/bad reviews can hamper the sales of in-ear headphones of different brands. For this study I have chosen in-ear headphones of different brands (JBL, SkullCandy, Boat, Ptron, Remembrand) on Flipkart.com. In this study the intent is to study how the behavior of Consumers changes ( in real time) when they come across a positive or a negative review

right before the time of making a buying decision. In this way I would be able to study the effect of OCR on the buying behavior of a customer (with the help of questionnaire and one on one discussion) and analyze new trends and effects of the Positive/Negative Reviews on the buying decision of the consumer. Through the primary research of the consumers we would be able to tap the effect of a customer review on the consumer behavior right before and after the point making a purchase decision. This will help us derive useful implications of the Online Customer Review of products.

### **Literature review**

The online customer review has transformed the way shoppers decide before purchasing a good. In a physical marketplace the shopper navigates through the store searching for his desired product. He often takes suggestions and insights from the store assistant present in the store or takes suggestions from a friend or colleague or some other companion. This helps him come to an optimum purchase decision before buying a product. However, in the online shopping scenario, the consumer might take reviews from his friends/ colleagues while shopping and before making the final purchase decision. But one parameter which we tend to neglect is the online customer reviews about a product. The online customer review plays an important role while purchasing a product online, and at times is a replacement for the suggestion provided by our friends or colleagues during store visits. The reviews help the customer collect information about the product, from the real time first users of the product. The review also helps the customer to gain an insight into the usage of the product. It gives an insight into the short term, medium term and long term usage of the product.

According to CMA 2015; Mintel 2015, surveys show that more than half of consumers consults online reviews. According to Nielsen, 2012, a majority of the consumers trust recommendations of other customers more than the traditional forms of advertising. Online customer reviews help consumers to make decisions such as purchasing product, or joining a club or other activities such as going out for a movie. OCR have become a major

driving force in marketing and are a common feature on many websites [1]. According to [2], information from other consumers, such as online reviews, is thought to be more persuasive and trustworthy, and is especially important in the online environment. Reviews can be seen as the most reliable and accessible indicators of product quality and customer experiences, and therefore play an important role while purchasing a product or a service [3].

The online customer reviews on various products and services may affect the consumers purchase decisions [4] and according to [5] sometimes the OCR may even overshadow other relevant product information such as price.

“Online product reviews can be described in terms of quantitative and qualitative features. Quantitative aspects of reviews are often expressed as numerical summaries such as average star ratings and number of reviews. Qualitative aspects present consumers’ assessment of a product or a service such as review content. Because quantitative aspects are often displayed above or next to a product description, they are read by customers without them perusing the textual portion of reviews. Qualitative aspects, on the other hand, require customers to either click on a ‘Review tab’ or scroll down a web page in order to find and comprehend a text. Usually qualitative review features require additional attention and/or action from customers compared to quantitative review features” [6].

There have been studies related to the effect of the positive and negative online customer reviews. Positive reviews of weak or lesser known brands help them penetrate into the market and helps them to increase their brand equity [7]. A similar case is displayed in our research where Boat which is a nascent brand found in 2016 build its customer base by targeting consumers searching for medium ranged earphones/headphones. We also see a strong relation between consumer preference and online customer review for the in-ear headphones considered in our analysis.

Past research in [8] and [9] have focused more on other outcomes such as helpfulness, credibility, attitude, and intention of Online customer review, and not focused on how

online customer review affects the consumer behavior and preferences. Previous research has also focused on different parameters of online customer review such as valence, length, variation, and volume [10]. In this paper we tried to focus on these gaps and with the help of our analysis we have tried to find out how the buying decision is affected by the online customer review in a consumer's purchase decision, and how the online customer reviews affects the buying decision right before and after the point of making a purchase decision. We also consider the effect of number of reviews and star ratings of a product, which are one of the most critical factors of online customer review.

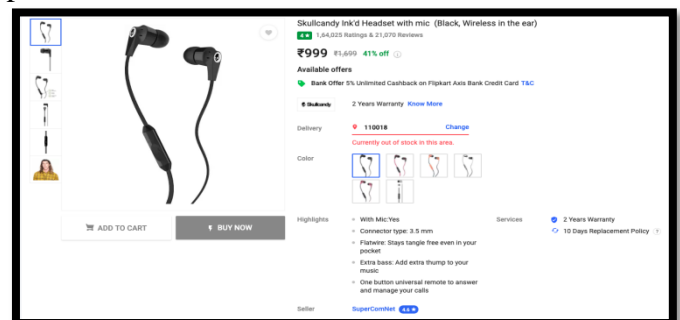
### Data Collection and Methodology

First, confirm that you have the correct template for your paper size. The in-ear headphones market has a wide product offering. For instance, we can find in-ear headphones ranging from a price range from as low as INR 190 (offered by MINISO) to INR 8999 (offered by Sennheiser). This study uses the online product reviews and purchase data of in-ear headphones of five Brands- SkullCandy, JBL, boAT, Ptron and Remembrand falling in the same category of price range INR 999-1500 (at the time of the preliminary research, May-2020). Since these products are from the same category and belong to the same price range, they are suitable for our analysis. All these products are listed on the online shopping website -Flipkart.com, which is an Indian e-commerce website similar to amazon.com in the United States. The e-commerce website Flipkart.com allows its users to post reviews and comments about the products which are visible to other customers as well. It allows its customers to post views and comments, and then segregates the review based on verified reviews (the reviews made by the buyers who have purchased the same product on Flipkart website).

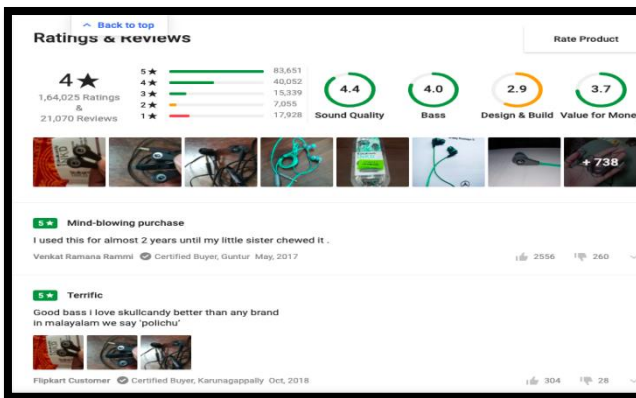
Once a customer finds a product, he/she wants to buy, he can then navigate through the images, star ratings, price, reviews, ratings and comments that are listed for that particular product. There are two major e-commerce players in India, Amazon.in and Flipkart.com. In this study I have chosen Flipkart.com

because finding the customer reviews and suggestions of non-essential items due to Covid-19 pandemic was difficult for other e-commerce websites. Due to the nationwide lockdown, only the trade and delivery of essential goods was allowed, with other goods in the non-essential items category not being listed on the website. Even though Flipkart.com was not delivering the non-essential items, it has reviews and ratings of different non-essential items listed on its website, which was the major reason for selecting Flipkart.com as the e-commerce website for this research.

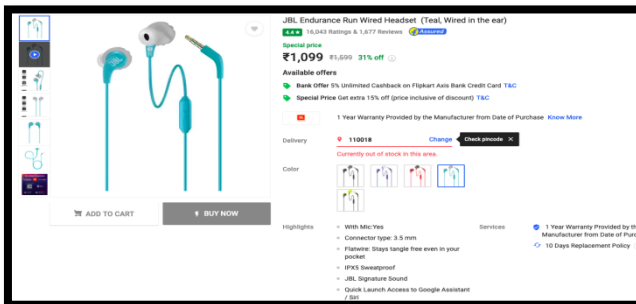
A self-administered questionnaire was prepared to gather information about the importance of customer reviews and its effect on the buying decision of the consumer. A sample of 118 participants were selected for the study from a population of students enrolled in various graduate and post graduate courses; as well as working professionals employed in the organized sector. There were 66 respondents which belonged to the age Group 18-30 and there were 52 respondents which belonged to the age Group 31-50. The gender ratio of the respondents was 62% Male and 38% females. The questionnaire was followed up by a one on one discussion with the participants to gather the consumer insights. The one on one discussion with the participants helped us gather the insights of whether the online customer reviews affect their buying decision while they shop on any e-commerce website; and whether the online customer reviews affected their buying decision in this particular case (while choosing a specific set of in-ear headphone). The questionnaire also tried to capture the weightage the customers assign to the online customer reviews while buying a product/service online.



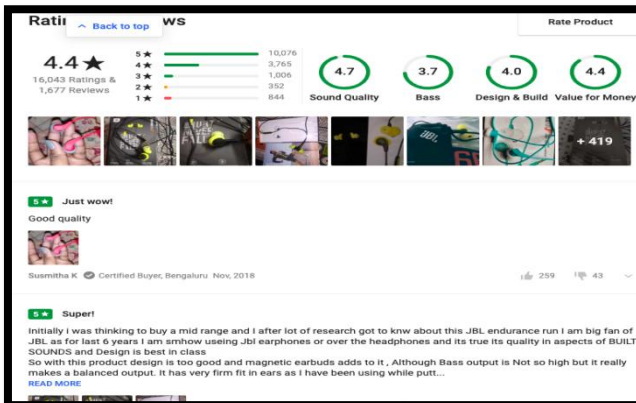
**Fig. 1. Product 1: Skullcandy Ink'd Headsets with Mic listed on Flipkart.com**



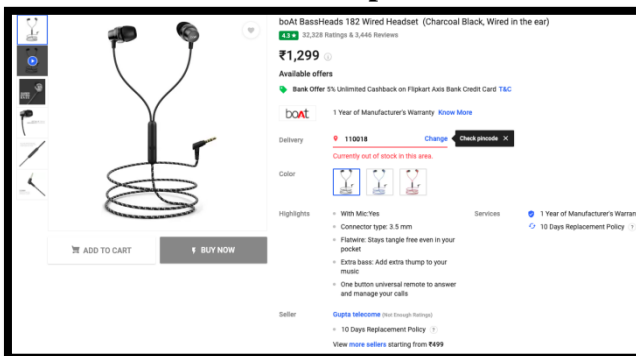
**Fig. 1.1. Review for Skullcandy Ink'd Headsets with Mic on Flipkart.com**



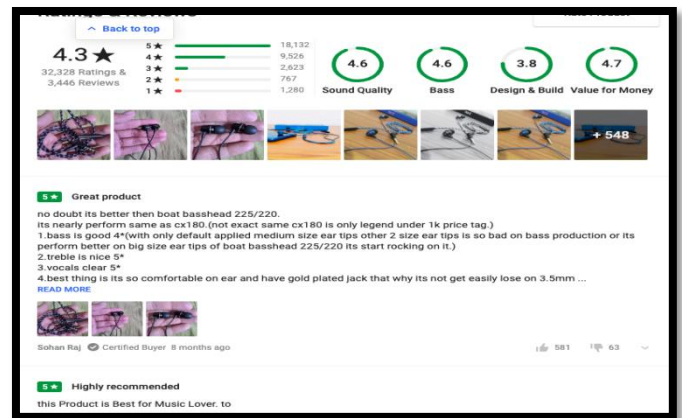
**Fig. 2. Product 2: JBL endurance run headset listed on Flipkart.com**



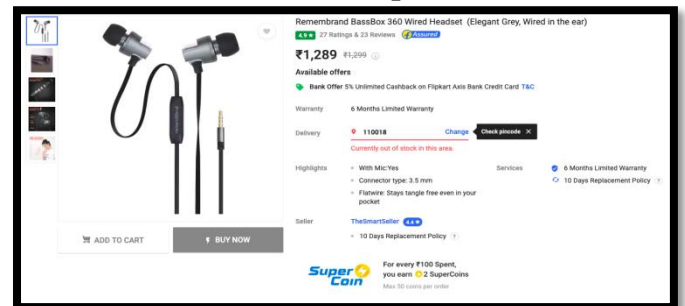
**Fig. 2.1. Review for JBL endurance run headset listed on Flipkart.com**



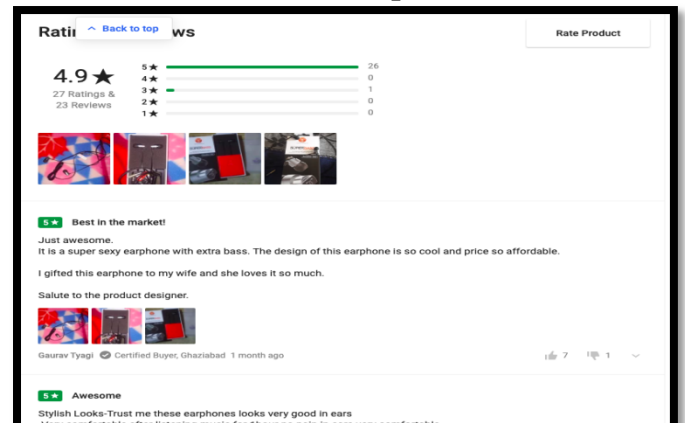
**Fig. 3. Product 3: boAT bassheads 182 wired headset listed on Flipkart.com**



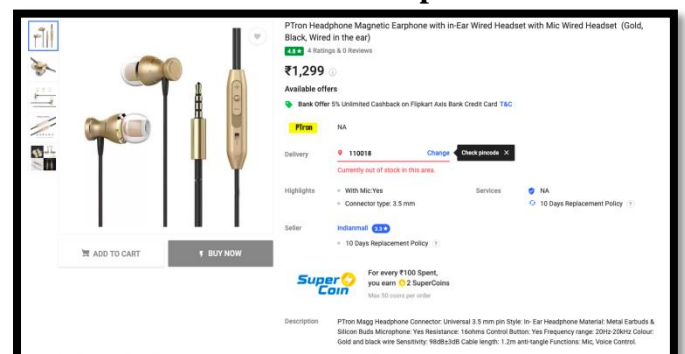
**Fig. 3.1. Review for boAT bassheads 182 wired headset listed on Flipkart.com**



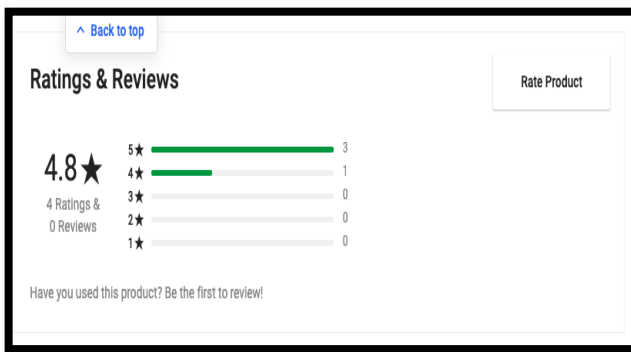
**Fig. 4. Product 4: Remembrand bassbox 360 wired headset listed on Flipkart.com**



**Fig. 4.1. Review for Remembrand bassbox 360 wired headset listed on Flipkart.com**



**Fig. 5. Product 5: Ptron Headphone Magnetic Earphone with in-Ear wired headset with mic listed on Flipkart.com**

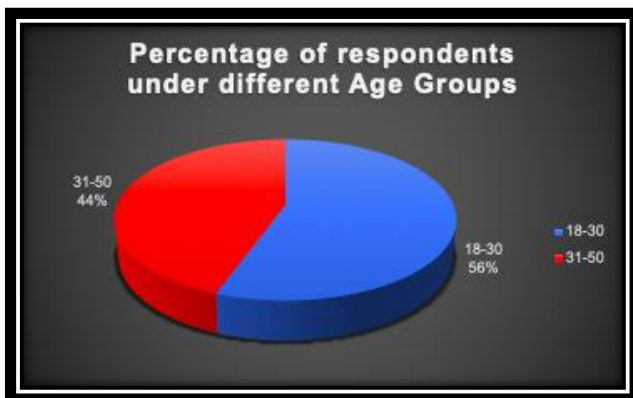


**Fig. 5.1. Review for Ptron Headphone Magnetic Earphone with in-Ear wired headset with mic listed on Flipkart.com**

We make use of the online customer reviews and ratings listed on the website for customers to make a decision on how these online reviews affect the buying decision of a consumer. The online reviews and ratings are listed under the product description and specifications. It gives the experience of different consumer experiences on using the product which influences the buying decision of the future buyer.

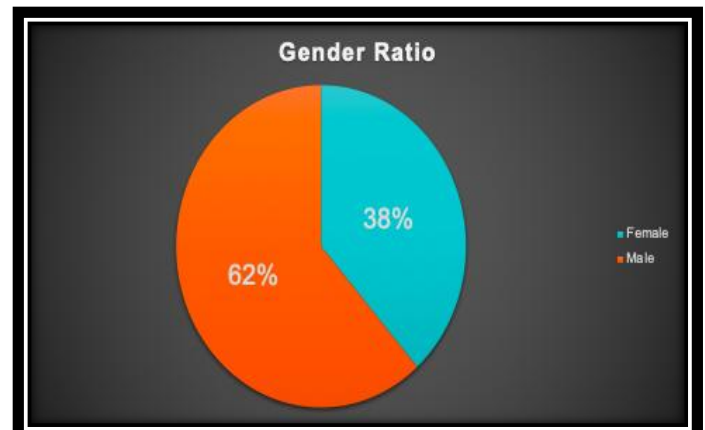
**Data Analysis**

This section contains the results of the primary research on the basis of the responses gathered from 118 respondents.



**Fig. 6. Percentage of respondents under different age groups**

Out of the total respondents list of 118, there were 66 respondents which belonged to the Age Group 18-30 (56% of the total respondents) and there were 52 respondents which belonged to the Age Group 31-50 (44% of the total respondents). The gender ratio of the respondents was 62% Male and 38% females.

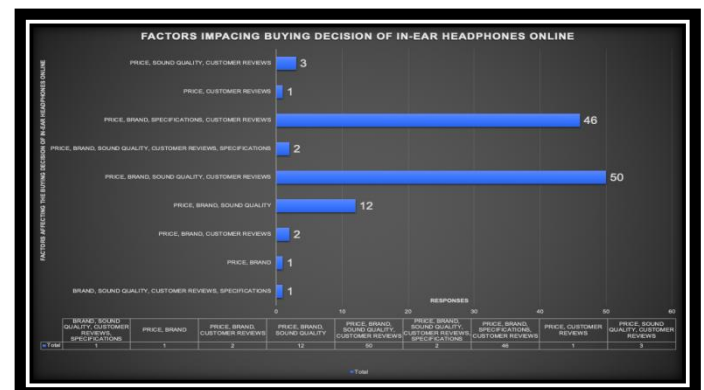


**Fig.7. Gender ratio of the respondents**

**Results**

Q1. Suppose your in-ear earphones wear out and you want to buy a new pair of in-ear earphones online. What are the factors that would impact your buying decision?

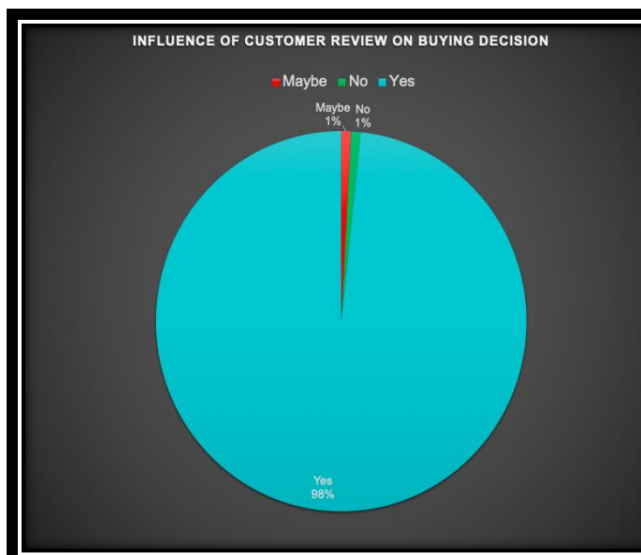
- (1) price
- (2) brand
- (3) sound quality
- (4) customer reviews
- (5) specifications



**Fig.8. Factors impacting the buying decision while purchasing in-ear headphones online**

**Implications:** All the applicants except one considered customer review as a major factor while buying in-ear headphones online.

Q2. Do customer reviews play a role in influencing your online buying decision?

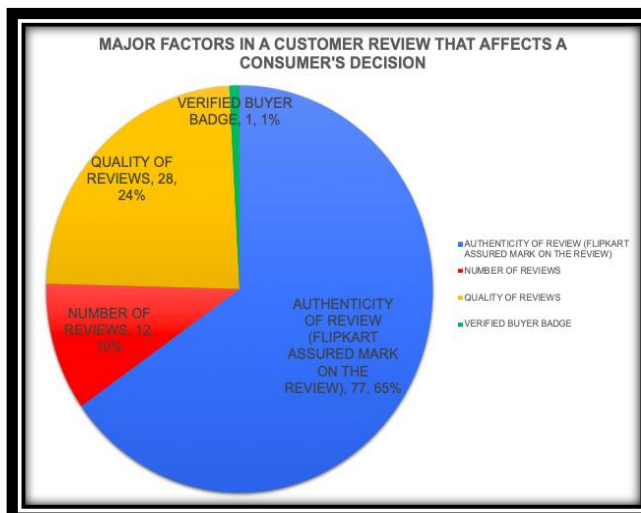


**Fig.9. Result of Influence of customer review on buying decision**

**Implications:** 98% respondents said that customer review plays a role in influencing their buying decision.

Q3. What are the major factor in customer review that drives your buying decision?

1. Authenticity of review (for example: flipkart assured mark on the review)
2. Verified buyer review
3. Number of reviews
4. Quality of reviews

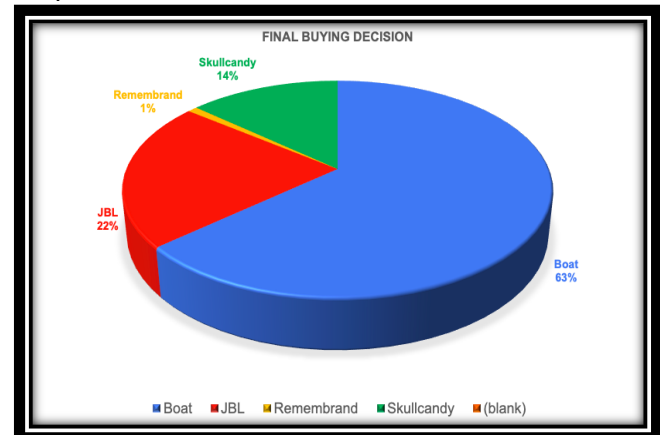


**Fig.10. Result of major factors in a customer review that affects a consumer’s decision**

**Implications:** 65% of the respondents had the view that the authenticity of the review is the major factor which affects their buying decision.

Q4. Given a choice, which one out of five earphones would you be willing to buy?

1. Product: Skullcandy Ink’d Headsets with Mic
2. Product: JBL endurance run headset
3. Product: boAT bassheads 182 wired headset
4. Product: Remembrand bassbox 360 wired headset
5. Product: Ptron Headphone Magnetic Earphone with in-Ear wired headset with mic



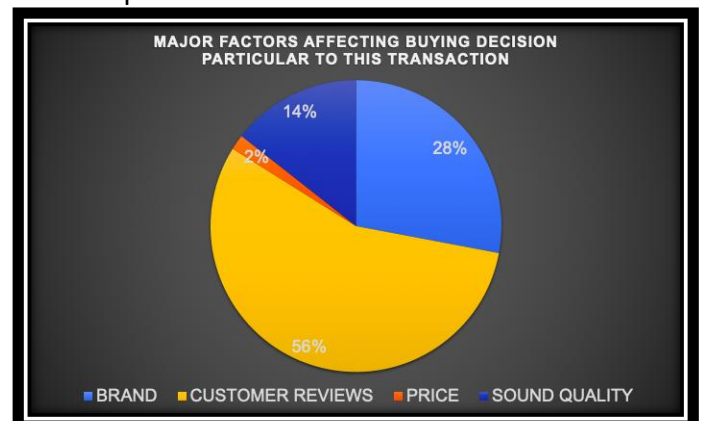
**Fig.11. Consumer preference of choice of earphones**

**Implication:** Therefore, 63% of the respondents said that they would buy in-ear headphones of Boat, followed by 22% respondents who wanted to buy JBL. Only 14% respondents wanted to buy Skullcandy and just 1% wanted to buy Remembrand.

*Note: None of the respondents wanted to buy Ptron.*

Q5. What is the major factor that drove your buying decision during this particular transaction?

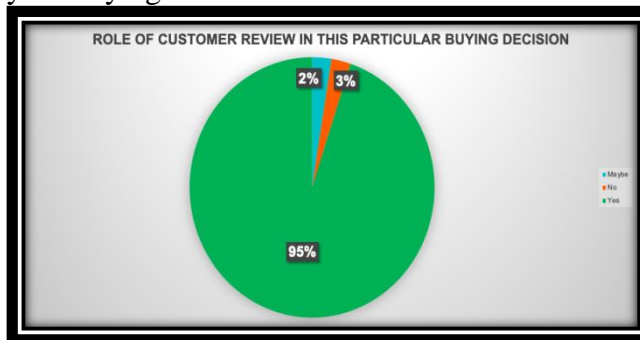
1. Price
2. Brand
3. Sound quality
4. Customer reviews
5. Specifications



**Fig.11. Major factors affecting the buying decision in this particular buying decision**

**Implications:** Customer reviews turned out to be the major factor influencing this particular buying decision. Customer reviews is almost double the second best factor that is the brand while making this buying decision.

Q6. In this particular experiment, did customer reviews play a role in influencing your buying decision?

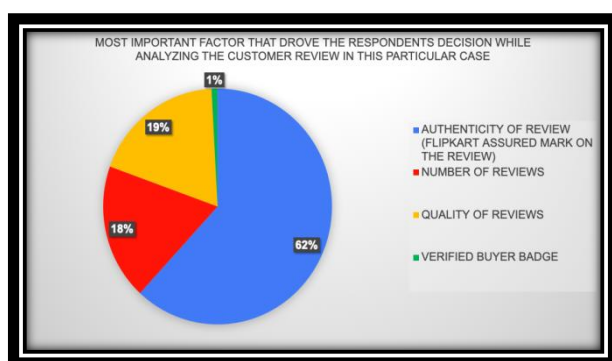


**Fig.12. The role of customer reviews in this particular buying decision**

**Implications:** Customer reviews played an important role in influencing the buying decision in this particular case.

Q7. What is the most important factor that drove your decision while analyzing the customer review in this particular case ?

1. Authenticity of review (flipkart assured mark on the review)
2. Verified buyer badge
3. Number of reviews
4. Quality of reviews



**Fig.13. The most important factor that drove respondents decision while analyzing the customer review in this particular case**

**Implications:** Authenticity of the review was the major factor driving the buying decision of the respondent in this particular case.

Q 8. What is the weightage “you” gave to customer reviews while making a purchase decision in this particular case ?



**Fig.14. The role of customer reviews in this particular buying decision**

**Implications:** 72% of the respondents gave a high weightage (Above 60%) to customer reviews while making this particular buying decision.

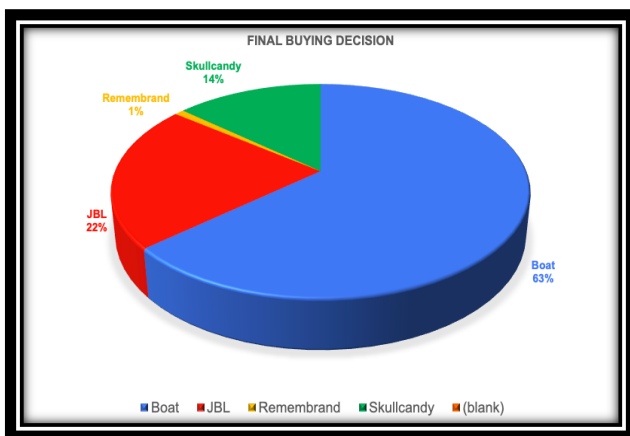
**Managerial Implications**

1. Around 63% of the respondents said that they would buy boAT In-ear headphones, followed by 22% respondents who wanted to buy JBL. Only 14% respondents wanted to buy Skullcandy and just 1% wanted to buy Remembrand.

Note: None of the respondents wanted to buy Ptron.

**TABLE 1. Total number of ratings, total number of reviews and 5 star, 4 star, 3 star, 2 star and 1 star rating as a percentage of total ratings for each product**

Product Name	Product Brand	Number of Star	Total Number of Ratings	Number of Reviews	5 Star Rating	5 Star rating as % of Total Ratings	4 Star Rating	4 Star rating as % of Total Ratings	3 Star Rating	3 Star rating as % of Total Ratings	2 Star Rating	2 Star rating as % of Total Ratings	1 Star Rating	1 Star rating as % of Total Ratings
Skullcandy Ink'd Headset	Skullcandy	4	166123	21203	85544	51%	40379	24%	15582	9%	7212	4%	18406	11%
JBL Endurance Run Wired Headset	JBL	4.3	18960	1957	11804	62%	4421	23%	1228	6%	437	2%	1070	6%
boAt BassHeads 182 Wired Headset	boAT	4.3	40780	4353	22991	56%	11844	29%	3270	8%	991	2%	1684	4%
Remembrand BassBox 360 Wired Headset	Remembrand	4.3	300	139	202	67%	37	12%	25	8%	11	4%	25	8%
PTron Magnetic Earphone	PTron	4.8	4	0	3	75%	1	25%	0	0%	0	0%	0	0%



In Table 1, Skullcandy has the maximum number of reviews and ratings, followed by boAT and JBL. Remembrand and Ptron have very less reviews and ratings.

All these brands have a similar offering between INR 999-1500.

In the primary research that we conducted we found out that 63% of the respondents intend to buy in-ear headphones of boAT, followed by 22% respondents who showed interest in buying in-ear headphones of JBL. Only 14%

of the respondents showed interest in buying in-ear headphones from Skullcandy.

From our respondents results we found out that having a large number of ratings and reviews does not ensure higher chances of getting converted into final sales. There may be a lot of other parameters that would be involved in making the final buying decision. Because, Skull candy has the highest number of 5 Star reviews, but it is still not being chosen by the list of respondents. Therefore having high ratings and good customer reviews might increase the chances of the sales of products, but is not the ultimate factor. The other factors such as brand, price, specifications, availability, customer word of mouth, knowledge about the product also play an important role.

The company boAT is a fairly new company as compared to JBL and Skullcandy, but has created a strong position in the Indian earphones and headphones market. On interviewing the respondents one on one on their reason for choosing boAT, the major



reasons that emerged were the Brand Equity, Economic pricing, durability and warranty on the products along with positive customer reviews and experience. The table above suggests that boAt had 56% of 5 Star Reviews, and 6% of the reviews were rated 2 Star and below. Therefore, boAT has the lowest number of 2 Star and below ratings as compared to all the other in-ear headphones listed above (except Ptron which had only 4 ratings). Therefore, this suggests that a company must have a lower percentage of “Less than 2 Star” ratings.

JBL has a very strong brand image in the global and Indian market, but in our research we found out that consumers preferred to buy boat over JBL. This finding is in line [7], that positive reviews of weak or lesser known brands help them penetrate into the market and helps them to increase their brand equity. Although both the in-ear headphones are present in the same price range, with the help of one-on-one discussion with the respondents, it was gathered that consumers preferred boat because boAT is perceived as a category leader in economically ranged in-ear headphones. The respondents preferred boAT because they have had a prior experience to use boAT products, or because of suggestions made by a close friend, family or relative. This result indicates that in this price range of in-ear headphones, brand is not the only factor that consumers consider when they make the purchase decision. When the respondents were asked, that if they had to increase their price range to INR 1500 and above, the consumers said that they were not sure which product they would buy. The consumers said that if they were to buy a product in a higher price range of INR 10,000 and above, then they would go for Beats by Dr. Dre or Bose. Therefore, the consumer choice of brand was uncertain and ambiguous in the lower price ranges, but the brand preference was stronger as the price range increased. This suggests towards the fact that the consumer may have a specific brand preference in their minds when they search for a product online, but it is subject to change to various other different factors like the specification, sound quality, durability, customer reviews, and many more. And the consumer decision is subject to change to these

different factors. Therefore, brand is not the only factor in the minds of the consumers while buying in-ear headphones from INR 999-1500 price range. **The consumers seek value for money.**

## **2. The effect of online customer reviews at the point of purchase**

The questions from serial number 4-8 in the results section indicate the questions specific to this research study. The consumers were prompted about customer reviews and rating after making a purchase decision of the in-ear headphones in the research, to study the importance the consumers placed on the online customer reviews. Consumer insights were also gathered with the help of one-on-one discussion. A total of 95% consumers agreed that the online customer reviews played a significant role while making a purchase decision. A total of 72% of the respondents placed a high weightage of 70-80% on online customer reviews while making a purchase decision in this particular transaction. Therefore, this indicates the fact that customer reviews have a significant impact on the consumers. The consumers check and evaluate the customer reviews before purchasing a product/service. With a high percentage of consumers agreeing to the fact that online customer reviews did play an important role while making a purchase decision, it indicates that it plays a significant role in influencing the buying decision at the point of purchase. A good/bad review can change the perception of the consumer towards the product driving him towards/ away from the product. A review which consists of both positive and negative reviews is viewed as a credible review by the consumer. This result was verified with the help of one-on-one discussion with the respondents.

Therefore, it is very important for a company to have credible reviews to build a positive perception of the product in the minds of the consumers. And the positive perception must be built with the help of honest and credible reviews posted by authentic consumers.

## **3. 72% of the respondents gave a high weightage (70-80%) to customer reviews while making this particular buying decision.**

This indicates that customer reviews play an important role while buying in-ear headphones on online e-commerce websites. The consumer while buying in-ear headphones compares different models of different brands with different specifications while buying the in-ear headphones online. Therefore, it is important to have positive and authentic customer reviews posted by verified buyers. Having a positive review can influence the buying decision of a consumer and make him/her more inclined to buy a particular product. The inherent nature of products like the in-ear headphones makes it important to assign a higher weight on the customer reviews. While making a purchase decision of this particular electronic item, the consumer wants to base part of his buying decision on experience that others have had while using the product. With the help of one on one discussion with the participants it was found that, when a consumer decides to purchase in-ear headphones in the price range of INR 999-1500, he/she is looking at it as an investment where the in-ear headphones deliver good quality and last for more than 6 months. So the first phase of filtering occurs when the consumer looks at the customer reviews for the product quality and performance posted by the verified buyers. If the product quality matches his expectations, then the consumer moves to other factors, one of them being durability (i.e., how long is my product going to last), and checks whether the durability of the product as posted by other customers and as posted by the manufacturer meet his personal expectations. There are several other factors that would affect the buying decision of the consumer. Some of the other factors could be the price of the product, and value for money which the consumer is investing on the product. The consumer wants to gain the maximum out of his investment, therefore he tends to go for a product which is tried and tested by other authentic buyers. But one thing to note here is that it also depends a lot on the consumer behavior. If the consumer is someone who likes to try out new products herself/himself and base his decisions on her/his own personal experience, then the customer reviews may not play a major role in influencing the consumers buying decisions.

Therefore consumer reviews act as a personal recommendation in case of online shopping. The consumers tend to trust the reviews with higher ratings and reviews than the products with a lower rating and recommendation. Online customer reviews have the similar effect that a friend has on influencing a buying decision in a brick and mortar store when you go out on shopping with them. The online customer reviews could be considered as that accompaniment friend who is there with you which has already used the product, and is therefore in the position to be able to suggest to you whether you should use that product or not, or what are the pros and cons of that particular product.

#### **4. All the applicants except one considered customer review as a major factor while buying in-ear headphones online.**

This implies that customer reviews play an important role while making purchase decisions while buying in-ear headphones. 99% of respondents agreed to the fact that customer reviews are to be considered while buying in-ear headphones. This implies that customer reviews play an important role in influencing a consumer's decision while buying a product online. Although the level of influence of online customer reviews might vary among consumers and within different category and sub-category of products. Therefore, limiting to our scope of study we can conclude that customer reviews play an important role while making a purchase decision.

Therefore, while making an online purchase decision customer review is one of the factors along with the other factors such as brand, price of the product, durability which affects the decision making process. The weightage of the factors may be different for different products. But customer review has a significant impact in the purchase decision. Therefore a company must create a feedback loop for its products listed on amazon, flipkart and other e-commerce websites.

In-ear headphone players must also place importance on online customer reviews and maintain a transparent flow of reviews on its product. This would help consumers evaluate their product offering and take a better decision.

**5. 65% of the respondents had the view that the authenticity of the review is the major factor which affects their buying decision.**

This implies that customers give a higher weightage to verified reviews as compared to the unverified review. The consumer places his trust on the authentic review with a verified badge. Therefore, a product having a verified review badge is likely to sell more than a product without the verified review badge. Therefore the companies should make sure that they display the correct specifications and description about the product when they post it on a website. Posting the correct information about the product helps the consumer understand the product better. And correct information about the product leads to positive reviews. If the company posts unusual or over ambitious specifications and descriptions of the product, which the product does not possess, then it leads to the product being dropped from the consumer's basket. The company should also make a genuine effort to filter out all the authentic reviews from the unauthentic ones. This task should be done on a regular basis to ensure that out of all the reviews posted on the website about the product only the most authentic and correct reviews are displayed.

**6. In this particular experiment Authenticity of the review played a major role while analyzing a customer review.**

This may be subjected to the nature of the product in this particular research. Since the purchase of in-ear headphones is based on the price, brand, specification and customer reviews, it's very important for a consumer to base his buying decision upon an authentic review. Therefore, authentic reviews play a very important role while making a purchase decision in case of in-ear headphones. This was a particular case of buying an in-ear headphones in the range of INR 999-1500. In this price range the consumer seeks value for his money. To get the maximum return on investment that he is making on the in-ear headphones, he tries to hedge his risk by focusing on the aspect of consumer reviews, and that too the authentic reviews that are being posted by verified buyers of the product. Authenticity of review makes a review more trustworthy for a consumer. It makes him believe more in the recommendations made by

the verified user in that review. With the added authentic mark on the review, the consumers have a positive impact in their minds. When the respondents were asked why authenticity played a major role while analyzing the customer review, the respondents replied with the fact that there are many reviews that they find about the product which seem to be biased and unauthentic.

Therefore a mark of authenticity by the company or the website creates a trustworthy image in their mind. It makes them assured that the review is a genuine review. But this could also be countered with a fact that a brand loyal person may post a positive review about the product, even though the product is not such a great performer. Therefore, the companies should make a careful selection and make a final decision by thoroughly evaluating the authentic review. We should look for an unbiased review of the product and try to avoid the biased review to get the maximum information about the product.

**7. The first few reviews make the maximum impact on a consumer**

On conducting a one on one interview with the respondent, it was found that while taking the purchase decision for the in-ear headphones, the customer tended to check the first ten reviews, and the first five negative reviews to evaluate the pros and cons of the product with the help of the customer experience of the verified users which have already used the product. So, although having a large number of reviews improves the credibility of the product, it is very important to have ten strong reviews about the product on the first page to increase the chances of conversion of the product. It also suggests that negative reviews also play an important role when a consumer makes a buying decision. Having all positive reviews might make the consumer suspicious of the credibility of the reviews, therefore it is important to embrace the negative reviews of the product as well. Therefore, this implies that the company should make a constant effort to review the customer reviews over the period of time, and display the reviews that give the closest picture of the product to the consumer. If the company has the power to choose the top 10 reviews to be displayed about the product,

then the company should choose the reviews that are best suited for its products and give a clear review of the benefits and working of the product to the consumer. The company should also make a genuine effort to display its negative reviews as they bring authenticity and credibility about the product. It gives an holistic overview of the product to the consumer which makes it easier for the consumer to make an informed decision.

### **8. Number of Star ratings**

Boat had a 4.3 star rating which is a decent rating to make a purchase decision. JBL also has the same 4.3 ratings, while Ptron has a 4.8 star rating, but it has very less number of ratings and reviews, which makes the user switch to a product with more ratings and reviews. Therefore, a rating of 4 star and above is decent for a consumer to choose a product. Star rating creates a positive impact on the minds of the consumers making the consumers perceive the brand as a trustworthy brand. When the consumer were asked whether the star rating had an impact on their buying decision, most of the consumers said that star ratings had a positive impact on their purchase decision. The respondents said that if a strong brand has a positive star rating of 4 and above, they can place their trust on the product partly due to the strong image of the brand, and partly due to the high customer rating of above 4. Whereas in the case of a weak brand with a rating of 4 Star and above, the customers have confidence in the product, but do not have much confidence in the brand, and therefore they research more about the product and look at more customer reviews to arrive at a final buying decision. In our experiment, Ptron had a star rating of 4.8, but none of the consumers chose the product partly because there were only 4 ratings listed for the product without any customer review, and also because many of the consumers were hearing the brand for the first time. Therefore, the consumers moved to other products with more ratings and reviews as they found them more reliable.

Although boAT and JBL had the same star ratings of 4.3, there are more comments and reviews for boAT as compared to JBL. This could be considered as one of the factors for consumers preferring boAT over JBL. Therefore, companies should try to maintain

star ratings of 4 and above backed up by authentic customer reviews.

Companies and brands should therefore develop a strong review and feedback mechanism. It should collect timely reviews of its products from the customers after the sales of its goods and services. Reviews and ratings also give a scope to the company to improve its products by filling the gaps as suggested by the consumer. It gives them the opportunity to work on the consumer insights which the customer displays in the form of the review and ratings. By working on the reviews and ratings, the company can improve its processes, products, delivery and management, which could lead to increase and improvement in the overall quality of the product and the overall business of the company.

Companies should also be aware of the fake reviews that might be posted about the product on the website. Fake reviews would mislead the consumer about the product/service. Both the consumers as well as the company or the service provider must be cautious about the fake reviews. Since, the fake reviews for a consumer might lead to a sunk cost, because the consumer might order a product based on his/her expectation about the product based on the fake review, but the product may turn out to be different. Similarly, fake reviews could be harmful for the company as well. It would lead to a negative brand image of the product and the company, which in-turn creates a negative perception of the brand in the minds of consumers. One fake negative review can tarnish the brand of the company and undo the work done by all the positive reviews posted by several customers. Therefore, the company should devise a mechanism to segregate the original reviews from the fake reviews to avoid a negative brand image in the minds of consumers.

The company of different products and services must try to work on the reviews and ratings as posted by the consumer. They should timely update the review ordering according to their relevance and recency. This would help the company display the most recent and honest reviews about the products to the consumer. This allows the consumer to view and segregate the reviews in an effective way and

come to the conclusion of whether to buy a product or not.

### **Conclusion**

Online Customer Reviews is a significant part of online purchase decision making. It influences the decision of a consumer to choose a particular product and to eliminate the other product from his basket of goods. With the above exercise we have tried to highlight the fact that online customer reviews can directly impact the customer decision making, which in-turn can impact the sales of a good/service. Therefore having a positive customer review can create a positive impact on the minds of consumers and can in turn translate into the final sales of the good/service. It makes the product more desirable to the consumers, since the consumers can place their trust on the product. The companies should have a decent number of online customer reviews which indicates the fact that many users have tried and tested the product. The product should not only have positive reviews, but it should have a mix of positive and negative reviews, as having a mix of positive and negative reviews builds trust and credibility among the consumers. Therefore the companies should strive to create an exceptional customer experience for its consumers which creates an impact on them after using their product or services. Creating a positive customer experience will help the company fetch positive reviews which acts as an organic way of marketing for the company. It creates a positive image in the market and attracts more customers towards the products. Therefore the company should create a feedback mechanism in which the company should train its employees to politely and patiently ask its customers to leave a review for the products and services they use via email or automated review mechanism on the app. The process of drafting and submitting a review must be easy to understand and easy to locate on the website where the product is placed so that it's easy for a consumer to post a review. If the website does not have a dedicated review section for the products and services it offers, then a website should work on it and create a dedicated review and rating system for its customers.

The companies which sell their products and services online, could also incentivize their customers to leave a review. They could provide them with discount coupons which could be redeemed in future transactions. This would not only motivate the customers to leave a review about the product, but might also lead to customers revisiting the particular brand/product/service to use the discount coupon, which leads to an increase in business for the company. There is weak evidence that positive online customer reviews can also help boost a company's search engine rankings and make it appear on the front pages of the search engine. This is because as more people leave a positive review about the product, it leads to an increase in customer engagement as more and more people search for your product online. Online customer reviews are like a two blade sword, it not only increases the brand awareness about the product, but also leads to increase in sales due to the positive word of mouth.

### **Limitations of the Study**

This research investigates the purchasing behavior of in-ear headphones in the price range INR 999-1500 of five different brands posted on Flipkart.com. The reviews and price of the product is subject to vary according to different websites and the number of users signed up on those different websites.

This study was limited to a single product. In-ear headphones were chosen for the research to assess how much weight does each customer assign to the customer review while making his purchase decision. This weightage will vary according to nature and type of product. The weightage assigned to assessing a product with the help of its customer review will be different for in-ear headphones and different while buying other electronic devices such as mobile phones, or tablets. Therefore; this study has tried to gauge an indication of how the customer reviews affects the buying decision of a consumer.

The list of respondents included respondents from the age group 18-30 and 31-50. There were no respondents in this study from the age group of 51 years above. Therefore; this opens opportunities for future research including the

respondent from the age group of 51 years and above.

The future scope of research could include products from different categories to gauge the holistic view of customer reviews on the purchase decision of the consumer. The researcher must analyze the different parameters involved in making a decision while purchasing a good online and then try to derive the results and assess the importance of customer reviews with respect to other parameters considered while making a

purchase decision on an ecommerce website. The future scope of research in in-ear headphones could include the in-ear headphones from different price ranges to gauge the relevance of online customer review with respect to the price of the product. Because as the price range increases, there are less number of reviews as compared to the number of reviews at a lower price range of product.

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**CUSTOMER BASED BRAND EQUITY FOR LUXURY CARS IN INDIA****Utkarsh Gupta**

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**ABSTRACT**

Customers now value Luxury in the same bucket as necessities. For Upper middle class to upper class, there is almost no difference between needs and wants. As a result, the demand of luxury cars has exponentially grown in the past decade. The rationale behind this research paper is to study how the brand perception for a particular product in our case which is Audi is highly renowned for having a distinct image for itself as compared to its competitors. A study on how Audi influences the purchasing buying pattern of the customers as relative to the competitors of them will be done. To build a strong brand, the customer's thinking and feeling about the product needs to be shaped. To build a strong brand and a long-lasting image, everything comes into picture from advertising to building an everlasting experience through test drives, walk throughs in the showrooms and customer support.

For understanding the competitive environment in the luxury car segment and how they stand with the respect to each other in terms of relative attributes a comparison based on CBBE (Customer Based Brand Equity) model which compares on four stages:

1. Identity of the brand (Who are you and what is your USP?)
2. Meaning of the brand (What are you and what do you stand for?)
3. Response regarding the brand (What do the customers think and feel about the brand?)
4. Relationship between the brand and the customers will be done.

The quantitative data was collected through 2 mediums. Primary data was collected from the consumers of the users of Luxury cars through questionnaires and surveys and secondary data was collected through websites and reports. The Result of the research can help the companies get a deeper insight on how brand perception has impacted the behaviour of consumers. This will provide them help in taking important decisions in future regarding Brand promotion and positioning for Luxury car segment.

**Keywords:** Customer based brand equity, Luxury, Brand Perception, Consumer Behaviour

**Introduction**

Luxury cars mean the vehicles provide more than necessary comfort, quality, sensory attractiveness, features, and specifications at an increased cost. The cars have a minimum standard of quality of the features which is way above the required quality in automobiles. Worldwide, there are several car manufacturers which are competing in this niche market.

In India, luxury cars are bought in large numbers by the Royals of pre independence British India. Today, Luxury cars are an exponentially growing market in the Indian Automobile industry. Due to constant increase in the disposable income and awareness regarding different luxury automobile brands, the luxury cars market in India is plummeting.

Our research has association of Customer Based Brand Equity (CBBE) with attitude of customers. Brand preference for any product from a customer's point of view is linked with both purchase intention and brand loyalty. The

research will analyze the impact of the country of origin and the attitude towards the company in connection with the CBBE construct, brand preference, behavioral loyalty, and purchase intention.

Customers decide on what to buy based on their perceptions of brands. How a brand is positioned in the eyes of the customer depends on several factors. To be selected as a Brand of customer's choice, there are factors that play an important role such as: Country of origin, comfort, brand visibility and many more

The market of luxury brands in India is rising with the passing day. It is to be taken into consideration that what are the factors that are responsible for building such strong brands in the luxury cars segment. How do the brands position themselves, and how does the communication for the same takes place decides the brand preference among the consumer.

Here, the CBBE model shall be used to understand the behavioral differences which



customers put forth while they are considering the luxury cars. The brand preference and the factors affecting the brand preference shall be assessed in the due course of the research.

Moreover, the communication strategies and their impact on the brand recognition and recall among the customers shall also be assessed. Perceptual mapping will be used to understand the effectiveness of communication, and how it has developed a brand image in the customer's mind.

- To do a competitive environment scanning in context of branding
- The identification of the behavioural differences pertaining to CBBE constructs
- To understand brand preference and factors affecting it
- To analyse the communication using perceptual mapping, and the factors influencing the brand preference of Luxury cars
- To analyse brand awareness of consumers around products, special features and accessories of Luxury cars

### Materials and Methodology

#### A. Brand Preference and Target segment

A brand is not just a tagline or USP but an overall experience of a customer that sets you apart from your competitors in the eyes of the customer. Branding is basically about a good word of mouth that helps to distinguish a company or a product from its competitors, aiming to create an ever-lasting impression with consumers. The key components that form a brand's toolbox include a brand's identity, brand communication, brand awareness, brand loyalty, and various branding (brand management) strategies.

Brand inclination is the point at which you pick a particular company's item when you have other, similarly valued, and accessible alternatives. Brand inclination reflects client reliability, fruitful showcasing strategies, and brand qualities. The brand inclination is a proportion of brand's endeavors towards conveying its qualities and contributions to a client. Brand preference can show how the brand is liked by the customers and whether the brand has successfully communicated its values to the target segment.

#### B. Consumer Based Brand Equity and Perceptual Mapping

Using "Brands and brand equity: definition and management." Management decision 38.9 (2000): 662-669 by Wood Lisa, we get to know Why customers follow a certain brand and what is their brand loyalty. Consumer Based Brand Equity model (CBBE) is a tool to understand the customer's brand knowledge, and their response to brand's marketing strategy. A customer can have both negative and positive CBBE towards a brand. Companies can create brand equity for their products by making them everlasting, easily recognizable, and superior in quality and reliability.

Perceptual mapping is a diagrammatic representation utilized by marketers. It endeavours to outwardly show the impression of customers or likely customers. Ordinarily the situation of a company's item, product offering, or brand is shown comparative with their opposition. Consequently, perceptual mapping can be utilized for increasing a serious edge of reference for a brand

#### C. Audi and factors affecting the brand-name

The study is trying to judge the brand strength of Audi as a luxury car provider in comparison to its competitors. The study is trying to determine the brand preferences among the respondents, and the factors affecting the brand preferences. In addition to this, the study is also identifying communication from the organization, from the industry, and the impact of communication on the brand strength.

Taking the above goal into consideration, a qualitative and a quantitative questionnaire has been created to get insights of the above-mentioned parameters, which will get the information about the population's insights on the topic, via a sample population. The questions are designed in such a way that they will elicit responses from the respondents in the areas of branding, communication, brand preferences, and competitive frame of reference.

Post the data collection, the data shall be checked for adequacy using **KMO test**. If the data is adequate, the data will be pushed in for analysis, from which information shall be extracted. The data will be put through various tests and methods such as **Multi-Dimensional**

**Scaling (MDS), and correlations** to reach various results. At the same time, the qualitative data will be analyzed through MS Excel, to reach the results.

**Hypothesis:**

The research conducted has both primary and secondary sources of information. Primary information can be obtained using surveys where a detailed questionnaire will be designed and floated across the customers. Secondary information can be obtained from different car manufacturing websites, different journals, and internet.

The research conducted has both primary and secondary sources of information. Primary information can be obtained using surveys where a detailed questionnaire will be designed and floated across the customers. Secondary information can be obtained from different car manufacturing websites, different journals, and internet.

**KMO and Bartlett's Test**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.780
Bartlett's Test of Sphericity	Approx. Chi-Square	1931.000
	df	276
	Sig.	.000

**Hypothesis 1:**

**H01:** The attitude towards the manufacturing company and the country of origin does not have a positive influence on the Customer Based Brand Equity

**HA1:** The attitude towards the manufacturing company and the country of origin does have a positive influence on the Customer Based Brand Equity constructs.

**Hypothesis 2:**

**H02:** Brand Preference does not have a positive influence on the purchase intention at the consumer level

**HA2:** Brand Preference has a positive influence on the purchase intention at the consumer level.

Aston Martin	2%	BMW	17%	Lexus	2%
Audi	28%	Bugatti	2%	Porsche	4%
Bentley	2%	Ferrari	1%	Range Rover	2%
Mercedes	19%	Jaguar	8%	Rolls Royce	9%
Lamborghini	1%	Volvo	3%		

Both these hypothesis aims to test and give us an deep dived result as to how the country of

origin of the brand has an influence on the perception of the brand in terms of the relevant attributes which the customer links with the brand based on the country in which is made which is not pervasive in the other brands made in a different country. It will also give a vivid idea as to how will these attributes based on the country of origin will fulfil all the needs and desires of the customers and will in turn lead them to be a brand loyalist and an advocator of the brand.

The hypothesis will also lead to us to form a general idea as to how the brand preference of the customers based on the perceived benefits which the customer aligns with that particular brand has an impact on the purchasing pattern and behavior of the customer towards the brand.

**Understanding of Sampling Design**

Keeping in mind the survey objectives and the resources in our hands the maximum amount of precision has been obtained in getting our responses right to the core of their integrity. The elements which have been included in our sampling is based on simple random sampling and mostly comprises students, friends, families, relatives and their relations among the other people who already own an Audi car or any other premium luxury car to gain their perspective and what exactly do they see in a premium luxury cars which includes Audi and its other competitors.

Sampling design is done in such a way which includes the adequate response concerning the analysis of the brand and the communication channels used by the different brands to convey their respective value propositions to the customers.

**Result**

A test was run to check the adequacy of the sample collected. Following were the outcomes of the tests.

The KMO test's show that the coefficient is 0.78, which shows that the sample collected for the research purpose is adequate.

**A. Brand Analysis Using Multi-Dimensional Scaling**

Based on the recall aspect from as close to 14 different brands including some brands like Aston Martin, Mercedes, BMW, and Jaguar

qualitative assessments from as close to 140 respondents are done. The top three brands which people can recall based upon our questionnaire are Audi (28%), Mercedes (19%) and BMW (17%). The last 3 brands based upon the brand recall attribute are Ferrari (1%), Lamborghini (1%) and Lexus (2%). On the parameters of Brand Recognition from out of the 140 respondents which was a multiple-choice question 76% of the respondents recognized Audi, Mercedes was recognized by 76% of the respondents, BMW by 67% and Jaguar by 62%.

**B. Brand recall analysis**

In the attribute of characteristics in premium luxury car segment people have chosen Style and Design (26%) and Performance (25%) the two most important characteristics which have been followed by Features (20%), Comfort (19%) and High Price (10%). Style and Design along with Performance thus forms the basis in which the evaluation of perceptual mapping of the brands with respect to one another will be done.

In the attribute as to what people see in luxury car which was a multiple-choice question 117 people have chosen performance as the most important parameter followed by brand (103), design (92), features (64) and price (36).

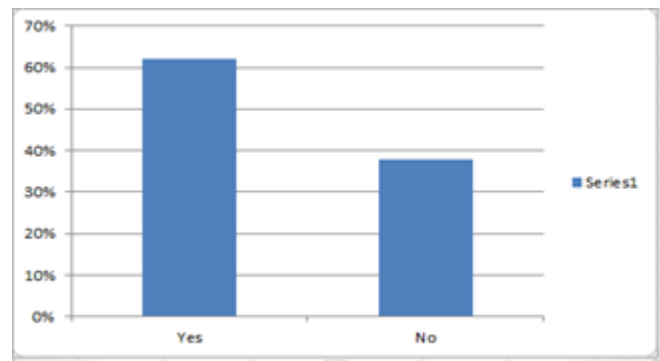
This analysis is helpful in finding out the brand strength of Audi by the components of CBBE model.

**C. The Nation of Origin and Brand Strength**

From the respondents, it was found that 61.2% of the people take into consideration the nation of origin of the luxury car.

People who take the nation of origin into consideration while making a perception.

In addition to that, it was found that 72.4% of the respondents get a positive feeling when they hear the phrase “German Brand”, as the name German is associated with it. This shows that the nation of origin of the brand leaves a positive impact on the buying decision of the respondents.



In addition to this, upon asked what factors they would take into consideration while buying a premium car, 80.6% respondents responded that they would look at brands while buying a car.

With the above data, can say that nation of origin and the brand does play an important role in buying decision in the luxury car segment. From this result, can interpret that both the null hypothesis can be rejected. The nation of origin plays an important role in strengthening the CBBE construct. At the same time, the brand of the manufacturer plays a critical role in influencing the behavior of the customers in luxury car segment.

**D. Perceptual mapping of brands in relation to one another**

Stimulus Coordinates Dimension

Stimulus Number / Stimulus Name	1	2
1 Audi	0.574	2.0845
2 Mercedes	0.6636	1.1523
3 BMW	0.5048	-0.0096
4 Porsche	-0.7692	-0.5938
5 Jaguar	1.4573	-0.8002
6 Lexus	0.1883	-0.9015
7 RangeRov	-0.6664	-0.6325
8 Volvo	-1.9525	-0.2991

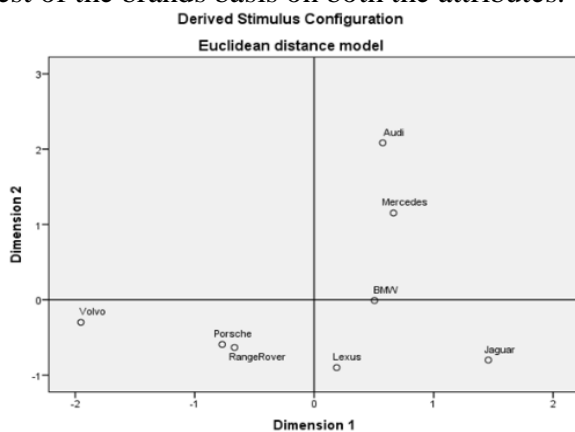
For matrix  
Stress = .01714  
RSQ = .85383

Dimension 1 and 2 are chosen Style & Design along with Performance respectively as these two re the attributes which got the maximum amount of response from our respondents and thus our brands relative performances have been measured basis these characteristics.

S- Stress value- .01714 which indicates how much our model lacks the fitness in depicting the effective result. The value so obtained is acceptable but not a good result.

RSQ = .8583 which indicates the goodness of fit of our model. 85.83% of our data is explained by the model which is a good fit.

The perceptual mapping of the brands in relation to the given dimension is as so obtained in the given figure as above can interpret basis this map that Porsche, Range Rover are quite similar to each other thus they form a cluster group of themselves. BMW, Audi, and Mercedes are quite similar based on 1st Dimension which is Style & Design but differ apparently on the basis of performance attribute. Lexus and Jaguar score similarly based on Performance but differ on a substantial basis in respect to Dimension 1. Volvo on the other hand is different with the rest of the brands basis on both the attributes.



**Dimension 1 is Style and Design, while Dimension 2 is Performance.**

These Dimensions were derived asking the respondents questions regarding their basis of rating the brands mentioned above. The two parameters that were found to ne repetitive among the respondents turned out to be Style and Design, and Performance.

A critical observation can be that even as a spectator, we see more Audi, Mercedes and BMW on the roads. Reason being the road infrastructure in India doesn't even support Top notch Luxury/sports cars. Investing heavily in Crores on cars that you can't drive on full speed is a major roadblock when it comes to cars like Porsche, Jaguar and Ferrari. To identify which dimension would go where, a look at the positioning of different brands which they used to communicate to the target segment out there was taken. Thus, the two dimensions were identified to be as Style and Design and Performance.

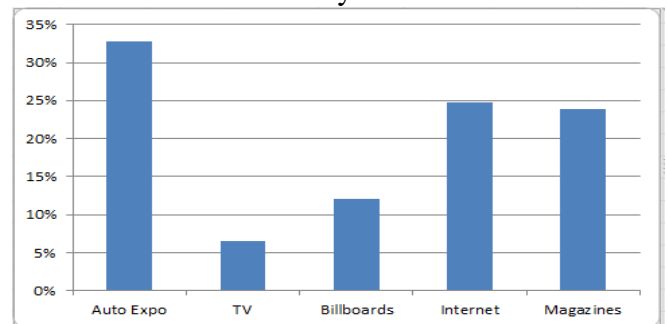
**E. Communication Analysis**

The respondents have chosen Magazine (29%) as the source where they find the maximum communication from the premium luxury car

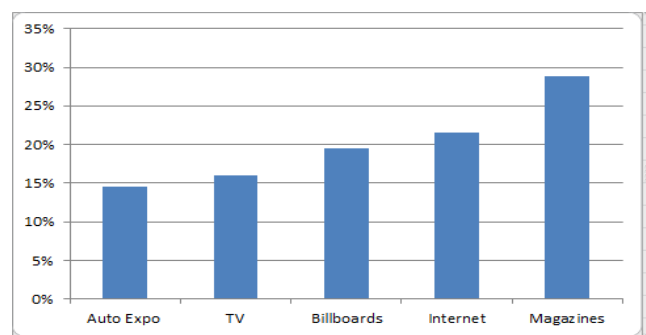
segment followed by internet (22%), billboard (19%), TV (16%) and Auto Expo (15%). This is the measure of communication in various platforms by the luxury car industry.

In contrast to what people perceive as the source of communication for premium luxury car, they have a different choice as per the weightage given by them to the source of communication. Auto Expo (33%) has been chosen as the most important source of communication by the respondents followed by internet (25%), magazine (24%), billboards (12%) and TV (7%). This shows where people look for the communication and information regarding the luxury car industry.

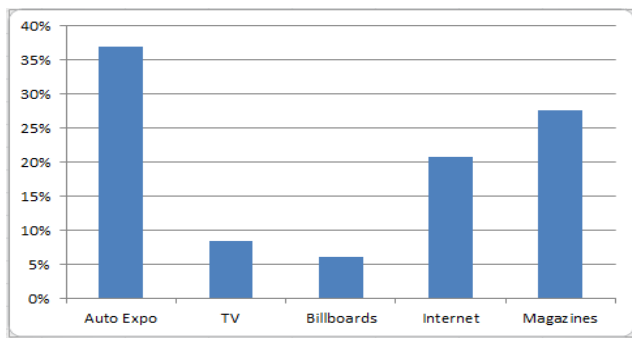
The medium of communication where the people have seen the most number of advertisements of Audi the respondents have chosen Auto Expo (37%) as the number one source of communication followed by magazines (28%), internet (21%), TV (8%) and billboards (6%). This is a reflector of where Audi does its communication, which is different from the industry.



**Where people look for communication from the luxury car manufacturers**



**Industry Advertisement and communication media break up**



### Audi advertisements and communication medium break up

This result shows us the comparison of communication strategies and communication mix of Audi with the rest of the luxury car industry. It also shows what communication mediums the respondents seek for getting updates and insights to the luxury car segment.

### Discussion

Luxury cars are those cars that provide comfort, quality, status, attractiveness, and features, etc. Luxury cars and the manufacturers compete in niche market and have a strong point of differentiation among their market as it is the other cars which make them charge a premium price from a customer. In Indian context the luxury cars are a growing market. Brand positioning in the luxury car segment of the motoring industry are critical as this industry is highly competitive including renowned brands as well as new emerging brands. To be selected as a brand, it must be perceived to be top notch to competing brands on attributes that are important to the consumer.

Brand is a communication to the customers about a particular company which creates point of differentiation among them to compete in the market with the existing players. Brand plays a major role in selecting a particular company's product. Some of the key components that consumers consider while selecting are **brand value, brand loyalty, brand resonance, brand recognition/recall**, etc. Strong branding is important.

The CBBE model acts as a branding ladder for any organisation's marketing programs. Consumers may have negative as well as positive CBBE towards a brand which may create hindrance towards a brand among the consumers. Companies make their brand recognizable, memorable, and easy to recall.

Organizations also use perceptual mapping to understand the perception of their existing customers or for their new customers which helps them in gaining competitive frame for their brand and bring effectiveness for targeting their potential customers.

In pursuit of the objectives of the research, a questionnaire was prepared, which was floated to collect primary data. The primary data from 140 respondents was collected. Further the data was cleaned and analysed to reach interpretations. The interpretations from the data got us the insights to the luxury car segment. The data has shown some interesting facts in the branding and communication aspect from the competitive environment scan. The customers in luxury car segment look for the nation of the origin of the car as well as other factors such as style and design, performance, brand and features while making a decision to buy the luxury car. Thus, these are the major factors that affect the buying preference of the customer in the luxury car segment.

It was identified that the Brand Recognition (76%) and Brand Recall (28%) for Audi is strong in the luxury car industry. This shows that Audi enjoys a strong brand salience in the respondent's mind. This is quite visible on roads as well. We usually see more Audi compared to Jaguar, BMW, and Mercedes. The performance rating of Audi is also commendable. The image of Audi has been impressive in the eyes of the respondents. All these imply that Audi has quite high brand equity based on CBBE model. Audi can enjoy this brand equity to command a premium from the customers, as the value proposition of Audi is perceived to be beneficial by the customer.

One thing that we can notice about Audi is that the price range it operates in also varies a lot. That means it starts at Rs 33 lakh for Audi A3, which is the cheapest Model and goes up till Rs 2.07 Cr for Audi Q8. This wide range of price offers a lot of options to the consumer, to choose from. On the contrary, we will not find this variety in other brands like Jaguar or Mercedes.

In perceptual map, 8 brands of luxury cars re mapped based on style and design and performance as dimensions. The competitive positioning of the brands in comparison to

Audi in the segment of industry can be seen from the perceptual map. Audi and Mercedes are close, and in the same segment. Jaguar and Lexus are in the same quarter of the perceptual map, which is perceived to have great style and design, but relatively little performance as compared to Audi and Mercedes. The brands Porsche and Range Rover are very similar in the perception of the respondents while, Volvo is perceived differently by the respondents. Thus, the perceptual map of the car brands has shown us where Audi stands in the perception of the respondents.

A competitive scan was done in the communication aspect of the luxury car industry. Following results are found:

	Industry Ads	Respondents seek	Audi Ads
Auto Expo shows	15%	33%	37%

TV	16%	7%	8%
Billboards	19%	12%	6%
Internet	22%	25%	21%
Magazine	29%	24%	28%

The above table shows that Audi does more Auto Expo ads than those of the competition. Also, the 33% respondents seek Auto Expo shows for updates in the industry. Hence Audi is doing a fair share of advertisements in Auto Expo Shows.

From the above table, it can be interpreted that Audi needs to improve its communication via the billboard medium of communication. In other mediums of communication, Audi is doing well in comparison to its competitors in meeting the needs of the target segment from the communication point of view.

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## STUDY AND DESIGN NOISE CANCELLATION SYSTEM USING ANTI-NOISE TECHNIQUE

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### ABSTRACT

Noise is among the most pervasive pollutants today. Environmental noise has been increasing since the industrial revolution. Noise from road traffic, jet planes, jet skis, garbage trucks, construction equipments, manufacturing processes, and rotary fans, to name a few, are among the unwanted sounds that are routinely broadcasting into the air. Environmental noise has become a significant effect on human life. If it exceeds the safe limits and cause headache, hearing loss, high blood pressure, stress, losing concentration, etc. Therefore, it is necessary to reduce the noise and make the human life better. Passive techniques are currently the predominant solution for the noise problem. Such techniques include insulation, absorbers and barriers but these techniques are effective over a broadband range of frequencies and ineffective at narrowband range (500Hz and below) and some specific frequencies. Also, such systems are impractical when they come to launch in outside environment like factories, airports etc. That is where active noise cancellation technology is used for the elimination of noise. Active noise control systems allow for attenuation of narrowband noise and low frequency noise, which do not effectively handle by the passive techniques. This technical paper deals with active noise control using adaptive filters and LMS adaptive algorithm.

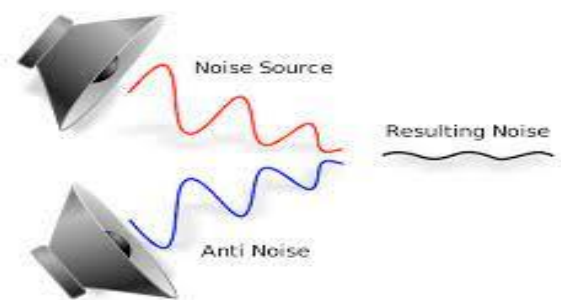
**Keywords:** Noise Cancellation, Anti-Noise, Least Mean Square (LMS), Adaptive Filters, Recursive least-squares (RLS)

### Introduction

Noise is, in fact, a form of sound, unwanted sound. Therefore, it must possess all the properties of the sound wave. For example, when two sound waveforms are identical and in-phase, the volume increases. On the other hands, when two sound waveforms are out of phase, the volume not only decreases, it disappears. This unique characteristic is the fundamental concept of the active noise cancellation [2,3,8].

The idea of using an anti-noise to reduce the original noise was the most fundamental concept of noise cancellation. From Figure 1, we can see that we first take a original noise signal then we generate a anti-noise signal (180° out of phase) and this anti-noise signal is superimposed upon the original noise signal then finally we get a residual wave which is much flatter than the original noise. [1,5,7]

In terms of the sound amplitude, the residual sound is much quieter than the original noise. However, we must make note that the anti-noise does not mask the noise entirely; but quite similarly, it reduces the noise level significantly.



**Figure1 Showing Noise and Anti-noise Signal**

Here the adaptive filter and its adaptive algorithms for generating the anti-noise signal. Now we first discuss about the adaptive filters then we will discuss about its algorithms.[2,18,22]

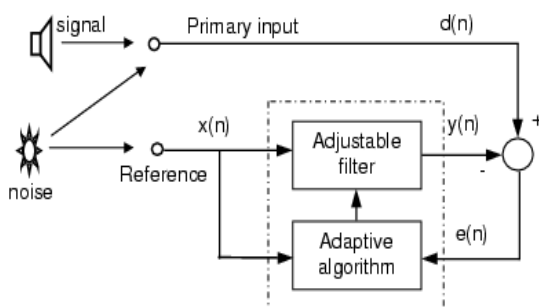
### General Description of Adaptive Filters

Adaptive filters are digital filters capable of self-adjustment. These filters can change in accordance to their input signals. An adaptive filter is used in applications that require differing filter characteristics in response to variable signal conditions [3,6,8].

The adaptive filter requires two inputs:

- The primary input signal
- The reference input

An adaptive filter has the ability to update its coefficients. New coefficients are sent to the filter from a coefficient generator. The coefficient generator is an adaptive algorithm that modifies the coefficients in response to an incoming signal. Adaptive filter requires little or no prior knowledge of the signal and noise characteristics. If the signal is narrowband noise is in broadband frequency range which, is usually the case, or vice-versa, no a priori information is needed; otherwise, they require a signal (desired response) that is correlated in some sense to the signal to be estimated [11,12,15].



**Figure-2 Adaptive Filter with Noise Canceller**

Moreover, adaptive filter has the capability of adaptively tracking the signal under non-stationary conditions. Noise cancellation is a variation of optimal filtering that involves producing an estimate of the noise by filtering the reference input and then subtracting this noise estimate from the primary input containing both signal and noise. The reference input can be obtained by placing one or more sensors in the noise field where the signal is absent or its strength is weak enough. [3,16]

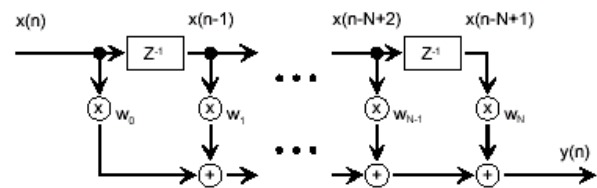
**Adaptive Algorithm**

Many computationally efficient algorithms for adaptive filtering have been developed within the past twenty years. They are based on either a statistical approach, such as the least-mean square (LMS) algorithm, or a deterministic approach, such as the recursive least-squares (RLS) algorithm. The major advantage of the LMS algorithm is its computational simplicity. The RLS algorithm, conversely, offers faster convergence, but with a higher degree of computational complexity. [4,5,21]

The adaptive filter algorithms are implemented with FIR filter structures. Since adaptive FIR filters have only adjustable zeros, they are free of stability problems that can be associated with adaptive IIR filters where both poles and zeros are adjustable. Of

the various FIR filter structures available, the direct form (transversal), the symmetric transversal form, and the lattice form are the ones often employed in adaptive filtering applications. [6,7,18]

The structure of a transversal FIR filter with N taps adjustable weights.



**Figure3 FIR filter with N taps adjustable weights**

The tap-weight vector,  $w_i(n)$  is represented as  $w(n) = [w_0(n), w_0(n), \dots, w_0(n)]$

The tap-input vector,  $x(n)$ , as  $x(n) = [x(n), x(n-1), \dots, x(n-N+1)]$

The FIR filter output,  $y(n)$  can then be expressed as

$$\sum_{i=0}^{N-1} y(n) = \sum_{i=0}^{N-1} w_i(n) x(n - i)$$

where  $n$  is the time index and  $N$  is the order of the filter.

The LMS algorithm is initialized by setting all weights to zero at time  $n=0$ . Tap weights are updated using the relationship

$$w_i(n+1) = w_i(n) + \mu e(n) x(n)$$

where,  $w_i(n)$  represents the tap weights of the FIR filter  $e(n)$  is the error signal  $x(n)$  represents the tap inputs and the factor  $\mu$  is the adaptation parameter or step-size.

The weights obtained by the LMS algorithm are only estimated, but these estimated weights improve gradually with time as the weights are adjusted and the filter learns the characteristics of the signal. Eventually the weights converge. The condition of the convergence is  $0 < \mu < 1/\lambda_{max}$ , where  $\lambda_{max}$  is the maximum eigen value of the input data matrix. [2,8,14]

**Implementation of LMS algorithm**

Choose the parameters and initial conditions:  $L, \mu$  &  $w(0)$ , where  $L$  is the order of the filter,  $\mu$  is the step size and  $w(0)$  is the initial weight vector at time  $n=0$ .

Adaptive filter output-

$$y(n) = \sum_{L=0}^{L-1} W_L(n) x(n-L)$$

Error signal-

$$e(n) = d(n) - y(n)$$

Update adaptive weight vector using the

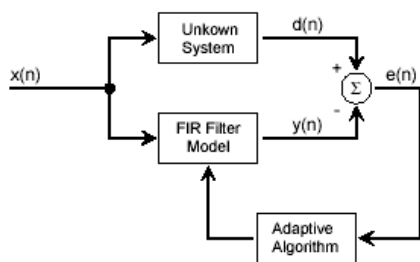


$$W_L(n+1) = W_L(n) + \mu x(n-L)e(n)$$

The LMS algorithm requires approximately  $2\mu+1$  multiplication and  $2\mu+1$  additions for each new set of input and output samples.

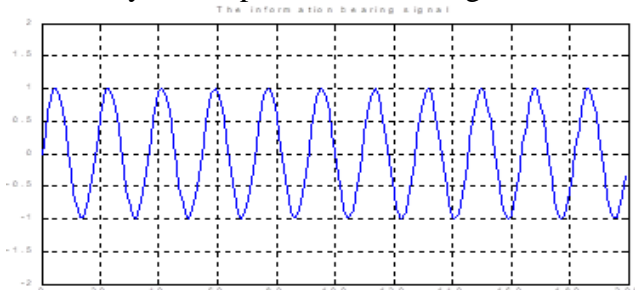
**Software Description**

In this technical paper the software description of noise cancellation is given with the help of MATLAB. The block diagram of adaptive noise cancellation using LMS algorithm is shown in figure-4. The LMS adaptive filter uses the reference signal (on the "In" port) and the error signal (on the "Err" port) to automatically match the filter response in the block labeled "Noise filter".



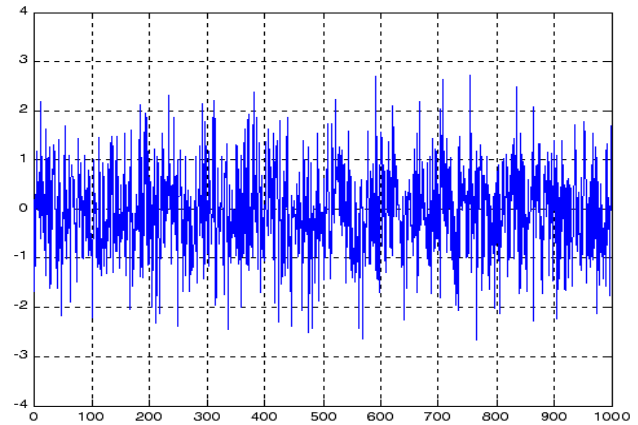
**Figure-4 block diagram of adaptive noise cancellation using LMS algorithm**

As shown in fig.4 first we generate a information bearing signal that is a sine wave of 0.055cycle/sample as shown in fig.5.



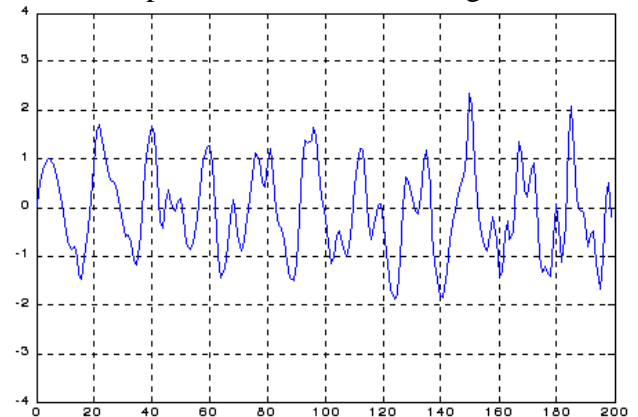
**Figure-5 Information bearing signal that is a sine wave of 0.055cycle/sample**

The adaptive noise cancellation system assumes the use of two microphones. A primary microphone picks up the noisy input signal, while a secondary microphone receives noise that is uncorrelated to the information-bearing signal, but is correlated to the noise picked up by the primary microphone. The noise picked up by the secondary microphone is the input for the LMS adaptive filter as shown in fig.6.



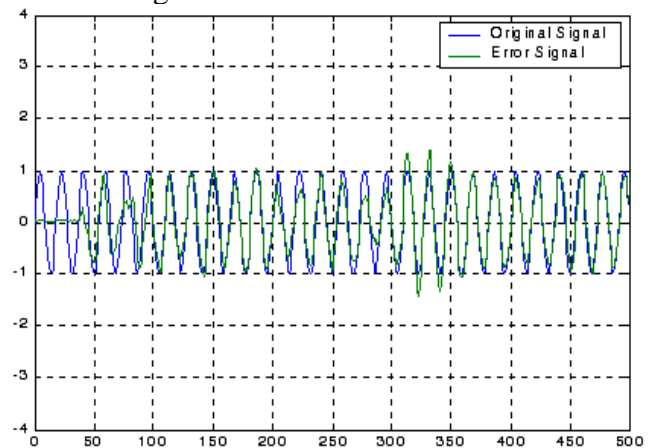
**Figure-6 noise picked up by the secondary microphone is the input for the LMS adaptive filter**

The noise that corrupts the sine wave is a low pass filtered version of (correlated to) this noise. The sum of the filtered noise and the information-bearing signal is the desired signal for the adaptive filter as shown in fig.7.



**Figure-7 Sum of the filtered noise and the information-bearing signal**

As it converges to the correct filter, the filtered noise should be completely subtracted from the "Signal + Noise" signal and the "Error Signal" should contain only the original signal as shown in fig.8.



**Figure-8 Showing Original and Error Signal**

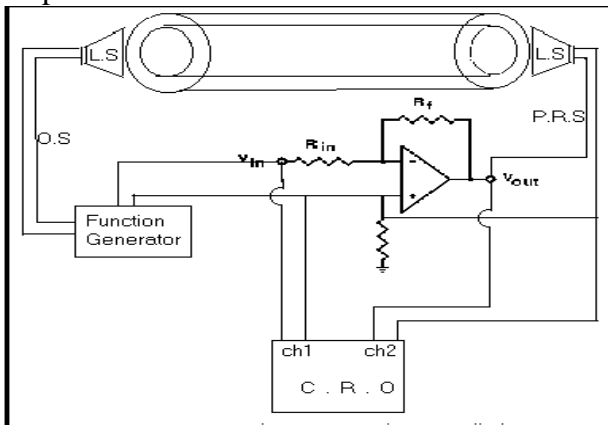
## Hardware Description

In this technical paper the hardware setup for the anti noise controller consists of the following equipments: -

- 2 PVC pipes with diameter of 4 and 6 inches of 4.5ft and 4ft.
- Inverting amplifier circuit
- Two speakers with 4 inches diameter and impedance  $8\Omega$ .
- DrDAQ kit along with a PC.
- Function generator
- Triple power supply
- Cathode Ray Oscilloscope

### Block diagram of the setup

The pipes of 4" was placed inside the pipe with diameter 6". On both the sides of the inner pipe a speaker was placed to which different signals were fed. To one of the speakers original signal was fed and to the other speaker anti phase of the original signal was fed. The anti phase signal was obtained by using an inverting amplifier.



**Figure-9 Experimental Setup for Noise Cancellation**

This inverting amplifier was made by using op-amp (BC741) in the feedback mode. The original signal was obtained from the function generator, which was set at 500Hz supplying signal in the form of sine wave. From this source two outputs were taken. One of them was fed to a speaker as pure signal and the other was used as input to the inverting amplifier. The phase reversal was observed using a CRO at the input and the output of the inverting amplifier. The signals obtained from both the speakers were received with the help

of DrDAQ apparatus, which was kept at the center of the pipe. This mic receives the signal whose amplitude was attenuated when compared with the input signal.

When the two signals i.e. the original signal and its anti-phase signals were applied on the two speakers we observe attenuation of the sound output which is received on the mic of DrDAQ. The kit of DrDAQ was kept in the center of the inner pipe towards the center where maximum attenuation would be received. DrDAQ helps in analyzing the sound output on the PC as it acts as both spectrum analyzer and oscilloscope. We applied sound signal of various frequencies and obtained the same attenuated output.

### DrDAQ

DrDAQ is a low-cost data logger from Pico Technology. It is supplied ready to use with all cables, software and examples. Very low cost, Built in sensors for light, sound (level and waveforms) and temperature, Measure pH - just plug in any standard pH electrode, Sockets for external sensors, Use DrDAQ to capture fast signals (e.g. sound waveforms) Outputs for control experiments ·Simply plug in to your PC and measure - supplied with both Pico Scope (oscilloscope) and Pico Log (data logging) software.

## Conclusion

Adaptive noise canceling is a method of optimal filtering that can be applied whenever a suitable reference input is available. The principle advantage of this method is its adaptive capability that allows the processing of inputs whose properties are unknown. By this method we can reduced low frequency (500Hz or below) repetitive noise.

For hardware setup the output obtained from the setup made shows attenuation of two sound signals where one signal is the pure periodic signal and the other signal is the phase-reversed signal. This kind of setup is only meant for attenuation of periodic noise, which is just a part of the various types of noise signals present

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## CUSTOMER JOURNEY MAP COMPARISON FOR ONLINE BUYING OF A LIFE INSURANCE PLAN

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### ABSTRACT

*The objective of this paper is to compare the customer journey map of buying an online Life Insurance policy for seven private Insurance companies of diverse nature (Bank backed or not, Old or New players) and to understand the different touch points taken into account throughout the journey. It is exploratory research to analyse the real time experience of users across touch points buying insurance services through online. A comparison table for all these companies based on the touch points would give an idea for the organization to identify their strength and weaknesses and also gives them an opportunity to bridge the gap with their competitors with this benchmarking. The results of the study gives an understanding for organizations on the touch points where they could improve and also device appropriate ways of improvement. It could also be used to understand the best practices in the country which could be taken into account for new players to create an immediate effect in the industry. The study identifies the fact that the customer journey for every organization is distinct and is a major factor for brand loyalty.*

**Keywords:** Customer Journey Map, Life Insurance, Online Buying, customer buying behaviour of insurance service

### Introduction

Life Insurance in India has never picked up to the expected levels as compared to other countries due to a variety of reasons. Less awareness, poor customer service or experience and non-customized products come to the top of the mind. Also, a large number of competitors in the insurance field have made it difficult for new players to gain market share. The new players find it difficult to understand that vital customer pain point which can create a point of differentiation from the rest which can be weighed upon to gain market share. Understanding the different factors and their weights during customer decision making is vital to gain an upper hand in this competitive market. With the increasing transparency and digitalization, the potential in the customer journey section is still left untapped which could be a major point of differentiation for companies in a highly competitive market like the life insurance industry.

The Life insurance industry in India is dominated by LIC (Life Insurance Corporation of India). Despite of the presence of twenty four companies in the market, only LIC is the public sector company but has seen a small slip in market share with the introduction of private

sector companies like ICICI Prudential, HDFC Life, SBI Life to name a few. But with insurance being a push product rather than a pull product, customer experience is of major importance in a highly competitive market. With the unprecedented circumstances of COVID-19, the demand for life insurance has sky rocketed due to fear over their health and wellbeing. The demand for online sales has also gone up due to these unpredictable circumstances. Therefore, there lies an opportunity in delivering a seamless customer experience for the online buying of an insurance plan. The objective of this paper to understand the gaps in the customer journey for seven different companies and propose recommendations for each which could improve their journey as well as the customer experience.

### Literature Review

There have been a number of studies which have identified the importance of service to provide a seamless customer experience which would improve the brand loyalty. The purpose of the research paper [4] is to identify whether customer interactions on social media platform influence the purchase intention of the customer and affects brand preference and

corporate reputation. It is a purely quantitative approach which was completed using an online questionnaire which was floated across to social media users in Indonesia aged between 25 to 40 years. The primary focus of the study was on the pre purchase stage to extend an understanding of the customer experience in an insurance customer journey. The findings indicated that c2c interaction highlighted how shared information was contributing to brand preference and that customer engagement strategies are imperative for the survival of an organization. The study strengthens the need of customer experience before the purchase stage and the beginning of the explore stage.

In the paper [3], a case study is presented in which the company introduces service design to improve customer experience by fostering transformation strategies and processes. They took an AR (Action Research) approach where it seeks to solve real life problems and then develop knowledge. Once the action was found out, a qualitative approach in terms of an open ended group discussion was conducted with upper and middle managers. Once the experiment was conducted, about 48 gaps were identified in the process out of which 16 were implemented in the short term. Therefore, with the rising technology, the need to reduce these gaps has become more important.

The purpose of the research paper [2] was to analyze whether the experience during claim settlement affects their attitude towards the organization also their subsequent loyalty. First, a consumer study was done to find the suitable target segment. A telephonic interview was done to understand their experience of the claims process and their attitude towards the company and the aspect of car insurance in general. This was done to three hundred motorists in the UK. The study also took an equal number of men and women as well. Upon analysis, they comprehended a strong relationship between the outcome of the claim settlement in terms of the alternatives provided and experience with the subsequent loyalty with the insurance company. Therefore, customer experience plays a major role in the motor insurance industry as well.

Another method to measure and analyze customer experience is looked into in the paper [8] where they confirmatory factor analysis to

propose a service quality instrument of six dimensions namely- assurance, competence, corporate image, technology, tangibles and planning. The aspects were identified through a very well detailed approach consisting of two surveys, five focus group discussions and eight in depth interviews and respondents for the pilot test was chosen using shopping mall intercept sample method. The paper provides a blueprint in terms of course of action to create satisfied customers.

Different methods of analysis have been used in the past to analyze the weightage of different factors in the decision making process of a specific brand of life insurance. The paper [5] indicates the relative positioning that each brand takes in the life insurance sector. It uses correspondence analysis to come up with the attributes based on key service attributes for each brand and uses this to develop a perceptual map to compare these brands.

The paper [6] explains how different factors affect the customer perception about a brand which plays a pivotal role in decision making. The analysis methods used were factor and descriptive analysis. Convenience sampling was used for this purpose. Exploratory factor analysis, KMO and Bartlett's test was implemented to understand the relation of each factor on customer perception. Based on this, the importance of each factor were compared and ranked.

The paper [7] has a similar outlook to understand the reliance of factors on customer investment of life insurance policies. This is a quantitative analysis based on Lucknow city where samples were selected through stratified and targeted sampling. The paper depicts the relation between the policies and demographics. A CHI Square test is done to establish this relationship and depicted with graphs for easier understanding.

The last paper [1] is a quantitative study of 150 policyholders in Jabalpur to identify those factors taken into account during decision making of a life insurance policy. Samples were selected using purposive and stratified sampling. Statistical tools like chi square, correlation and weighted average method are used and are represented using graphs and charts. The paper concludes that demographics

play a role in the purchase of life insurance policies.

### Research Methodology

The objective of this paper is to analyze the customer journey map for online buying for seven different private players and understand the gaps in each of the processes which could be a reason for poor customer experience. First we had to identify proper companies from different backgrounds to benchmark so as for a better understanding of the industry. Next, the major life stage for the customer journey was identified and the different KPI's which would be measured at each stage. Finally, we would complete the customer journey for each company from initiation to cancellation and then analyze them at each stage. Through this, we identify the shortcomings of each company and modes of improvement through the benchmarking, thus improving customer experience.

Since the objective to provide a better customer experience was to improve the market share, only private players were taken into consideration. Here, private players from different backgrounds were chosen to get a broader understanding of the working of the overall industry. The factors we took into account for this was if the company was bank banked or not and if they were an old player or a new player. Therefore, we divided this into three buckets, namely- Old bank banked players which were ICICI Prudential, HDFC Life, and CanaraHSBC. Next was the old players which were not bank banked which included Bajaj Allianz Life insurance, MAX Life. Finally, the last bucket included those companies which were comparatively new and was not bank banked which included Aegon Life and Edelweiss Tokio Life Insurance.

Once the competitors were decided, the next step was to identify the life stages in a customer journey map and the KPI (Key performance Indicators) we would be measuring at each stage. Every customer journey map has different life stages, namely awareness, consideration, decision, use, loyalty, and ends at the termination stage. The customer journey map starts the moment you hear about the organization. After creating awareness through different mediums like

word of mouth, website, social media, we consider our options and make a decision after which you are a customer of the organization. Here starts the use and loyalty stage which is the post buying experience you have with the company which decides the fact you stay loyal to the company or not. For an online insurance buying journey, we revised this journey map into five defining life stages which are

1. Exploring stage
2. Buying Stage
3. Issuance/Post buying stage
4. Query Resolution stage
5. Cancellation stage

Defining life stages required further granularity i.e. further KPI's on what I would be measuring in each of these stages for the seven companies.

Exploring- We looked the product specification first which included the premium price, features of the policy and the additional riders available along with the policy. We also felt that the website would be a major area where people would engage with in the exploring stage. The factors we looked into here is the availability of information for the policy in terms of FAQ's and whether a customer persona was used or not, the responsiveness and adaptability of the chat bot, the display of customer testimonials, how easy was it to reach out to the organization and the website transition time. Finally, since we live in a digital age, online buying is backed up with proper research through digital channels as well. Therefore, we looked at the responsiveness in handles like Facebook and Instagram. We look at the frequency and content for posts, the responsiveness to queries and feedback as well.

Buying- For the buying stage, the application form was taken into i.e. the number of languages available, alternatives provided for filling the form, number of sections in the form and if an auto fill option was available in case of any problems in the midst of the form. Next, we looked at the documentation process mainly at the number of documents required for the policy and the alternatives for each document. The payment process was as important where we kept an eye on the modes of payment available, the transition from webpage to the payment portal and the

functioning of the auto debit facility. Agent interaction plays a pivotal role in any insurance journey and we recorded the soft skills and the quality of advice of the agent. The last factor we took into account was the response TAT (Turn Around Time) in terms of communication via Email and SMS.

Post Buying or Issuance – Once we become a customer, the journey doesn't stop, It is equally important to keep the customer happy and ensure loyalty and evangelism. The factors we looked into here were the Issuance TAT, the frequency, mode and content of communication. Application tracking was recorded in terms of the alternatives provided and this display of the status in the application tracker and the time taken to receive the soft cop and hard copy of the policy bond.

Query Resolution – Every insurance customer journey would include a query resolution whereas mentioned in the buying stage, we look at the agent interaction quality again. The first call resolution of the agent is also considered. We also look at the waiting time and whether an app is provided or not by the company.

(i) Cancellation – In the cancellations stage, we look at the different modes through which we can initiate cancellation, the content of communication from the company i.e. whether they are trying to retain me as a customer or understand the reason for cancellation. We also recorded the time take for refund and the documents required for cancellation.

Once the life stages and KPI's were identified, we completed the customer journey map for an online buying of an investment plan for all the seven companies and recorded our findings.

### Results And Analysis

We completed the customer journey map for each company and recorded the findings in each stage which has been listed below:

#### Edelweiss Tokio Life Insurance

In the exploring stage, the major findings were in the website where we found that customer personas were used to illustrate the features of the policy. The website had a chat bot of moderate responsiveness but there was only one language available. The customer testimonials were displayed in the homepage

and the product page but could have been included more demographics of the customer (Only name was included). The website transition was not up to standards as well due to a delay of about 3 seconds for moving from one page to another. In terms of the buying stage, the application form consisted of a single page with 14 sections (Figure 1.1) and none of the travel and medical history were prefilled with 'NO' which could have reduced the number of clicks. There was very less flexibility for the form as there were no alternative methods to fill the form. There were a lot of payment options (Fig. 1.2) which was pleasant. The communication in terms of Email and SMS was satisfactory with proper content and the right time of communication.

In terms of the documentation, documents were requested on four different occasions which made it difficult for the customer which was the reason that the issuance TAT was 12 days which was the highest of the lot. For the issuance stage, the application tracker had no alternative methods of tracking and the display of the status in the tracker could have been better as only the current status was mentioned but not what steps lie in the future before the issuance of the policy. There was no communication from the company post buying other than a feedback form for the buying process. The cancellation journey for Edelweiss Tokio Life Insurance was the best which could be initiated via E-mail and required only two documents and the refund TAT was about 11 days.

#### ICICI Prudential

In the exploring stage, the website font size was a bit too big which required a lot of scrolling for information. Reaching out to the organization or scheduling a callback was really difficult. There were no customer testimonials but a rating scale out of 5. In terms of their digital handles, the content was not very engaging but the responsiveness to each comment or query was top notch as they replied to our query as well as gave personal messages on both handles, Facebook and Instagram. The buying stage was much more pleasant as the application form was well structured. It was divided into 4 main sections and further subsections which made all the information available with fewer actions



(scroll, clicks etc.). There were alternatives provided to fill the form which were to fill it manually, or upload documents and organization fills the form based on details in the documents or if you were an existing customer, they would fill the details from that. The travel and medical history of the form was already prefilled with 'NO' which reduced the number of clicks in the form. The agent interaction was really pleasing as the agent was really well informed and was respectful as well enquiring if I was comfortable with the language.

There were less payment options but it was sufficient. The communication throughout the journey was well thought of with proper content at just the right frequency. The documentation was proper and all the documents were requested at one go but the processing of the documents took time which lead to an issuance TAT of 8 days. In the issuance stage, the application tracker had four different alternatives which was mobile number, application number, policy number or transaction ID which made it very easy to track the application but the display of the status was not well detailed. The query resolution stage was indifferent as there was a large waiting time and the voice over response could have been better in this period. The cancellation stage was moderate as well as the agent was not very understanding but was trying to retain me as a customer which was understandable but was not giving proper instructions to initiate cancellation. They requested for four documents for the initiation of cancellation.

### **Aegon Life**

When we moved to the buying stage, the application forms upon completion showed an error to proceed further. Upon agent interaction, the company was not providing the option to buy online due to the COVID-19 scenario and buying was only possible through the agent initiation. Therefore, we did not proceed with the buying as it would be out of the scope of this research paper.

### **HDFC Life**

The website was attractive with proper font size and a lot information and FAQ's for each product. The customer testimonials were displayed with more demographics about the

customer attached to it. The security was high as even for requesting callback, verification of mobile number is done via OTP. The chat bot required a lot of details before query resolution which was difficult. The website and the application form were available in English and Hindi which was not available for any other company. The digital handles were responsive as well with proper instructions given to each query in Facebook and Instagram. The application form was well structured but the highlight was the presence of shortcuts like chat bot, have an agent callback on the side of the application in case of any problem in the midst of the process which was really helpful. The medical and travel history was prefilled with 'NO' as well. The payment was not up to standards as the auto debit option would not accept all the modes of payment. The communication via agent, Email and SMS was very aggressive as they would initiate communication every hour to continue communication which was an unsatisfactory experience.

The documentation was satisfactory and the issuance TAT was 7 days. During the issuance stage, the application tracker had two alternatives but the structure of the status display of the tracker was very well detailed. The query resolution stage was indifferent as all the details of my policy had to be entered via the dial pad before connecting to an agent.. The cancellation stage was satisfactory as the agent was understanding but required four documents for the initiation of cancellation via E-mail.

### **CanaraHSBC**

The website was not attractive as it was a very large font and required lot of scrolling for information. The highlight was the ease of reaching out to the organization but with the absence of a chat bot and a customer persona for illustration of policy features, the website was not attractive compared to the competitors. But the buying stage was seamless and smooth. The digital handles were not being looked after as the posts were less and there were no comments to any of their queries. The application form had a single page with 10 sections but there were options to save and proceed and had three alternatives to fill the form similar to the options in ICICI Prudential

and the medical and travel history was auto filled with 'NO' as well. There were a sufficient number of payment options and due to proper documentation and communication, the issuance TAT was only 2 days which was the least amongst the companies. But it was difficult to get agent assistance throughout the buying journey and the buying was done without any agent interaction.

The application tracker was not well structured or detailed but since the issuance TAT was less, it did not affect customer experience as much. There was no communication via SMS, E-mail post buying. The query resolution stage was satisfactory as the waiting time was less but there was no customer service FAQ's in the website as well. They had the best cancellation process as the agent was understanding and upon sending four documents, they were the first to refund the amount.

### **Bajaj Allianz**

The website was the most attractive of all the websites. Customer testimonials were properly displayed, and a number of shortcuts on the side for easier reach to the organization. The webpage transition was slow compared to other websites but it was engaging such that a message popped during the transition such that the customer does not leave the webpage during the slow transition. The chat bot was super adaptive and responsive due to the support of five regional languages, speech recognition and a higher number of options. It was so complete this helped the query resolution stage and throughout the customer journey. There was no agent interaction during the buying process but the application form was well structured with 3 sections divided into further subsections and the medical and travel history were prefilled with 'NO'.

There were sufficient payment options and in terms of documentation, for each document, the alternatives provided were very large which was not done by any other organization. The communication was done through agents and through official Email ID's which was not as professional. The issuance TAT was 7 days. During the post buying process, the application tracker had two alternatives but the display of the status was very well detailed and was the best of the lot. There was proper information, what has been done, what is currently

processing, what are the steps remaining before the issuance of the policy. The query resolution journey was unique as even though the waiting time was high, the voice over response would repeat every minute which mentioned the waiting number and an alternative to switch to the chat bot. Also, with the life assist app, there was higher chances of self service through this app in case of queries. The cancellation stage was not satisfactory due to slow response from the company and overall slow refund TAT.

### **Max Life**

The website was moderate with readable font size and the display of customer testimonials is very well detailed with proper detailing the customer demographics which includes name, age and location of the customer which was something other customer could relate to. There was proper reasoning for different target groups to buy policies which was helpful in understanding the features of the policy. An option based chat bot is available on the right corner but it is slow and less responsive. The application form was really confusing as it had no structure as such but a number of questions with a percentage of completion bar on top. There was no clarity as to whose details were being asked for. A highlight of the buying journey was that they asked about our risk portfolio with a few questions and suggested the investment plan we should go for which was not done by any other company. There were very limited payment options but the documentation was well structured with all documents requested at once which was the reason for an issuance TAT of 2 days.

During the issuance stage, the application tracker had no alternatives and a poorly structured display of status in the tracker. The communication via Email and SMS was frequent with different content each time. The query resolution journey was moderate as the waiting time was high but the voice over response would repeat every minute to keep the customer engaged. Also upon agent interaction, the details of the customers policy was already with the agent which was a major positive as they had tracked it with my mobile number. Also, there was further assistance from the customer service FAQ's in the website. The cancellation process was indifferent as the agent was not very understanding but was

initiated by sending four documents via Email. The refund TAT was 11 days.

### **Discussion**

Being a highly competitive market which is dominated by the public sector organization which is LIC, the private players need any upper hand they can get so as to get a larger chunk of the market share. Since the competitors and alternatives for each customer is high, the loyalty would also be less. This is where customer experience could play a major role. The purpose of this paper was to analyze the customer journey map of line buying of an insurance plan for seven different companies so as to identify the gaps in their process and also suggest modes of improvement based on the benchmarking process. Our research suggests the different pros and cons for each company and along with it, methods to improve the journey.

This study could also be used by new players before entering the market so as to understand the best practices in the industry and provide a seamless customer experience as the degree of error being a new player would be very less compared to the existing players. Therefore, an understanding about what factors could be inherited from each of the existing players could aid the organization to take large strides forwards.

### **Conclusion and Recommendation**

After completion of the customer journey maps of online buying of an insurance plan for all companies, we have listed down the pros and cons of each company in terms of the different stages in the journey. The recommendations to each company would be:

#### **Edelweiss Tokio Life Insurance**

A better structured website with a responsive chat bot will improve the customer experience in multiple stages such as the exploring and the query resolution stage. Also, better responsiveness to queries in the digital media handles could also be a potential touch point to look at. A structured application form with medical and travel history prefilled with 'NO' is high priority as all the other companies have adopted this strategy. More frequent communication post buying and a quality application tracker with larger number of

alternatives could improve the adaptability of the whole journey. In case of longer waiting times, a voice over response with waiting number could keep the customer engaged and easier identification of the customer by the agent in case of calls to the call center.

#### **ICICI Prudential**

The website could be decorated with customer testimonials and not just ratings. Also the visibility and responsiveness of the chat bot could be improved in case of queries. Another minor tweak could be to add more payment options in order to improve the accessibility to the customers. A better display to the application tracker could help improve the experience post buying. The agent interaction post buying was inconsistent compared to the interactions during buying which could be a gap as well. Shorter waiting times and recognition of the customer without mentioning the details could decorate the query resolution experience. The cancellation process could be reduced to two documents as printing, writing and scanning a document is a major problem in this digital.

#### **HDFC Life**

Since the security in the website was well sorted out, there was a case that a lot of information was requested just to get a callback. Therefore, an easier way to reach out to the organization in case of queries could be handy. During the payment process, our payment option was not supported and the agent interaction at this time was not satisfactory as they were very aggressively calling every hour expecting us to find another payment method rather than find an alternative solution for us. This was a major gap compared to other companies where the communication via agent, Email and SMS was very aggressive and was nullifying the customer experience. In the documentation process, the process of printing and scanning a document was not comfortable for the customer as it was a time consuming and tedious task. During query resolution, the agent should be able to identify the customers' policy details other than the policy holder entering all the details via the dial pad.

### **Bajaj Allianz**

The major gap was the lack of agent interaction throughout the journey. The addition of customer testimonials to the website could be helpful for customers to relate to the product more. Even though the alternatives provided to each document was much higher than the competitors, the request for application ID for documents like photograph did not make any sense which had to be filled with random numbers. Also all the documents should be requested together. More alternatives to track the application could improve the experience. In terms of communication, the frequency was really less be it through agents, Email or SMS and this keeps the customer anxious about the purchase of the policy. The cancellation initiation could be made easier by reducing the number of documents and not requesting a documented to be printed and scanned which reduces the customer experience.

### **Max Life**

Reaching out to the organization was a major difficulty for us as it was difficult to find the required plan and we were stuck for a few days. Also the structure of the application form should be much better given the fact there was no assistance as well, clarity in the form is of major importance but this was not the case. There should be more payment option to improve the overall adaptability of the process and making it more accessible to the customers. Application tracking had no alternatives which could be improved as well. I had send a wrong document for the documentation process but this was accepted as well which shows the company did not check the documents properly. For the query resolution stage, shorter waiting times could improve the experience as their voice over response is well thought of. For the cancellation stage, the documents could be less and could remove the request to print and scan a document.

### **CanaraHSBC**

The situation was similar here as well as agent interaction was absent in the overall buying journey. In such cases, the chat bot plays a major role for online buying. But the chat bot was faulty and was not visible. Therefore, this is a major gap which could improve the

customer experience. Application tracking is also an area where they could improve by providing more alternatives as well as a more detailed display of the tracker status. The communication post buying could be improved so as to improve chances of further loyalty from the customer. In the query resolution stage, the FAQ's provided in the customer service section should be available so as for easier query resolution and a better application can also help to make it much more user friendly.

### **Aegon Life**

In terms of the website, the absence of a chat bot is major gap in the overall customer journey map. In case of errors, it would have been more suitable if the error message was displayed before the completion of the application form. Since we could not complete the buying journey, the information was not sufficient in case of the rest of the stages.

Therefore, we have analyzed the pros and cons of the customer journey mapping for each organization and also identified modes of improvement for each company based on the best practices of their competitors. Companies like ICICI and Bajaj Allianz had a number of pros which outweighed the cons and such customer experience can improve the brand loyalty and evangelism of the organization.

### **Limitations**

For the customer journey mapping of the online buying of an investment plan, the major limitation is the number of companies chosen for the study which could be improved for further accuracy in the recommendations and overall quality of the research paper. Another limitation is the number of KPI's chosen for each life stage as that could be increased as well like more the flow of buying and much more. By introducing such higher granularity, the quality of the study improves. Another aspect could be to improve the reach from the private players to the public players and also not just India but other countries as well so as to widen the accessibility of the study

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## **GEN Z AT THE WORKPLACE: WHAT ARE THE MOTIVATIONAL DRIVERS FOR THIS GENERATION AND HOW THEIR ATTITUDES, PERCEPTIONS AND EXPECTATIONS CAN BE MANAGED IN THE WORKPLACE OF THE FUTURE**

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### **Introduction**

Generation Z is the generation of ‘digital natives’ (Prensky, 2001). Their attitudes, values and motivators differ greatly from millennials and the generations who came before. They have an entirely unique perspective on careers and define success in work and life in a radically different manner when compared to their predecessors (Schawbel, 2014). As Generation Z has started to enter the workforce and is slated to comprise a significant percentage of the workforce in the upcoming years, the article aims to explore what drives them - is it simply compensation or a bevy of benefits, perks in addition to the overall organizational culture which constitutes their overall ‘experience’? Particularly in the context of the changing landscape post the COVID-19 pandemic, the paper aims to find out the kind of benefits and non-monetary perks this generation expects from their employers during and after such a period of uncertainty.

Every generation has its fallacies and shortcomings, even if these are based on stereotypes of the generation. However, managers today have to ensure to look beyond such stereotypes and find out the best ways to put the unique experiences and skills of Generation Z to use in their organizations. Understanding the generation’s formative experiences, the culture they grew up in as well as the normalization of technology for communication, can help managers to better understand their behaviour, anticipate their needs at the workplace and better integrate this generation within the organization and avoid multi-generational conflict. These needs include work environment, learning and development, career goals and aspirations.

### **Literature Review**

This study aims to find the attitudes and motivators of the latest generation of the incoming workforce, as well as their expectations from employers in a post COVID-19 world. It would be significant for organizations to assess these factors as this generation forms the biggest workforce cohort for them after the millennials. These factors will greatly affect the future performance and retention of this cohort at organizations, making it important to understand what matters to them and what organizations can do to maximize the potential and cultural cohesion of their multi-generational workforce. It is important for businesses to be ready with these assessments as this generation becomes the dominant generational force in the workplace. On applying the key takeaways from this study to various aspects in HR such as talent acquisition, retention strategy and culture, organizations can look at building a stronger, more sustainable workforce for the future.

A generation consists of people who were born during the same period of time and who were exposed to the same critical social events - they were impacted similarly by similar technologies and typically spent their lives under equitable conditions (McCrindle, 2018). This is what causes different generations to have differing needs and aspirations as well as different responsibilities when it comes to work (Harber, 2011).

Coming to the generation in focus, Generation Z has been defined using different cutoff years by different publications and researchers. The American Psychological Association starts Gen Z at the year 1997 (American Psychological Association, 2018), and publications such as The Wall Street Journal, The New York Times and The Harvard Business Review also subscribe to the same timeline. However,

psychologist Jean Twenge uses the year 1995 as a cutoff (Twenge, 2010). As do Deloitte (2020), Forbes (2020) and the BBC (2020). Roughly, Generation Z can be said to consist of people who grew up in an era of new and accelerated technological developments such as the availability of wireless internet access and high-bandwidth cellular service became commonplace. Typically, this generation has been seen as one which grew up with the Internet and is hence often referred to as the *Internet Generation* (Statistics Canada, 2011). They have also been called *Digital Natives*, owing to their comfort and ease with technology and their having adopted technological mediums such as text, voice, video and video telephony as their preferred means of communication. In the wake of the 2020 coronavirus pandemic outbreak and the industry wide changes that accompanied it, these means of communication had to be adopted by all the generations as the primary means of work as well as personal communication. In general, the competencies of this generation - including reading and critical thinking - have evolved and transformed greatly because of their acquaintance with digital platforms and text (Amiama- Espaillat and Mayor-Ruiz, 2017). Familiarity with technology from such a young age has separated their preferences for the type of work they prefer, their working and interaction styles with coworkers and managers as well as their attitudes towards the self. This kind of dependence on technology, or a 'digital bond' as Turner (2015) calls it, may be a factor which helps them to escape emotional and mental struggles faced offline or in real life.

When we look at existing literature on the generation's attitudes, they view themselves as being loyal, thoughtful, compassionate, open-minded, responsible and determined (Seemiller, 2016). The attitudes and outlook of this generation has been influenced greatly by various global political, cultural and economic events including but not limited to the 9/11 terrorist attacks, the Great Recession of 2007-2009 and now, the COVID-19 pandemic. These events have had significant psychological impacts on Gen Z, in particular the Great Recession which may have led to considerable stress during their formative years

due to the financial stresses faced by their parents. It has also instilled in them a desire for independence and an entrepreneurial spirit, after having witnessed their older siblings and parents struggle to make ends meet due to the Great Recession (Business Insider, 2015). It is not surprising then that this generation was found to be more fiscally conservative, money-oriented and pragmatic about money than their predecessors (Business Insider, 2015). Generation Z has also witnessed the peaking costs of higher education and the explosion in student loan debt. This may have led them to put more value in work experience than in higher education. Furthermore, the rise of entrepreneurs from the previous generation as well as the prevalence of start-up culture gives further encouragement to members of Generation Z to pursue entrepreneurship as opposed to a traditional nine to five corporate job. With easy access to resources such as social media platforms, drop shipping services and website building tools, Generation Z is fully equipped with the right tools to sell their ideas to a ready market. At the same time, they are aware about the extensive changes occurring in the job landscape. They understand that technical skills are already changing at an unprecedented rate and that their present job may not even exist in the next 10-20 years. This is why they are driven to acquire more skills on the job and learn more. They are comfortable with a self-directed and independent approach to learning (LinkedIn, 2018)

More recently, the COVID-19 pandemic has led to similar financial and job-related stresses on the generation, now struggling with temporary and permanent loss of employment as well as extensive disruption in the mode of work. While they were previously poised to enter a job market with high opportunities and low unemployment, they are now faced with the opposite scenario - the economic downturn caused by COVID-19 has in fact hurt Gen Z the worst of all, with nearly 16% working Gen Zers having lost jobs and having become susceptible to anxiety and depression due to the disruption caused by the pandemic (International Labour Organization, 2020). However, with work from home becoming a compulsion due to the pandemic, members of

this generation seem to have adapted quickly to the new norm despite all the fallouts and issues that have accompanied this change, indicating their adaptability and agility. Focusing on literature that deals with generational attitudes towards the workplace, research has shown that every generation has different attitudes towards their work and the workplace (CIPD, 2008; Harber J., 2011). So, it is no surprise that Generation Z has a remarkably different take on what work and the workplace means to them, when compared to their immediate predecessors and the generation before. While Gen Z shares millennials' desire to have jobs which they are passionate about (Business News Daily, 2020), they are more risk averse as a result of their experiences growing up. Hence, they are looking for jobs which offer security as well as sufficient avenues for growth and personal development. In fact, a majority of them have reported that they would rather have a stable job than one which they are passionate about - in stark contrast to the generation before them. A CNBC report revealed that 35% of Gen Z respondents planned to start saving for retirement in their 20's while 12% of them had already started saving, which further serves to enforce the notion that they are immensely concerned about their financial and job security.

While Millennials prefer managers who are positive, achievement oriented and provide structure (Murphy, 2007), Generation Z is looking for managers who are supportive, caring and make them feel known (Workforce Institute, 2019). For members of Generation Z flexibility, transparency and personal freedom are non-negotiable aspects of work. They expect to be informed and feel the need to be heard. However, some literature suggests not relying on generalisations regarding the generations, which are often overstated, but to work on having an HR strategy in place to manage any potential inter-generational conflicts which could arise (Kirton, 2014). When it comes to their teams or co-workers, Generation Z is keen on team members who are collaborators and are from diverse educational and cultural backgrounds. Being the most diverse generation to have existed till now, they appreciate and recognize the value of

diversity at the workplace and many of them see it as an important factor while choosing whether or not to work for an organization (Jenkins, 2020). One of the strongest expectations this generation has from the organization is the opportunity to learn multiple skills and take on multiple roles. As traditional career trajectories become a thing of the past, Gen Z is seeking work in setups which allow them to broaden their skill set and be more entrepreneurial. This ties in to the previously mentioned willingness to explore new learning opportunities and approaches to learning, making L&D an important aspect to consider for organizations looking to recruit Gen Zers. Given the current scenario wherein the threat of automation looms large over the entire workforce, there is an increased emphasis on lifelong learning - upskilling and reskilling - in order to stay relevant in the job market. This aspect most definitely impacts Gen Z's aspirations and work preferences.

### Research Methodology

**Primary Research** and analysis of the obtained data was the methodology used for this study.

A **qualitative questionnaire** was developed for Gen Zers who are currently employed, are currently students or have previously been employed. The questionnaire covered Motivators,, how they think their needs at the workplace differ from those of previous generations and what kind of benefits would make them want to continue at an organization - essentially how they perceive work and what they expect from the organization they would work at.

The sample consists of 97 present day Generation Z employees and students in India, many of whom quit full time work to pursue a postgraduate degree. For the questionnaire scale, a new scale was developed, which took elements from the personal inventory scale as well as some from the Minnesota Job Satisfaction scale. For analysis of the obtained responses from the participants, normal statistical analysis using non-parametric statistical tests, namely chi-square analysis and correlation.



### Results & Analysis

Some significant results were obtained in the course of the study. On studying the basic demographic profile of the respondents, we find the following:

**Table 1: Demographic characteristics**

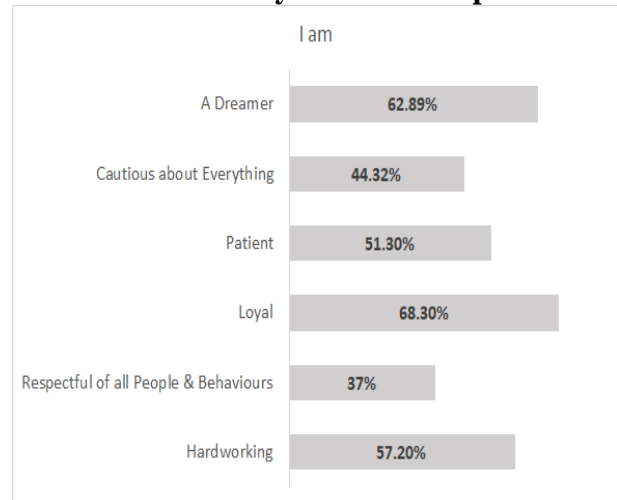
Gender	Frequency	Valid %
Male	56	57.8
Female	41	42.2
Total	97	100

Employment Status	Frequency	Valid %
Currently Employed	31	32.0
Student - Fresher	18	18.5
Student - Previously Employed	48	49.5
Total	97	100

Age Group	Frequency	Valid %
18-20	23	23.7
21-23	74	76.3
Total	97	100

Elaborating on some key takeaways from the tables, **57.8%** i.e. majority of the respondents were male while **42.2%** of the respondents were female. The age group of the respondents skews towards the 21-23 range, with **76.3%** of the respondents belonging to that age range. **32%** of the respondents are currently employed, **18.5%** are currently still completing their collegiate studies and have never been employed before, whereas **49.5%** of them were previously employed and are currently pursuing a master’s degree or its equivalent. Of the respondents who are currently employed or have been employed before, **67.8%** currently work or previously worked in the IT/ITES sector, **12.2%** currently work or have worked in the FMCG sector, **3%** are currently employed or have been employed before in the BFSI sector, while the remaining are currently employed in a other sectors which includes, but is not limited to Consulting, Entertainment, Media & Broadcasting, etc.

### Chart 1: Personality & Self-Perception

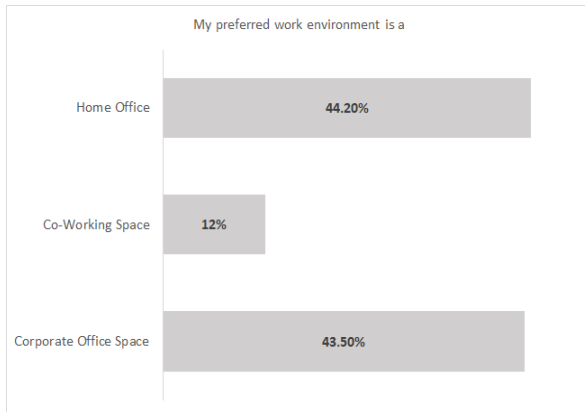


Coming to the responses from some pertinent questions of the questionnaire which related to their personality and perception of themselves, we can see that **57.2%** see themselves as being hardworking. Nearly **37%** agree or strongly agree that they are respectful of all people and behaviours but **40%** are neutral regarding this statement. About **51.3%** identify as being patient, while the other half of the respondents are neutral toward the statement or disagree with it. It is interesting to note that **62.89%** of the respondents identify themselves as being dreamers. **44.32%** also agree or strongly agree to the statement that they are cautious about everything.

### Chart 2: Factors influencing decision to work for an organization



A majority of the respondents chose work life balance (**61.6%**) and job stability/security over compensation as a crucial factor they look for before joining an organization. Job security as well as company culture rank high on the list of factors Generation Z considers before they choose to be employed in an organization.

**Chart 3: Work Environment Preference**

There is an almost even split between the preference for a home office and a corporate office when the work environment preferences for Generation Z are analyzed. A minority of them prefer co- working spaces also, however most would prefer to split their time between a home or corporate office.

On the basis of the questions which had been posed to the respondents in the questionnaire, the hypotheses are listed below:

**H1:** There is a significant statistical relationship between the respondents who see themselves as being dreamers and those who see work as a way to realize their dreams and potential.

**H2:** There is a statistically significant relationship between respondents who identify as being cautious and those who view their work as the means to a better future by securing economic stability and independence for themselves and their families.

**H3:** There is a significant statistical relationship between the respondents who view being open to new ideas and innovation as a major factor for success at work and those who see their work as a way to keep learning new things, improving and growing in their chosen field.

**H4:** The relationship between the respondents who identify as being cautious and those who view Medclaim/Health insurance and Retirement/PF/PPF benefits as non-negotiable benefits that an organization should provide to its employees is a statistically significant one.

**H5:** There is a statistically significant relationship between the respondents who view proper L&D and Training as a non-negotiable benefit/resource that an organization should provide to its employees and the respondents

who believe that the chance to acquire new skills by taking on new roles matters significantly to them when it comes to their workplace.

On conducting a chi-square test on the responses related to the aforementioned hypotheses, the following results were obtained. The crosstabulation for the same responses is provided in the appendix, its evaluation is elaborated upon in this section.

**H1:** Hypothesis H1 was statistically significant according to the chi-square test results which stated ( $p = .000$ ) with no missing cases. This proves that there is in fact a significant correlation between Gen Zers' who see themselves as being 'unrealistic' or 'dreamers' and those who see their work as a means to realize their dreams and potential. The correlation coefficient between the two parameters is 0.117, which suggests a relatively low but positive correlation. Furthermore,

68.04% of those who agree and strongly agree that work is a way to fulfill their dreams and potential, also agree and strongly agree that they are dreamers. It can be concluded that they have high aspirations for themselves and expect these aspirations to manifest into reality by means of their work.

**H2:** Hypothesis H2 was also accepted as being statistically significant by the chi-square test which stated ( $p = 0.008$ ) for the two cases. The correlation coefficient of 0.23 also suggests a positive correlation between the two aspects of the respondents. It proves that the relationship between Gen Z members who see themselves as being cautious and those who see their work as a means to secure economic stability and independence is a significant one. We can see that there is a high tendency for members of this generation to be cautious owing to various events in their formative years, and they proceed with this caution in their work life, looking to utilise their skills as a way to ensure an economically stable and financially independent future for themselves and their families.

**H3:** The hypothesis H3 was revealed to be statistically significant according to the results of the chi-square test. The significance value was stated as being ( $p = 0.000$ ) which substantiated the hypothesis that there is a

significant relationship between members from Gen Z who believe that being open to new ideas and innovation is a crucial factor for being successful at work and those who see work as a means to keep learning, improving and growing in their chosen field/career. It is evident that a majority of the members from this generation truly believe that openness to new ideas and innovation is the way to go if one wants to be successful in their chosen career. At the same time, they see their work as an extension of their learning journeys - giving further weight to the notion that they are proponents of being lifelong learners in order to stay relevant in the job market.

**H4:** The fourth hypothesis was accepted as statistically significant by the chi-square test with significance level ( $p = 0.007$ ). The test showed a significant relationship between Generation Z's tendency to be cautious and their need for crucial security benefits such as mediclaim/health insurance and retirement/PF benefits. In fact more respondents have strongly agreed that they would not work for an organization which does not offer these benefits to its employees than an organization which does not offer wellness benefits or student loan repayment assistance. It signifies that Generation Z places more emphasis on job security and learning opportunities than on other kinds of benefits which organizations provide. Generation Z is looking for security and stability, for themselves as well as for their families. The correlation coefficient of 0.307 between the two parameters confirms the positive relationship.

**H5:** The final hypothesis was also shown to bear a relationship which is significant according to the chi-square test, showing a significance level of ( $p = 0.000$ ) The final hypothesis focused on Generation Z's expectations from the organizations they are working at and their need for appropriate learning & development as well as training opportunities at these organizations is a non-negotiable one. **74.2%** of the respondents agree or strongly agree that they would be willing to leave if this benefit is not provided by the organization. The correlation between the two aspects further strengthens the fact that learning and development is a top priority for Generation Z, a sentiment which is echoed in

H3 as well. The key takeaway is that they are looking for the kind of organizations that allow them to be autonomous and give them the ownership for jobs that involve acquiring multiple skills by taking on multiple roles at work.

### Discussions & Recommendations

The findings revealed by the study mostly confirm the existing notions held regarding members of Generation Z in the workplace. The study overall provides some valuable pointers on what the incoming members of the workforce from this generation want from their work and the workplace, and how organizations could meet the same.

Contrary to popular belief, this generation values security and stability more than they value the amount of money they are able to make. They are also family oriented and more interested in the traditional security benefits such as mediclaim and PPF than 'new age' benefits such as wellness related benefits. They need more of these benefits in order to keep their families secure. They are also concerned about work life balance As far as their personal attitudes are concerned, they are patient and cautious, brimming with entrepreneurial spirit. A small portion also view work as a way for financial stability while they plan their entrepreneurial venture, but most of them view it as a way to achieve stability, security and independence, as well as a way to keep improving and growing in their chosen field.

Clearly, learning and development opportunities are of utmost priority to this generation. This, as stated before, is a necessity due to the competitive job market they have seen growing up as well as the job market which they are expecting to enter again once the economy starts recovering from the impact of the coronavirus pandemic.

In light of these findings, the following recommendations can be made for organizations to ensure that they can provide the employee experience that Generation Z expects from them:

- It would be prudent to provide a comprehensive and flexible benefits offering to Gen Z employees so that they can choose an optimum mix of security, healthcare and wellness benefits according to their own

preferences. While it is good to include new and innovative benefits such as mental health checks/days and counseling, student loan repayment assistance, etc. the most significant portion of the benefits offering should be dedicated to healthcare and security.

- If organizations did not already have a formal work from policy in place, they should look into having a defined work from policy going forward which would be applicable post the pandemic also, and would cover salient aspects such as the need for defined working hours when working from home, an appropriate allowance for setting up a home office, reimbursement/coverage of internet and electricity expenses and so on. This would be beneficial not just for existing employees but any new employees who could be hired on a remote basis in the future. Given the fact that freelance and gig workers are becoming more common than ever and with Generation Z following such models naturally, it will be a good addition for organizations to embrace as part of their policies.

The communication and management style which Generation Z would most appreciate is one that is transparent and caring. They want leaders who are open to their ideas as opposed to being dismissive of them because of their age or lack of experience. Generation Z wants clear expectations and empathy from their managers, so it would be appropriate to launch certain initiatives which promote two way dialogue with leadership as well as give them an understanding of what their role helps in accomplishing in the larger scheme of values and organizational goals/mission.

- Learning & Development opportunities should be abundant and if possible, customized to the needs of each employee. There are many platforms available for L&D which enable employees to choose their individual learning tracks as opposed to a standardized learning track common for all employees of a particular department. Organizations have already seen an increase in the usage of personalized learning platforms by their employees in the wake of the pandemic, this can be leveraged to revamp the current L&D systems for one that is more suited to the individual needs of employees.

- A hybrid work week model which

provides employees the flexibility to split their work week between home and office must be looked into. This would be a model which would allow employees to get downtime on their own to avoid burnout as well as keep the social aspect of the workplace intact. Various models such as a 4/10 or 9/80 work week can be looked at and piloted on the basis of the sector and type of workforce.

- The availability of the most appropriate digital technologies needed for work and communication is a must for Generation Z. They expect to have easy access to the right technology for communication (such as Slack, Microsoft Teams, etc.), collaboration (such as Trello) and productivity (Microsoft Office, Asana, etc.). They also expect that they will have access to the applications which will automate mundane or routine tasks. Organizations should have the right technology in place because Generation Z would be entering the workforce with a native understanding and preference for technology; they can drive digitization and automation of tasks even further, helping the organization optimize time and cost, as long as they have access to the right applications.

- Despite the preference for technology, Generation Z does not want to use it as a crutch and prefers face-to-face interaction, be it with their recruiters or their coworkers. They want positive relationships with their coworkers and a significant portion believe that collaboration is a key element of success at work. Organizations should attempt to keep the human element alive and promote the right blend of the human touch and technology.

### Conclusion

The world was in a constant state of change even before the COVID-19 pandemic. When it struck businesses and organizations, it forced them to adapt to a new way of working within a short time or perish. The changes brought in by organizations during this period will pave the way for their future, which will be highly digitized and automated and yet more connected than ever. This is a crucial juncture for organizations and a great time for them to rethink and revamp their existing practices and policies keeping in mind Generation Z, which will form a significant portion of their

workforce in the upcoming years. The observations made in this study and the recommendations suggested will enable organizations to anticipate, meet and even exceed the expectations of this generation, which is undoubtedly motivated by different things and are looking for different things from work than their predecessors were. Future managers and recruiters of Generation Z employees should keep these pointers in mind when evaluating future prospects and restructuring their organizations for a better future.

**Limitations**

The study is limited by the type of respondents who participated in the survey. A majority of the respondents are currently students from a business school who have worked previously but are currently pursuing a postgraduate degree in management. Hence, their aspirations and attitudes will tend to be roughly similar. The study can be further extended to include the attitudes of the same set of respondents once they re-enter the workforce in the post-COVID 19 era.

**Appendix A**

**A1. Cross Tabulation for H1**

<b>I am a Dreamer * Work is a way to Fulfill my Dreams and Potential Cross Tabulation</b>								
			<b>Work is a way to fulfill my dreams and potential</b>					<b>Total</b>
			<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>	<b>Strongly Agree</b>	
<b>I am a Dreamer</b>	<b>Disagree</b>	Count	0	5	6	5	3	19
		Expected Count	1.4	5.7	4.7	5.3	2	19
		Residual	-1.4	-0.7	1.3	-0.3	1	
	<b>Neutral</b>	Count	6	4	4	3	0	17
		Expected Count	1.2	5.1	4.2	4.7	1.8	17
		Residual	4.8	-1.1	-0.2	-1.7	-1.8	
	<b>Agree</b>	Count	0	20	12	16	3	51
		Expected Count	3.7	15.2	12.6	14.2	5.3	51

		Residual	-3.7	4.8	-0.6	1.8	-2.3	
	Strongly Agree	Count	1	0	2	3	4	10
		Expected Count	0.7	3	2.5	2.8	1	10
		Residual	0.3	-3	-0.5	0.2	3	
Total		Count	7	29	24	27	10	97
		Expected Count	7	29	24	27	10	97

**A2. Cross Tabulation for H2**

			I see work as a way to economic stability, independence and better future					Total
			Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	
<b>I am cautious about everything</b>	Strongly Disagree	Count	1	3	11	1	2	18
		Expected Count	0.2	1.9	10.2	2.8	3	18
		Residual	0.8	1.1	0.8	-1.8	-1	
	Disagree	Count	0	2	19	2	0	23
		Expected Count	0.2	2.4	13	3.6	3.8	23
		Residual	-0.2	-0.4	6	-1.6	-3.8	
	Neutral	Count	0	0	5	5	3	13
		Expected Count	0.1	1.3	7.4	2	2.1	13
		Residual	-0.1	-1.3	-2.4	3	0.9	
	Agree	Count	0	4	7	4	9	24
		Expected Count	0.2	2.5	13.6	3.7	4	24
		Residual	-0.2	1.5	-6.6	0.3	5	
Strongly Agree	Count	0	1	13	3	2	19	

	Expected Count	0.2	2	10.8	2.9	3.1	19
	Residual	-0.2	-1	2.2	0.1	-1.1	
Total	Count	1	10	55	15	16	97
	Expected Count	1	10	55	15	16	97

**A3. Cross Tabulation for H3**

**Being open to new ideas and innovation is crucial to success at work\* For me work is a way to keep learning new things and growing in my chosen field**  
**Cross Tabulation**

		For me work is a way to keep learning new things, improving and growing in my chosen field					
			Disagree	Neutral	Agree	Strongly Agree	Total
<b>Being open to new ideas and innovation is crucial to success at work</b>	Strongly Disagree	Count	2	2	0	0	4
		Expected Count	0.2	0.9	1.7	1.2	4
		Residual	1.8	1.1	-1.7	-1.2	
	Disagree	Count	0	3	0	7	10
		Expected Count	0.5	2.2	4.2	3.1	10
		Residual	-0.5	0.8	-4.2	3.9	
	Neutral	Count	0	5	4	5	14
		Expected Count	0.7	3	5.9	4.3	14
		Residual	-0.7	2	-1.9	0.7	
	Agree	Count	0	5	29	15	49
		Expected Count	2.5	10.6	20.7	15.2	49
		Residual	-2.5	-5.6	8.3	-0.2	
Strongly Agree	Count	3	6	8	3	20	

	Expected Count	1	4.3	8.5	6.2	20
	Residual	2	1.7	-0.5	-3.2	
Total	Count	5	21	41	30	97
	Expected Count	5	21	41	30	97

**A4. Cross Tabulation for H4**

I am cautious about everything * Mediclaim & PF/PPF is a crucial benefit for me Cross Tabulation								
			Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
I am cautious about everything	Strongly Disagree	Count	2	4	5	0	7	18
		Expected Count	2	1.5	4.1	2.4	8	18
		Residual	0	2.5	0.9	-2.4	-1	
	Disagree	Count	4	2	8	3	6	23
		Expected Count	2.6	1.9	5.2	3.1	10.2	23
		Residual	1.4	0.1	2.8	-0.1	-4.2	
	Neutral	Count	0	2	2	2	7	13
		Expected Count	1.5	1.1	2.9	1.7	5.8	13
		Residual	-1.5	0.9	-0.9	0.3	1.2	
	Agree	Count	5	0	7	4	8	24
		Expected Count	2.7	2	5.4	3.2	10.6	24
		Residual	2.3	-2	1.6	0.8	-2.6	
	Strongly Agree	Count	0	0	0	4	15	19
		Expected Count	2.2	1.6	4.3	2.5	8.4	19
		Residual	-2.2	-1.6	-4.3	1.5	6.6	
Total		Count	11	8	22	13	43	97
		Expected Count	11	8	22	13	43	97

**A5. Cross Tabulation for H5**



Proper L&D and Training interventions are a crucial benefit for me * Acquiring new skills by taking on different roles matters to me most at work			The chance to acquire new skills by taking on different roles matters to me most at work					Total
			Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	
Proper L&D and Training interventions are a crucial benefit for me	Disagree	Count	4	3	0	3	0	10
		Expected Count	0.4	1.3	1.6	2	4.6	10
		Residual	3.6	1.7	-1.6	1	-4.6	
	Neutral	Count	0	6	5	4	0	15
		Expected Count	0.6	2	2.5	2.9	7	15
		Residual	-0.6	4	2.5	1.1	-7	
	Agree	Count	0	4	11	5	40	60
		Expected Count	2.5	8	9.9	11.8	27.8	60
		Residual	-2.5	-4	1.1	-6.8	12.2	
	Strongly Agree	Count	0	0	0	7	5	12
		Expected Count	0.5	1.6	2	2.4	5.6	12
		Residual	-0.5	-1.6	-2	4.6	-0.6	
		Count	4	13	16	19	45	97
		Expected Count	4	13	16	19	45	97

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## WILL CONSUMER PSYCHE MUTATE WITH PANDEMIC - CONSUMER INSIGHTS WITH ARTIFICIAL INTELLIGENCE

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### ABSTRACT

*Pandemic has influenced consumer behaviour, by ways that will spur Artificial Intelligence and its development and advancement. As consumer's psyche has changed and has compelled for purchasing progressively online to maintain a strategic distance from the new dangers of shopping in stores, they are giving dealers more information on inclinations and shopping propensities.*

*Artificial Intelligence is a wide-going tool that empowers individuals to re-evaluate how to coordinate data, examine information, and utilize the subsequent bits of knowledge to improve and it is changing all social statuses. The pandemic has brought life to a standstill. The adverse effect of this situation has a great amount of impact on the way consumers would now think, buy and behave through*

*their mutation in the Consumer behaviour. The purpose of this study is to understand the consumer insights through Artificial Intelligence. The objective is to understand if this consumer psyche mutation will continue in the same way. This will also mutate the Mall hopping behaviour which consumers had ever since the Organized Retailing emerged. The methodology that would be adopted for this study Comprised of Primary and Secondary data. The methodology adopted was content and literature on the topic along with a structured questionnaire to arrive at detailed analysis. EFA is carried out along with Principal Component analysis through the analysis*

**Keywords:** *Pandemic, Online shopping, Mutation, Consumer psyche, Artificial Intelligence*

### Introduction

AI innovations and devices play a key role in each part of the COVID-19 emergency reaction understanding the infection and quickening clinical exploration on medications and medicines distinguishing and diagnosing the infection, and foreseeing its development helping with forestalling or easing back the infection's spread through reconnaissance and contact following reacting to the wellbeing emergency through customized data and learning checking the recuperation and improving early admonition devices.

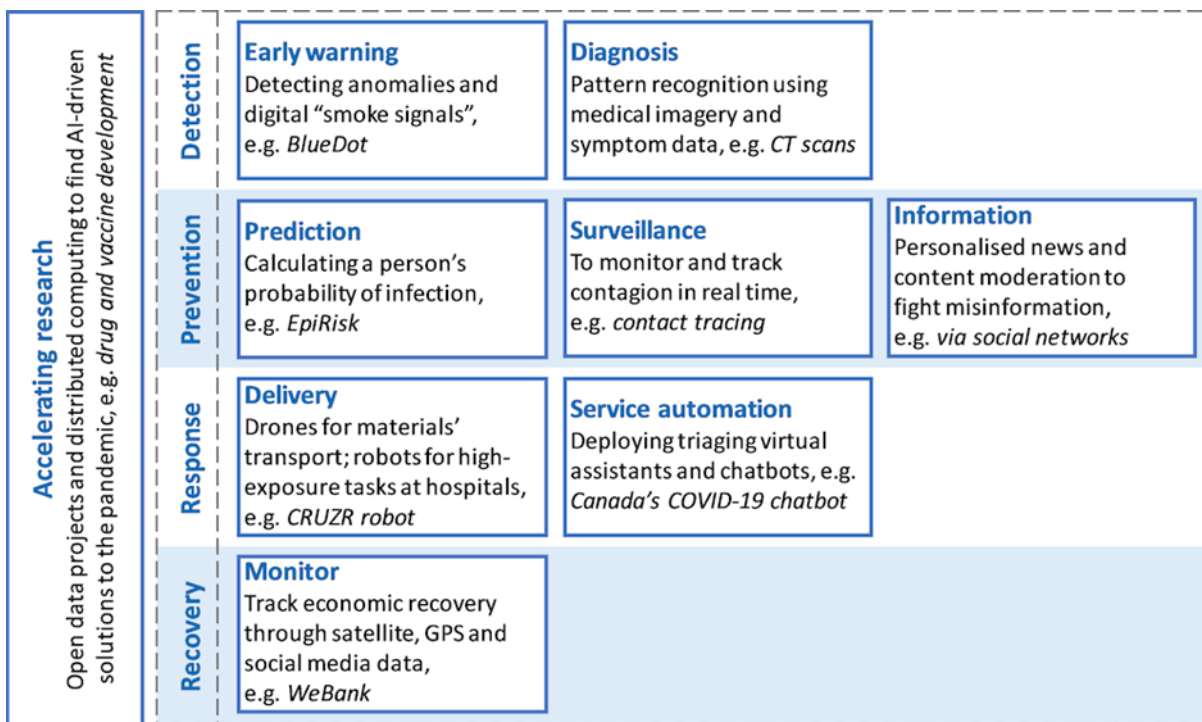
Man-made consciousness has demonstrated its value in this season of emergency. The innovation is probably the best officer the world would ever get in the battle against coronavirus. Computer based intelligence alongside its subsets is utilizing critical advancement over the social insurance segment and others too to win against the pandemic. The authorities and government specialists are identifying individuals who are not wearing a mask or protection gear which is very basic in the present time, Artificial Intelligence (AI), Natural Language Processing (NLP) powers

talk projects to help distinguish the episode in the underlying stages. NLP, also, is driving checking endeavours so as to limit the infection spread.

To help encourage the utilization of AI all through the emergency, strategy producers ought to energize the sharing of clinical, sub-atomic, and logical datasets and models on communitarian stages to help AI specialists fabricate viable apparatuses for the clinical network, and ought to guarantee that scientists approach the fundamental processing limit.

### Artificial intelligence to Addressing the challenges of The corona virus

To understand the full guarantee of AI to battle COVID-19, arrangement creators must guarantee that AI frameworks are reliable and lined up. They should regard human rights and protection; be straightforward, reasonable, powerful, secure and safe; and entertainers associated with their turn of events and utilize ought to stay responsible.



**Figure 1. Examples of AI applications at different stages of the COVID-19 crisis**  
 source: oced.org

Utilizing AI to help identify, analyse and forestall the spread of the coronavirus. Early Warning research utilizing AI to comprehend and treat COVID-19 Simulated intelligence apparatuses and methods can support policymakers and the clinical network comprehend the COVID-19 infection and quicken research on medicines by quickly examining enormous volumes of exploration information. Computer based intelligence text and information mining instruments can reveal the infection's history, transmission, and diagnostics, the board measures, and exercises from past pandemics.

Profound learning models can help foresee old and new medications or medicines that may treat COVID-19. A few establishments are utilizing AI to distinguish medicines and create model antibodies. DeepMind and a few different associations have utilized profound figuring out how to foresee the structure of proteins related with SARS-CoV-2, the infection that causes COVID-19. Devoted stages or fora permit the union and sharing of multidisciplinary ability on AI, including universally. The US government for instance has started an exchange with worldwide government science pioneers that incorporates utilizing AI to quicken examination of coronavirus writing made accessible.

Access to datasets in the study of disease transmission, bioinformatics and atomic demonstrating is being given, for example through the COVID-19 Open Research Dataset Challenge by the US government and accomplice associations that makes accessible more than 29 000 scholarly examination articles for coronavirus and COVID-19. Figuring power for AI is additionally being made accessible by innovation organizations, for example, IBM, Amazon, Google and Microsoft; people giving PC preparing power (for example Folding@home); and by open private endeavours like the COVID-19 High Performance Computing Consortium and AI for Health.

Inventive methodologies including prizes, open-source coordinated efforts, and hackathons, are quickening research on AI-driven answers for the pandemic. For instance, the United Kingdom's "CoronaHack – AI versus Covid-19" looks for thoughts from organizations, information researchers and biomedical specialists on utilizing AI to control and deal with the pandemic.

Significance of AI to help recognize, analyse and forestall the spread of the coronavirus AI can likewise be utilized to help distinguish, analyse and forestall the spread of the infection. Calculations that distinguish examples and oddities are as of now attempting

to recognize and foresee the spread of COVID-19, while picture acknowledgment frameworks are accelerating clinical determination. Computer based intelligence fuelled early admonition frameworks can help recognize epidemiological examples by mining standard news, online substance and other data diverts in various dialects to give early alerts, which can supplement syndromic observation and other human services systems and information streams (for example WHO Early Warning System, Bluedot). Artificial intelligence devices can help recognize infection transmission chains and screen more extensive monetary effects. In a few cases, AI advancements have shown their capability to surmise epidemiological information more quickly than conventional revealing of wellbeing information. Foundations, for example, Johns Hopkins University and the OECD (oecd.ai) have likewise made accessible intelligent dashboards that track the infection's spread through live news and constant information on affirmed coronavirus cases, recuperations, and spread.

Fast conclusion is critical to constrain infection and comprehend the ailment spread. Applied to pictures and manifestation information, AI could help to quickly analyse COVID-19 cases. Consideration must be given to gathering information illustrative of the entire populace to guarantee versatility and exactness. Constraining infection is a need in all nations and AI applications are forestalling the infection's spread.

Various nations are utilizing populace observation to screen COVID-19 cases. For instance, in Korea calculations use geolocation information, reconnaissance camera film and Visa records to follow coronavirus patients. China appoints a hazard level by shading code - red, yellow or green to every individual showing disease chance utilizing mobile phone programming. While AI models use travel, instalment, and correspondences information to foresee the area of the following episode, and advise fringe checks, web search tools and web-based social networking are likewise assisting with following the infection progressively.

Numerous nations, including Austria, China, Israel, Poland, Singapore and Korea have set

up contact following frameworks to recognize conceivable contamination courses. In Israel, for instance, geolocation information was utilized to distinguish individuals coming into close contact with known infection transporters, and send them instant messages guiding them to segregate themselves right away. Semi-self-sufficient robots and automatons are being sent to react to quick needs in emergency clinics, for example, conveying food and prescriptions, cleaning and cleansing, supporting specialists and medical caretakers, and performing conveyances of hardware.

### Objectives

Understand the change in Consumer buying patterns in Pandemic

Assess role of Artificial Intelligence with relation to consumer insights

How AI can help the reaction to the emergency,

and the recuperation to follow

Conversational and intelligent AI frameworks help react to the well-being emergency through customized data, exhortation and treatment, and learning. To battle deception – the COVID-19 "infodemic"- interpersonal organizations and web crawlers are utilizing customized AI data and instruments and depending on calculations to discover and expel risky material on their foundation. Remote helpers and chatbots have been sent to help medicinal services associations, for instance in Canada, France, Finland, Italy, the United States and by the American Red Cross. These apparatuses help to triage individuals relying upon the nearness of side effects. The United States' Center for Disease Control and Prevention and Microsoft have built up a coronavirus self-checker administration to help clients self-evaluate COVID-19 and recommend a game-plan.

Recognizing, finding and reaching powerless, high-chance, people. Medical Home Network, a Chicago-based non-benefit, has actualized an AI stage to distinguish Medicaid patients most in danger from COVID-19 dependent on danger of respiratory intricacies and social detachment. Artificial intelligence may in the long run assume a job in quickening preparing and instruction of human services work force.

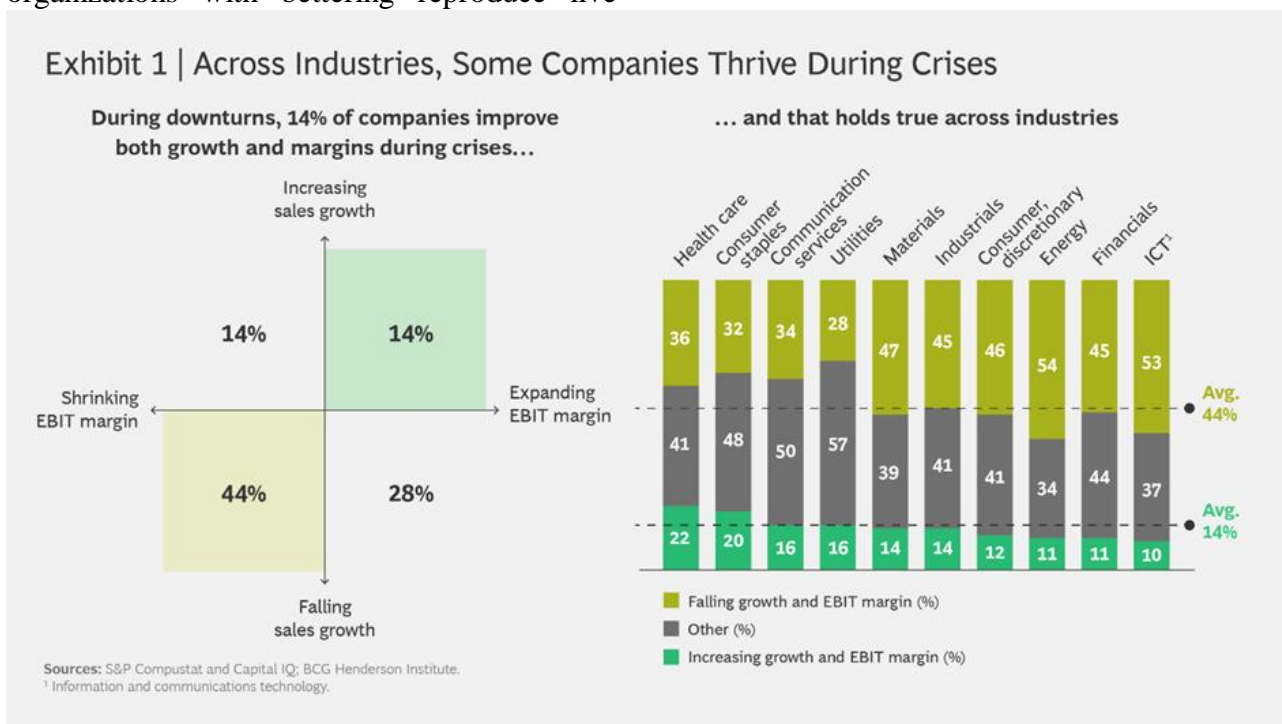
At last, AI instruments can help screen the monetary emergency and the recuperation- by means of satellite, long range interpersonal communication and other information. Google's Community Mobility Reports can gain from the emergency and construct early admonition for future episodes.

**Theoretical Background and Understanding the Significance of AI**

The use of man-made consciousness will be monstrously important in helping organizations adjust to these patterns. Propelled robots that can perceive articles and handle undertakings that recently required people will advance the activity of industrial facilities and different offices all day, every day, in more areas and with little included expense. Artificial intelligence empowered stages will assist organizations with bettering reproduce live

workplaces and make on-request work powers. Through AI and propelled information examination, AI will assist organizations with distinguishing new utilization designs and convey "hyperpersonalized" items to online clients. The best use cases will be those that consistently consolidate AI with human judgment and experience.

A few organizations that are on the cutting edge of these patterns and have just started the AI excursion will flourish in the post-COVID world. Once more, history gives a guide: during the four past worldwide monetary downturns, 14% of organizations were really ready to increment the two deals development and net revenues, as per Boston Consulting Group research. Most of organizations, in any case, are at the beginning phases of the excursion—or presently can't seem to start.



Source: BCG analysis

Achievement won't be simple. A few organizations have just propelled AI use cases that will be useful in the current emergency. The test will be proportional them up. Those that improve ready to explore dubious gracefully and request, acclimate to disturbances in tasks and flexibly chains, designate their workforces, and adjust to sharp changes in purchaser certainty and needs. Advanced locals

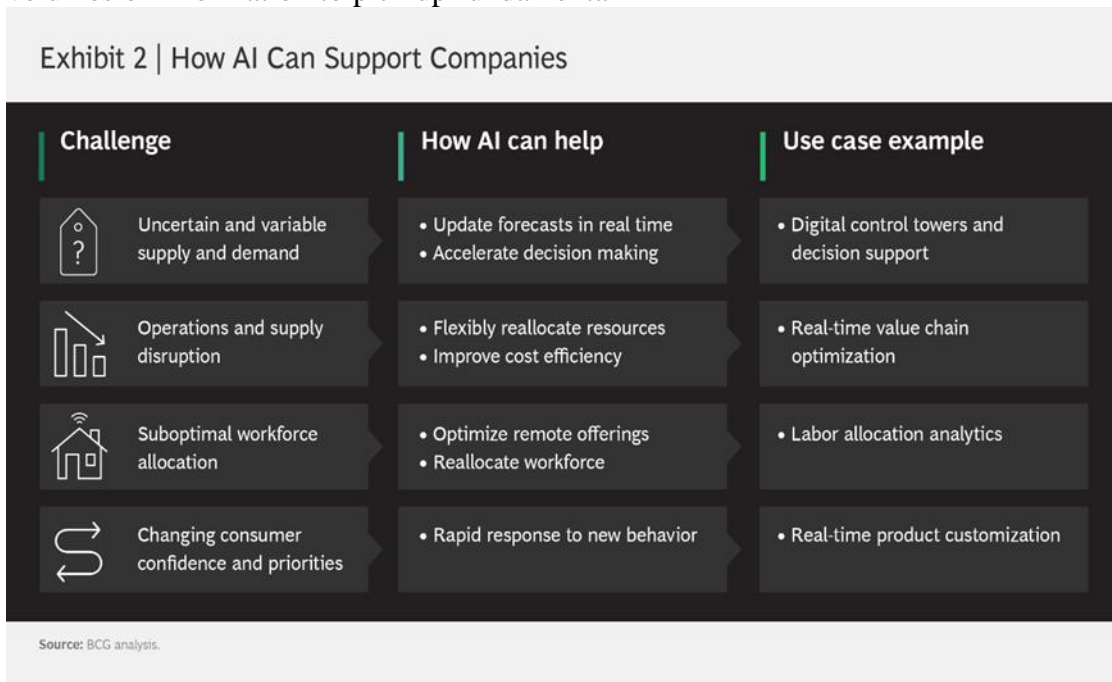
may have an underlying edge. Different organizations should act rapidly to obtain the abilities, capacities, and methods of working expected to start the AI venture. Yet, paying little mind to their beginning stage, organizations must look past the COVID-19 emergency and start concentrating on changes that put AI at their centre.

### Why Ai will be a Must in the Post-Covid World

Most organizations as of now have broad involvement in advanced applications, for example, robotization and essential information examination. In any case, AI, which empowers machines to take care of issues and take activities that in the past must be finished by people, goes a long way past that. Man-made intelligence instruments examine gigantic volumes of information to pick up fundamental

examples, empowering PC frameworks to settle on complex choices, anticipate human conduct, and perceive pictures and human discourse, among numerous different things. Computer based intelligence empowered frameworks additionally ceaselessly learn and adjust.

These abilities will be gigantically significant as organizations go up against and adjust to the new truth of the current emergency and its consequence.



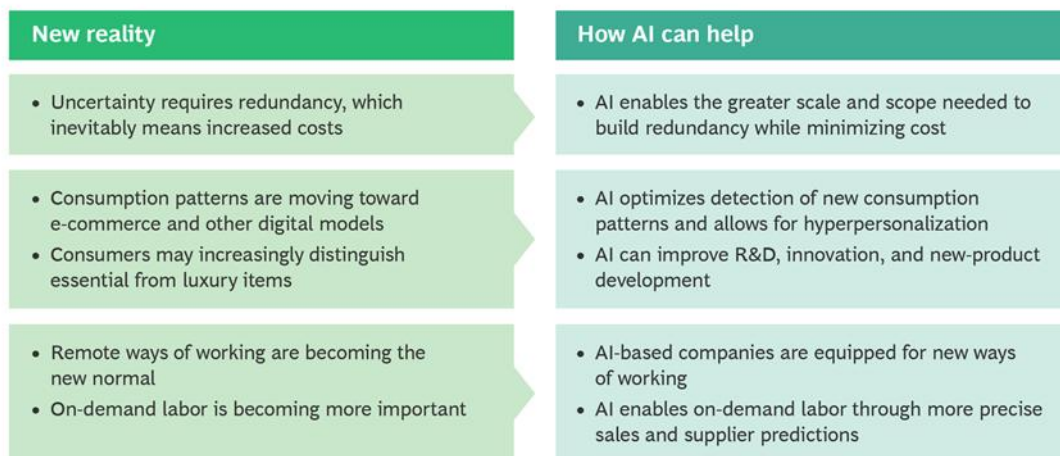
Source: BCG analysis

This new reality will essentially affect organizations' costs, income, and working models. Beneath we survey how the worldwide business scene is changing along three measurements—esteem

chain repetition, moving utilization examples, and far off methods of working—and the job that AI can play in empowering organizations to flourish and hold onto upper hand in this new condition.



## Exhibit 3 | The COVID-19 Crisis Is Accelerating the Shift to a New Reality



Source: BCG analysis.

Source: BCG analysis

**A. Types of Artificial Intelligence**

At an exceptionally significant level computerized reasoning can be part into two expansive sorts: limited AI and general AI. Thin AI is the thing that we see surrounding us in PCs today: clever frameworks that have been instructed or figured out how to complete explicit errands without being unequivocally modified how to do as such. This kind of machine knowledge is obvious in the discourse and language acknowledgment of the Siri menial helper on the Apple iPhone, in the vision-acknowledgment frameworks on self-driving vehicles, in the proposal motors that recommend items you may like dependent on what you purchased before. In contrast to people, these frameworks can just learn or be instructed how to do explicit undertakings, which is the reason they are called restricted AI.

**Defining Narrow AI**

There are countless rising applications for restricted AI: deciphering video takes care of from drones doing visual investigations of framework, for example, oil pipelines, arranging individual and business schedules, reacting to straightforward client assistance inquiries, co-ordinating with other savvy frameworks to do errands like booking a lodging at an appropriate time and area, helping radiologists to spot expected tumours in X-beams, hailing improper substance web

based, recognizing mileage in lifts from information assembled by IoT gadgets, the rundown continues forever.

**Defining General AI**

Counterfeit general knowledge is altogether different, and is the sort of versatile acumen found in people, an adaptable type of insight fit for figuring out how to do immeasurably various assignments, anything from haircutting to building spreadsheets, or to reason about a wide assortment of themes dependent on its amassed understanding. This is such an AI all the more usually found in motion pictures, any semblance of HAL in 2001 or Skynet in The Terminator, however which doesn't exist today and AI specialists are wildly separated over how soon it will end up being a reality.

**Execution of AI**

An overview directed among four gatherings of specialists in 2012/13 by AI analysts Vincent C Müller and rationalist Nick Bostrom revealed a 50 percent chance that Artificial General Intelligence (AGI) would be created somewhere in the range of 2040 and 2050, ascending to 90 percent by 2075. The gathering went considerably further, anticipating that alleged 'genius' - which Bostrom characterizes as "any astuteness that significantly surpasses the subjective exhibition of people in for all intents and purposes all areas of intrigue" - was normal somewhere in the range of 30 years after the accomplishment of AGI. All things considered, some AI specialists accept such projections are uncontrollably hopeful given

our restricted comprehension of the human cerebrum, and accept that AGI is still hundreds of years away.

### **B. Ways to Combat Corona with AI**

Man-made consciousness is having an influence in each phase of the COVID-19 pandemic, from anticipating the spread of the novel coronavirus to driving robots that can supplant people in clinic wards. That is as indicated by Oren Etzioni, CEO of Seattle's Allen Institute for Artificial Intelligence (AI2) and a University of Washington software engineering teacher. Etzioni and AI2 senior right hand Nicole DeCario have come down AI's job in the current emergency to three quick applications: Processing a lot of information to discover medicines, decreasing spread, and rewarding sick patients.

Artificial Intelligence is assuming various jobs, which are all significant dependent on where we are in the pandemic cycle," as per GeekWire in an email. "In any case, imagine a scenario where the infection could have been contained. Canadian wellbeing observation start-up BlueDot was among the first on the planet to precisely recognize the spread of COVID-19 and its hazard, as indicated by CNBC. In late December, the start-up's AI programming found a group of unordinary pneumonia cases in Wuhan, China, and anticipated where the infection may go straightaway.

"Envision the quantity of lives that would have been spared if the infection spread was moderated and the worldwide reaction was activated sooner," Etzioni and DeCario said.

### **C. Can AI carry analysts more like a fix?**

The best thing computerized reasoning can do now is assist analysts with scouring through the information to discover possible medicines, the two included. The COVID-19 Open Research Dataset (CORD-19), an activity expanding on Seattle's Allen Institute for Artificial Intelligence (AI2) Semantic Scholar venture, utilizes regular language handling to break down countless logical exploration papers at an uncommon pace. "Semantic Scholar, the group behind the CORD-19 dataset at AI2, was made on the theory that remedies for some, ills live covered in logical writing," Oren and DeCario said. "Writing based revelation can possibly

advise antibody and treatment advancement, which is a basic subsequent stage in the COVID-19 pandemic."

PC models outline tainted cells

Coronaviruses attack cells through "spike proteins," yet they take on various shapes in various coronaviruses. Understanding the state of the spike protein in SARS-Cov-2 that causes coronavirus is critical to making sense of how to focus on the infection and create treatments. Many examination papers identified with spike proteins are in the CORD-19 Explorer to all the more likely assist individuals with understanding existing exploration endeavours. It has been a couple of months since COVID-19 initially showed up in a fish and-live-creature showcase in Wuhan, China. Presently the infection has crossed fringes, tainting more than one million individuals around the world, and researchers are scrambling to discover an immunization. "This is one of those occasions where I wish I had a gem ball to see the future," Etzioni said of the probability of AI carrying specialists more like an antibody. "I envision the antibody engineers are utilizing all instruments accessible to move as fast as could reasonably be expected. This is, for sure, a race to spare lives." In excess of 40 associations are building up a COVID-19 immunization, including three that have made it to human testing.

Aside from immunizations, a few researchers and pharmaceutical organizations are cooperating to create treatments to battle the infection. A few medicines incorporate utilizing antiviral remdesivir, created by Gilead Sciences, and the counter jungle fever sedate hydroxychloroquine.

Man-made intelligence's mission to confine human communication

Constraining human cooperation pair with Washington Gov. Jay Inslee's compulsory stay-at-home request is one way AI can help battle the pandemic, as indicated by Etzioni and DeCario.

Individuals can arrange goods through Alexa without venturing foot inside a store. Robots are supplanting clinicians in emergency clinics, sterilizing rooms, give telehealth administrations, and process and examine COVID-19 test tests. An InTouch Vici telehealth machine like the one rewarding a

patient in Everett, Wash. Specialists even utilized a robot to treat the principal individual determined to have COVID-19 in Everett, Wash., as indicated by the Guardian. Dr. George Diaz, the segment head of irresistible maladies at Providence Regional Medical Centre, told the Guardian he worked the robot while sitting outside the patient's room.

The robot was furnished with a stethoscope to take the patient's vitals and a camera for specialists to speak with the patient through an enormous video screen. Robots are one of numerous ways clinics around the globe keep on diminishing danger of the infection spreading. Simulated intelligence frameworks are helping specialists recognize COVID-19 cases through CT sweeps or x-beams at a fast rate with high exactness. Bright.md is one of numerous new businesses in the Pacific Northwest utilizing AI-fuelled virtual social insurance programming to assist doctors with rewarding patients all the more rapidly and proficiently without having them really step foot inside an office.

Two Seattle new companies, MDmetrix and TransformativeMed, are utilizing their advancements to help emergency clinics the country over, including University of Washington Medicine and Harborview Medical Centre in Seattle. The organizations' product assists clinicians with bettering see how patients ages 20 to 45 react to specific medicines versus more established grown-ups. It likewise checks the normal timespan between individual to-individual versus network spread of the illness. The Centres for Disease Control and Prevention utilizes Microsoft's HealthCare Bot Service as a self-screening apparatus for individuals pondering whether they need treatment for COVID-19.

### **Review of literature**

According to Anyanwu (1993: 131), consumer behaviour is the problem solving activities undertaken by a consumer with a view to reducing purchase related risks while enhancing satisfaction by buying the right goods and services.

It could also be described as how people decide to spend their available resource that is their money, credit, time and effort. They spend these resources to accumulate experiences in

the form of product, services and ideas with the hopes of satisfying their needs and possibly making themselves happier in the process.

The consumer tries to attain maximum satisfaction from every action of his income spent (Kalu: 1998, P. 207). The study of the consumer focuses on what products or services one purchase, why he purchase them, where he purchase them, how he uses them, how frequently he purchase them and who influences his purchase (Marcus et al: 1980., P. 39). Every effort is targeted to identifying the customer and his needs. But it takes a great deal of insight to know what they desire (The customer).

Gupta (2006, P. 176) defined consumer behaviour "as a study of a complex of those factors which resulted in particular buying decisions of consumers based on rationality, emotions or compulsion.

Further to this, consumer behaviour is likely to reveal whether target consumers of the enterprise emphasize more on the price of the product or its quality. On this basis, suitable pricing strategies and programmers aimed at upgrading the quality of organizations products to suit the needs, habits and behaviour of consumer will be put in place. Consumer decision making process varies from consumer to consumer and from product to product. It may vary in length of time required. According to Onah et al (2004, P. 80), consumer decision making is a problem solving process which presumes that the consumer goes through phases in undertaking a decision.

Man-made intelligence is universal today, used to suggest what you should purchase next on the web, to comprehend what you state to remote helpers, for example, Amazon's Alexa and Apple's Siri, to perceive who and what is in a photograph, to spot spam, or identify charge card misrepresentation.

On December 31, 2019, the China Health Authority alarmed the World Health Organization (WHO) to a few instances of pneumonia of obscure etiology in Wuhan City in Hubei Province in focal China. The cases had been accounted for since December 8, 2019, and numerous patients worked at or lived around the nearby Huanan Seafood Wholesale Market albeit other early cases had no presentation to this market. On January 7, a

novel coronavirus, initially shortened as 2019-nCoV by WHO, was recognized from the throat swab test of a patient. This pathogen was later renamed as serious intense respiratory disorder coronavirus 2 (SARS-CoV-2) by the Coronavirus Study Group and the illness was named coronavirus ailment 2019 (COVID-19) by the WHO. As of January 30, 7736 affirmed and 12,167 speculated cases had been accounted for in China and 82 affirmed cases had been recognized in 18 different nations. Around the same time, WHO proclaimed the SARS-CoV-2 flare-up as a Public Health Emergency of International Concern (PHEIC). Unpleasant life occasions bring about commencement, increase or changes in utilization propensities in an exertion to deal with the pressure (Mathur, Moschis, and Lee 2003). Hazard loath utilization conduct has been seen after enormous scope occasions, for example, fear based oppression (9/11) and its effect on the aircraft industry and the travel industry around the world; tidal waves in Thailand, Indonesia and all the more as of late in Japan; tremors in Haiti, Japan and New Zealand; significant floods and demolition in New Orleans also, Queensland; pandemics, for example, SARS, the H1N1 infection; fierce blazes in California and Victoria (Fortin and Uncles 2011).

Cataclysmic events, including those regular occasions we anticipate every year (e.g., typhoons, tornadoes, out of control fires, and floods), have come about a downturn in monetary action (Fortin and Uncles 2011) and changes in utilitarian and libertine shopping thought processes both during and after the occasion (Larson and Shin 2018). Utilitarian thought processes in buy incorporate restocking necessities, recharging things, supplanting things harmed by storms though decadent reasons incorporate the quest for opportunity, to challenge fatigue, celebrate the finish of the tempest and to revive with family what's more, companions (Larson and Shin 2018, 302–303). A three-section study directed post-Hurricane Katrina (United States 2005) recommends that shopper practices changed both during the quick progress after the tempest and years after the fact (Kennett-Hensel, Sneath, and Lacey 2012). Discoveries propose that expanded securing

and purchasing exhibited following the occasion was trailed by diminished utilization in the long haul; with certain respondents showing they were done willing to over-expend, less liable to overspend.

Regarding COVID-19, or the novel coronavirus-19, the general masses of every nation responded inside approximately fourteen days of staying alert of the infection's essence in their nation, to start a stock-up attitude. As this mind-set of readiness kicked in, the accompanying classifications turned into a need: clinical supplies, scouring liquor, antibacterial wipes, emergency treatment units, disinfectants, cold and influenza cures, and hack cures (Nielsen 2020). With numerous clients feeling "found napping", it could be viewed as a pre-cursor to things that will be kept in prepared flexibly by the populace later on. As the populace fulfilled crisis wellbeing supplies, the purchasing designs went to wash room stock-up. The accompanying classifications saw the best gains in deals: powdered milk, dried beans, canned meat, chick peas, rice, fish, dark beans, bread blend, water, and pasta (Ibid). As the populace filled storerooms with rack stable items that could be both named as filling and prepared when required (as restricted to new foods grown from the ground and new meats). In equal, these things are like the storeroom stacking things during war time. As nations have advanced into "another ordinary", numerous examples of conduct have changed, for example, utilizing online for food conveyances, increasingly close to home separation than already, and a move to less sharing of food, attire, and any things where an infection can be transmitted.

As observed from the war time age of both World War I and II, the accomplice living through that time commonly had a "stock up" mind-set that was viewed as "antiquated" by Millennials also, Centennials, who will in general have the thought fundamental food supplies will consistently be promptly accessible. Work deficiencies, lockdown gridlock, shut ports, and accumulating made gracefully shortages not recently observed in created nations. In this sense, it is possible the COVID-19 accomplice will come back to the act of wash room

stacking what's more, keeping up a stock of clinical supplies what's more, rack stable arrangements, having seen stock disturbances during the pandemic of 2020.

As indicated by Nielsen, the move to web based buying of food is one that will probably stay at a higher percent of the populace than before the pandemic (Nielsen 2020). It will be possible any items and administrations which included "high contact" or nearness to others will be forever affected by the pandemic.

Gaps identified through review of Literature: Though there is much research done on the Pandemic and Consumer behaviour, not many papers discuss on the aspect of Consumer psyche per se and ways of combating it with use of technology, Artificial Intelligence. The current study has identified this gap and attempts are made to address this.

**Methodology**

The methodology comprised of Primary data and Secondary data. Primary data was collected through a structured questionnaire to understand the psyche of consumers with the Pandemic. The role of AI in understanding these consumer insights has been highlighted.

To find out the perception of respondents towards Pandemic, Factor Analysis has been used. The correlations amongst variables factor analysis, has been carried out.

Sampling technique. Convenient sampling technique has been for a sample size of 250 customers. The areas covered include few districts of Maharashtra. These are Pune, Satara, Aurangabad, Nashik and Nagar. The respondents were Millennials.

Secondary data was collected through a review of literature and research articles.

**Analysis**

Frequency tables are administered and depicted, showing the percentages of employed respondents. Spearman Rank order correlation coefficient (Rho), non-parametric test has been used. This is used to measures the degree of relationship between two set of ranked observations. This clearly determines the degree of effectiveness in predicting one ranked variable based on another ranked variable Rho assumes any value – 1 or + 1 indicating perfect relationship.

The rank correlation coefficient formula:

$$rs = 1 - 6 \sum d^2$$

$$N (N - 1)$$

Where  $\sum d^2$

= sum of the squared difference

in the ranking of the subject on the two variables

N = Number of subject being ranked a = 0.05

rs denotes the total summary measure and not the significance. The coefficient varies between – 1 and 1 and its value as a measure of the degree of association between dependent and independent variables. The consumer behaviour and AI are the variables here.

**Table 1.1. Demographic Profiles**

Sex	Sub-total	%Rate
Male	190	76%
Female	60	24%
<b>Total</b>	<b>250</b>	<b>100%</b>
<b>AgeGroup</b>		
18-25	50	20%
26-29	61	24.4%
30-35	80	32%
36and above	59	23.6%
<b>Total</b>	<b>250</b>	<b>100%</b>
<b>EducationalQ ualification</b>		
graduates	50	20%
Post Graduates	130	52%
Employed	70	28%
<b>Total</b>	<b>250</b>	<b>100%</b>

Factor analysis falls into a class of statistical techniques usually SPSS software has been used for testing the data. After the data was fed, the Bartlett's test of sphericity was run along with KMO.

Exploratory factor analysis is used to identify the underlying key constructs and investigate relationships amongst the key survey interval-scaled questions regarding perception towards consumer behaviour and consumer psyche. To test the suitability of data, reliability test has been conducted and value of Cronbach's alpha comes out to be 0.814 which is significant.

The following steps have been conducted to analyse the data.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy is computed which is found to be 0.728. It is indicated that the sample is good enough to proceed for factor analysis.

The overall significance of correlation matrices is tested with Bartlett Test of Sphericity (approx. chi square = 637.780 and significant at .000) provided as well as support for validity of the factor analysis of the data set.

Hence, all these three standards indicate that the data is suitable for factor analysis. Principal components analysis is employed for extracting factors.

**Table 1.2 : Kmo & Barlett's Test**

<b>TABLE 1.2</b>	
<b>Kaiser Meyer Olkin Measure of</b>	
Bartlett's Test of sphericity	chi Square
	Df
	Sig.

**Pivot Method:**

Symmetrical pivot with Varimax was applied with the end goal of the current examination. Symmetrical revolution is favored when the analyst wishes to have factors or measurements which are not connected with one another. The dormant root standard is utilized for extraction of variables. According to the models, factors having dormant roots or

Eigen esteems more noteworthy than one are just viewed as critical. There are just seven components having Eigen esteems surpassing one in our investigation which are 5.166, 1.840, 1.738, 1.406, 1.288, 1.254 and 1.157 individually. The level of all out fluctuation is utilized as a file to decide how well the all-out factor arrangement represents. The present arrangement of record represents 60.219 % of the all-out variety of the information. It is truly acceptable figured which we got from the examination and we just lost 39 % of the data content in our investigation.

**Table 1.3 Principal Component matrix**

	1	2	3	4	5	6	7
S1	-.092	.205	.272	.008	-.045	<b>.637</b>	.143
S2	.384	<b>.500</b>	.073	.228	.224	.067	.176
S3	.174	<b>.750</b>	-.019	-.144	-.281	.225	.156
S4	.092	.033	<b>.845</b>	-.066	-.013	.070	-.003
S5	<b>.781</b>	.299	-.102	.233	.054	.030	.036
S6	.373	-.102	<b>.447</b>	.244	-.027	.428	-.095
S7	.012	-.034	-.096	.011	.002	<b>.667</b>	-.096
S8	.039	-.024	.007	-.109	<b>.779</b>	.026	-.164
S9	<b>.641</b>	.047	.420	.061	.032	.120	-.030
S10	<b>.723</b>	.138	.049	.090	-.143	.069	-.164
S11	<b>.796</b>	-.058	.089	-.075	.134	-.043	.051
S12	<b>.671</b>	.322	.180	.303	.200	-.051	.141
S13	.151	.076	-.036	.141	.484	<b>.488</b>	.216
S14	.224	.077	.229	<b>.344</b>	.256	.308	.000
S15	-.013	-.017	.276	.296	-.114	-.376	<b>.510</b>
S16	.031	.103	-.121	-.052	.072	.061	<b>.645</b>

S17	.039	.060	.191	<b>.790</b>	.052	.114	-.153
S18	.090	-.013	-.178	.366	<b>.556</b>	-.038	.221
S19	-.033	<b>.473</b>	.274	-.051	.469	-.030	.125
S20	.345	.044	-.243	<b>.623</b>	-.071	-.045	.120
S21	.268	.251	<b>.543</b>	.247	-.023	-.204	-.340
S22	.194	<b>.576</b>	.070	.228	.085	-.029	-.478
S23	.396	<b>.419</b>	-.024	.261	.208	-.060	-.188
ei ge	<b>5.166</b>	<b>1.840</b>	<b>1.738</b>	<b>1.406</b>	<b>1.288</b>	<b>1.254</b>	<b>1.157</b>
Cumul ative	<b>14.917</b>	<b>23.210</b>	<b>31.379</b>	<b>39.512</b>	<b>47.021</b>	<b>54.236</b>	<b>60.219</b>

TABLE 1.4

Table 1.4 Rotated component matrix

Statement	Factor Loadings	Factor name & variances explained
1). Corona virus has created fear in me	0.796	
2). Corona virus is Airborne	0.781	
3). Corona originated from the Vet market	0.723	<b>INITIATION</b>
4). Corona originated from Wuhan	0.671	
5). Corona originated from China	0.641	
6). Corona originated from New York	0.750	
7). Corona is Air borne	0.576	
8). Corona is Water borne	0.500	<b>ORIGIN</b>
9). Corona is both air and water borne	0.473	
10). Corona is a virus	0.419	
11). Corona is a bacteria	0.845	
12). Corona is a parasite	0.543	<b>AWARENESS</b>
13). Corona is fatal	0.447	
14). Corona can be is Cured	0.790	
15). Corona is contagious	0.623	<b>HEALTH</b>
16). The Lock down due to Corona has increased stress in my life	0.344	
17). The Lock down due to Corona has impacted my work life balance	0.779	
18). The Lock down due to Corona has not disturbed my life at all	0.556	<b>LIFE CYCLE</b>
19). The shopping pattern has changed for all Purchases	0.667	
20). The shopping frequency has multiplied	0.637	<b>FREQUENCY</b>
21). The shopping options have multiplied Online	0.488	
22). The products are overstocked	0.645	

Several aspects relating to Initiation, Awareness, Origin, Health, Life cycle are relating to the Consumer behaviour and frequency are mapped for the purchase patterns to better understand the Consumer psyche.

How can AI help

Straightening the curve. Easing back the spread. I still can't seem to peruse - or hear - anybody state we are attempting to stop the coronavirus infection. To beat it. The nearest

has been a news analyst saying that if everybody halted abruptly, six feet separated from every other person, the spread of the infection would end right away. Obviously, that won't occur. So we manage real factors. We attempt to foresee who will get the infection; cause analyse as fast as could be expected under the circumstances; to recognize who will react to treatment. Without an all-around demonstrated treatment, we need to realize who has the most obvious opportunity

with regards to endurance and should, consequently, get a ventilator. These are not inquiries to be messed with. Incredibly, we don't have the appropriate responses. Any of them. It is a staggering representation of how little we think about the eventual fate of our species and the unsure occasions in which we live- lowering signs of a pandemic that fell on us abruptly.

### **A Flurry of AI Reports**

Since the episode started, there has been a whirlwind of reports distributed about how AI may help. A great part of the exploration on which these reports are based could in the long run be imprinted in peer-inspected diaries. One, apparently in press at Radiology and online since March 19, 2020, depicts how AI may help in the brisk and exact conclusion of this infection.

The creators of this paper depict how a profound learning calculation can identify in chest CT pictures indications of the respiratory illness brought about by the coronavirus and how this calculation can recognize it from other lung ailments, including customary pneumonia.

As of now in late December 2019, CT checks indicated injuries in the lungs of Chinese patients particular from those related with different types of viral pneumonia. The March 27 ITN article noticed that "computer based intelligence may help with both the test procedure and perusing of the pictures taken." Days after the fact, the online rendition of IEEE SPECTRUM revealed that few U.S. emergency clinics had started conveying AI apparatuses to distinguish COVID-19 in CT and X-beam chest checks and to screen ailment movement. As indicated by the article, AI examination was being utilized on account of its "capability to ease the developing weight on radiologists." later on, the innovation "may help foresee which patients are well on the way to require a ventilator or drug," the article expressed. On March 30, New York University reported an exploratory AI device that predicts which patients with the infection will create "genuine" respiratory illness. Around that equivalent time analysts announced the improvement of an AI "structure" for foreseeing clinical seriousness from the coronavirus. The scientists composed that

"given the expanding caseload, there is a pressing need to increase clinical abilities so as to distinguish from among the numerous gentle cases the not many that will advance to basic ailment."

In a world inundated with "most exceedingly awful" and "best" case situations (with a qualification between the two difficult to recognize), when the President of the United States forces a war-time protection creation request to drive makers like General Motors to make ventilators; when the Governor of New York says his state will require up to 40,000 of such gadget - endeavours to distinguish patients who need them takes on extraordinary significance.

### **Chest AI**

Radiology sellers have for some time been creating AI bundles for lung illnesses. Computer based intelligence controlled calculations have been coordinated into clinical choice help bundles for the location and division of lung sores, just as the estimation of their volumes and distances across. The target has been to decrease the weight on radiologists - to recoil the time required for these doctors to do what they should do. In any case, the need has never been so tangible as with the coronavirus episode. If at any point there was a period for huge information to be procured, this is it. Picture, maybe, calculations plunging over and over into test information excessively voluminous for individuals to successfully examine. In any case, such profound jumps are non-existent. The explanation? Since the large information for them doesn't exist. The testing units expected to give it are not accessible. Indeed, countless coronavirus test packs are being delivered every day. However, these are negligible details contrasted with the 330 million individuals living in the United States. The packs can scarcely fulfil - on the off chance that they even do - the quantity of patients announcing indications and the human services labourers who are attempting to think about them, labourers who need fundamental individual defensive gear veils and facial sprinkle monitors.

### **Worldwide Testing**

South Korea has endured the flare-up moderately well. The administration there tried a large number of those in the politically



separated nation, confining individuals who tried positive close by those with whom they related. Be that as it may, the U.S. has not had the option to do this at any rate not yet.

As per National Institute of Allergy and Infectious Diseases, it was noted on March 27 on National Public Radio that testing got looking moderate so far. In any case, presently we're seeing a considerably more improved framework with respect to its accessibility and usage. What's more, trying should enlarge generously. Consistently we catch wind of flattening the bend" and "easing back the spread." Is braving this emergency all we need to anticipate? Am I among the individuals who will bounce back from contamination or the individuals who will bite the dust from it.

### **How would this come to an End?**

There are a couple of ways this episode could end, as per Vox's Brian Resnick clarified. Maybe general wellbeing measures distinguishing cases quick, placing contaminated individuals in seclusion will slow the spread of this coronavirus. That is the thing that halted the spread of SARS in 2003. "In the event that we moderate it with the goal that contaminations occur more than 10 or a year rather than more than one month, that is going to have a major effect the extent that what number of individuals genuinely tainted, what number of individuals may wind up hospitalized, and what number of they wind up kicking the bucket," said Tara Smith, a Kent State University disease transmission specialist. "We talk about it as 'straightening the plague bend'- so it is anything but a major, unexpected top in cases, however it's a progressively moderate level after some time." Since this is a zoonotic ailment, which means it originated from a creature, finding and taking out that source would likewise help.

Or on the other hand perhaps an immunization or antiviral will be imagined rapidly to control a more extensive pestilence however an antibody is relied upon to take in any event a year.

We have to begin getting ready for the following enormous, fatal flare-up now

The race to build up a treatment and antibody for the novel coronavirus outlines exactly how much science expands on past endeavours,

similar to the reactions to MERS, SARS, and the Ebola infection. Be that as it may, it additionally shows that persevering exploration consideration matters much after a flare-up disseminates. An illness that spreads to a huge number of individuals in days can do a ton of harm in the months or years it takes to make a treatment or antibody, so a current group of examination can spare lives.

What should be accomplished for the infections that we don't comprehend too that despite everything has pandemic potential is simply fill in the database, to examine those infections, comprehend the structure of their proteins, comprehend the manner in which antibodies neutralize them," (NIAID's Graham). In any event, analysts and medication organizations should "create one model [vaccine] inside each [viral] bunch right through a clinical preliminary. And afterward possibly it goes on the rack or it's recorded in the writing, with the goal that you have that data accessible when things like this occur."

The Road ahead Coronavirus has made room for robots and automatons. Coronavirus is infectious and difficult to contain, which implies that it's more secure for some human-to-human cooperation to be done remotely. Both in medical clinics and out in the open, remote correspondence implies that patients abstain from transmitting the malady and wellbeing labourers spare time on straightforward assignments. This has freed the route for robots and parts from other computerized advancements to assist. Presently, robots are being utilized to purify rooms, speak with confined individuals, take fundamental data, and convey prescriptions.

Close to Seattle, a robot helped specialists treat an American man determined to have the novel coronavirus. The robot, which conveyed a stethoscope, helped the patient speak with clinical staff while constraining their own introduction to the ailment. In the interim, Chinese clinics are presently transportation in robots from the Danish organization UVD Robots that can sterilize tolerant rooms, as indicated by an announcement. UVD Robots says that its wandering mechanical units work by radiating bright light all through a region, executing infections and microscopic organisms, including the coronavirus. Self-

driving vehicles are in any event, conveying supplies to clinical labourers in Wuhan.

Flying robots, otherwise called drones, are additionally in the blend. Shenzhen MicroMultiCopter said in an announcement not long ago that it is conveying automatons to watch open spots, shower disinfectant, and lead warm imaging. Chinese authorities have utilized automatons to follow whether individuals are going outside without wearing face veils or abusing other isolate rules. More on this reconnaissance pattern in a second.

General wellbeing information observation organizations Metabiota and BlueDot were both used to follow the underlying flare-up of the novel coronavirus. BlueDot really advised its customers of the coronavirus danger a few days before both the World Health Organization and the Centres for Disease Control and Prevention (CDC) gave their open alerts. Presently, a similar sort of innovation keeps on observing internet based life posts and other openly accessible substance to search for indications of the ailment's spread, as Wired has revealed.

Artificial intelligence is likewise helping out in diagnosing the disease. A few clinics in China are utilizing AI-based programming from the organization Infervision to look over CT pictures of patients' lungs to search for indications of Covid-19, the contamination brought about by the novel coronavirus. Simultaneously, the coronavirus pandemic has likewise enlivened a few medication organizations to utilize man-made reasoning controlled medication disclosure stages to scan for potential medicines. That procedure can include utilizing AI to discover altogether new atoms that may be equipped for rewarding the pneumonia-like sickness, or mining through databases of effectively endorsed drugs (for different ailments) that may likewise neutralize Covid-19.

Critically, while AI medicate disclosure may accelerate the way toward discovering contender for new medications and medicines, there's no assurance that the innovation will concoct anything better than what human researchers could discover all alone. Coronavirus has catalysed rivalry for all the more impressive facial acknowledgment. As Covid-19 has put quite a bit of this innovation

in plain view, it's additionally introduced another defence for observation innovation: the danger of a pandemic. This thought isn't what you regularly get notification from either defenders or pundits of this conceivably obtrusive tech.

Keep in mind, simply a year ago the Hong Kong government attempted to boycott wearing face veils in open congregations so as to smother star vote based system dissidents. Presently, the Chinese government is encouraging makers to support creation of covers, wanting to slow the coronavirus spread in China, where the ailment has hit the hardest. So while distinguishing individuals not wearing covers could ensure general wellbeing, that ability likewise raises worries about the further advancement of facial acknowledgment that works whether individuals are wearing veils or not. This stands to make the innovation's danger to common freedoms far more atrocious. The coronavirus pandemic has additionally motivated facial acknowledgment organizations to coordinate their tech with warm imaging. This kind of checking is being utilized to detect whether individuals may have raised temperatures, which may demonstrate whether they've been tainted with the coronavirus and help confirm their character. SenseTime is selling warm imaging-empowered facial acknowledgment, as is Sunell, another China-based video observation organization, as per an official statement.

In the meantime, in Thailand, a biometric fringe screening framework is presently utilizing fever-identifying cameras, as indicated by the organization giving that innovation, Germany-based Dermalog.

Furthermore, facial acknowledgment venders are additionally utilizing coronavirus to push the possibility that sans touch biometric frameworks are more secure than, state, utilizing a key or a unique mark to enter a structure. This idea isn't really off base, as the CDC says it might be conceivable that the coronavirus could be spread by contact with contaminated surfaces, similar to a unique mark scanner. Thusly, Remark Holdings discharged an announcement asserting that facial acknowledgment is more secure than different types of biometric verification, such as fingerprinting, since it "expels the odds of

sickness being spread through human-to-surface contact."

From numerous points of view, these more up to date, further developed innovations remain to help battle the coronavirus episode. But on the other hand there's something tragic about a flare-up being utilized as support for more reconnaissance. Defenders of observation tech centre around dangers to people groups' wellbeing and property, highlighting "hazardous" individuals like psychological militants and sex guilty parties. Less regularly, in any case, do defenders of this innovation point to the dangers related with an expected pandemic. In any case, presently pundits of observation tech who have commonly contended that the innovation compromises our common freedoms and here and there doesn't work will probably need to push against an alternate contention: serious dangers to general wellbeing. It's eventually hazy how the open will respond to the moving job of observation. So the robots and the AI won't really spare us, however they may help. In the interim, the good old ways to deal with remaining solid assistance, as well. Try to adhere to the CDC's guidelines for keeping yourself and your relatives solid, for example, washing your hands and avoiding wiped out individuals which isn't especially cutting edge.

### Key Suggestions And Discussion

Governments and different partners are urged to:

Energize multi-disciplinary and multi-partner co-activity and information trade both broadly and globally by the AI people group, clinical network, engineers and strategy creators to plan the issue, distinguish pertinent information and open datasets, share apparatuses and train models.

Perceive that AI is anything but a silver slug. Computer based intelligence frameworks dependent on AI work by distinguishing designs in information, and require a lot of information to discover these examples. The yields are just comparable to the preparation information, and now and again, analytic cases have been raised doubt about and some chatbots have given various reactions to inquiries on side effects. Guarantee that AI frameworks are conveyed capably and regard the OECD AI Principles. This is especially valid for transitory proportions of populace control and checking, as some AI frameworks raise worries about reason particular and the threat that individual information could be re-utilized in manners that encroach protection and different rights. Create and expand upon AI-fuelled observing instruments that empower research without yielding security.

Gain from this influx of the pandemic to plan for its possible reappearance. One measure is to resolve to investigate on AI innovations that can gain from restricted information, for example, from patients with peculiar conditions.

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## INVESTIGATION ON THE SURFACE PROPERTIES OF ALUMINUM AFTER ND: YAG LASER NANOSECOND TECHNIQUE IN SOME MEDIA.

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### ABSTRACT

Laser induced shock wave (LSP) attracted much attention. View of the extensive its uses in various fields. Al metal is used in a wide range for different uses. In this work we study the effect of LSP in Al metal, Optical microscopy and SEM images with assistance of AFM images was used to found shock wave effect, SEM and Optical images show the uniformity of LSP in water than in air and ethanol medium, AFM images were taken in different places along irradiated area to show the surface roughness of air, water, and ethanol media, the hardness of LSP in water is uniform along irradiated area than air because of the presence of dislocation with high density also the confined medium (water) work as a nonlinear medium also the decreasing in grain size in water rather than others

**Keywords:** laser induced shock wave, SEM of Al before and after LSP, AFM analysis before and after LSP of AL, Hardness

### Introduction

Short laser pulses provide huge power to the surface of illuminated material the required effect is obtained [1] Laser-induced shot peening (LSP) means the laser energy strikes a material surface, atoms on the material surface are processed under the effect of tensile stresses and left stressed over after crushing, fuses, heating, and other production processes. The cracks quickly initiated in the regions of tensile stress due to tensile stresses drag the metal atoms from each other. By laser induced peening, the material provides a layer of compressive stress by pushing the material. As peening is produced, atoms on the surface of the metal become crowded [1, 2].

### Experimental work

In this work, the laser-induced shock wave effect on Al metal in different media (air, water and ethanol) was tested. The metal was prepared in specific dimension to fit the measurement's type required. For structures and morphology measurement, the samples were cut in  $(1 \times 2)$  cm<sup>2</sup>. This was followed by polishing them by using graded Amery papers in the range (220-2000), then immersed in diluted HF acid in water (1:50) ml to remove dirt and native oxide layer. The preparation process was finalized by putting them in an ultra-sonic ethanol bath for about 30 min. The component of Al could be shown in EDX analysis as in figure (1). The working setup was

based on an Nd: YAG laser operating at a wavelength of 1.06  $\mu$ m and guided by red diode laser pointer. The emitted laser power can produce laser intensity, high enough to break down the materials and form plasma; see figure (2). This is usually associated with a rapidly expanding gas; associated with a strong pressure wave, a shock wave, emanating from the breakdown volume [3]. When reaching the free surface, the pressure wave creates surface waves on the substrate surface. The spatial and temporal profile of the surface waves contains information on the location and shape of the breakdown volume. The material was irradiated by single laser energy on Al materials.

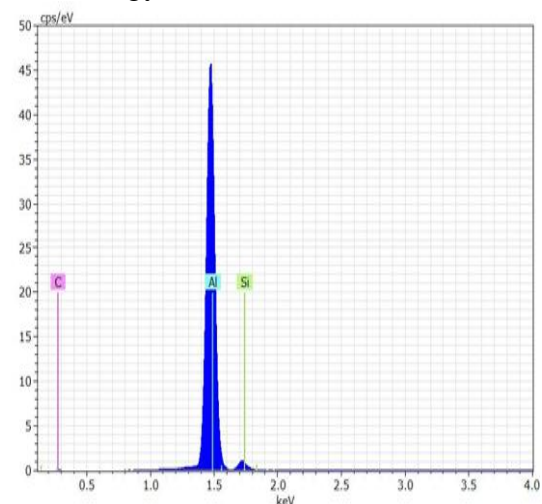
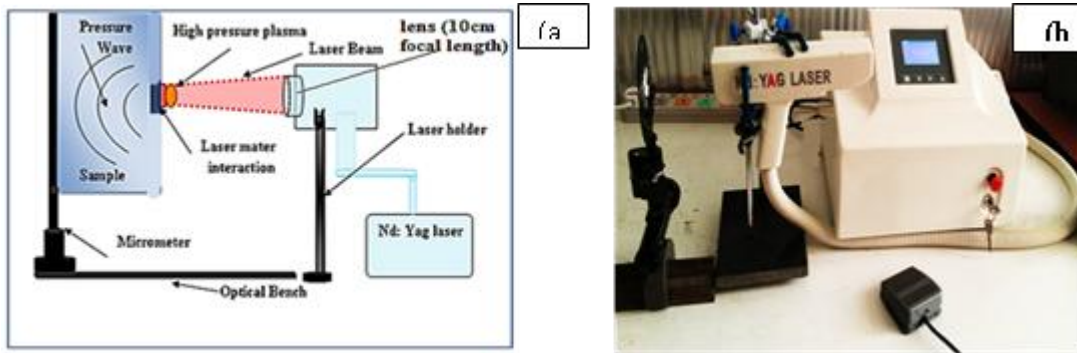


Figure (1): EDX analysis of Al.



**Figure (2): Sketch and photographic images of the experimental procedure.**

According to Maxwell's theory of electromagnetism, energy flux (intensity) is expressed by the pointing vector  $S = E \times H$ , the time average intensity  $\langle S \rangle$  divided by the light speed utilized by an electromagnetic wave on the target surface if the wave is absorbed completely, the optical pressure is measured from relation [4]:

$P = \frac{\langle S \rangle}{c} = \frac{I}{c} \dots (1)$ , The pressure defined as the amount of force performing per unit area [5].

$P = \frac{F}{A} \dots (2)$  By equaling eq. 1 and 2 we obtained  $F = \frac{I \cdot A}{c} \dots (3)$

Where the F: is Laser force, I: laser intensity and c: the speed of light. Table (1) shows the force of laser, intensity and energy values, the laser gives pulses by changing applied voltage, the calibration and converted from voltage to joule achieved by using Joule meter Genetic type. Laser intensity (I) as calculated in Eq. (2) can be obtained in terms of  $GW/cm^2$ , either directly from the laser energy or calculated in power increments. The intensity of laser calculated as following [5]:

$$I = \frac{P_{peak}}{A} = \frac{E}{A \cdot t_p} =$$

$$\frac{P_{AVG}}{A \cdot f \cdot t_p} \dots (4), \text{Fluence} = \frac{J}{cm^2} =$$

$$\frac{E}{A} \dots (5)$$

Where; P peak is peak power (W), E laser energy (J), P<sub>AVG</sub> average power in (W), f laser frequency in (HZ), t<sub>p</sub> Pulse time in nanoseconds, A laser spot area in  $cm^2$ . The spot area was measured using carbon black paper because its absorption is high and has low thermal diffusivity rather than other materials. The 700 V in Nd: YAG laser it gives energy 200 mJ laser intensity spot area  $0.005 cm^2$  and intensity  $5.7 GW/m^2$ , the laser force is 0.095 N.

**Table 1: laser intensity calculations using 10 cm focal length lens. The averaged spot diameter was 0.8 mm and its cross-sectional area is  $0.005 cm^2$ .**

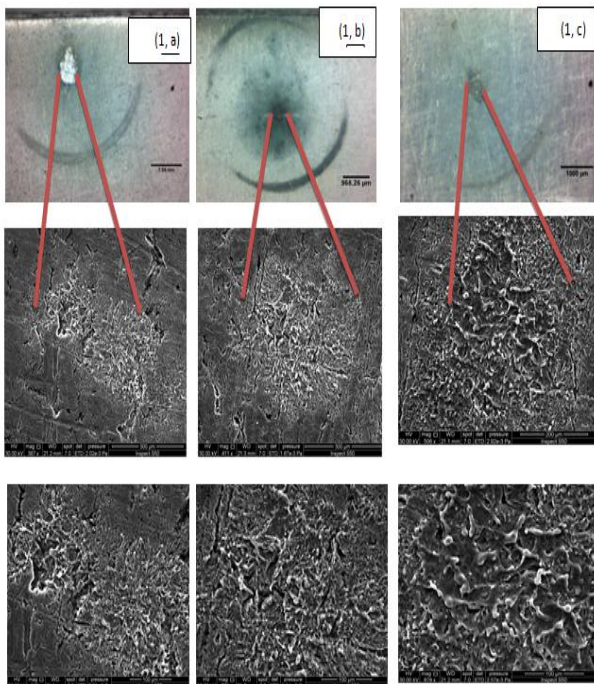
Laser energy (mJ)	$I = \times 10^{10} W/cm^2$	Optical pressure $\times 10^5 Pa$	Laser Force (N)
50	0.14	0.48	0.024
100	0.29	0.95	0.048
150	0.43	1.43	0.071
200	0.57	1.90	0.095
250	0.71	2.38	0.119
300	0.86	2.86	0.143
350	1.00	3.33	0.167
400	1.14	3.81	0.190

AFM images achieved at Baghdad University, type AA3000 made in U.S.A by Angstrom Company. The detector is built directly into the base, eliminating the chance of damaging it through handling. A3000 is capable of performing contact mode, tapping mode, lateral force microscopy and scanning tunneling microscopy. The standard unit is equipped to view sample areas up to 10 micron.

**Results and discussion:**

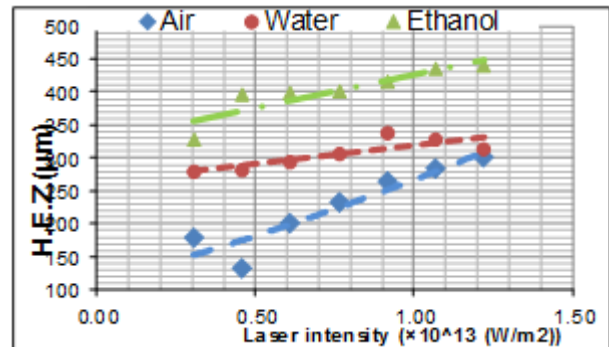
**1. Surface morphology of shocked and unshocked Aluminum:**

SEM images supported by high resolution images of CCD camera connected with optical microscope were carried out to identify the microstructure, morphology and physical features of layers including heat effected zone (HAZ), delamination for different materials at different laser intensities. Figure (3) shows SEM images micrograph for Al layer produced at different laser irradiation intensities with constant number of pulse .The irradiation area has been achieved by using Nd: YAG laser with intensity shown in table (1), we can see that the effect of laser on the morphological surface appear clearly the different magnification used to show laser effect inter the surface, pillar like structure clearly observed the crack was appeared clearly also the uniformity of spot in water is greater than in air due to confinement effect of laser pulse in water, in ethanol medium the wavy shape is great because the ethanol has flammability at 365°C[6] .



**Figure (3) LSP of Al at laser energy 200mJ at (a,) air, (b) water, and (c) ethanol media**

The measured heat affected zone from figure (4) images could be shown in figure (5)

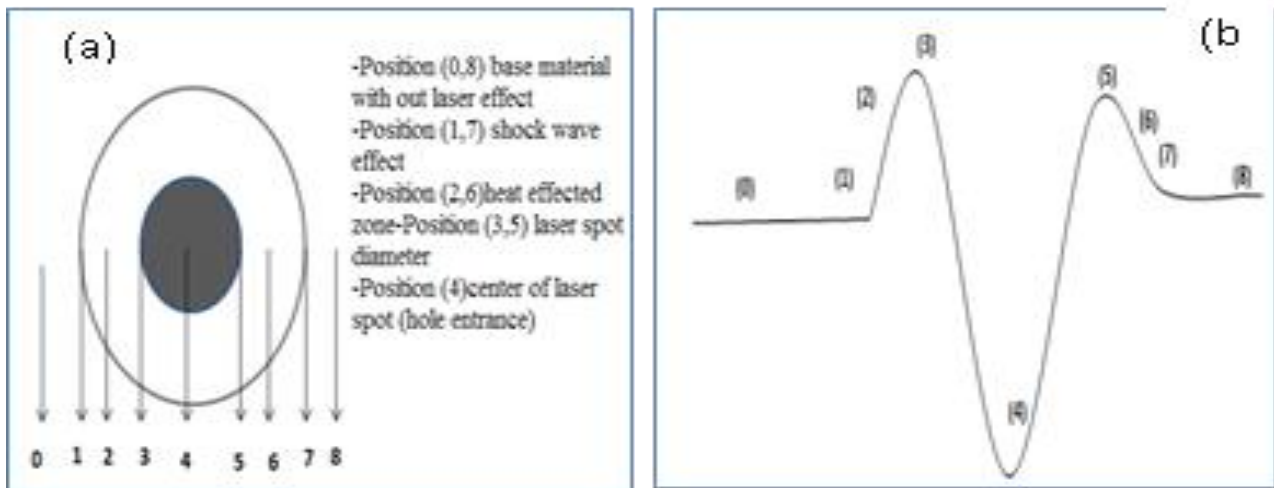


**Fig (4) Heat affected zone of Al in air, water, and ethanol medium at different laser intensity.**

**3. AFM analysis of shocked and unshocked material:**

AMF images were measured of the unshocked and shocked Al in the air and water media to see the laser spatial profile distribution along the material surface in places as shown in Fig. (7).

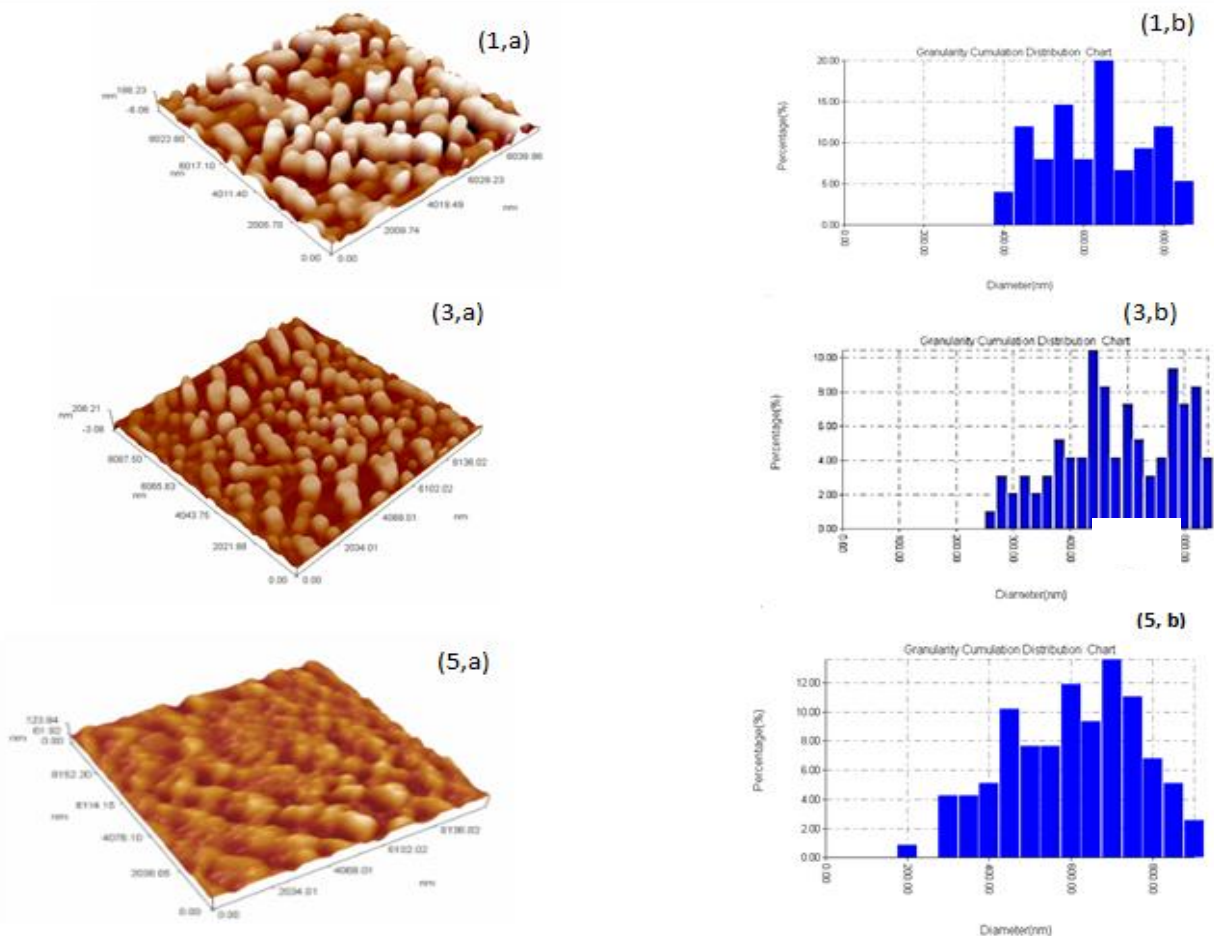
The AFM images are taken at different distances from the laser spot (different regions) to show the distribution and laser energy profile at different positions. Where to position (0, 8) denotes unshocked surface, position (1, 7) denotes the shock wave, position (2, 6) the region between shocked and laser spot, finally positions (3, 4, and 5) denote the laser spot located at material.



**Figure (5) Schematic diagram of AFM image of laser spot (a) top view, (b) side view.**

In Fig. (6, a), represents the surface topography while (6, b) represents the granularity of the grains of shocked and unshocked surface, The number of grains is increased when go to the spot center due to Gaussian profile of laser pulse where the intensity at center is greater than the pulse edge .In general we observed that the shocked region has Gaussian

distribution of grain size along irradiated area that mean any shocked part has Gaussian distribution of grain size and it becomes fine and increased in number as we get closer to the pulse center region in two media air and water. We couldn't able to attached all AFM images so we take the important places as illustrated in Fig(6,7)



**Fig. (6) AFM images of laser pulse at laser energy 200 mJ in air medium.**

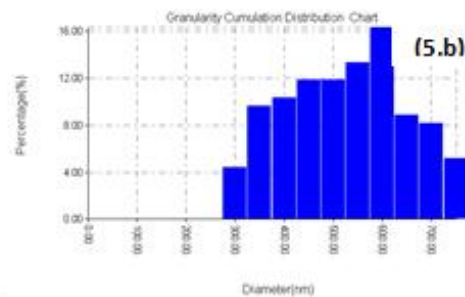
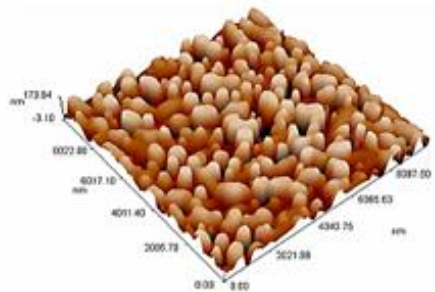
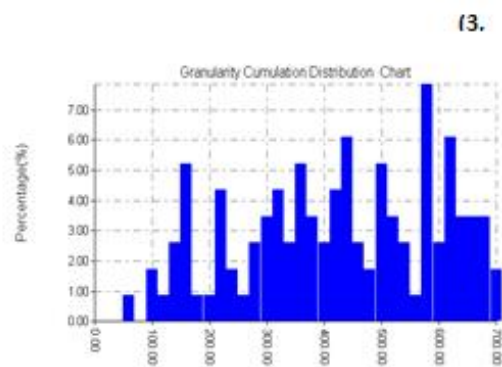
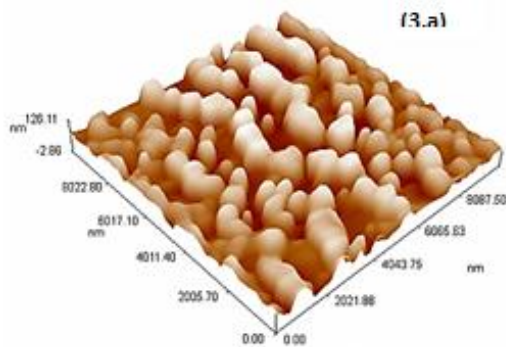
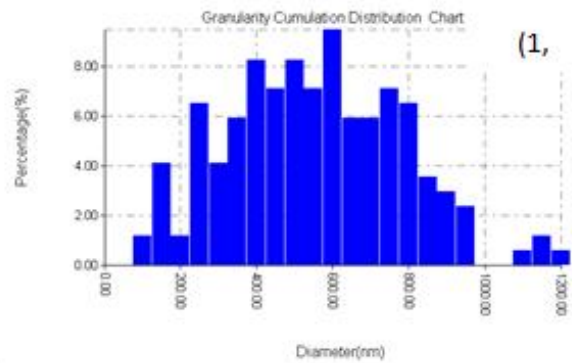
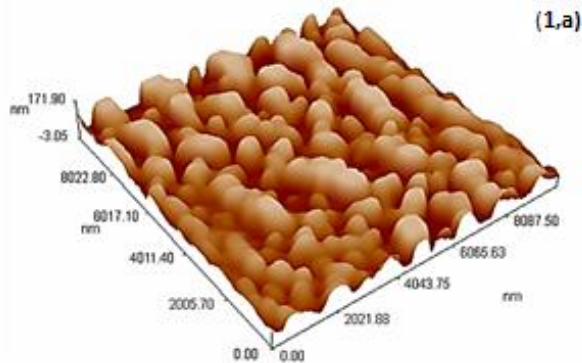
Fig. (7) Illustrates the surface topography of shocked surface within the laser in the water medium. The Gaussian distribution of laser

pulse modulated the surface topography so, we can easily distinguish grains. The grain sizes with different testing point represent different



laser intensity along pulse. The maximum intensity is located at the center of the Gaussian beam. This large value of intensity lead to the presence of a uniform surface of pillar contains a (pillar –like structures) of

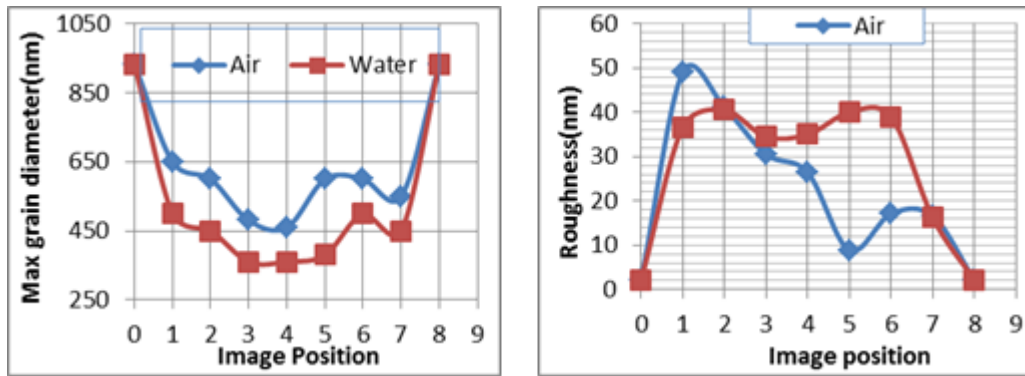
grain with a very small value Also, seen that the uniformity of laser grain size along spot area and seem to have the constant value rather than ablation the surface in the air.



**Fig.(7)AFM images of laser pulse at laser energy 200 mJ in water medium.**

From figures (6 and 7, (b)), by taken max.grain size, the obtained results given in Fig.(8). In general, seen that the grain size of the laser spot has a smaller grain size rather than other un shocked region its arranged in Gaussian distribution, the grain size in water medium is smaller than other medium due to the uniformity of laser intensity in water medium rather than in air. The root mean square (RMS) for surface roughness averaged values was illustrated in figure (8,b), the roughness increased at irradiated area rather than unradated surface due to phase transation at the surface also the shock wave region (position 1 and 7) has roughness grater than

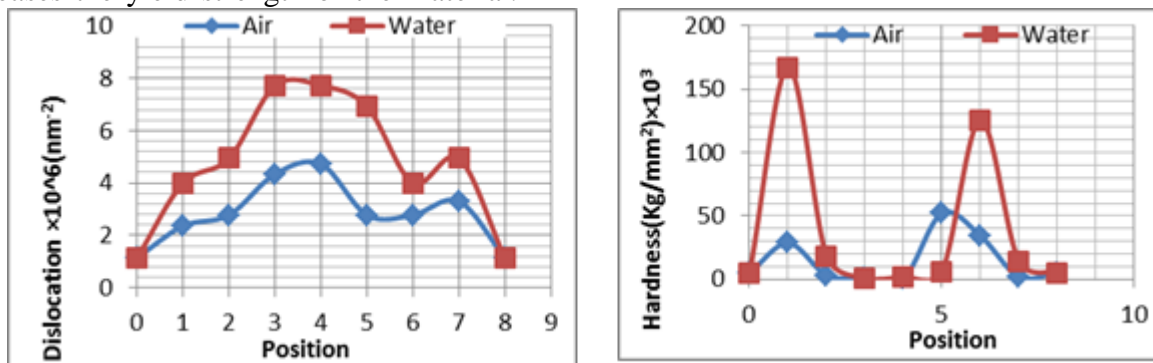
fresh surface because of the applied shock wave energy, and has roughnes greater than laser spot region (positions (3,4,5) ) because of the laser energy applied high heating and melting and evaporation make ablation to the surface. Finally we see that the surface roughness in water medium is more irregular than in air because of the uniform distribution of shock wave pressure and temperature along the irradiated area and water work as a confinement medium and the confinement effect that inanced stress [2]. The maximum grain size in air medium is greater than water that interpret the high shock pressure in water effected on Al grain size.



**Fig. (8) Grain size maximum diameter and Roughness profile at different positions**

The dislocation ( $\delta$ ) is generated in the Al surface after LSP calculated from eq.(5) [6], and illustrated in Fig.(9,a).  $\delta = \frac{1}{D^2} \dots$  (6), Where (D) grain diameter, after LSP dislocation movements and generation within the crystal structure of the material cause cold working; also known as strain hardening, or work hardening, is the strengthening of a metal by plastic deformation[5]. Dislocation density in LSP in two media is high at the spot region due to deforming the material and this increases the yield strength of the material. In

the water medium dislocation density is higher than in the air medium due to shock pressure generated more stresses applied to move these dislocations through the crystal lattice. Dislocations can also interact with each other, becoming entangled. The governing formula for this mechanism is [8,9,10]:  $\Delta\sigma_y = Gb\sqrt{\delta} \dots$  (7) Where  $\sigma_y$  is the yield stress, G is the shear elastic modulus, b is the magnitude of the Burgers vector, and  $\delta$  is the dislocation density



**Fig. (9) Dislocation profiles and Hardness profile along irradiated area.**

Hardening which define as the applied load divided by the area [6] was illustrated in figure (9,b), was calculated from equ.(3) divided by spot area of metal after laser effect, the hardening in water is uniform along irradiated area than in air, In all media we see the laser center area has hardness less than other position that due to the laser spot region has great dislocation density due to cold working (strain hardening, work hardening), is the strengthening of a metal by deformation, the dislocation move and generate within the crystal structure of the material [10,11,12].

**Conclusion**

SEM and Optical images show the uniformity of LSP in water than air and ethanol media, AFM images were taken in different places along irradiated area show the surface roughness of other media, grain size in water is smaller than other media (450 and 350 nm) at air and water media respectively, LSP increased the Aluminum hardness rather than without LSP treatment, the hardness of AL in water medium is uniform than the hardness in air medium. the hardness of LSP in water is uniform along irradiated area than in the air due to the presence of dislocation has  $(4.8, 7.8) \times 10^6 \text{ g/cm}^2$  for the LSP in air and water respectively

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**AN ASSESSEMENT OF ECONOMIC COSTS OF CORONAVIRUS****Yaatin Dhamija**

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**ABSTRACT**

*Influenza pandemics have occurred many times in the last century and it is almost inevitable in the present and future too. Presently, the world is suffering through Coronavirus which originated from Wuhan, China. The virus was first observed in December 2019, and since then, there has been no stopping for this deadly outbreak. This paper aims to discuss the economic impact of Coronavirus across industries in emerging country, India. Scope for this study is limited to the Coronavirus pandemic. The study tends to observe the spending behavior of consumers before the outbreak and during the pandemic, job losses experienced by people, GDP shrinkage of countries taken into consideration and the overall economic impact that the countries would face due to pandemic, Coronavirus. Data will be collected from published articles by big financial institutions, news reports, and blogs and major projections made by the international bodies will also be considered.*

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**Keywords:** GDP: Gross Domestic Product; India; Covid-19; pandemic; financial institutions

**Introduction**

A pandemic is an epidemic of disease that has spread across a large geographical area, like many countries or continents and affecting a large number of people. It can greatly increase rates of morbidity and mortality. Diseases such as seasonal influenza which have recurrences and infect a stable number of people does not qualify to be a pandemic. Throughout history, there have been a number of pandemics such as Spanish flu, H1N1, HIV/AIDS and many more. The first death due to Covid-19 was traced back in China in early January 2020, and, since then, the virus has spread through almost all the countries and dominated the world and every media platform. The initial spread of the virus, which was earlier confined only to China, later on spread through Asia, Europe and rest of the world. On March 12, 2020, Covid-19 was declared to be a global pandemic by World Health Organisation (WHO). By May 6, 2020, number of cases crossed 3.7 million and deaths due to the virus exceeded 260,000 across the globe. Beyond the health and social costs, the economic costs incurred by households, firms and wider economy resulting from the outbreak of Covid-19 are likely to be significant.

This study investigates the impact of Coronavirus (Covid-19) on various sectors of the Indian economy, initial estimates of the

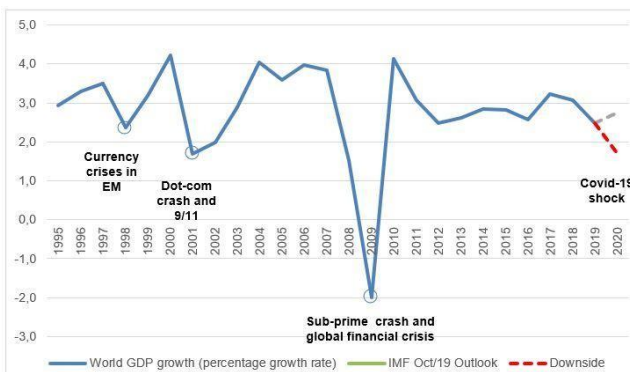
extent of losses that can be caused due to shutdown of local factories in our subject country, loss of employment, changes in consumer spending responses, predicted GDP shrinkage, etc. due to the onset and spread of Covid-19 in India. First documented case in India was reported in Kerala on 30 January, 2020. As the virus spread, central government introduced various public health measures such as social distancing, aimed at reducing the spread of the virus. And in late March 2020, India along with many other countries across the globe imposed full lockdown, large gatherings were prohibited, international and domestic borders were closed, sporting events were cancelled worldwide, social distancing policy was implemented, vulnerable people were isolated and many other such practices were brought into consideration.

India started with a lockdown period of 21 days which was extended beyond, which resulted in economic activities coming at a standstill. By suspending the economic activities, states were incurring huge economic costs. Outbreak of Covid-19 supplemented by the already decelerating economic growth brought volatile conditions in Indian markets. Before the spread of virus, the Indian economy was already suffering with blows of economic downturn for the past few quarters. There was increasing unemployment, weakening demand and low industrial outputs. It will be difficult to

predict the effect and magnitude of Covid-19; but it can be safely said that the impact will be much worse than 2016 Demonetization and 2017 GST roll out. The economy was already reeling with the blows of the past and another one has supplemented and left the economy with uncertainty. In the events of declining domestic consumption and low investment, government took various fiscal and monetary measures to help revive the economy.

As the rate of cases is increasing at an alarming rate, both internationally and domestically, the outlook for global economy as well as Indian economy is not good and will further deteriorate. The outbreak has put forward many challenges on demand side as well as supply side of the economy. India's informal sector which employs approximately 91 percent of the total workforce in India has been again left with uncertainty. Informal sector is the most vulnerable and with economic constraints, economy has been put in an unprecedented and adverse situation.

There is no doubt that the outbreak of the pandemic is likely to severely affect the developed economies of the world as well as the emerging countries like India. Below graph shows the movement of world GDP from 1995-2020, showing the impact of various crises occurred in the past and GDP outlook due to Covid-19.



Source: UNCTAD; Figure: Loss in global GDP

From the medical perspective, the ability of India to contain the virus spread will heavily depend on the health care system of the country. With rising cases making new highs daily, there are many critiques and comments being made on the condition of hospitals, clinics. India's budget allocation on health care system as a percentage of GDP is 1.15 percent, which is very poor. India is being ranked 150

among 195 countries by World Economic Forum report in December 2019, ranked on the basis of health care access and quality of treatment provided to the patients.

In order to assess the impact of Covid-19 on India, this paper contains data collected from secondary sources such as newspaper articles, blogs, financial institutions reports, scholarly articles.

### Literature review

This section provides an outline regarding the impact of the pandemic on different aspects of the society and economy. It has been seen in the past that pandemics such as Spanish flu, SARS, Ebola have forced upon substantial costs on the real economy. The magnitude of these costs varies considerably and depends on the duration of outbreak, extent and timing of public health interventions and many other factors.

Early evidence suggests that Covid-19 is likely to impact the global economy with huge costs due to disruptions to the global supply chains, closures of businesses, suppressed human sentiments leading to their low spending levels [1],[2]. All these factors contribute to the negative consequences for output, low production levels and hence, job losses. The overall impact on economy is likely to depend on the extent of government investments in healthcare. Taking the fatality rate of two percent of Spanish Flu pandemic, it can be observed that this would be equivalent to 150 million deaths arising from Covid-19 [3]. If realized, such a scenario can result in global GDP decline of 6 percent. Another paper asserts that the economic structure and industry composition will lead to varied impact across different countries, with the countries, that are more service-oriented, will be more affected [4].

### Impact on Businesses

Recent articles suggest that uncertainty of doing business has increased dramatically since the onset of Covid-19. With the increasing spread of the disease worldwide, firms are worried about the collapse in demand, heightened uncertainty, disruptions caused with supply chains and all of it can prove to be detrimental for employees and firms. In a recent joint survey of 14,444 Indian small and

medium sized enterprises (SMEs), conducted by an NBFC, Magma Fincorp, and a B school Bhavan's SPJIMR, 50 percent of the respondents said that they have witnessed a 20-50 percent decline in their earnings due to disruptions caused by the pandemic. Nearly half of them had availed of the government's moratorium. Talking about MSMEs in non-essential sectors, they expect the negative outlook for quite some time. It is apparent that the pandemic outbreak will have a long lasting and significant impact on firms' earnings.

### **Impact on Stock Markets**

Stock markets response to the Covid-19 outbreak has been filled with severity as investors have adjusted expectations of a decrease in corporates earnings in the near future. Since the announcement of the pandemic, it has been a major news coverage and the most significant driver of stock markets across the globe. Firms with high debt exposure are also facing the reduction in their value, as investors are looking for higher yields in this tragic time, thus leading to the falling value of fixed income capital, such as debt [5]. It was also noticed that the bourses declined sharply as the virus spread to Italy, South Korea, Spain, Iran and other countries around February and later in March, when the travel restrictions were imposed across the globe internationally as well as domestic travel in many countries [6]. The stock market decline was so huge that investors lost as much as Rs. 5.50 lakh crores in a single day late February in India, when the BSE Sensex crashed by 1448 points [7].

### **Impact on Households**

Household level responses to the onset of Covid-19 are emerging. Much of the evidence presented was collected through secondary data. A survey of G7 countries revealed that 31 percent of the people believe that the outbreak had already impacted their household income and another 39 percent believed that this virus outbreak will impact their household income in the near future, though not impacted yet [8]. Also, a significant decline in demand of digital and electronic goods and a significant increase in sale of groceries was observed in many countries, people collecting the essentials for their homes amid lockdown. Data collected

showed that consumer spending declined by 32 percent across Chinese cities. A large variation was observed in Wuhan, the origin of outbreak, experiencing more significant decline of 70 percent in consumer spending within a time period of 3 months.

Another study showed that a survey of Indian consumers was conducted to gauge the response of household to the Covid-19. From a sample of 1,046 responses, mostly from urban areas, 60 percent of consumers believe that the pandemic would alter their buying behavior [9]. 29 percent of the respondents are expected to turn frugal, another 19 percent are expected to make deep cuts in their spending and 2 percent of the respondents will largely be unchanged.

### **Research Design**

The research follows a deductive approach using secondary research methodology. In order to answer the research problem, we took the data from March to mid-June. Numerous articles from various newspapers and some reports of elite institutions were being referred to and the articles and reports were chosen depicting the impact of covid-19 on various sectors of the economy. The data used was collected through newspaper articles of Economic Times, Indian Express, reports of McKinsey and Company and other such sources. The study also uses the statistical data from secondary sources such as money control, CNBC, IHS Markit, etc. We gauge the impact of Coronavirus outbreak on essential sectors of Indian economy which are manufacturing sector, services sector and also the impact of the outbreak on Indian stock markets and effects on international business. The loss suffered by these vital sectors of the economy and its impact on GDP, future projections of GDP, and what should be the government policies to mitigate the effects of the virus induced lockdown has been discussed.

### **Results & Analysis**

Our analysis is based on the data provided by various websites, blogs, newspaper articles, scholarly articles and other such sources. We focus our analysis on the economic costs suffered by India due to ongoing pandemic, Coronavirus (Covid-19).

### Effects on Stock Market

The first wave of uncertainty due to Covid-19 was felt across stock exchanges in March 2020. Most stock indices around the world witnessed record one day falls in their history. For example, Dow Jones Index saw the worst ever fall of 2977 points in a single day in March [10]. Companies' stocks did not remain unaffected and they lost 80 percent of their value in a matter of few days. In few weeks, nearly one-third of the global market was shaved off the pandemic outbreak.

In India as well, market capitalization of each major exchange was \$2.16 trillion before the outbreak of the pandemic. Both the indices, BSE Sensex and Nifty 50 hit their peaks in the start of 2020, with making levels of 42,273 and 12,430 respectively (Ravi, 2020). At the start of the year, there were approximately 30 companies that were expected to file IPOs. The market was supportive as the bourses were making highs. But ever since the outbreak of the pandemic, all things have come to a halt. The first effect of virus in India was felt on 28th February, 2020; when the Indian market saw a massive crash and investors' wealth worth Rs. 5 lakh crores was wiped out in a single day, attributable to Coronavirus scare. Indian indices witnessed a steep fall of 3.5 percent which was the second biggest fall in the history of the Sensex. After a gap of few days, on 9th March 2020, Sensex crashed again by over 1900 points on a single day, which is considered to be the significant intra-day decline since August 2015 [11].

A Comparison of Pre and Post COVID View of Indian Stock Markets

Bourses	Indexes-14 Jan 20	Indexes-23 Mar 20	Indexes-24 Apr 20
Nifty 50	12,362	7,610	9,154
Sensex	41,952	25,981	31,327

### Source: Money Control

Ever since the outbreak of Covid-19, markets all over the world have been crashing which was not seen since the Global Financial Crisis of 2008. Strong correlation between global indices and Indian indices came into the picture once again with Indian markets falling by 38 percent. Loss of total market capitalization has been a significant 27.31 percent from the start of the year. Sentiments of domestic investors as well as foreign investors have been alike, that is negative sentiments and all hurrying to exit the falling markets, exacerbating the fall. Foreign Portfolio Investors (FPIs) withdrew

over Rs 1 lakh crore from India market in the month of March amid heightened Coronavirus fear which was a clear signal of deteriorating market conditions [12]. Companies have been scaling back, layoffs have multiplied and employees compensation have suffered a lot, leading to zero growth in the months of March and April. Sectors which provide non-essential services such as tourism, hospitality and entertainment have been plummeted by more than 40 percent and are the worst effected sectors of the economy.

To add to the global economic uncertainty, global crude oil war also begun. Decision of restricted production of oil by Organisation of Petroleum Exporting Countries (OPEC) was rejected by Russia. An increase in the supply side of oil and meeting no demand from consumption side further aggravated the situation for the world. War between Saudi Arabia and Russia brought volatility into other assets and global markets; and along with scare of Covid-19 on equity and debt markets, commodity and currency markets were also impacted badly with the US oil collapsing to its lowest level for the past 18 years. China being the largest importer of oil globally was in the lockdown period and hence there was no demand for the oil for the biggest consumer worldwide. Just after few days, many countries across the globe went into lockdown and at some point of time, there was a negligible amount of consumption of oil, and all this orchestrated to a major crash in oil prices.

### Effects on Manufacturing Sector

One of the hardest hit sectors of Indian economy has been the manufacturing sector. Repercussions of Covid-19 induced lockdown were and are hugely being felt by this sector, and there will be prolonged and serious effects on it.

Manufacturing sector's contribution to the GDP is almost 20 percent, of which 50 percent is contributed by the auto industry [13]. On the other hand, manufacturing sector faces a double challenge. First, there are going to be supply side disruptions linked with the international markets as well as within the domestic markets. Second, on the demand side, several industries would be impacted ranging from consumer durables and automobile to the industries producing intermediate goods and

basic goods and it will have a cascading impact on the whole sector.

The first two months of 2020 were critical for China when there was a tremendous slowdown in its business. The heat of slowdown in China was being felt by the manufacturers in India, who are largely dependent on raw materials, imported from China. And then the increasing cases in India as well spiked panic in people and shook the manufacturing sector. On March 19, 2020, Federation of Indian Exports Organisations (FIEO) also released a statement stating that the micro, small and medium sized enterprises (MSMEs) will be the worst affected sector due to the outbreak of Covid-19, particularly in the first quarter of 2020-21, which largely went through the lockdown. At a very broad level, a single day of full shut down with no production of goods and services costs around Rs 50,000 crore of real GDP.

India's manufacturing sector witnessed an unprecedented contraction in the month of April amid national lockdown restrictions. It entailed collapsing business orders at a rapid pace, firms shut down their productions and staff was reduced at a record pace, impacting all the related stakeholders.

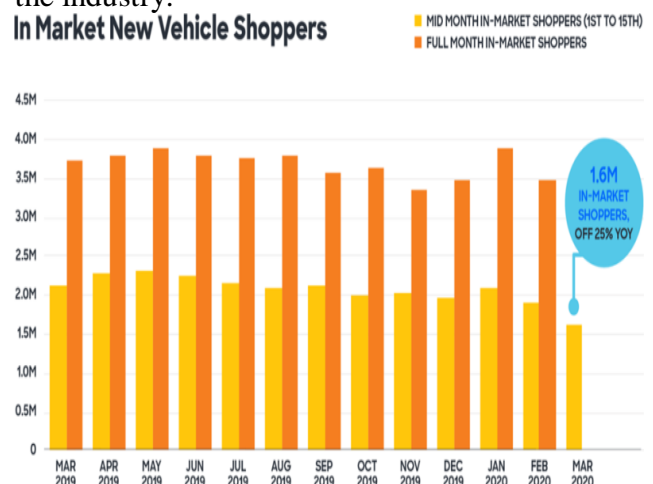
Purchasing Managers' Index (PMI), which is considered vital in projecting the direction of manufacturing and services sector, fell from 51.8 in March to 27.4 in April; reflecting the sharpest decline in the index in the past some time [14]. The index witnessed decline after 32 consecutive months of growing levels. Such a PMI score indicates contraction in the economy, which was induced due to the nationwide lockdown. Amid widespread business closures, demand conditions were widely hampered, as there was no source of income with the consumers left. Rate of new orders fell for the first time in last two and a half years and that too at an unprecedented rate.

Major industries such as pharmaceuticals are strongly connected to China and supply chain disruption of raw materials of drugs has given a huge blow to the sector. Though India is a major exporter of drugs in the world, it relies on the imports of bulk drugs. In the year 2018-19, India imported around 24,900 crores of drugs and a huge chunk of it was domestically consumed[15].

Also, automotive industry, which was already facing a slowdown before the outbreak of pandemic, has seen a drastic impact. The Covid-19 outbreak not only disrupted automobile industry but also impacted the automotive components industry. India imports 27 percent of auto components parts and considers China to be the leading supplier to India. Early shutdown in China and then shutdown in India left automobile manufacturers with many constraints to deal with, with almost all suffering huge losses. Big automobile players like Mahindra & Mahindra, Maruti Suzuki, Tata Motors revealed that they were facing supply side constraints due to the lockdown.

An estimated USD 4.5 billion worth of auto-components were imported from China in the fiscal year 2018-19, which constituted 27 percent of the imports, as stated above. The deadly outbreak rendered Chinese factories ineffectual, which in turn impacted the Indian automotive sector and came to a halt and the situation was further supplemented by the lockdown worldwide, causing a huge loss to the industry.

#### In Market New Vehicle Shoppers



Taking a look at the chemical industries, India's dyestuff companies depend on China for importing of raw materials and intermediate materials of several kinds. Ongoing crisis led to the supply chain disruption, delayed shipments and fears of rising prices of raw materials has in turn increased the prices of finished goods. Also, chemical industries, not producing essential goods for the society, are further facing many problems dealing with the pandemic. Electronics industry is also not left unscathed. A significant share of inputs required in manufacturing of electronic goods



has been imported from international markets such as China. Even those supplies arrived in India earlier required advanced level of sanitization before using them to manufacture the required components or dispatching them to the local markets. From mobile phone manufacturing to printers, to set up boxes and inverters were effected since PCBs were being sourced from China and they were assembled in India. In the current scenario, supply and demand disruptions brought all the activities to a standstill.

#### **Effects on Service Sector**

Services sector is considered to be the backbone of Indian economy. It is the lifeblood for economic growth and jobs and contributes approximately 60 percent to the country's GDP [16]. Impact of Covid-19 and its induced lockdown was inevitable for services sector too. The sector contracted in March sharply as new business and export demand fell rapidly due to the havoc created by the pandemic outbreak. Ever since India's honorable Prime Minister Narendra Modi announced the nationwide lockdown, ordering 1.3 billion people of the country to stay home and shut shops, businesses and jobs, the havoc was on the cards for the economy.

With the humanitarian crisis evolving from the pandemic, grappling the people across the globe, it has become difficult for firms to continue serving their customers and keep the wheels of the economy running. The task was like an uphill battle for those companies that rely heavily on in- person interaction to serve their customer base. These companies include banking, insurance, hospitality, telecommunications and many more. Measures taken by the government of maintaining social distance will be effective for containing the spread of virus but it came as a nightmare for these industries. Physical distancing posed fundamental challenges for companies of these industries to serve their customers and concerns were raised of about how the customers can avail services of these vital players of the economy, while practicing social distancing.

Unfavorable economic effects of the coronavirus pandemic impaired business operations, restricted consumer footfall, shut down shops and everything around came to an

abrupt standstill. The IHS Markit India Services Business Activity Index stood at 49.3 in March and it further fell to 5.4 in April, an extreme decline, which indicated one of the most severe contraction in services output since the beginning of recording from December 2005. Then in May, IHS Markit India Services Business Activity Index registered a number of 12.6. This measure of business index indicates the atmosphere and sentiments of the services sector prevailing in the country and anything below 50 indicates contraction, which was very well being indicated by the halted business and services activities.

Strong growth momentum seen in services sector in 2019 was muted by the outbreak in March 2020 as demand conditions were deteriorated, both domestically and internationally, leading to a reduction in business activity. That mirrored a sharp deceleration in the global activities as the pandemic outbreak paralyzed the economies worldwide.

New export business – which acts as a proxy for foreign demand – also fell at the fastest rate since its formation in 2014. Talking about the banking and financial sector of the country, it was already reeling before the outbreak of Covid-19. The economy was suffering from the collapse of Yes bank and the pandemic further worsened the health of banking sector, which led to the downgrading of banking sector by Moody's from stable to negative. The pandemic will affect the key margins of the banks in the coming quarters as there has been an increase in loan provisioning and decline in revenues [17]. The reduction in the assets value of corporates, micro, small and medium enterprises (MSMEs) raised concerns about their repayment capability and induced further pressure on bank capitalization. Economic slowdown will also impact the demand for loans from big players which will dent profits of NBFCs and banks.

Services sector cannot go untouched without talking about tourism sector, as this sector accounts for approximately 11 percent of global GDP and around 10 percent to India's GDP, along with employing 8 percent of the total population of India. Tourism in India is expected to grow at an annual rate of 6.9

percent and revenue generation of Rs. 32.05 lakh crore for India by 2028, which will then be a contributor of 9.9 percent to the GDP. But the Covid-19 impact could be devastating for people of this sector and could render 3.8 crore people jobless, which is equivalent to almost 70 percent of the total workforce employed by tourism and hospitality sector. The Federation of Associations in Indian Tourism and Hospitality (FAITH) also said that there should be a support fund created for a period of twelve months to support people of this sector by giving them “direct transfer” of money. “A large percentage of total tourism business activity of India, which is estimated at USD 28 billion+ in forex and upwards of Rs 2 lakh crore in domestic tourism activity will be at economic risk through the year. Thus, in excess of Rs 5 lakh crore of direct tourism industry and almost double that of total economic activity is at risk”, said a letter from FAITH to Prime Minister. The association also requested for doubling the stipulated working capital limits on interest free and collateral free terms [18].

Various big hotel chains and resort chains have begun to suffer losses to the amount of Rs 130 to 150 crores; on the other hand, alternate accommodation providers also incurred losses over Rs 420-470 crores. Industry which was doing well till the month of January started feeling the heat from February due to number of cancellations by the tourists. Overall losses in this summer holiday are expected to be 25 percent on year-on-year basis. It can be fairly said that the tourism and hospitality sector will take a lot of time to revive because of the fear prevailing in the minds of people.

#### **Economic effects on International Business**

In this integrated world, effects of Covid-19 on world economy can be far reaching. The outbreak of the pandemic has impacted trade relations between India and China to a great extent. China has been a major trade partner for India for quite some time. China has been an importer of Indian products which include jewelry, pharmaceuticals, seafood, etc. India's exports of diamond are equivalent to 36 percent of total exports to China and 34 percent of total exports of pharmaceuticals. But owing to the outbreak of the pandemic, all of these activities have come to a sudden halt. Outbreak

has significantly disrupted the manufacturing activities across the globe and it has severely hit Indian exports. Exports, in the period of March, took a dip of 34.57 percent, bringing down the exports for the period 2019-20 to \$314.31 billion [19]. Muted exports could shave off the economic growth that was already suffering through the economic slowdown before Covid-19. India's exports rose for the first time in February after seven months, up by 2.9 percent and the up move was majorly driven by growth in shipments of petroleum, chemicals and engineering.

Imports, on the other hand, also witnessed a dip of 30.26 percent during the period of March to \$31.16 billion. Decrease in imports was mainly driven by precious and semi-precious stones, gold and a major drop in oil prices. With the virus induced lockdown imposed, India's imports fell further and hence, it would bring down India's import bill. Fall in exports and imports reduced the trade deficit significantly to \$9.76 billion in March. This figure was registered to be the lowest in the past 13 months. For the full fiscal year (2019-20), imports reduced by 9.12 percent to \$467.19 billion. Trade deficit for year 2019-20 was \$152.88 billion, against the trade deficit of \$184 billion in 2018-19. Commerce ministry cited in a statement, “the decline in exports has been mainly due to the ongoing global slowdown, which got aggravated due to the current Covid-19 crisis. The latter resulted in large scale disruptions in supply chains and demand resulting in cancellation of orders.” Federation of Indian Export Organisations also said that the trade data obtained was expected beforehand as exporters were not able to ship the goods during the second half of March due to lockdown, revoked and delayed shipments and orders. Spread of Covid-19 has not brought the negative sentiment among people across the world but has also disrupted the supply chains and has brought world economies to the stage of recession. Similar trend was expected during the first quarter of 2020-21 as well and the recovery is expected from the second quarter and that too at few percentage levels of pre Covid-19.

During 2019-20, sectors which registered negative growth included petroleum (8.10 percent), handicrafts (2.36 percent), cotton/yarn fabrics (10.67 percent), engineering (5.87 percent), gems and jewelry (11

percent) and leather (9.64 percent). Other sectors such as tea, coffee, tobacco, rice and cashew also witnessed a negative growth in the last year. World Trade Organisation (WTO) also forecasted that the world trade would witness a reduction between the level of 13 percent and 32 percent by the disruption caused by the Covid-19 pandemic (FE,2020).

#### **Changes in Consumer Behavior**

Outbreak of Covid-19 has taken the whole world by a storm. People are caught up in the fear of getting infected with virus and in the wake of that, Prime Minister, Narendra Modi announced a nationwide lockdown on March 24, 2020, which was extended further and a complete lockdown of approximately 2 months was followed by some relaxation of restrictions by the government. All these activities led to disruptions and confusion prevailing in the mind of people, thus affecting the consumer behavior. As soon as the lockdown was announced, people started hoarding daily essentials such as rice, wheat, packaged food, etc. and it was observed that all this hoarding didn't contain non-essential items such as beverages, etc. But a secondary research reveals that even after hoarding up of items, there was a drop in demand [20].

Consumers purchase decisions were heavily altered resulting in higher spending in health and hygiene sector, ordering food items and other products online rather than going to the stores. Social distancing norms would be followed by the customers visiting the retail stores, resulting in low footfall per store and fewer customers; and this will likely put more pressures on retailers' profitability and margins [21].

#### **India's growth projections**

Due to the challenges faced by the Indian economy as a result of the outbreak of Covid-19, there are high chances of the economy going into recessionary phase. The pandemic affected the last quarter of the fiscal year 2019-20, it is expected to have major repercussions on the upcoming quarters of fiscal year 2020-21 as well. Taking into consideration the negative outlook of the global economy, many agencies have revised their ratings and growth projections for the countries across the globe. Supply chain disruptions, muted demand growth, restrictions on travelling internationally as well as somewhere domestically, declining investment levels, all have contributed to the sluggish growth of the economy.

Big financial institutions such as World Bank and rating agencies such as Fitch Ratings have revised their ratings for India and will continue to do so in the future as the situation folds out.

World Bank lowered India's growth outlook by asserting that the economy will shrink by 3.2 percent in 2020-21, as of June 8 [22]. The contraction in the economy was attributable to the lockdown imposed to contain the spread of Covid-19. World Bank said in the edition of Global Economic Prospect, "Stringent measures to restrict the spread of the virus, which heavily curtails short-term activity, will contribute to the contraction." The World Bank said that the global economy will witness the worst depression since the

Second World War.

On the other hand, Fitch Ratings expected the Indian economy to contract by 5 percent in the ongoing fiscal year [23]. However, the economy is projected to bounce back with a growth rate of 9.5 percent in the next fiscal year, the rating agency reported. Fitch Ratings said in a statement, "The pandemic has drastically weakened India's growth outlook and laid bare the challenges caused by a high public-debt burden".

#### **Conclusion and Recommendations**

Coronavirus (Covid-19) spread throughout the world in the early 2020, originating from Wuhan, China. It has created havoc since then. This paper attempted to study the impact of Covid-19 on Indian economy comprising of various sectors. The impact on these sectors will be last long and the pandemic has effected operations of firms across the globe and severely impacted their profitability, productivity and margins. Indian economy was already suffering with the economic slowdown before the disruption created by the pandemic, and this outbreak has further aggravated the economy, bringing it on to the verge of recession phase. Many people lost their jobs, losses suffered by the firms of different sectors were very huge and it can be safely said that there would not be any sector that would remain unscathed from the disruptions caused by this pandemic.

After measuring the effects of Covid-19 on Indian economy and its different sectors, this study proposes various measures for both short – term and long – term. An important aspect for the revival for any slowing economy is transferring cash into the hands of people and specially people of lower class. Direct transfer of money to the people of low class will mean that they will spend most or all of that money for fulfillment of their needs and by this way, money can be easily injected into the economy, which can in turn run the slowing wheels of the economy. Giving money in the hands of middle class or upper class may lead to most of the money being saved by them and not being spent. Other measures can be effective implementation of monetary policy tools such as: by lowering repo rate by RBI, banks can avail funds at low cost from the central bank and then they should lend money to people at the corresponding lower rate, leading to a swift

execution of monetary tool. By lowering the lending rate, banks can enjoy the credit growth and borrowers, as well, can borrow funds at low cost and continue their business activities. There is a strong need for the RBI to encourage banks and NBFCs to increase their credit supply by lowering the lending rate. Another measure can be of extending the moratorium period, which was directed by the central bank to the banks, to a period of 8-9 months. Banks can charge the interest during the moratorium period at minimal levels. Government can propose more capital intensive plans for MSMEs. MSMEs should be given cheap credit as their revival can be a significant boost for the overall economy; because they employ a large section of the society and giving them easy money, which in turn can attract their employees with high wages can change the scenario quickly. Further, central government can expedite the process of disbursing money to the state governments so that all can work freely in their own capacity. MGNREGS plan should be properly implemented in each and every state and ensuring that people get minimum number of employee days along with their pay. Several assistance plans that include lower and

important section of the society, that is farmers, daily wagers, etc., should be announced by the government. Government should also start improving its health care programs; start allocating a large portion of its budget to the health care sector. International assistance from developed countries and financial institutions to emerging and developing countries can prove to be effective during this unprecedented time.

Findings of the above analysis and recommendations can be helpful for the policy makers, analysts, government and various other corporate players in order to formulate the policy which is suitable for the economy, assuaging the impact of the pandemic.

### Limitations

The paper aims to study the impact of Covid-19 on some sectors of the economy and try to assess the impact of the outbreak in the form of job losses and financial losses incurred by the sectors. The data collected is for the period March, April and May. The information presented in the paper pertains to the date of research and hence, can be considered lagging.

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