ADOPTION OF DIGITAL HEALTHCARE AND TELEMEDICINE IN INDIAN HEALTHCARE POST COVID-19

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ABSTRACT

The healthcare sector is currently undergoing an irreversible and huge transformation which has made it quite evident that the time has come when telemedicine and digital healthcare shall be practiced by doctors to diagnose initial symptoms because the population has proved to be more accepting towards it. Apart from providing expert advice from a virtual environment, Telemedicine also helps in establishing and maintaining doctor-patient relations and to educate and consult the medical practitioner more openly. The study appraises the drivers and the barriers of telehealth in India; with a specific importance on the adoption of it as a technology by the public in the post-COVID situation. The study will review established articles and research papers, further backed by empirical evidence through a survey (Questionnaire) and evaluated through data analysis. Awareness and Willingness to adopt Telemedicine and Factors that affect usage of telemedicine among the population and its adoption. With the changing scenarios in this current and post COVID situation, the healthcare sector has gained utmost importance with the growing need to reach maximum number of people and avoid unimportant visits to the hospitals/clinic which will be beneficial for both: the people and the doctors. This study is original in nature and includes the change in consumer preferences post COVID-19 and due to which there is increased tendency towards novel technologies like Telemedicine and Digital Healthcare and hence a thorough understanding in this area is required.

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Keywords: Telemedicine, Digital Healthcare, Healthcare, Technology, COVID-19

Introduction

Telemedicine is the effective usage of the electronic communications for the sharing of medical records and information from one location to another, virtually, with the main objective to improve the health of a patient. Telemedicine facilitates the communication and sharing of information between providers, and hence enables an interactive tele conferencing between associative medical and health care teams to recommend the diagnosis of radiology scans and images, pharmaceutical and medical reports, and recordings. Health-care delivery is facing drastic yet systematic changes with the inception of this new technology which has become a major player to the adoption of telehealth practices. Telemedicine has been around since very long and is being practiced from the early 1900s when healthcare providers administered the use of two-way radios for communication of required medical services. And this further specifies that monitoring and consulting valetudinarian with the help of cell-phones have been established in the compositions since 1960s. (Neville, 2018)

With the advancement and continuously increasing population and the respective emphasis over public investment and basic health services, along with their economical and geographical viability trade-offs is an important aspect for governments and other public institutions to prioritize. Health of an individual is one of the most important and sensitive issues for sustainability and the longevity of life. With that respect, Telemedicine has emerged to be the most favourable solution to the healthcare industry's various problems. Therefore, given the limited human and financial resources, Expanding access to healthcare services for a significant amount of population is essential to identify the major factors influencing, both acting as aids or barriers, telemedicine adoption. (Abdalla, 2019) Telehealth, or Telemedicine, can offer alternatives for receiving medical advice and healthcare services in urban as well as rural locations and thus improving reach and cutting costs occurred due to excessive traveling caused for acquiring services. Although, with the slow and disintegrated adoption rate; the full potential of telemedicine has not been fully realized. This study describes Telemedicine-attached awareness, perceptions and understandings related to its benefits and shortcomings. Given that the patients can affect

the way telemedicine services are transfered, understanding patient awareness along with their perceptions becomes imperative in order to develop widely accepted services that are also accessible with ease to the community.

Literature Review

The word "telemedicine" can be literally translated into 'healing at a distance'. Telemedicine is often used as a broad term to encompass various other healthcare and medical practices like health care delivery in addition to other activities such as health surveillance, education, public health promotion and healthcare research. [1] The main attraction of telemedicine is in its ability to communicate medical related patient data over a distance and to be produced electronically where and when required. The earliest record of telemedicine was found to be when ECG was transmitted, to a remote location, over telephone lines which was published in the first half of the revolutionary 20th century. [2] Although, the first known instance of live video consultation was found to be when the medical practitioners at the University of Nebraska used interactive telemedicine in real time (video) consultation to transmit neurological examinations in the year 1959. [3]The telemedicine practices assist in reduction in frequent hospital or clinic travel expenses, reduces medical costs, provides easier access to specialist doctors, for the common man, without disrupting the person's daily responsibilities and life work and also saves a lot of time. Moreover, Telemedicine also makes the healthcare providers' life easy by drastically reducing the load of cancellations and missed appointments and hence increasing revenue and increasing the consumer experience by improving health outcomes and required follow ups. [4]

As per the American Telemedicine Association (ATA), Telemedicine can be defined as "the natural evolution of healthcare in the digital world" while the World Health Organization (WHO) has defined telemedicine in a more comprehensive manner which can be simply put as, the delivery of healthcare services by various healthcare practitioners by adopting communication technologies and information for the transfer of correct and trusted information for the disease treatment as well as the prevention, research and evaluation, diagnosis and for the extending education help to the medical workers. [3]

A. Background

Telemedicine administrations shouldn't substitute the requirement for in-person arrangements, yet to supplant physical conferences where clinically appropriate. Rustic patients embrace the utilization of telehealth discussions at their close by a clinic or from typical clinical practice in the region. A mix of indicative test results can be provided to the specialist before the discussion or can be made accessible for survey and investigation progressively over the span of the interview. [2] Whenever required, the supporting clinician may attempt physical assessment and is additionally answerable for guaranteeing that the patient has comprehended the result of the discussion. Master telehealth discussions would thus be able to be conveyed for a wide scope of clinical reasons, for example, pre-or post-usable assessment; oncology, endocrinology, nervous system science, cardiology, and so forth.; psychological well-being appraisal, and pre-and post-natal obstetric consideration. [5]

There are numerous boundaries to getting to human services in creating nations, for example, accessibility, practical perspectives, topographical variables, lastly the adequacy. These hindrances are getting increasingly tricky for ladies, youngsters, the old, and individuals with physical impairments. The Healthcare area is embracing the utilization of telehealth exercises to conquer boundaries in order to expand the capacities of its administrations to the general individuals. Specifically, stupendous headways in data and correspondence advancements (ICT) have made more up to date open doors for moderate social insurance for the populace. In the end, the telemedicine is rising as the most appropriate and flexible apparatus for building government social insurance approaches [6] . Telehealth has a few positive viewpoints which can help improve a crisis activity when there is a connection between natural and ecological risks. During flare-ups of irresistible infections, telehealth can permit remote consideration triage and give quick information and data through innovation –, for example, chatbots, as

found in Singapore during COVID-19. Telehealth can likewise help with the analysis of ailment through video interviews with social insurance experts. [7] There are different applications for continuous consideration, as exhibited by a clinic in the US where doctors at present use telehealth remotely to think about COVID-19 patients. Besides, telehealth can permit individuals to explore the wellbeing framework and to get to routine consideration during contamination. While the possible advantages of telehealth are clear, telehealth take-up has been constrained in crisis circumstances [6]. For instance, the subsidizing gave by the Australian government to help conveyance of psychological wellness administrations web-based (videoconferencing) to individuals influenced by the bushfire emergency appears to have had little impact. Outside of crisis circumstances, telehealth by and large take-up was moderate and divided. Considerable endeavors have been made to scale up telehealth routine use, regularly with constrained achievement. In Australia, telehealth spoke to under 1 percent of all expert conferences gave, in spite of the presentation of liberal monetary motivating forces for pro video interviews. Outside of crisis circumstances, the general take-up of telehealth has been moderate and divided. Generous endeavors have gone into scaling-up the normal utilization of telehealth, frequently with constrained achievement. In Australia, in spite of the presentation of liberal money related motivators for pro video meetings, telehealth spoke to under 1% of all master discussions [5]. The involvement with the U.S. has been comparable, was under 1 percent of country individuals have ever had telehealth. Purposes behind low telehealth take-up are differing and multifaceted, yet factors, for example, clinician readiness, money related repayment, and (re)organization of the wellbeing framework might be to blame [8].

B. Present Scenario

In the present evolving situation, the advantages of the Medical field are as yet accessible to the favored rare sorts of people who dwell predominantly in urban territories, notwithstanding a few advances made in it. 75 percent of qualified doctors and experts work in urban focuses. While the majority of the number of inhabitants in India live in rustic regions. Telemedicine can improve fundamental medicinal services for a transcendently provincial Indian populace. Telemedicine can end up being the least expensive approach to connect the country's urban wellbeing separately, just as the quickest. Considering India 's colossal advances in data and correspondence innovation, telemedicine could help carry specific medicinal services to the remotest corners of the nation [9]. Telemedicine's adequacy has just been shown through the system made by the Indian Space Research Organization (ISRO), which through its geostationary satellites has associated 22 super-claim to fame medical clinics with 78 rustic and remote emergency clinics the nation over. This system has empowered a great many patients to get to meetings with specialists in super-claim to fame clinical foundations in remote areas, for example, Jammu and Kashmir, Andaman and Nicobar Islands, the Lakshadweep Islands and ancestral territories of India's focal and north- eastern locales. ISRO has likewise given a few towns better network to portable units, like telemedicine, in towns, especially in the regions of network wellbeing and ophthalmology. Telemedicine can likewise be surprisingly helpful to individuals living in detached networks or even remote zones and is by and by utilized in for all intents and purposes each human services field. Patients living in these zones can be seen by a clinical professional who can give an exact and careful assessment while the patient might not need to travel or sit tight for ordinary separations or events, for example, those from conventional medical clinic or GP visits [10]. Telemedicine can likewise be received as an instructing device that permits experienced specialists or clinical staff to watch, show and train clinical staff present in different areas and thus can be utilized a quicker and increasingly viable showing procedure and improve access to clinical and human services offices for patients even in the remote areas. Increased access, however, Telemedicine has additionally appeared to lessen the general human services cost and productivity, limit voyaging necessities, and remain at the medical clinics [1].

Health care institutions assessed and began using eHealth services to support patient care for several years. The evolution of mobile phones and the wide availability of applications for prevention, wellness, and fitness scenarios have resulted in eHealth becoming more important to the healthcare industry as these new services help to better support the care process [10]. When it comes to eHealth services, both the primary and secondary health care markets are important. As eHealth is an important economic factor, the Organization for Economic Co- operation and Development member countries spend an average of 8.9 percent of their gross domestic product on health. Furthermore, start-ups and "big players" (e.g., Google, Apple, Facebook, Amazon, and Microsoft) play an important role in the eHealth economy. There are several models available to evaluate the use of technology, such as the Technology Acceptance Model and the Unified Theory of Acceptance and Use of Technology, which are often adapted for eHealth assessment. Such models provide criteria for assessing the acceptance of technology. These models can somewhat explain the use of eHealth in routine care. Those models may, however, benefit from several additions and modifications, particularly with regard to implementation [11].

Over the last few decades, the use of internet, broadband service and wireless technology has become more and more advanced, including the use of smart-phones or cell-phones which has become almost omnipresent. Patient education with videos and images, transfer of digital data such as X-rays and scans, and audio and video consultations in real-time has become a real thing in today's world. Advancement in the infrastructure of internet such as digitalizing information, web service backups, encryption and password protection, bandwidth communication speeds, standard formats for data transmission, Health Insurance Portability and Accountability, Act of 1996 i.e. HIPAA guidelines, and establishment and increased usage of EMRs (electronic medical records) and information storage databases, has made telemedicine and e-health cost-effective and hassle-free. Telemedicine practices using new age technologies reduce travel expenses and medical bills, saves time, provides easier access to specialist doctors, irrespective of location, without affecting their daily duties and responsibilities [3]. Moreover, it tends to make the life of healthcare and medical practitioners easy by reducing the tension of cancellations and missed appointments, increasing revenue, and easing follow up activities and hence improves overall health outcomes. Several virtual software platforms are being adopted, as the world faces the impact of COVID-19. Other software platforms such as chatbots and wearable devices are being adopted, beyond video consultation software and mobile phone applications. These virtual software platforms are deployed to support both asynchronous and synchronous outpatients [12] [8] These virtual software platforms also provide simultaneous, real-time audio and visual-enabled visits that are easy to use for anyone like physicians , patients, and staff attendance scheduling appointments, allowing patient treatment via smartphone computers or tablets, and complies with patient privacy legislation. Furthermore, other emerging virtual software platforms such as voice- interface systems (e.g., Google Voice, Amazon Alexa, Apple Siri) or mobile sensors such as thermometers, smartwatches, or oxygen monitors can be adopted for home treatment. Although it is difficult to adopt these virtual software platforms in severe situations, many medical health systems are already using existing telemedical platforms to respond to patient treatment [13].

C. Classification of Telemedicine

Telemedicine can be divided into three main categories as:

1. Store-and-forward telemedicine: Includes the acquisition of health data (such as image processing, bio signals etc.) and subsequent transmission of the whole data to either a doctor or medical specialist at an appropriate time for offline evaluation. It does not demand that both stakeholders be present simultaneously. A component of that transfer should be a properly constructed medical record preferably in electronic form. The omission of an actual physical exam and history is a key difference that makes in-person patient meetings and telemedicine interactions. The 'store-and-forward' process needs the physician to rely, instead of a physical examination, on the

history report and audio / video information. [1] [14]

2. Remote monitoring: Also recognized widely as self-monitoring or evaluating, medical professionals can supervise a patient remotely using several novel technological instruments. This method is especially useful for chronic disease management or some other specific conditions which require time to time consultation with the doctor. These services have capability to deliver comparable healthcare outcomes to conventional face-to-face patient consultations, can provide patients with greater satisfaction and can be cost-effective too. [1] [14]

3. Interactive telemedicine: Services deliver real-time patient-provider interactions, including telephone conversations, digital chats, and home visits. Many exercises such as history review, medical examination, psychiatric evaluations, and ophthalmology analyses can be performed in comparison with those performed during conventional face-to - face visits [1] [14]

D. Indian Scenario

India, a large nation, geographically and demographically, and having a population of 121 crores and higher, the equitable and proper distribution of medical and healthcare services has, in the present and in the past, found to be a tedious and task and hence considered an important aspect in public health management [6]. As per the recommendations of the World Health Organization (WHO), a doctor-people population ratio of 1:1000 is considered to be fair enough and should be targeted by any country; whereas the current doctor-public population ratio, as per The Economic Survey 2019-20, in India stands at only 1:1456 [7]. In addition to this fact, is the known truth of increased concentration of medical and healthcare facilities to the urban posh areas, cities and towns; including the almost two-third doctor population, away from the rural India, where around 68.84 percent of the total national population resides and hence it can be rightly stated as almost 27 percent of the Indian population has access to 75 percent of the medical manpower and healthcare infrastructure [3]. Just like NASA, the Indian Space Research Organization (ISRO) made a modest, yet profound, beginning in the field of

telemedicine and e-Healthcare in India in 2001 with the Telemedicine Pilot Project, which linked Apollo Hospital in Chennai to a rural Apollo Hospital located at Aragonda village in the district Chittoor of Andhra Pradesh. Apart from ISRO, the initiatives are taken by the Department of Information Technology (DIT), Ministry of Health and Family Welfare, Ministry of External Affairs, and the state governments have played a vital role in the advancement of telemedicine in India. Setting up a National Telemedicine Task Force in 2005 by the Indian Health Ministry; can be considered as one of the many other positive steps taken by the government [3].

Adoption of any technology does not always follow an exponential curve of adoption but the slow pace of adoption, often, makes more sense [1]. It is a well-known fact that technology adoption in medical consultation and healthcare often lags adoption when compared to other sectors. Hence, the adoption of new technologies, in the Healthcare sector, sometimes takes longer to be adopted by the people and is done after considering most of the consequences and outcomes [15].

Telemedicine is increasingly changing the healthcare sector and is expected to become the most recognized and used diagnostic and prescribing tool in the coming years. Demand growth is likely to be driven by increased telemedicine adoption, increased incidence of chronic diseases, increased geriatric population, government initiatives, and, among others, a shortage of physicians [13]. Advances in the digital medical technology, rapid processing of images; even remotely in an emergency situation, and a rise in the number of chronic illnesses such as congestive heart failure, orthopedic injuries, and others are some of the main factors driving telemedicine market growth. In addition, the upgraded IT infrastructure and improved healthcare spending also expected to increase the market growth. The evolution of low-power, wireless, and portable X-ray technology is likely to provide significant market growth opportunities over the forecast period. In addition, increasing awareness and acceptance of remote monitoring solutions, and boosting technological advancement in telecommunications, is the key factor

responsible for the global burgeoning demand for telemedicine. The COVID-19 pandemic has quickly expanded the telemedicine market, replacing health care encounters with telehealth [6].

E. Major Players in India

Telemedicine was a field which was successful, in Indian healthcare scenario too, in invoking a keen interest in the private sector and various start-ups and making them take an active part in public health management. The major players of Indian private telemedicine landscape are as stated below:

1) Practo

Practo is India's oldest telemedicine enterprise, initially founded in May 2008 which works solely as a gateway to the medical practitioners or doctors; in order to book medical appointments or consultations, store health records, get insurance, get prior reminders for appointments, or deliver medicine, all through its website and mobile application for people seeking medical help. Practo also enables doctors to increase their presence, establish themselves further, and enhance engagements with the patients. It has been able to build trust in millions of people to provide genuine services. It also helps people with regular and normal health conditions too by helping in finding a good doctor, booking a health check-up appointment, carrying out blood tests and efficiently managing and safekeeping their health records. It also helps to people looking for learning new ways to live fitter and healthier life. With its consumer and software business, it has established presence in more than 15 countries with around 200,000 doctors listed with them and almost 50 million appointments every year. They follow all the rules and regulations of telehealth like a medical license, specialization and qualification are verified for all the doctors supported on their platform. They further consider the HIPAA compliance act to safeguard the confidentiality and privacy of the patient.

2) 1mg

1 mg is primarily a provider of online medicine and was established in 2015. They are a provider of authoritative, accurate, and trustworthy medical information, and hence help people use medicines effectively and safely. 1 mg has become pioneer in home delivery of pharmaceutical (medicinal) products and other healthcare products, from authorised and licensed pharmacies, in around 1000 plus cities across India. Leveraging their strong online presence as a medicine provider, they have also started providing home and telemedicine service and laboratory tests appointments and services. 1 mg offers the verified and registered doctors, on their platform, an unlimited and free consultation in less than 30 minutes. 1 mg has seen a gradual increase in its telemedicine services adoption and have had several doctors listed with them, since they started to practice telemedicine, and have also done more than 30 lakhs consultations.

3) Medlife

Medlife was established in 2014 with an aim to make medical services and healthcare easily accessible and arguably affordable to everyone in the country. Medlife addresses almost all the health needs with their laboratory testing, online consultations, medicine delivery, and health reports recording storage services. On its platform, a patient can consult a doctor online within 1 hour of online appointment and is available round the clock day and night i.e. 24/7 availability. They follow a detailed and rigorous selection process to onboard the trusted, verified, and appropriately experienced doctors on their platform which is highly rated by patients or the users. Their presence currently is in 29 Indian states with more than 1000 doctors and medical practitioners listed, on its platform, who have further consulted more than 10 million customers, providing around 30 plus specialties.

4) Lybrate

Lybrate was established in 2013, and was India's first mobile communication and delivery platform for healthcare. It helps the patient make informed health decisions and makes seamless and smooth consultation with the doctor. Just like all the other telemedicine applications, Lybrate provides a platform to the patients to ask for free questions or directly interact with doctors on a one-on-one basis. They also provide their users with a health feed from experts in healthcare, aimed at keeping them healthy and fit. They guarantee that

physicians, on Lybrate platform, continue improving their methodology and practice conveniently by obtaining specific suggestions from their patients and peers for the fine services that they offer and thus improve their popularity not only in the online community but also in the medical fraternity. Lybrate provides doctors with a special feature to manage the patient information from different clinics who use its online multi-specialty telemedicine platform. They have around 90,000 plus verified physicians on their platform.

5)   Mfine

Mfine was founded in 2017, mfine is an on-demand, digital primary healthcare platform that provides professional diagnostics and health inspection services that can be used from anywhere. Impelled by an unwavering focus on quality and driven by groundbreaking artificial intelligence, mfine 's efforts have always been to make good health more accessible, reliable and trouble-free for everyone. Using mfine, users can instantly consult with doctors online and get health inspections at home-all by pressing or clicking a button. Mfine recently bagged $4.2 million in Series-A funding led by Prime Venture Partners with participation   from its existing investors, Stellaris Venture Partners and Mayur Abhaya, an entrepreneur. By making the best use of state-of-the-art technology, mfine aims to provide a seamless customer experience in the healthcare sector by pooling top hospitals and the finest physicians in the field. By aligning standard medical protocols with AI systems, mfine analyzes various data sources, such as global symptom standards, ontology of diseases, and the literature and research data needed for those systems. It also captures data on customer interaction to facilitate the visualization of the underlying health issues. This way, it helps doctors and   health professionals for diagnosis in a smoother way.

6)   Others

Apart from these major start-ups, there has been an increased affinity towards telemedicine from healthtech start-ups too. For example, Curefit, which is a Healthtech app, has added telemedicine services under the name Care.fit which will be essentially a virtual consultation clinic. The company provides both physical and digital consultation amenities and including full-body check-up and individualised health care plans for multiple specialties such as gynaecology, ENT, dermatology, dentistry and more.

F. Factors affecting adoption rate

There are certain shortcomings and gaps in the total acceptance of telemedicine, from both the medical practitioners and the patients, and the Telemedicine or Telehealth applications/ start-ups not only bridge these existing shortcomings or gaps but also provide certain benefits in addition to regular virtual consultations. The various factors that hinder the adoption of telemedicine as an activity by the patients are- [2] Trust on Doctor: patients tend to have a   greater trust on their family doctors and prefer to choose them over any other doctors. [2] [6] Cost of Consultation: Cost can be considered one of the major hindrances as most of the people do   not realize actual value of telemedicine. [11] [6] Data Security & Privacy: The patients are very averse that their personal information and data will be used in some other activities unknown   to them. [2] Service Quality: The patients do not feel much satisfied after the service due to lack   of personal touch and satisfaction. [11] Resistance to Change: Any new technology when implemented faces the brunt of resistance to change from people because of slower rate of adoption and less knowledge. Similarly, the various that aid in adoption of telemedicine are- [6] Lesser Clinic/Hospital visits post Covid-19: Due to COVID-19 pandemic, there is increased awareness to not visit hospitals and clinics for non-emergency purposes. [8] Ease of Access to Healthcare: Telemedicine facilitates access to renowned doctors from just booking an appointment from the application. [6] Electronic Health Recording and Monitoring: Telemedicine helps in keeping medical records safe and secure in electronic format and facilitates the ease of reproducing them when and where required. [11] [2] General Awareness on healthcare: Telemedicine helps in increasing general awareness about personal health by accessing valid and trusted information from the doctors directly. Reduced [11] Load on Hospitals: With increased adoption of telemedicine, the hospitals will be

able to handle patients more efficiently and also address to healthcare issues in remote area hospitals.

Research Methodology

The past literatures talked mainly about Telemedicine as a technology to improve healthcare services and its adoption rate before the pandemic scenario. This paper focuses majorly on the adoption of Telemedicine post the arrival of pandemic situation in India. It also focuses on the various aspects that could facilitate telemedicine adoption rate. This is a descriptive research and for the purpose of finding the awareness and adoption of Telemedicine, the responses and attitudes of the people were recorded through a google form. The questionnaire circulated generated responses from 122 respondents and their data was then analysed. Most of the respondents through this medium were college students both graduate as well as post- graduate. Though the respondents belonged to various parts of the country, the majority of the data analysed was for Pune region in Maharashtra. The adoption of Telemedicine also changes with the change in geographical locations of the people.
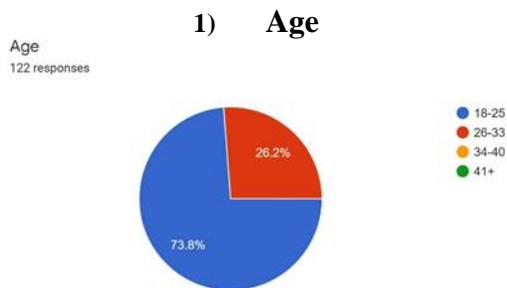
1) Age

Fig. 1 Age Distribution of Respondents

Most of the respondents, 73.8%, belonged to the age range of 18-25 years. From the literature analysis it was evident that most of the adopters of the Telemedicine have found to be in the age range below 30 years followed by age range of 30 to 45 years. Also, in some instances the old aged people are more inclined towards the Telemedicine usage, but in India, they are considered to be dependent on their children and other family members.

Data Analysis & Interpretation

G. Awareness Levels for Telemedicine

1) Awareness about Telemedicine as a Practice:

A majority of the respondents (69.7%), are aware of the term Telemedicine which is considered to be good number as per the literature analysis and also, most of this awareness level positive can be considered due to increased digital integration after the COVID outbreak. Also, around 30% of the respondents can be considered to be unaware of Telemedicine
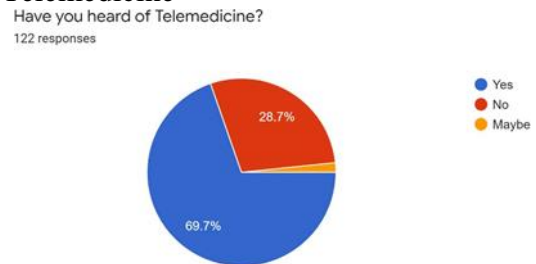

Fig. 2. Awareness Level of Telemedicine

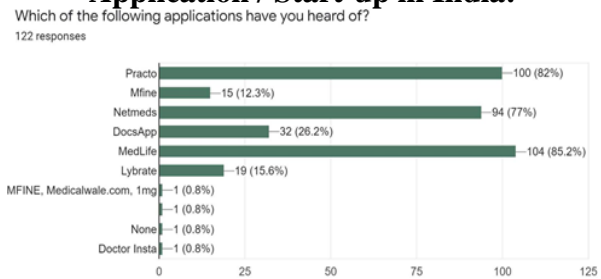#### 2) Awareness various Telemedicine Application / Start-up in India:

Fig. 3. Awareness of Telemedicine Apps and Startups

3) Awareness about recent Government step taken in India related to telemedicine:
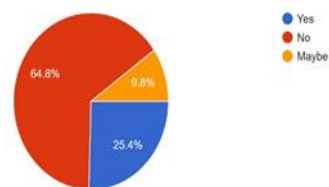

Fig. 4. Awareness of Government Initiatives for Telemedicine

Figure 4 explains that a majority of the respondents, around 65%, were not aware about the major step taken by the Indian government to fast-track the telemedicine adoption on commercial basis. Although, 25.4% of the respondents were aware about this fact.

H. Willingness to Adopt:

Given this post Covid scenario, how willing are you to adopt Telemedicine and avoid unnecessary hospital visits? [1- Less & 5- High]
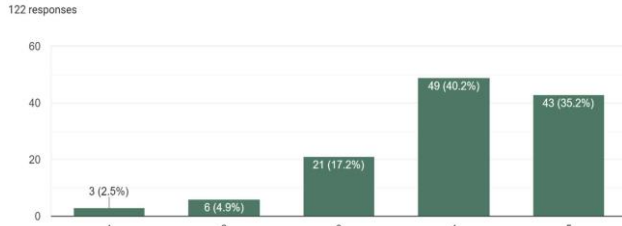122 responses

Fig. 5. Willingness to Adopt Telemedicine post COVID-19

Figure 5 is a pictorial representation of the willingness to adopt Telemedicine post COVID-19 so as to avoid hospital visits and around 75.4% of the people who filled the questionnaire were willing to adopt Telemedicine. Other 24.6% were not that much inclined towards this type of consultation.

Would you utilize Telemedicine facility if provided in integration with Fitness App? For eg. Curefit is providing Virtual Consultation with doctors through its app.
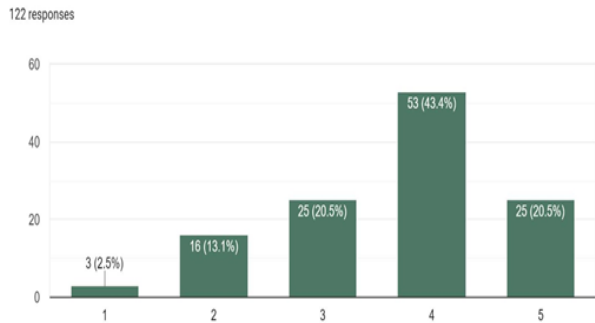122 responses

Fig. 6. Willingness to Adopt Telemedicine when provided with a separate application as an additional service

Figure 6 shows that 63.9% said that they would utilize Telemedicine facility if it is integrated with some kind of Fitness App. Curefit is one such example which provided this type of feature. 20.5% had a neutral opinion regarding it. Other were not interested in availing this facility.

How likely are you to use Telemedicine if provided in integration with your Health Insurance Policy? For eg: Fee for 5 yearly virtual consultations is covered in insurance premiums.
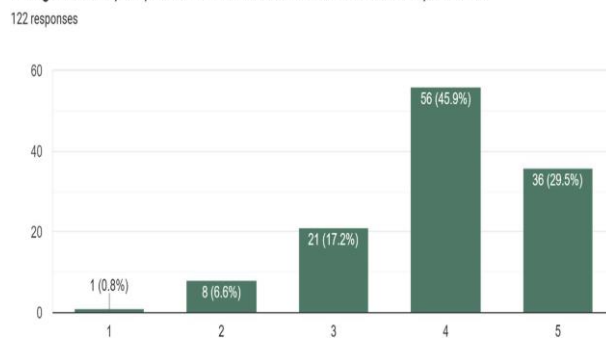122 responses

Fig. 7. Willingness to Adopt Telemedicine when provided with a Insurance Apps

Figure 7 shows that 75.4% of people were willing to Telemedicine if Health Insurance policies are added along with it. 17.2 % had neutral opinion about it and 7.4% did not want to avail this facility even when such policies were attached with it.

I. Factors Affecting the Adoption Rate

The most important reason for that was to have lesser clinic or hospital visits post COVID-19 so as to avoid contact with other people. It will provide easy access to other healthcare facilities and better health recording and monitoring. Very few people considered reduction of load on hospitals as one of the factors to switch to telemedicine. Apart from this, even if once the doctor is physically met with or get hospitalized, follow up visits and post hospitalization can be easily done through telemedicine. Also, for mental health issues like anxiety and depression, most of the people think it would be beneficial, as shown in figure 8 below:

Rank the below factors for the "Negative Impact" i.e. create a hindrance in adoption of Telemedicine.
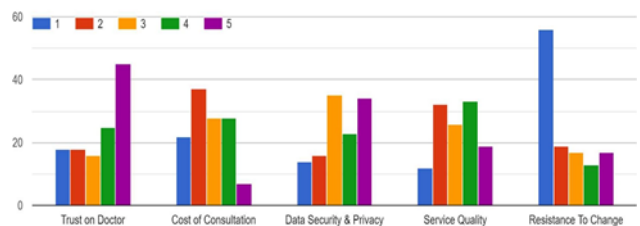
Fig. 8. Willingness to Adopt Telemedicine post COVID-19

Rank the below factors for the "Positive Impact" they would have in adoption of Telemedicine. i.e. Ease Telemedicine Adoption
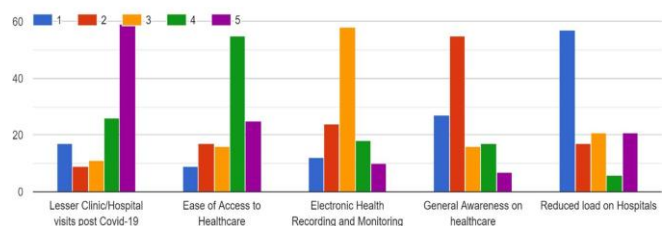
Fig 9.. Willingness to Adopt Telemedicine post COVID-19

Figure 9 shows the factors that affect the most and create hindrances in adoption rate. The respondents were reluctant of having virtual consultation for chronic illness and dermatological issues. Most of the people were not resistant to this type of change but were concerned about the services and

treatment they might receive from doctors due to the absence of physical meets. Also, data security and privacy become a concern when people from towards this type of virtual consultation.

Discussion

Medicinal services in creating nations is amidst a change in perspective, from a customary supplier focused, ailment situated way to deal with a patient-focused, wellbeing the executives model. Telemedicine has impacted practically all parts of human services and numerous examples of overcoming adversity have announced the job of telemedicine in improving medicinal services get to, diminishing expense of care, and upgrading the nature of care. Telemedicine could be a significant device in accomplishing human services coordination and diminishing social insurance incongruities. Notwithstanding of so much turn of events and fruitful work in the field of telemedicine, it still can't seem to become basic piece of social insurance framework. Achievement of telemedicine possibly depends when it becomes fundamental piece of medicinal services conveyance framework and not as an independent task. Presently, the time has come to take telemedicine from pilot mode to routine operational mode in standard wellbeing administrations conveyance framework. There is colossal weight on governments to give available moderate and quality human services to its kin. Just other option and creative strategies like telemedicine can assist with satisfying this hole. Current status of telemedicine in creating nations isn't extremely palatable and going through a phase of emergency. This part has investigated the different boundaries in the improvement of telemedicine in creating countries. These different obstructions referenced above are blocking the speed of extension of telemedicine in creating nations. It is presently an ideal opportunity to limit the previously mentioned hindrances and expel the bottlenecks for smooth advancement of telemedicine organize over the globe for the improvement of mankind

Conclusion

In spite, of the fact that there are potential concerns related with telehealth, there are additionally cost decreases and improved access to mind, along these lines the general advantages exceed the likely negatives. The progressions in telehealth are being incorporated into present day medication and are probably going to turn into the standard of care specifically parts of medicinal services. The propelling innovation, lack of suppliers in certain geological areas, open door for protection repayment, government award openings, and government affirmation are for the most part signs that telehealth is digging in for the long haul and possibly altering the course of the human services industry. In a post-COVID-19 world, we will observer significant changes in the way human services administrations are conveyed. The investigation infers that during the COVID-19 flare-up, a patient sees telemedicine to be helpful and more qualified for the conveyance of medicinal services administrations than at any other time. The patient is all the more ready to attempt telemedicine in the current situation, which will bring about expanded selection of telemedicine in the post-COVID world. The patients discovered outward inspiration, for example, decreased expense and diminished requirement for movement for utilizing telemedicine offices. Last however not the least, the utilization of some type of telemedicine has gotten basic for the vast majority. They are not getting threatened by innovation and putting forth attempts to grasp it. The discoveries of this investigation infer that respondents saw less unpredictability in the utilization of telemedicine post-COVID-19 episode.

Limitations

Following are the limitations of the study:
1. The study was conducted using a sample size which was rather small. To study further about customer behaviour in the Indian telemedicine sector a larger sample size would have been quite handy.
The study focussed on the questionnaire collected majorly from Pune region, and also did not put much emphasize on the rural and sub-urban population where adoption of telemedicine is found to be pretty low. Also,

some government and healthcare workers were not included during the data collection.

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AUDIENCE TARGETING – IDENTIFY GAP IN AUDIENCE TARGETING FOR WIN/LOSS IN AP SYSTEMS STORAGE REVENUE YTY

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ABSTRACT

The trend of conservatively purchasing plenty of available cloud-based storage systems with built in redundancy and committed storage controllers with exclusive firmware was trend off late catching up globally. However, recently the slowing down of demand is witnessed and growth of these types of systems has loosened resulting in declining revenues presents a transformed market scenario.

Through this research we are trying to find the various patterns which has resulted in the decline of the revenue of a Fortune 500 storage company in YTY.

This research attempts to explore the gap audience targeting for win/loss in AP system storage revenue.

Results indicated the region wise and year wise trend of opportunities which can be utilised to forecast the data storage.

This article becomes useful to analyse the trend as it takes into consideration five years' data for study. This also helps in segmenting the market and strategically positioning the firms.

This kind of study is generally limited to firms' internal and exclusive functions but not for market focus. Here we are trying to correlate with marketing strategy formulation

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Keywords: Targeting, ERP, Trend, storage system, Fortune 500

Introduction

Today we are living in the age of Information which is crucial for our day-to-day tasks and becoming more and more significant in our regular lives. Information dependency of the new era, living in a virtual world translates the requirement of information on a continuous basis. Accessing the information from the internet continuously surfing, presence on social media platforms, communicating through e-mails, uploading and sharing images and videos, and many other applications. Loaded with huge quantity of information on various data generating devices, additional data is being produced by individuals than by businesses. Data created by people achieve value once it is shared and acknowledged by others. Data is generally created locally exists on individual devices such as mobile phones, laptops and camera etc. IT stays there unless uploaded via networks to data centres and gets shared and distributed across. Ironically the creation of this humongous information every moment is done by millions and billions of individuals, it's storage and management is done by comparatively a trivial number of organizations.

The rapid digitization has fuelled the dependency, significance and dimensions of information generation and consumption. Some of the business service applications that process information for its basic functioning includes Airlines for reservations and flight scheduling, Telecom companies and KPO's for telephone billing systems, E-commerce, Banks and Financial Institutions for ATMs and Financial transactions, Manufacturing and Marketing firms for product designs, inventory management, Promotions and communications to the stakeholders etc. The outcome of these functional applications not only entails the financial and strategic advantages at the commercial level but also are productive at operational levels.

Earlier decades witnessed storage arrangements of different capacities, small, large and magnetic tapes for archiving, FDD, USB , CD etc. Current era presents vivid storage landscape filled with numerous options. Storage options are expanding, as are application requirements and I/O profiles. What worked a decade ago, is not adequate now. In this

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research paper we are trying to understand the patterns and changes which are affecting the win/loss possibility of the storage market.

A.   Development of Data Storage:

Earlier, centralized computers (mainframe) and small individual Data storage devices (tape reels and disk packs) were the main sources for the enterprises as their own data centre. Gradually with the advent of technology, open systems and the economical disposition available   made it possible for corporates possessing their very own servers and storage systems. Basic capabilities of storage devices combined with supplementary layers of hardware and software to get better performance, improved reliability and convenience access makes the base for developing a storage system.

RAID: It is a redundancy architecture for data storage and is Redundant Array of Independent Disks. This is basically control unit which was built to fulfilling the requirement of economical and better performance and availability of data. The technology is growing constantly even today and is still used as it provides data protection in real time.

DAS : As the name suggests Storage here is directly added to the server or the group of servers which can be internal or external as per the requirement hence it is Direct Attached Storage system . Limited storage limitation is catered by external DAS .

NAS: In contrast to SAN, this attaches to a current local communication net- work (LAN) and carries file access to diverse clients hence Network attached Storage system. Dedicated file serving applications storage is provided. Its usage for file server applications, makes it highly competitive in terms of cost, performance and scalability aspects as compared to general purpose file servers. It is ideal for data sharing.

SAN: These are sleek Fibre Channel (FC) switches which are network supporting block-level communiqué between multiple servers of the clients and their respective storage, hence Storage Area Network. Segregated storage which is allocated to a server for retrieving its data, SAN offers range of benefits like output, scalability and cost efficiency compared to DAS.

IP-SAN: IP-SAN is a convergence of technologies used in SAN and NAS, as One of the ground-breaking developments in storage architecture.   IP- SAN offers block-level information exchange across a local or wide area network (LAN or WAN), resulting in greater consolidation and availability of data hence Internet Protocol Storage Area Network.
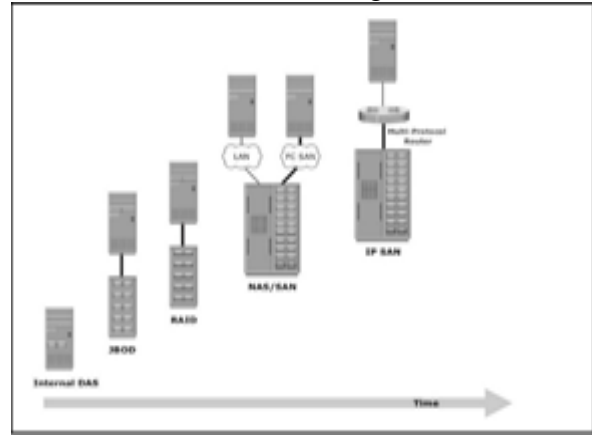
Fig 1: Glimpse pie of different types of Storage box.

B.   Data Storage Market Outlook

Currently, electronic media is used to store data by means of several recording arrangements as compared to earlier times when data storage was done on numerous small devices which were having small storage and life like magnetic tape, phonographic recordings, scripts , DNA, optical discs , RNA etc.   Sometimes, unstable organic amalgams are also used to make the data perish over a period of time. Presently, the enterprise data and consumer storage applications are stored in these electronic data storage devices. Corporate data is also stored using the same devices. Looking at the exponential growth of digitization in big corporate houses across the globe, the market size of the cloud storage was estimated at $46.12 billion in 2019 and expected to reach $222.25 billion by 2027reflecting a growth of CAGR of 21.9% which is in itself enormous. (Global opportunity Analysis and Industry Forecast, 2020-2027).

C.   Data Storage Market Growth Drivers:

The exponential growth of data

Fig2: Data generation Globally
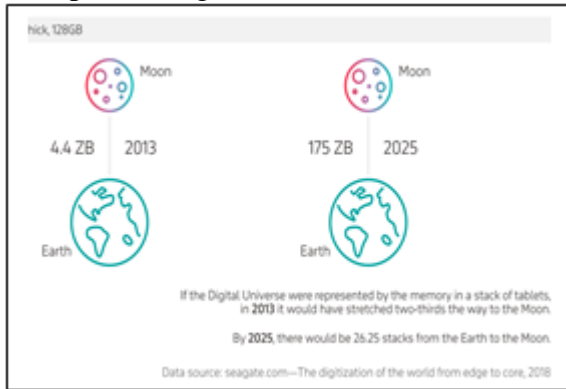
The Permeation of Cloud storage services in Organizations

Cloud computing is being used from 1990 onwards, and most of firms worldwide have already subscribed to the cloud services. The question arises as where they are storing the data and how? According to the statistics presented by The Software Alliance; Global Cloud Computing Scorecard (BSA), cloud computing has presence in around   24 countries currently. If we refer to the statistical chart below, the private and public data storage percentage can be seen as fluctuating owing to multiple reasons such as quantity of information, security levels rising and the cost. Not to mention the technology advancements, Enterprise data storage on the other hand is showing a stable path indicating a different trend altogether.
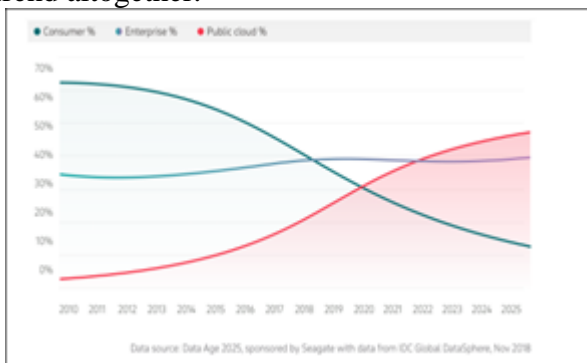

Fig3: Data storage

Adoption of cloud services among different industry verticals

The ease of storing the large amount of data and accessing the data over virtual space has stimulated the adoption of cloud computing and cloud technology across various industry globally and has forced the industry to look for

cloud storage options and also hard-pressed the cloud storage market growth.
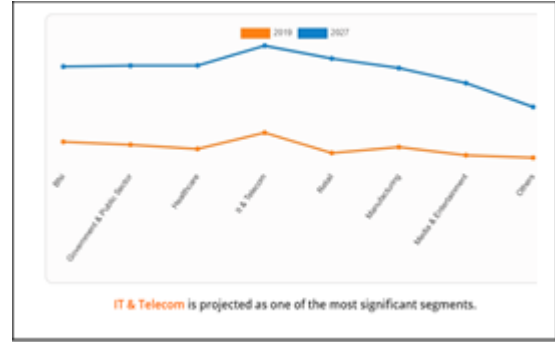
Fig4: Industry wise data storage   Source: Allied Market Research

D.   The End-Users Generating Personal Data

Consumers are creating an astonishing volume of data and media files every moment, especially since the frequent usage of hand-held devices are powered with software and continuous streaming of audio and video information obtainable on the Internet. Moreover, due to the dominance of Internet of Things (IoT) providing functional and pleasurable benefits to all customer segments, the quantity of personal data is growing unanimously. This mounting personal content generation is generating a income avenue for the sellers in the data storage markets.

Fig 5: Storage Market Value

E.   AI Requirement

Almost every enterprise is relying heavily on creating and using AI and data storage is becoming critical for AI workloads and successful functioning. The important aspect for proper functioning of AI is single repository which is tied to the AI and MLL and Deep learning. These repositories must be able to coordinate with physical data centres as well as cloud configuration should be able to support the exabyte of data. All big players are vying to utilize sophisticated AI data platforms based on data configuration, ingestion, organization,

distribution, machine learning, deep learning and archiving.

F. Data Storage Market Challenges:

Data storage devices and the methods are not completely secure. Always there is a threat and the s the prospects of data theft and data loss. So, individual consumers are also moving towards cloud computing methods and cloud storage data systems which is pushing the growth of data storage market on one hand but is also forcing the downward trends of revenue generation of individual data storage devices on the other hand. Nevertheless, the vendors are endeavouring to reinforce the security protocol in individual products by modifying them and adding more storage and security, thereby becoming updated and competitive in the market. Data mining and data storage are becoming the buzz word hence the significance of cloud storage even on hand held device s is the new trend.

G. Data Storage Market Key Players Perspective:

The market is largely held by Western Digital (WD) with revenue of $19.1 billion in fiscal 2017 in primary data storage but when we consider next generation data storage market by storage system, storage architecture, storage medium and end user the players are majorly HP, Dell, Hitachi and IBM with Dell holding the major share (Markets and Markets report March 2019). Western Digital market share is credited to its HDD persistent leadership. The company showcased its updated third generation 10TB HDD and dispatched worldwide 16 million HDDs.

H. Data Storage Market Trends and developments

WD took over SanDisk in May 2015, for a enormous $19 billion. It was a high growth trend for a major Data storage company.

Dell Computer and EMC had strategically merged in September 2016, to take over the data storage market.

HPE announced innovative Intelligent store solutions in November 2018 to help customer's in understanding and utilizing their data storage systems.

Fig 6: Top companies in Enterprise data storage system

Literature Review

The literature suggests many articles which indicated gradual development of software data storage system and the challenges faced by the users and the clients. The growth is driven by customer requirements and the technology development in each stage. It also shows the usage of data as well as issues like privacy and price involved.

In 1996, (Joel E. Ledain ,John A. Colgrove,Dan Koren) discussed about log device based data storage system which had the functionality of providing proficient storage and the retrieval of data. It was performing on a computer system with respect to its operating system, attached to the data storage system. The basic principle was maintaining a record through a log device which was further attached between storage device and the computer system. A control program was there executing the log structured file system. The Control program was useful in identifying the location of the destination file within the storage system. Their research on "Efficient virtualized mapping space for log device data storage system" has world wide application and they got patent (US5996054A) for it. They made first claim of a log device system attachable to computer system (Executing an operating system and file storage system) manages the transfer of data and storage of data. Their tenth claim and patent in 2016 talked about the log device system and predetermined aging criteria recognizing the time interval between first set of pre-determined file system blocks were written to the second addressable storage space.

Similarly, This was supported by the article and the patent(US6438586B1) claimed by Yeshayahu Hass, Natan Vishlitzky,Yoav Raz in 1996 for inventing "File transfer utility which employs an intermediate data storage system".

Here the claim was regarding the transfer of communicating and transferring the information from one process to another process (each having their own operating systems) through a shared storage medium. They made their latest claim in 2018 of Targeted search of backup data using facial recognition system which is quite useful considering the privacy and security of Data storage systems for storing and retrieving of data.

There is a reference of one research article discussing about "Data set level mirroring to accomplish a volume merge/migrate in a digital data storage system "by Robert M. Perego(2003) . Here the research was about merge data extracted from multiple individual devices (Disk volumes) to larger DASD devices and to combine data set extents. He claimed and patented (US7146475B2) a method for merging extents of data sets with least down time enforced on applications retrieving the source data sets. He made around 55 claims revising and upgrading the process which are widely used by companies like Microsoft Corporation, EMC corporation and Sybase Inc for Data storage and Data processing and Data backup system.

Philippe Armangau (1999) proposed and patented (US 6434641B1) "Snapshot copy facility for a data storage system permitting continued host read/write access". He claimed that while maintaining the data set, a snapshot copy of production data set is created at multiplicity of storage locations in data set providing access to the host processor for read/write access during maintenance of snap shot copy. This enables an enterprise to have multiple snapshots of the data which is editable during the maintenance in the storage system. He made around 14 claims latest in 2003 which stated the virtual storage and block level direct access of secondary data for data recovery. This is focussed on vulnerability of data storage and loss of files during the process and hence providing the snapshot for data recovery, this was also researched during his time in EMC Corporation which handles bulk data for other organizations.

Steven M. Blumenau, Yoav Raz (1998) researched and patented "Virtual ports for data transferring of a data storage system" which is data storage subsystem comprising of storage as well as data storage controller. There has to be at least one physical data port for data network which includes host processor as well. This storage controller is programmed for providing the number of virtual ports for access to storage and virtual switch to route storage access request from physical port to the virtual port.

They made around 15 claims, latest in 2002 where storage controller transmits to and receive data from networks so the virtual ports and switch are compliant to fibre channel network standards.

Pre allocation of file system cache blocks in a data storage system was researched and patented (US6571259B1) by Jiannan Zheng ,Xiaoye Jiang,Uresh Vahalia (2000). Their claim was a method of operating a file server having file system reserve memory and storage. This states that a kind of index is formed which is maintained and processed at Data base management system which helps in fast processing of data. Their focus was on speed of data transfer and data storage which otherwise is slower when cache memory was generated at operating system level only.

The next level research regarding the Methods and device for providing security for a data storage system by Allan L. Scherr was conducted and patented US7134138B2(2001) . The research was largely focussed towards providing safety to the stored data while giving access to the data by other systems from host system. Here the concern was of safety as data storage system was not private or exclusive to one organisation and the data manager generates an access token assigned to storage location where the data is stored in storage assemblies. This was a hint towards the need for having private data storage system which was not yet done.

Around the same time Gregory A. Becker,,Robert Condon,David A. Knight,David E. Medders,Michael Rowan(2003) researched and patented(US7617414B2) for "System and method for restoring data on a data storage system" which is highlighting the requirement of back up as well as restoring the data for emergency on the data based storage system as image of primary computer system. Here again the requirement was felt as there are chances of losing data while transfer and also might be in case of data hacking. This was a research

indicating the multiplicity of transactions and each transaction analogous to a multitude of data inscribes to the data storage system.Virtual private network software system requirement and research was simultaneously being conducted but major breakthrough was when Tom Clayton ,Richard Bruce Rakes patented (US7216173B2) VPN Wherein a virtual private network system provider software is delivered from the server computer to setting up a virtual private network connection to multiple client computers over network. It is more or less like internet. Once the software is delivered, it can be implemented as data communications made over VPN. As this is stored and controlled by master servers and delivered on need basis to the clients, it's distribution and integrity can be enhanced and updated by simply accessing the server computer system. Further research in this area was carried out by Gary Mawdsley,Steven Meyfroidt(2010) patented(US9202085B2) where the focus was on cloud computing system for storing the private information without the interference of provincial privacy laws . Here the method is customized for data identifiers and data deviators keeping the anonymity of personal data and selected data items can be derived by either of the category from the reference archives. This statistic can then be uploaded on Cloud based storage system. The research suggests further decoding of the data which is uploaded maintaining the anonymity. This is supported by an article (Frederico Durão et al 2013) discussing the cloud-based storage software system "USTO.RE: A Private Cloud Storage Software System" describing the model of cloud storage hardware software and platform are perceived as services. The concept of Data as a service is highlighted which is provided to the customers irrespective of their location. This article states the data availability at a very high cost based on unwarranted replication of data to ensure the availability. Thus the USTO.RE alternative is proposed as economic alternative which is effectively executing data storage without replication of data. Here we witness the customer requirement of efficient storage and qualitative data storage which is reliable and trustworthy.

There are attempts by organization to build private data storage systems instead of outsourcing the data storage services for file hosting, back up data and archiving the data to public providers. There are challenges as when access required, server provider might not be available as well as the assurance of management procedures along with control on data is not certain in this case. (J.L.Gonzalez et al 2013)

The article suggested building a unified storage system which is fault proof and also the data allocation and data recovery process therein, to safeguard from faults.

There are evidences of research regarding Synchronizing proprietary data in an external cloud with data in a private storage system (Ton Engbersen,Martin Schmatz2019) . The claim and the patent here are about coordinating proprietary data in a public cloud provided by a cloud service provider with data of a private storage system. The method was focussed on copying outward data sent from private cloud to the external cloud. The outward data being the proprietary data. Here the synchronised system compares the outward data with stored data on the private storage system, to conclude if the compared outward data are already copied in the private storage system. This was patented (US10230792B2) and 13 claims were made latest in 2017 regarding formation of system for storing, managing, organizing and sharing the information on multiple cloud services.

Another article discusses the data storage system which is hybrid with private storage and public storage system. When we look at the amount of information of varied importance and wish to store the same. But storing it at private data storage system might provide costly in terms of accessing and client profiles. So, a device such as computing tool having memory configured to store the data. This is stored in public data storage or private data storage depending upon the importance of the information file which is identified by the device. This device is also equipped for generating the recovery data based on the priority and significance of the file. This recovered information is the stored on public data storage system. It made 20 claims latest being configuring the device to store some recovery information in the private storage cloud as well (Jun Xu et al 2019 patented in 2018 US20180373600A1)

Looking at the amount and the requirement of data storage system, companies are initiating towards private storage cloud which provide them with accessibility and the security. It also provides the flexibility to the intra cloud information migration securely. There will not be data security issues and the threat of internal or external environment dynamics to be taken care of. Research proposes Hadoop Distributed File System (HDFS) in private storage cloud system. The paper highlights the aspects of security and proposing architecture design for imposing data security facilities on the layer of HDFS (Qingni Shen et al 2013) .

Reviewing the literature ensure the corporate requirement of system which ensure the information which is generated and consumed every Nano second and urgency of system to ensure the safe technology to store this information. With the advancement in technology, the size of the storage drives keeps shrinking as the capacity keeps increasing.

Objective

The main objective of this project is the Audience targeting and identify gaps in audience targeting for the decline in AP Systems Storage revenue YTY for the fortune 500 storage company. Study the Win/Loss pattern YTY, Quarter by Quarter using Geographical attributes.

Importance of Study

The worth of next-generation storage market was estimated to be USD 21.55 billion in 2018 and is anticipated to touch USD 40.80 billion by 2024, recording a CAGR of 11.4%, through the forecast period (2019 - 2024). Cloud storage system which is next gen storage is compatible to human language and incorporates support for decision making methods by strategy makers. The traditional data storage technologies are not competent to handle a large quantity of everyday data. The next-generation data storage set-up proposes a dependable, quicker, and economical explanation to meet the demands of ever-increasing data storage.

• All devices or gadgets which are used generate data. Hence it is inevitable to inculcate Next-generation data storage as an essential technology. It ranges from virtual games, movies, advertisements, wearable electronics,

essential devices like Smart TV, Smart phones etc i.e., almost all generate data. This storage technology is used to save and recover data more efficiently.

• Moreover, the emergent e-commerce business, digitization of everyday activities, and escalating volume of media data transmission are estimated to influence the development of the market confidently. For illustration, the US Department of Commerce approximations that consumers spent USD 513.61 billion virtually in 2018, increased by 14.2% from 2017.

Next-generation storage technology deals with an innovative assortment of products and solutions, which is embedded of technologies like machine learning, Natural language processor, information retrieval and automated reasoning to name a few interpreting raw data into logical solutions.

Fig7: Types of Storage with User Industry and Geography

Key Market Trends:

Retail Sector to Witness Significant Growth

• Retail sector becoming organized and relying more on customer data is commending corporate retail houses to migrate their huge data base to the cloud for utilizing storage capabilities and accessibility. Big Data technique and data mining for filtering and segregating data to improve sales, reducing operational cost and extending and improving CRM looks much easier to adopt and implement.

• Generating data at different touch points, for multiple products and brands managing pricing and communication requires flexibility and adaptability of data. Real time data provided to the retailers by linking cloud storage and Big Data analytics is helping in data-driven decision-making which is

• faster and impactful from the C-Suite to the sales floor. Also helps in assigning and identifying IT tools for augmenting the customer engagement and experience management across the markets.

• Enhanced storage competencies are also empowering retailers to organize their customer data value wise and quality wise. Most of the companies turning towards E Commerce simultaneously rely heavily on customer data base stored and segregated for making customized offers and prepositions to their valued customers globally. Levis Strauss is an example of running value chain network and value delivery network based on its data management system which was efficient and reliable long ago. We have the references of successful brand like coke and Amazon whose business models depends heavily on Data storage systems adopted by their channel partners as well which corresponds to the customers and the vendors actively.

Fig 8 : Retail sales which is going to be big business for Storage industry

Largest Market Share held by North America. The rising internet usage and applications stimulating user-generated data responsible for the accelerated pace of market growth and the North American region witness's maximum amount of IP traffic internationally. According to report by CISCO, the region's estimated IP traffic growth is expected 108.4 EB per month by 2022 at a CAGR of 21%.

Fig 9: Upcoming Storage Market

• Surprisingly there a significant smart share of retail market in the region, which produces enormous volume of data, in turn, generating the earnest demand for storage solutions.

• As per US Census Bureau, the country logged USD 146.2 billion retail e-business sales during the second quarter of 2019.

• The change in business approach is motivating the BFSI sector to embrace and revolutionize its services as well. Banking service providers through the world are accepting and embracing cloud storage solutions. Rendering to American Bankers Association, most of the new core banking projects initiated by 2020 will be on the cloud.

Research Methodology

The research has used data analytics, descriptive statistics and some forecasting techniques to gain valuable insight about the present and coming future. The research approach involves the collection of data from ERP forms. The form questions were prepared and were uploaded on ERP systems. In this ERP systems all the sellers and marketing folks has the access who puts data start to end from getting any customer source or probable buyer. The main issue with data was storage and access as there were records of last 10 years, pertaining to different functional aspects – region wise and client wise.

This ERP data has columns of Customer name, Date of origin, win/loss reason, recommendation etc. The data captured on

Fig10: Snippet from the data.(Source AP system storage)

ERP was exported on the Excel file and this is for consecutive 3 years i.e. Year 2016, 2017 and 2018.A pre-processing was done on the CSV file using PIVOT tool. Excel pivot table is used to build the charts from the data. Trend analysis was used as basis for projection.

Theoretical Framework

There is extensive industry covenant that software-defined storage (SDS) signifies an important, encouraging next step concerning facilitating organizations address the numerous storage and data challenges they face today

Why do organizations "need" SDS, and why is the IT industry developing it? The cliché that most IT organizations have been experiencing incredible growth in storage-related demands for volume, functionality, performance, Speed and flexibility is not only true, but it is also getting to a thresh hold point with traditional storage approaches. New applications have garnered up amplified requirement of big data analytics, mobility, and social platform integration. Initiatives related to various styles and models of cloud computing and even the "Internet of Things" are driving massive data growth, new storage challenges, and new expectations.

With these changes ongoing, organizations need to be unencumbered by traditional storage and infrastructure- related constraints. They need flexibility. "Traditional storage" is not sustainable enough to overcome contemporary data challenges of scale, integration, and flexibility.

A. The Various Approaches to SDS

Multiple SDS routes and options exist, but it is helpful to understand the main approaches under the software- defined storage umbrella.

First, make no mistake: Storage has been "software-defined" for decades. The only difference was that the industry used to talk only about microcode on controllers rather than software on servers. As vendors moved from ASICs to x86 processors as the foundation for their arrays' functionality, the move to "SDS" was effectively underway.The availability of massive processing power and network bandwidth enables true separation of software and physical storage in some manifestations of SDS. And in general, current storage software capabilities—wherever they reside—are much greater than just a few years ago.

As mentioned, the fundamental obligation is to meet workloads' and end-users' needs. Their needs will determine (1) what type of SDS is optimal, (2) where the SDS software will run, and (3) how broad the software's functionality will be. SDS subcategories (which can be considered separately or in combination) encompass:

☐ Storage virtualization.
☐ Management and monitoring.
☐ Orchestration.
☐ Full software-derived storage functionality.

Fig 11: SDS architecture model(Source AP storage system)

Each of these might be tied to a particular vendor's product or even to an open source stack, and each might operate with heterogeneous or commodity hardware.

SDS frees your most valuable assets – your team and data to easily adapt to new workloads and enable to the cloud initiatives. SDS is also crucial for deploying multi-cloud on-demand consumption of public/private cloud resources.

☐ Reduce costs with analytics-driven data management

☐ Lower total cost of managing data retention with active archive data

☐ Increase the amount of data that can be stored by virtualizing mixed environments
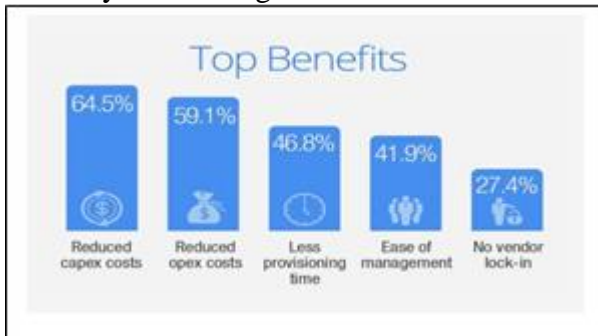
Fig 12: SDS major advantages (Source AP storage system)

In this throat cutting competitive environment, companies have shifted their focus towards new technology to have a competitive edge over their competitors. By the usage of SDS,

this helps in minimizing the cost by automating process controls and by replacing the traditional hardware by software. The global Software-Defined Storage market is expected to grow from US $4.72 Billion in 2016 to US ~$18.5 Billion approx. by 2022, at an estimated Compound Annual Growth Rate (CAGR) of 27%.
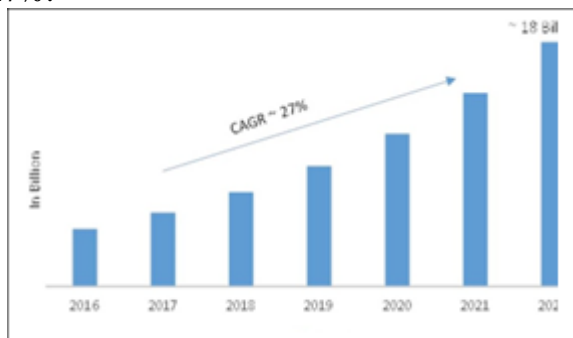
Fig 13: Key players in SDS (Source AP storage system)

B. Key Players

The prominent companies in the market of software defined storage market are- EMC(UK), IBM(US), HP(US), VMware (US) ,Avaya(California), Big Switch Networks(USA) , 6Wind(France), Arista Networks(US), Brocade(US), Cisco(US), Dell(US), Ericsson(Sweden), HDS(US), Juniper Networks, NEC(US), NetApp(US), Pertino(US), Pivot3(US), Plexxi(US) and SwiftStack(USA).

C. Segments

The Global Software Defined Storage Market has been categorised on the basis of components, application and usage type. Components include - Platforms/Solutions (Controller, Data Management, and Hypervisor, Software-Defined Server, Data Security & Compliance,) and Services among others. The application area includes- Telecom and ITES, Healthcare, Media and Entertainment, Logistics and Warehouse Education and others. The usage type includes- Data-Backup and Disaster-Recovery, Surveillance, Storage Provisioning and High Availability.

VI. Data Result
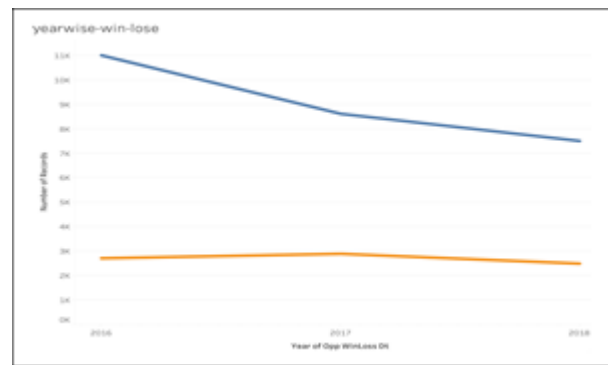
Fig14: In the year 2016 we won 11K opportunities and in 2018 it declined to 8K opportunities due to the impact of Cloud
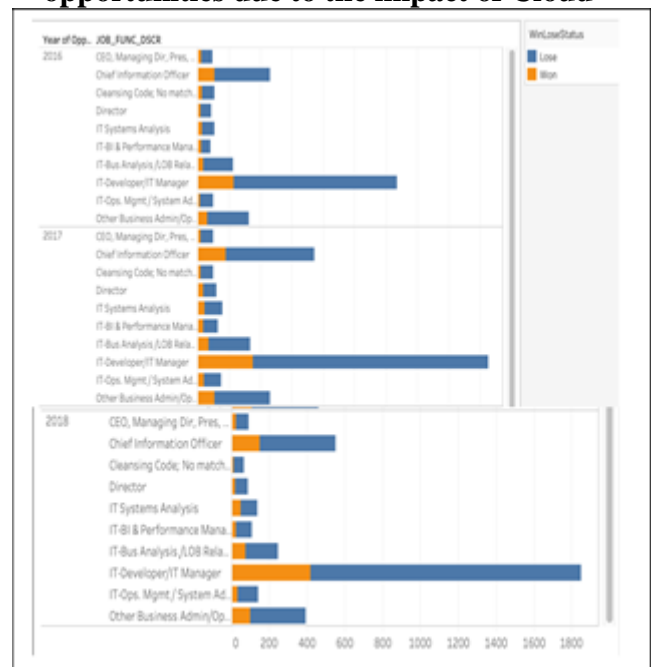
Fig 15: In the year 2016 top3 job role/ audience which impacted the deals to be won

IT Developer/IT Manager Chief Information Officer Other Business Admin/operations

In the year 2017 top3 job role/audience which impacted the deals to be won are: IT Developer/

IT Manager Chief Information Officer Other Business Admin/Operations. In the year 2018, top 3 job role/audience which impacted the deals to be won are IT Developer/IT Manager Chief Information Officer Other Business Admin/Operations.
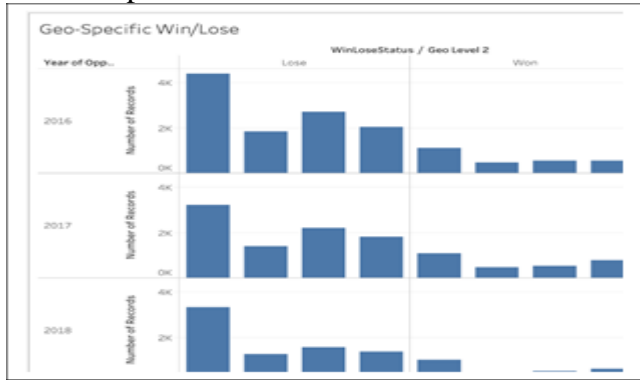
Fig16: The above diagram explains that in the Year 2016,2017 and 2018, ASEAN provided more deal opportunities and the least one was Australia in all the three years.
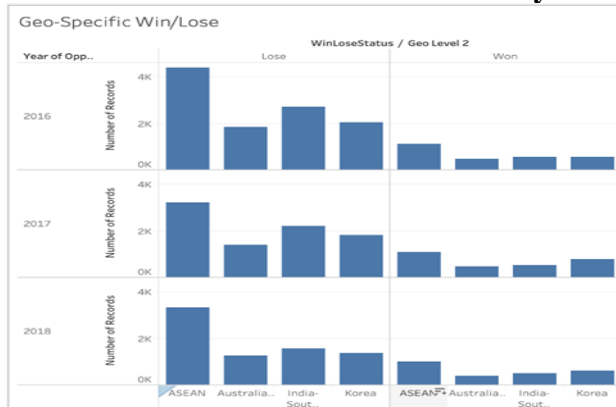
Fig17: In the year 2016,2017 and 2018, ASEAN had the highest no of win opportunities but with the same stand true for lost opportunity with ASEAN.
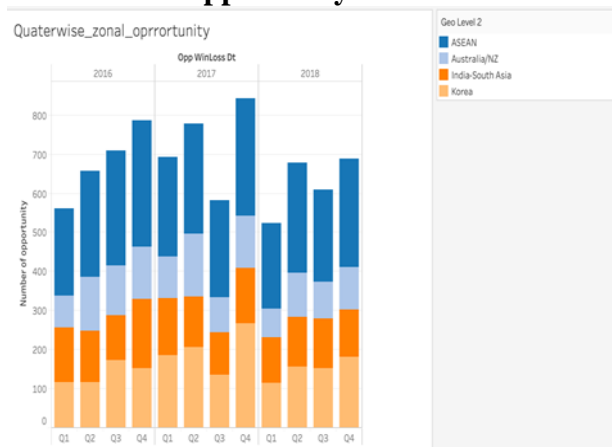
Fig 18: The above figure shows the total number opportunity as per GEO wise. Here ASEAN has the more number opportunity in all the three years i.e 2016,2017 and 2018. Followed by the Australia/NZ.
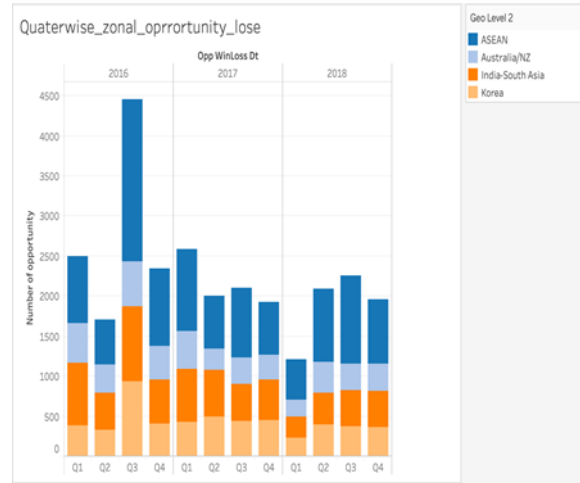
Fig19: The above diagram explains the quarter wise lost opportunities as per the GEO's.
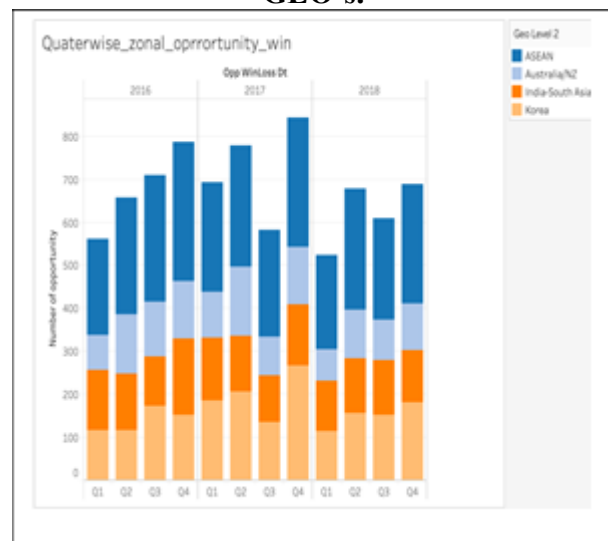
Fig20: The above diagram explains the quarter wise won opportunities as per the GEO's.
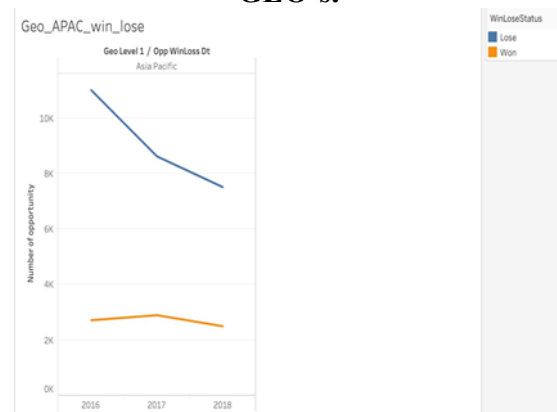
Fig21: The above diagram shows the Win/Loss Opportunity at the Asia Pacific level.
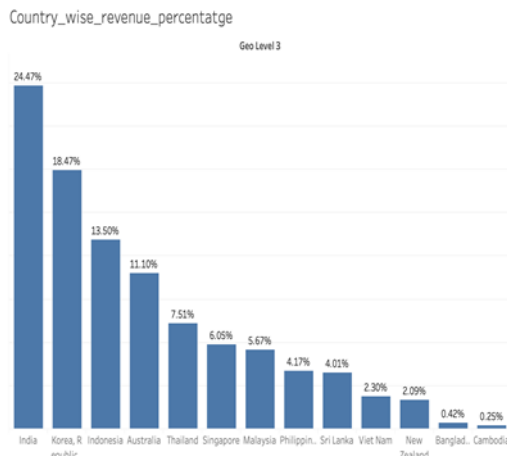
Fig22: The above diagram shows the country wise revenue generation in the Asia Pacific region.
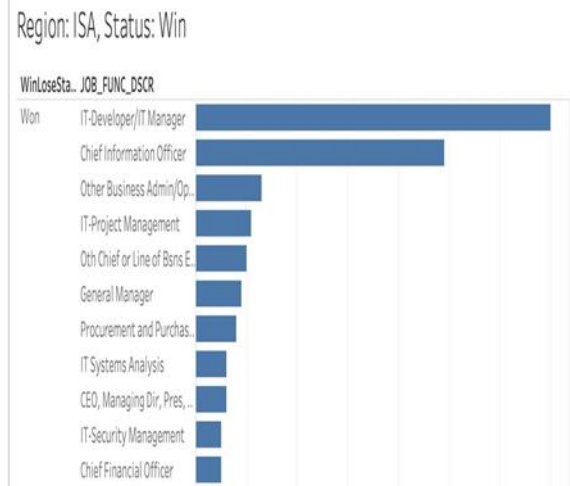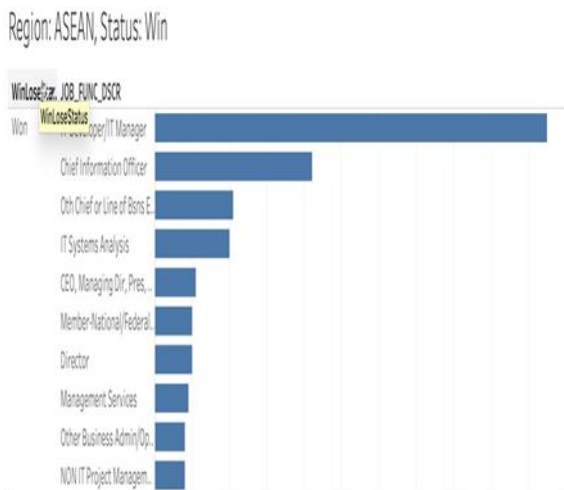
Fig23: ASEAN wise top audience/job role who has influenced the deals.
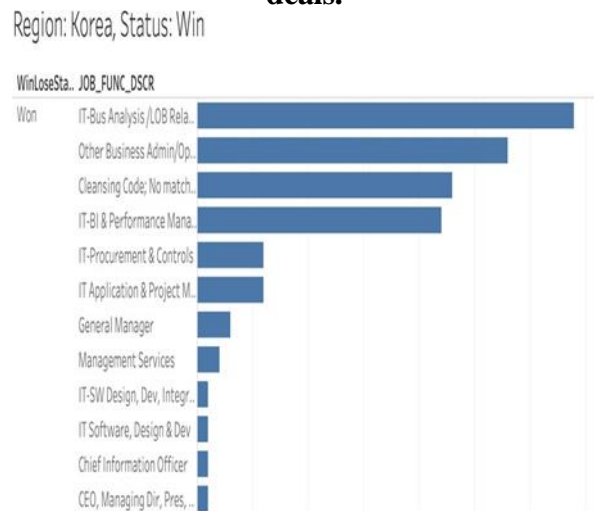
Fig 24: Australia/New Zealand wise top audience/job role who has influenced the deals.

Fig25: India/South Asia wise top audience/job role who has influenced the deals.

Fig 26: India/South Asia wise top audience/job role who has influenced the deals

Data Findings

After analysing the data from above survey, the findings are listed below.

It can be seen that in the Asia Pacific, ASEAN generates the highest number of Win opportunities.

Since storage is a technical product, targeting the right audience would get us the deals as we can see that highest number of win opportunities came via IT Developer/IT Manager followed by Chief Information Officer. Observation shows that there is a decline in the opportunities from year 2016 onwards though we tried to gain in the 2017 but yet again falling in the year 2018. It is observed that in year 2016 Q3 onwards there are more lost opportunities. Findings indicate the top

audience via different Geography wise who has influenced the deals.

We also see the trend of change in the preference of storage options over the years. It is more based on the convenience of accessing and how it is stored. The focus here is more on credibility and privacy of the system. Third party storage are there in system for long but ownership and control is something corporates are seeking for managing he huge data which is churned out year after year. More so, the analysis of the data while it is stored and interpreting the same YoY basis is also called for. The demand of total congruence with data system is actually becoming crucial which makes it demanding for the clients.

Discussion

The study shows the significance of Data storage system with the advancement in technology and also the customer requirement which is showing a sea change. The historical evolution of the storage device also supports the exposure of the customer towards changing trends and the change in their attitude. Earlier, the storage was the solo objective but competition in alternatives available as per cost, convenience, compatibility and most crucial of all the trust and the security are the deciding factor for identifying and utilizing the Data storage system. Further, there is great scope in next generation data storage market which is growing at the rate of 12.48% CAGR. The drivers of growth of Next gen data storage market is individual hand-held devices creating massive digital data per usage.

There are indications of highest CAGR growth of NAS in next generation data storage as it offers cost effective solution which is first choice for small and medium scale enterprises. The research also points at the enterprise growing to hold the major share in next gen data storage market. Most of the operation decisions and the applications are based on

stored data related to the customers and their requirements Even the forecasting also require past data analysis. This in turn is acceleration the data generation in bulk which makes the foundation of future prospects.

The implications of this study are for different stake holders which have direct usage like enterprises and the end consumes along with data storage providers who are in a sort of transition and upgradation. With the turn of century, technology has also advanced in leaps and bounds. Individuals are seeking virtual solutions with help of their Devices having latest software tools. They are eager to make their presence felt in each sphere by generating content and storing it on cloud for others to analyse. Corporates are taking leverage of this new-found attitude and its win- win situation for all. This research implores on evolution of storage devices and comprehensive analysis of the market. This aim to strengthen the decision of clients in selection and utilizing the data storage system giving them competitive advantage along with scope of trade off in attributes of the system.

The study has a vital scope as the technology is in forefront and data generation is a continuous process by all the corporates irrespective of the size and magnitude. It provides insight to the clients as well as to the data storage vendors to come up with the strategies to maximize the advantage of the system and sharpen the strategic edges which cater the way for decision making. The future scope of this study is also quite broad in terms of flexible cloud-based data storage systems which are linked to central servers and are automatically arranging the data by analysing the data usage wise and category wise. As the environment is changing fast, technology is also becoming more adaptive and user friendly which calls for easy and advance AI system which is customized and unique to each user.

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FOOD REVIEW RATING BASED ON SENTIMENT ANALYSIS

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ABSTRACT

Today the digital reviews play a vital role in deciding things all around and helps in enhancing global communications among customers influencing buying patterns. With the presence of social media around the world the no of reviews for any particular food product is in millions where it is exists in particular websites. The end users take lot of time to search the best product because there are no of reviews which are highly and equally trademarked. In order to urge valuable insights from the massive dataset of reviews, classification of reviews into positive, negative sentiments is required. The proposed system performs the task of identifying the sentiments using Polarity ranks. This paper establishes a simple form of food review rating model based on information retrieval and opinion classification methods. Final results are shown in different parameters and can also be enhanced in various graph formats

Keywords: *Sentiment analysis, parameters, valuable insights, reviews, Polarity Scores.*

Introduction

Sentiment Analysis (SA) is an emerging domain within the research field of tongues Processing (NLP).SA is used to analyse or classify the reviews from the customer and derive opinion from it. This technology and platform used is java & MYSQL.

1.1 Sentiment Analysis

Analysis of sentiments may be a method of text classification which segregates the text supported (SO) of emotions. [1]In text mining & computational linguistics SA of food review model is recently became famous. SA is additionally referred as mining of opinions. In this paper, performance of each stage architecture is shown through documents of texts. The most part in SA is that emotions are put together. [2] In this digitalized world, both machines and emotions should be reliable and flexible to understand the process and perform accordingly.

1.2 Challenges

The comments or reviews given by the user are considered at two points of judgements as positive & negative situation. Most reviews will have both positive, negative comments, which somewhat manageable by analysing sentences once. [3] Purposefully people give fake reviews which results in bad formation of the product. These problems can be dealt with manual methods too.

1.3 MAIN FOCUS

The below diagram is a sample flow for sentiment model.
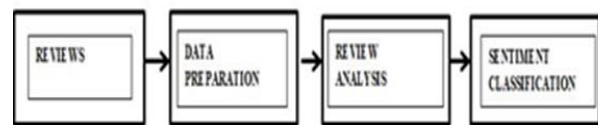
Figure1: sentiment model flow

Data Preparation:

This step performs necessary data pre-processing and cleaning on the dataset. This step can be a sampling of reviews fir the building a classifier. For example, removing non-textual contents and mark-up tags, and removing information about the reviews that are not required for sentiment analysis are considered process of data preparation.

Review Analysis:

This step analyses the linguistic features of reviews and identifies some properties that suits the product features, often applies different written and spoken languages. Most commonly adopted tasks for review model is will be in the form of tagging. Numerous algorithms adopt extraction of phrases having tags in it as a pattern of sentiments for the features of product.

Sentiment Analysis:

The two ways of approaching SA are SO and machine learning (ML) approach.

Literature review:

Most of the researchers mine their data and experiment various functions through online. Before the birth of internet or any digital resources, the entire process of recording data was manual. Many literary base papers describe that subjective contents are extracted with sentiment way of different emotions. These are tokenized and separated into English words. Related tags are used based on the parts of speech. [5] A process of feature vector formation is been done. The proposed method describes and incorporates sentiment lexicon as prior knowledge with machine learning approaches to improve the accuracy of sentiment analysis.

Sentiment orientation (SO) = mutual information between given positive phrase

– Negative phrase.

The user can surf many varieties of opinions about the food items and its services. The method of sentiment analysis system can be tested through Bayes algorithm and predict its complexity. Combination of product and its features can be mined through various data mining or opinion mining strategies. From these results, it can also be compared with traditional fact-based analysis. Different methods we approach, give different results. The only thing people should think is the effectiveness at which they mostly grab.

Proposed method:

The main aim here is to collect feedback form the people and classify it to different opinion categories. Prediction of comments is done through sentence level, i.e. parts of speech tagging (POST). Negation phrase algorithm is specific in use, when the expression of negative comments is identified. Faster the growth of E-commerce, nature of the product can also be identified. [7]Large repository of resource is the internet, were everything we search comes in fraction of second and becomes ease. Thus, the system which is modelled gives summary of feedback given and rates it accordingly. This saves time and makes the decision of improvement easier.

Implementation:

Implementation process can be done through R language since it is the heart of natural language processing. Statistical calculations are made easier when the report is generated. [8] The basics steps are loading text, cleaning and stemming. Associativity of words, its frequency and scores are used for the implementation.
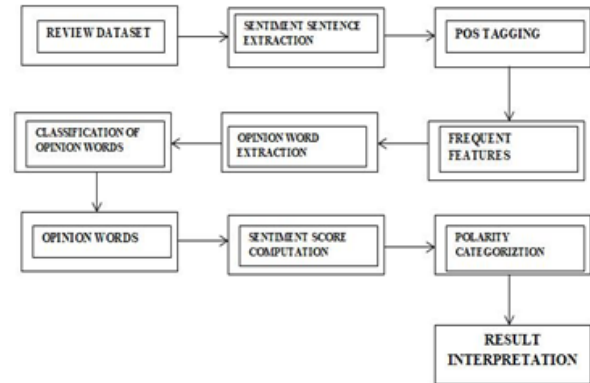
Figure 2: architecture of the proposed system.

In this division, figure 2, represents an architecture model of the proposed system.

1) Loading the text:
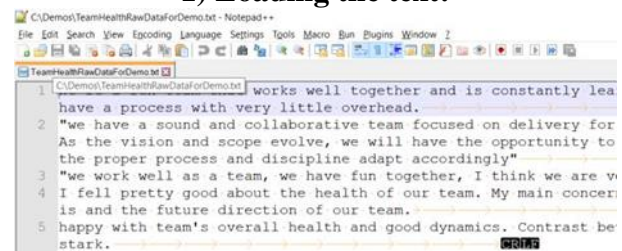
Figure3: loading the text

This sample input file takes random text as a file. Performance is returning the line as a character string.

2) Cleaning & Stemming:

Cleaning steps involve removal of unnecessary whitespaces, special characters, numbers and punctuation. Ultimate is removing stop words. Stemming is done in order to reduce the word and gain its root word. It simplifies to common origin. As these steps are done, the next is to build a term document matrix. To count the occurrence of each word, this strategy is played.

3) Word cloud:

Word cloud is a way to visualize and analyse qualitative data. This quality gives a better understanding of various themes.

Figure 4: word cloud of sentiment words

4) Word Association:

How strongly variables are related is the matter in this step. Correlation statistical technique is used for the effectiveness of the context of the word. In this method, script can be modified as many times.

5) Sentiment scores and Emotion classification: Emotions prediction model gives main focus on experiment of texts. To test the data any predictive techniques can be used. To express the sentiment of the data scores can be presented in numeric scale. To summarize it, we have a common goal before comparing them.

The below figure 5 represents a sample emotion classification in a bar plot.

Figure5: Bar graph of various emotions.

Performance evaluation and common metrics:

For the classification of texts, use of Performance metrics form information retrieval is essential. The familiar parameters are recall, precision and accuracy. [9]

These are classified into 4 categories:

(tp), (fp),(tn), (fn)….. With this number of total data count is calculated and common metrics are evaluated.

Total data count= tp + fp + tn + fn

1. Recall:

This quality is defined as the number of all right positive results made out of all positive predictions that could have been made.

i.e., True Positive & only positive.

Percentage obtained during recall metrics is 90%.

2. Accuracy:

This quality is defined as closeness of measurements value obtained during the performance.

i.e.., Positive & Negative mixed.

Percentage obtained during recall metrics is 90.47%.

3. Precision:

Thus quality is defines as the as closeness of measurements to each other.

i.e., True Positive & only positive.

Percentage obtained during recall metrics is 87%.

The below figure 6 represents the pictorial view of all three performance measures.

Table representation of common metrics.

Conclusion And Future Work

The excellent technique from prediction can be concluded with bag-of-words with little exactness. Same ways, for the huge set of data utilize calculations and keep executing in method called Direct Instance Classification Analysis. The paper formed is to check the performance evaluation measures that are received from the customer. These types of analysis give in depth feedback for the customers whether to buy the product or not. It is as simple which is assorted to collect various digital information from individuals. It's an immense powerful domain (data analytics) especially for the stream of business. Direct contact and virtual is far away different in any sense. The aim is to increase the confidence of the customer from our product and service delivery we are representing. Although there is competition all around every team has to think differently to achieve in quick process creatively. With the basic knowledge in the stream, utilize the techniques that are existed and propose a new one. Underlying the techniques, investigation of overall result must be noted. There are basic labels and pos tag labels in the preparation of information and for the conclusion modifiers. To get the prescient esteem, each individual has to contribute different labels. Other propelling systems can be utilized to discover a compared data values and connect them..

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ECONOMICS OF INTEGRATED FARMING IN KERALA

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ABSTRACT

The present research article unfurls the research findings of the work on economics of Integrated farming in Kerala.The findings were extracted from the primary survey conducted in six agro-ecological zones of Kerala namely, Onattukara, Southern-midlands, Northern-midlands, Malayoram, Riverbank alluvium and High ranges.The important findings state that the integrated farmers in Kerala gain considerable amount of income and that the losses in other systems of farming are compensated from integrated farming.The farmers were generally categorized into three based on stratified random sampling,the stratum being the size of land holdings and they were small, medium and large. The category of 'medium farmers' were found to be more advantageous than other categories of farmers. The size of landholdings in the state of Kerala compared to other states in India are less.With the limited availability of land and high density of population in Kerala,the system of integrated farming has empirically proved the best system of agricultural practice in Kerala.Though the system of integrated farming has gained momentum in Kerala,it has not become popular among the farming community of Kerala.The agricultural offices of all fourteen districts have to make initiative for such a venture.

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Introduction

Integrated farming was practiced in India and in the state of Kerala from time immemorial. It gained a distinct gesticulation from 1968 onwards as integrated farming was commenced to practise under the auspices of the Integrated Farming Systems Research Station (IFSRS) located at Nedumcaud in the district of Thiruvananthapuram, which was established in 1955. The station has an area of 7.65 hectares of which 7.25 hectares is double cropped wet land and 0.4 hectare garden land. The centre, formerly known as the Model Agronomic Research Station and was established in 1955. New schemes and projects were started from 1968 onwards under the All India Co-ordinated Agronomic Research Project (AICARP) of the Indian Council of Agriculture Research (hereafter, ICAR). From October, 1983 onwards, the station was upgraded as the headquarters (HQ) of the AICARP in Kerala. Lead functions are rice-based cropping system and verification functions are agro techniques (rice), integrated farming systems with rice, fish, poultry and cattle. From 1986, a unit of All India Co-ordinated Agronomic project is functioning here. Integrated farming is practiced in Kerala in the districts of

Thiruvananthapuram, Kollam, Alappuzha, Idukki, Ernakulam, Malapuram, Trissur and Kannur. In 1986, a pioneer study was done in Kerala on integrated farming and found out that it was a profitable venture for an economy like Kerala. From then various studies undertaken in this area have brought out the result that integrated farming was conducive even in the coastal districts of Kerala, namely Thiruvananthapuram, Alappuzha, Ernakulam, Trissur, Malapuram , Kozhikode and Kannur. Nevertheless, integrated farming has not become the best agriculture practice in Kerala. However, integrated farming is gaining ground in the agricultural community of Kerala. It is in this backdrop the present article was developed.

Concept of Integrated Farming

Integrated Farming System camouflages the idea of integrated agriculture where the elements interact each other in order to make farming more productive and environmentally sustainable by cutting down the chemicals or unhealthy artificial content. The studies in this field identified Integrated Farming System as a natural way of farming, which suited the constrained conditions of agriculture. The complex and compatible integration helped

farmers, especially those with small land holdings to use their off-farm resources to upsurge the farm output at a reduced cost. Research works around the world support this argument of integrated farming and space for trial and error experiments with different crops and farm practices are high in this system of farming. Various works had mentioned about the significance of integrated farming in controlling the environmental losses incurred due to bad agricultural practices. In defining the basic concept of integrated farming system many researchers had made their contribution. Integrated Farming System (IFS) was defined as a complex interrelated matrix of soil, plants, animals, implements, power, labour, capital and other inputs controlled in part by farming families and influenced, to varying degree, by political, economic, institutional and rest factors that operated at the level of the farm (Mahapatra, 1992). The definition disclosed the interrelation of the factors in a more effective way within the level of the farm. Unlike the traditional farming system, integrated farming system had more correlation among the inputs of the farm, both internal and external. The natural interrelations framed in a systematic way helped to maintain the sustainable conditions of the environment. The waste recycling and re-composting techniques like aerobic and vermi-composting involved in the integrated farming system was found to be more effective in their study than the use of chemicals and pesticides. Their study made an effort to learn about the environmental and sociological impact of existing farming system, which had high use of chemicals and pesticides, and integrated farming system, which was a fusion of traditional and modern farm techniques with limited chemicals. Interrelation and interaction of agro elements in the farming system was also discussed by Sharma et al. (1991) in their work in farming systems. For increasing productivity and profitability of the farm the families allocated their resources in its best way so that it could be efficiently utilized in the existing farm enterprises. These farm enterprises included crops, livestock, aggro-horticulture and agroforestry. In the integrated farming process this enterprises interacted each other and efficient utilization of resources happened with

these interaction and interdependence. This integration was extended to other elements like aquaculture and energy management Lightfoot C. (1990) defined integrated framing on this basis. His definition was reflected in the article 'Integration of aquaculture and agriculture: a route to sustainable farming system'. In the article he explained about the conditions of African and Asian countries to explain the relevance of integrated farming and the researches done on farming systems. He explained that researching on individual crops and individual fish would not be enough to feed the needs of food availability of the 21st century. Instead, studies about combined agricultural patterns and systems would be adopted. Integrated farming systems are considered to be less risky, if managed efficiently. They benefit from synergism among enterprises, diversity in produce, and environmental soundness. He also added that researches were worth when they were able to produce outcome.

Integration results in better income and healthy environment, which also lead to multiple results influenced by Socio- economic and geographical elements. The geographical significance of farming system was mentioned by Gangwar (1993). In this work, farming system was considered as a highly location oriented research. The most effective combinations of farm enterprises and the available means to the individual farmers derive the profitability of the farm systems. The author added that integrated farming involved a multidisciplinary intervention as it revolved around social, economic and geographical factors. Technological innovation in agriculture developed as a consideration of farming system as a whole rather than considering individual crops or techniques. The sustainability both in economic and environmental cases needed to be mentioned while explaining about the significance of integrated farming system. Chandakavate and Shivaramu (2008)in their work 'Sustainable rural livelihood through integrated farming system' has mentioned about the important components of Integrated Farming System. They had tried to define Integrated farming system in Indian context, by marking it as a mixed animal crop system

where animal is raised by using the crop or farm byproducts and animal waste is used for farm activities. Considering the components of integrated farming system, they have included crop diversification+ fodder+ diary+ biogas+ vermi-compost, crop diversification+sheep/goat, crop diversification+ seed production+ livestock, SWC (Soil Water Conservation) + crop diversification+ livestock. These components were selected by the farmers based on the biophysical resources available for them. As the elements were selected on the basis of both affordability and environmental factors, the balance between both environment and agricultural trade-off could be maintained. Extending the Concept of farming system and farming system research defined farming system as a set of agricultural professions avowed on a farm unit. The choice of farm enterprises were mainly guided by factors like the agro-ecological limits, the farm resources, availability of market, extent of mechanization, technology level of farmers, infrastructure back-up and managerial skill and acumen of the farm entrepreneur. Further explaining farming system he mentioned farming system as an art and science of realizing the most suited combination of enterprises to achieve two goals: maximum profit, maximization of net worth of the farming unit.The activities should also be given consideration to the environmental factors. The integrated farming took the principles from economics, natural biology, geography and management. Their study mainly revolved around the regions of Bangladesh, where sustainability of Integrated farming models showed good results.

 The concept of integrated farming system could be extended to different dimensions that incorporated methods, practices and strategies involved in the broader farming system. The concept of Intensive Integrated farming was used by Swaminathan (1996) in which the factors or elements like soil health care, water harvesting and management, crop and pest management, energy management, post-harvest management, choice of crops, farm animals were considered as the seven pillars of Intensive Integrated Farming System. The other components of the farming like information, skill, organization and management empowerment also played important role in deriving the benefit and viability of Farming systems. Similarly, the technique of participatory rural appraisal considered in Integrated Farming System was used by Neela Mukherjee (1997) in her book Participatory Rural Appraisal: Methodology and Application. The work had devoted a section for recognizing the importance of PRA approach in Integrated Farming System. During 1970s, Indian farming system had a tremendous shift in the practices, methods and strategies. In this scenario her attempt was to make assessment of the PRA approach in farming system in India. In her study she also mentioned about the conditions that existed in the South Asian countries, who were trying to adopt a new or alternative farming technique, during that period. Japan had their studies in the integration of paddy-fish-duck-azolla cultivation model. Similarly countries like India, Bangladesh, Cambodia, Philippines conducted their own research with the help of innovative farmers and developmental organizations. All of them had the conclusion that this kind of intra-subsystem linkage is required to solve the existing issues in agricultural sector. She also added the issues existing in implementing integrated farming and elaborated how Participatory Rural Appraisal can act as a solution for it. The issues quoted by Neela included the social and organizational issues like distance from farm, sense of security issue, inefficient government mechanism to monitor farming systems. The Food and Agriculture Organization (FAO, 1977) had made their effort to define Integrated Farming system. They mentioned about the necessity of introducing integrated farming in Asian Regions as the adoption of integrated farming would help the small and marginal farmers to find solutions for their existing issues, such as low production and high poverty level. Integrated Farming facilitated to reduce the cost incurred in production for the purchase of raw material and other waste by reusing the waste generated from other components. FAO report had quoted the concept of integrated farming system as "there is no waste" and "waste is only misplaced resource which could be a valuable resource for another product". IFS depends on this

principle for its interactions and inter-relations for bringing better output thereby improving the productivity and efficiency.

Result and Discussions of the Research Finding

3.1 Profile of Selected Agro-ecological Zones

The state of Kerala is located in the South-West corner of India, with a geographical area of 38863 Square Kilometre (hereafter, Km).It lies along the Arabian coastline, to the extreme south west of Indian Peninsula, bordered by Lakshadweep Sea on the west and the mountains of the Western Ghats on the east. The land size of Kerala stretches north-south along a coastline of 580 Km with a varying width of 35 to 120 Km (Profile, Kerala State, 2019). Kerala is one of the smaller states of India and possesses only 1.18 per cent of the total area of the state. The agro-ecological zones of Kerala are classified into 13 different types based on four parameters which are: altitude, soil type, rainfall pattern and topography (*ENVIS, Kerala 2019*). There are different levels for each parameters, with the variations in the parameters, there will be changes in the temperature, water availability, climatic conditions and cropping pattern. The parameters are divided into different levels based on the profile of various agro-ecological zones. Agro-ecological Zone (AEZ) methodology is a common approach used to measure the productivity and capability of different regions on agriculture and farming. Thus, the parameters distinguishing the agro-ecological zones facilitated to understand the variations in agricultural patterns of different zones. Out of the total agro-ecological zones, six zones, giving importance to their locations, are selected for conducting the study.

Table 1.1 Parameters for Identifying Agro-Ecological Zones

Parameter	Level	Description
I Altitude	Type I	Altitude Up to 500 m above MSL (Low altitude zone- hot humid tropics, spread over the entire state)
	Type II	More than 500 m above MSL
II Rainfall	Pattern I	Both the southwest and northeast monsoons are active and moderately distributed.

		Southwest monsoon with June maximum (South of 11ºN latitude)
	Pattern II	Poorly distributed rainfall; southwest monsoon with July maximum and concentrated in 3-4 months. Northeast monsoon relatively weak (North of 110 N Latitude).
III Soil Type	1	Alluvial soil (Spread over river banks)
	2	Sandy soil (Coastal areas)
	3	Sandy loam soil (Coastal areas)
	4	Late-rite soil with well-defined B horizon (Natural midlands)
	5	Late-rite soil without B-horizon (Natural highlands).
	6	Red soil (Southern-most Kerala)
	7	Black soil (Chittur Taluk of Palakkad district)
	8	Peat (kari) soil (Kuttanad)
	9	Acid-saline soil (Pokkali and Kaipad areas)

IV Topology		Valleys	Hill Tops	Slopes
	Model I	Extensive valleys with level but raised garden lands		
	Model II a	Valleys less extensive	Hills with moderate gradients	Slopes having mild gradients
	Model II b	Valleys less extensive	Hills with moderate gradients and top with egg shaped hump	Steep slopes
	Model II c	Valleys less extensive	Hills with table tops	Steep slopes
	Model III	Narrow valleys	Hills with steep gradients	Steep slopes

Source: ENVIS centre: Kerala

Table 1.2
Profile of the Selected Agro-ecological zones

No	Zones	Altitude type	Rainfall Pattern	Topography	Soil Type
I	Onattukara	I	I	I	Sandy loam
II	Southern midlands	I	I	III	Laterite without B-horizon
III	Northern midlands	I	II	II b	Laterite
IV	Malayoram	I	I	III	Laterite without B
V	Riverbank alluvium	I	I	I	Alluvium
VI	High ranges	II	I&II	III	Red loam

Source: ENVIS centre: Kerala

The six agro-ecological zones selected were Onattukara, Southern midlands, Northern midlands, Malayoram, Riverbank Alluvium and High ranges. Each agro-ecological zones have different characteristics based on the parameters such as altitude type, rainfall pattern, topography and soil type. Considering the altitude type, Onattukara, southern midlands, northern midlands, Malayoram, and riverbank alluvium have type I altitude condition, that is, altitude up to 500 m above MSL (Low altitude zone- hot humid tropics), whereas, high ranges have type II condition of more than 500 m above MSL.

When it comes to the rainfall pattern, Onattukara, southern midlands, Malayoram and riverbank alluvium have type I condition of active southwest and northeast monsoons which are moderately distributed and blessed with southwest monsoon at maximum during the month of June. In northern midlands the rainfall condition is type II, where the rainfall is poorly distributed and southwest monsoon is maximum during July and concentrated in 3-4 months and the northeast monsoon is also relatively weak. The high ranges experience both type I and type II rainfall conditions.

The topology is different among the selected six agro-ecological zones. The topology was analyzed based on the nature of the valleys, hill tops and slopes. Onattukara and riverbank alluvium have a similar topology of extensive valleys but with raised garden lands. Malayoram, High ranges and Southern midlands have a similar topology of narrow valleys, hill with steep gradients and steep slopes. Finally, the northern midlands have a topology of less extensive valleys, hills with moderate gradients and top with egg shaped hump and steep slopes.

The six agro-ecological zones have six different types of soil. Onattukara possesses sandy loam type of soil and southern midlands have late-rite without B-horizon type of soil, and northern midlands are blessed with late-rite soils, Malayoram with late-rite without B soil type, riverbank alluvium has alluvium soil and high ranges have red loam soil.

The agro-ecological zones based on the above mentioned parameters are located in different regions of Kerala. The locations of them are mentioned in table 1.3.

Table 1.3 Distribution of agro-ecological zones of Kerala

No	Zones	Description
I	Onattukara	Quilon, Chavara, Karunagappally, Ochira, Kayamkulam, Mavelikkara, Mavelikkara, Muthukulam, Haripad.
II	Southern midlands	Trivandrum, Trivandrum Rural, Kazhakkuttam, Chirayinkeezh, Attingal, Varkala, Kilimannoor, Ethikkara, Mukhathala, Anchalummude, Chadayamangalam, Kottarakkara, Vettikkavala, Chittumala, Sasthamkotta, Elanthur, Pandalam, Kulanada, Bharanikkavu, Madappally, Pallom, Kottayam, Ettumannur.
III	Northern midlands	Pandalayani, Balusseri, Perambra, Meladi, Vadakara, Thodannur, Kunnummel, Tuneri, Badagara, Thalassery, Thalassery, Kuthuparamba, Edakkad, Cannanore, Irikkur, Cannanore, Taliparamba, Payyannur.
IV	Malayoram	Perumkadavila, Vellanad, Nedumangad, Vamanapuram, Anchal, Pathanapuram, Parakode, Konni, Ranni, Vazhoor, Kanjirappally, Pampady, Erattupetta, Lalam, Pala, Uzhavoor, Thodupuzha, Elamdesam, Muvattupuzha, Muvattupuzha, Kothamangalam, Chalakudy, Kodakara, Ollukkara, Pazhayannur, Mannarkkad.
V	Riverbank alluvium	Distributed as narrow stretches in the river banks all over Kerala. For Sample collection places like Chegannur, mallappilly, koippuram, pulikeezhu, thiruvalla were visited.
VI	High ranges	Arudai, Devikulam, Attapadi, Kalpetta, Sultan Battery, Mananthavady.

Source: Kissan Kerala (2020)

Primary Survey Analysis

The sample of the present study formed 390 farmers from 6 different agro-ecological zones in order to give representation to different types of Integrated Farming Systems (IFS) based on multi stage random sampling, across Kerala. Based on the Integrated Simulation Model of IFS different components related to the sustainability of the farm fields were studied. The Integrated Simulation principle used in this study comprised of two parts, i.e., Socio- Economic factors and Bio-Physical Factors. The Social Economic factors included: conditions of the farm, basic profile of the farmers, labour supply, land availability and market accessibility. Bio-physical factors included; farm components and interactions, main crops, farming technique, use of technology and climatic conditions. This chapter is categorized into four parts: (I) Socio-Economic Factors, (II) Bio-physical Factors, (III) Economic Variables, (IV) Benefit - Cost analysis and (V) Regression Analysis.

Socio- Economic Profile of the Farmers

The Socio--demographic profile of the farmers give a basic understanding about their background which has an important role in determining the nature of their farming. It is a critical element in determining the behaviour of the farmers and is relevant for explaining the economic relations and helps to suggest necessary policy changes. The main aspects of the socio-economic profile of the respondents include: Condition of farm and land availability, basic-profile of the farmer, labour supply and market accessibility.

1.5.1 Condition of Farm and Land Availability

The condition of farm and land availability are explained using the size of landholding, average land size, ownership of land, nature of agricultural activity, income share of farming, water resource, and method of irrigation.

1.5.2 Size of Land Holding

The size of the landholdings categorized were hooked on to three categories based on stratified random sampling as small, medium and large, the stratum being the size of landholdings. Here, the small landholdings constitute, landholdings which were less than 2 acres, landholdings more than 2 acres and less than 4 acres and above 4 acres were respectively termed as medium and large. These categorizations of the landholdings were distributed among the six different aggro-ecological zones. The cross tabulation of zones and category of landholding are given in table 1.4

Table 1.4 Size of land holdings.

Type of land area	Place						Total
	High ranges	Mala yoram	Northern mid lands	Onat tuka ra	River bank alluvium	Southern Mid lands	
Large	12	3	20	7	31	16	89
Medium	35	45	32	48	26	30	216
Small	18	17	13	10	8	19	85
Total	65	65	65	65	65	65	390

Source: primary Survey

The size of the landholdings selected for the study were distributed in such a way that 22 per cent were large farmers, 55 per cent of the farmers were medium and rest of the farmers held small landholdings (i.e. Less than 2 acres) . In the High ranges, 53 per cent of the respondents had medium landholdings, 27 per cent with small landholdings and 20 per cent with large landholdings. At this juncture it could be observed that the general trend of the size of landholdings of the state of Kerala was reflected here. In Kerala the size of large landholding is less compared to other states. At the outset it should also be inferred that the farmers engaged in integrated farming cluster more around the medium size of landholdings. In Malayoram, 69 per cent of the respondents possessed medium landholdings, 26 per cent had small landholdings and the rest were large landholdings. In Northern midlands, 49 per cent of the respondents had medium landholdings and 30 per cent were large landholdings and rest had small landholdings. In Onattukara, 74 per cent of the respondents had medium landholdings, 15 per cent of the respondents had small landholdings and 11 per cent of them had large holdings. Among riverbank alluvium, 48 per cent of the landholdings were large, 40 per cent of the

landholdings were medium and the rest belonged to small farmers. In southern midlands, 46 per cent of the landholdings belonged to medium farmers, 29 per cent of the landholdings were small and 25 per cent of the holdings were large. At this junction it is to be approved that majority of farmers engaged in integrated farming in gist belonged to the category of medium farmers. That was why 74 per cent belonged to the category of medium farmers. In Kerala, the average size of the cultivable land was only 0.22 whereas it was 1.67 at all India level (Monitoring and Evaluation Division, Directorate of Agriculture, (Agricultural statistics, Govt.of Kerala 2020).

However, the overall average land area was 4.53 acres. In the case of large farmers the average landholdings was 10.25 acres and for the medium farmers the average land area was 3.41 acres and for the small farmers the average land area was 1.64 acres. For the High ranges, the average land area was 4.45 acres and the average land area of the larger farmers was 12.75 acres, for medium farmers, it was 3.39 and for the small farmers the average land area was 1.72. It was observed here that the density of population in high ranges was less as compared to other areas under the consideration of the study. In the northern midlands, the average land area was highest with 5.88 acres and among them, the large farmers were having an average land area of 12.83 acres. The average land area was lowest in Malayoram (low land of the high ranges) with 3.02 acres. In the case of average size of land in Kerala, the small category of farmers (i.e. below 2 hectares of land) constituted the highest. As explained in table 1.4, the average size of land available for cultivation in Kerala was lower than the all India level.

Table 1.5 Average Land Area (in acres)

Type of land area	Place						Total
	High ranges	Malayoram	Northern midlands	Onattukara	Riverbank alluvium	Southern Midlands	
Large	12.75	7	12.83	10.5	8.15	10.8	10.25
Medium	3.39	3	3.6	3.5	3.56	3.57	3.41
Small	1.72	1.67	1.875	1.23	2	1.47	1.64
Total	4.45	3.02	5.88	3.83	5.59	4.74	4.53

Source: primary Survey

1.5.3 Ownership of Landholding

Out of the 390 farmers considered, around 75 per cent of the landholdings were self-owned, 9 per cent of them were using purely rented land or leased and 16 per cent of them were both self-owned and rented or leased. In riverbank alluvium, 85 per cent of them had own land and 15 per cent of them had both self-owned and leased or rented. In Northern midlands, 15 per cent of the landholdings were rented or leased, 74 per cent of them were self-owned and 11 per cent both self-owned and rented or leased. In High ranges, 24 per cent of them were both self-owned and rented or leased, 14 per cent of them were rented or leased and 62 per cent of them were self-owned.

Table 1.6 Ownership of land

Place	Self-owned	Rented/Leased	Both A and B	Total
High ranges	40	9	16	65
Malayoram	49	7	9	65
Northern midlands	48	10	7	65
Onattukara	53	3	9	65
Riverbank alluvial	55	-	10	65
Southern Midlands	47	6	12	65
Total	292	35	63	390

Source: primary Survey

1.5.4 Agriculture as Primary Occupation

Integrated farmers engage in farming considering it as primary or subsidiary bustle

or occupation, as there was no organizational structure or norms. Nature is the determining factor of the time involved in farming. This made some of the farmers to consider farming as a subsidiary activity. Primary farmers engage in farming for the whole day and had no other occupation for their livelihood whereas in the case of subsidiary farmers, they were engaged in other occupations such as government job, part time work, casual labour, auto drivers, teachers in aided sector, government sector and unaided sector and self-employed people. It was observed during the primary survey that the farmers who considered farming as primary occupation, had no other means to supplement their family income and were likely to make a living from integrated farming. Thus they depended too much on integrated farming. Their concentration was entirely given to the integrated farming system that made them to invent and experiment different ways to make it viable and appealing for them to sustain in it.

Table 1.7 Agricultural Activity-as Occupation

Place	Agricultural activity- as occupation		Total
	Primary	**Subsidiary**	
High ranges	65	0	65
Malayoram	65	0	65
Northern midlands	55	10	65
Onattukara	65	0	65
Riverbank alluvial	65	0	65
Southern Midlands	45	20	65
Total	360	30	390

Source: primary Survey

The distribution of farmers in the agricultural activity as primary and secondary, are explicated in table 1.7. It could be inferred that 92 per cent of the farmers considered farming as a primary activity and 8 per cent of the farmers considered it as a subsidiary activity. In northern midlands and southern midlands, 15 and 30 per cent respectively deliberated farming as a subsidiary activity, rest of the farmers in the entire agro- ecological zones

ruminated farming as primary activity. Thus for majority of the farmers integrated farming was a way of living and means of livelihood. They earned income, made a living and acquired profit for the economic sustainability of the IFS.

1.5.5 Income from Agriculture

The share of income from agriculture in the entire income of the family varied from household to household. Around 46 per cent of the farmers had income of more than 75 per cent imminent from agriculture and around 34 per cent of the farmers had 50-75 per cent of their income upcoming from agriculture. 12 per cent of the farmers had income of around 25-50 per cent from farming and 8 per cent of the farmers had less than 25 per cent of their income from farming. 80 per cent of the farmers had more than 50 per cent of their household income looming from agriculture. This brought out an interesting fact for researchers that integrated farming sector had generated considerable portion of the income of the farmers. From the primary survey it was understood that framers engaged in integrated farming had compensated their shortages in income in other agricultural activities from the high earnings they gained from integrated farming. It was also observed that in integrated farming farmers could earn income one area if not from the other and the entire process went on in harmonized and synchronized style. Integrated farmers especially the medium category farmers shared that they were blessed because they had opted for this type of farming.

Figure 5.1
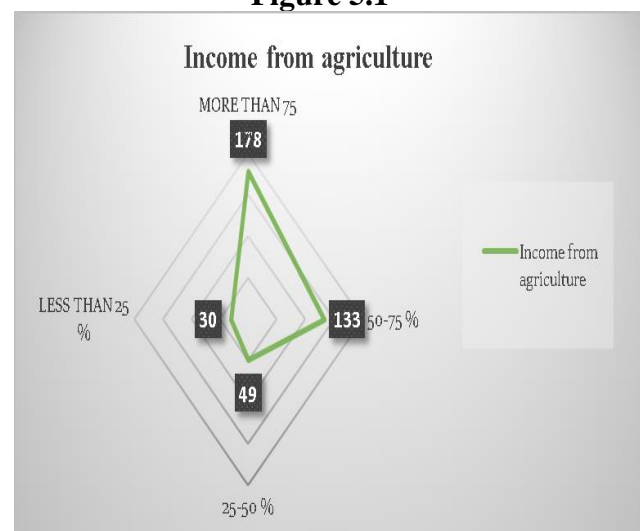
Percentage of Income from Agriculture

Source: primary Survey

1.5.6 Source of Water

The major sources of water for farmers were well, pond or tank, canal, river and bore well. Kerala is renowned for its water resources. There are 44 rivers in Kerala and ensures its water supply through south-west and north-east monsoons. There were possibilities of water shortage during the season of summer and the farmers were effected typically due to the dependence of farming on water resource availability.

Table 1.8 Source of Water

Place	Well	Pond/Tank	Canal	River	Bore well	Total
High ranges	42	11	5	4	3	65
Onattukara	38	12	4	3	8	65
Southern midlands	52	5	2	0	6	65
Northern midlands	36	11	6	3	9	65
Malayoram	37	7	3	6	12	65
Riverbank alluvium	41	8	0	13	3	65
Total	246	54	20	29	41	390

Source: Primary data

Kerala as understood in general parlance, is blessed with abundance of natural water and common people depend on natural sources for their need of water. From table 1.8, it could be anecdotal that 63 per cent of the farmers depended on wells and 13 per cent of them on ponds or tanks, 10 per cent on bore wells and the rest of them on canals and rivers. Among those who use well as their major resource, Southern midlands had highest with 21 per cent and northern midlands had the lowest position with just 9 per cent. Among the farmers who used pond or tank 22 per cent of them were from Onattukara and 9 per cent of them were from southern midlands making them the highest and lowest category respectively. Among the canal water users 30 per cent of

them were from northern midlands and there was no one who used canal water among the respondents in riverbank alluvium. Among the river water category 44 per cent of them were from riverbank alluvium and none of them from southern midlands used river water directly for farming. Finally, in the category of those using well, majority of them were from Malayoram with 29 per cent and lowest per cent shared in the riverbank alluvium and high ranges.

1.5.7 Methods of Irrigation

The major methods of irrigation were supported by diesel or electric motor, traditional motor, solar or wind motors. The farmers who had more than one type of motors and farmers who had modern irrigation techniques like splinters, drip irrigation and sprayers are well expressed in table 1.9.

Table 1.9 Method of Irrigation in the Cultivated Land

Place	Diesel/ electric motor	Traditional motor	Solar/ Wind motor	More than one type of motor	Modern irrigation technique	Total
High ranges	19	28	2	10	6	65
Onattukara	21	26	-	6	12	65
Southern midlands	8	32	4	16	5	65
Northern midlands	10	35	-	9	11	65
Malayoram	14	24	1	12	14	65
Riverbank alluvium	17	28	2	13	5	65
Total	89	173	9	66	53	390

Source: Primary data

Out of the major methods, 44 per cent of the farmers used traditional motors and 23 per cent of them used diesel or electric motor. Only 2 per cent of them used solar or wind motor, around 17 per cent of them used more than one type of motor and the rest of the 14 per cent used modern irrigation techniques. Only 4 farmers in southern midlands, 2 each from high ranges and riverbank alluvium castoff solar or wind powered motors. Malayoram steered in those who used modern irrigation techniques and Southern midlands headed in those who used more than one motors. Onattukara had the highest number of diesel or electric motors and the least in southern midlands. In the case of using the traditional motors northern midlands lead in number of users and Malayoram with least number of users.

Conclusion

The present research article brought out the income and other variables such as availability of land ,size of land holding, ownership of land, source of water and methods of irrigation of the integrated farming in Kerala.The study had found out that the farmers earned an income for a decent living from the integrated farming.Integrated farming in Kerala had proved that it was one of convenient, suitable and comfortable methods of farming in Kerala in all the six selected agro-ecological zones of the state.The integrated farming has roots in all the districts of the state but it has not become a common practice of agriculture in Kerala. It is a viable method of farming. It has to be promoted and encouraged by Krishibhavans (agricultural Offices) in all the districts of Kerala.It has to be encouraged to make a common practice among the farmers.The advantage is that if the farmers make losses in one area of cultivation they are likely to gain from other segments of cultivation and other combinations.There are varieties combinations in this farming.The farmers have to select the most convenient and profitable combination.

Acknowledgement

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ANTECEDENTS OF EMPLOYEES WORK ENGAGEMENT: A STUDY ON AN ETHIOPIAN UNIVERSITIES IN CASE OF AMHARA REGIONAL STATE"

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ABSTRACT

This study aimed to investigate the antecedents influencing employees' engagement at universities in Amhar Reginal state Ethiopia. The study used descriptive and explanatory research designs. A total of 320 academics staffs were taken from ten Amhara Reginal State public Universities as a sample and 282 valid questionnaires collected. Convenience and snowball sampling were used to select the employees from each University. Also, cross sectional survey method applied to collect data via Likert scale questionnaire. Correlation and multiple regression modeling were used to appraisal association and predict the relationships. Initially, a pilot test was a sampled of 30 instructors to check data scale reliability. The study found that all the independent variables (work environment, leadership, reward, organizational support, work motivation) variables had statistically significant correlation with employees' engagement. Morover the study founded that all the studied variables were predictors of workers engagement (R2= 0.662); but the predictors that had foremost influence were working environment, leadership and work motivation. Remarkable emphasis and devotion is required particularly on variables such as working environment, leadership and work motivation as they have reveled significantly greater influence on employee's engagement. Universities shall focus on creating better work environment, working on instructors motivating factors and more work is required to improve the leadership to boost work engagement.

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Keywords: engagement, work environment, leadership, reward, organizational support, work motivation, Universities, Amhara

Introduction

Employees work engagement is a notion given substantial concern in recent years (Bedarkar & Pandita, 2014). In today's organizations engaged employees are taken as an instrument for competitive advantage in their success. Because, according to Bakker, Albercht and Leiter (2011) in a contemporary world, having highly talented employees is not enough organizations should also enthuse and aid the workers to dedicate their utmost competences to their job. Work engagement is a notion which comprises three dimensions: vigor, dedication and absorption. Employees which are highly engaged are characterized by high level of effort, dedication and vigor. Employees' engagement involves the logical and emotional connection of employees with its firms (Nagesh, Kulenur & Shetty, 2019).

Employees' job engagement is positively and significantly correlated to employees' productivity, creativity, commitment, willingness, innovativeness and customer services and I role and extra role behavior (Belay & Lehal, 2019). As mentioned in the work of Bakker, Albercht and Leiter (2011) workers which are greatly engaged robust, effective person who use impact on actions that influence their endeavors. As a result of their energy level and positive assertiveness, engaged workers create their own positive attitude, recognition and be successful. On the other hand, disengaged workers have a huge loss on organizations. For instance, as mentioned in the work of Osborne and Hammoud (2017) disengaged workers generally caused to incur $ 350 in United States Companies annually. Engaged workers are more probably devoted with increased level of continual energy than those who are disengaged (Arnold. 2011).

Firms across sectors struggle to persist and beat today's fierce competition, mental and physical health of the workers is one of the critical concerns that a human resource managers should focus on. Therefore, workers' engagement is today considered as an influential foundation of competitive advantage in disruptive times (Bedarkar & Pandita, 2014). A review by Robertson-Smith & Markwick, (2009) reveled that engagement is positively

associated with productivity, group and organizational success and can lessen absenteeism and turnover levels.

Organizations know that engaged workers are more productive and therefore every employers needs to analyze the antecedents of employees engagement. As the work of Arnold (2011), AbuKhalifeh & Som (2013), Bedarkar & Pandita (2014), Zainol, Hussin, & bintiOthman (2016), Wuttaphan (2016) Fazna Mansoor (2016), Nagesh, Kulenur, & Shetty (2019), there are many antecedents factors influencing employee engagement, namely teamwork, and collaboration, company management, supervisor and coworker relationship, communication, the image of the organization, job role work-life balance, environment, leadership, decision **making** and policies and procedures, incentives and pay, training and development. The most critical asset which is available to an organization is its workers; hence, having engaged worker is very decisive for any organization (Ngethe, Iravo, & Namusonge, 2012). Employees engagement is becoming a vital issue in the recent body of research as engaged workers not only accomplish better in their jobs but also more satisfied in the workplace and feel happier (MacDongh & Orla. 2017).

As per the finding of Arnold (2011), engaged employees are enthusiastic in their work, bursting with energy and deep in their work activities. Workers who are engaged in their job are completely attached to their job and they will not have the intention to quit their job, performs better, and has a positive emotion and high energy towards their duty (Wuttaphan, 2016; Arnold, 2011).

Ethiopia has a young and quickly expanding higher education system (Abebe, 2015). Ethiopia has been noticeably expanding its higher education institutions over the past two decades simultaneously the number of faculty also increased (Portela & Gebremedhin, 2020). According to Alemayehu & Woldemariam(2020) the faculty's willingness to stay in its respective institution is depending upon the presence of impartial human resource, rules, regulation , policies and practices, the existence of fair reward scheme which is reasonable, better working conditions,

academic freedom, and career path. When employees leave their jobs, it is often a sign of disengagement or there is something going wrong (Ngethe, Iravo, & Namusonge, 2012). Ethiopian Universities expect their faculties to show high initiative, to be proactive, and take responsibility for their own professional development. Moreover, they need staffs who engaged with their work: that feels energetic and dedicated, physically, and emotionally attached to his/her institution. Furthermore, the public at large expects that higher education contributes a lot to a nation's development; but this development is contingent upon competent faculties of the higher education institutions. Nowadays, getting competent and qualified academic staff is becoming tough for higher educational institutions since the potential candidates are choosing for banks, political organizations, and other sectors that are offering better salaries and benefits. Consequently, this would have a negating consequence on country's overall education system.

As far as the researcher's knowledge is concerned, there are not academic research studies which had not been conducted on the antecedents of employee engagement in Ethiopia in general in Amhara regional state in particular. Therefore, the current study tried to investigate antecedents that influenced the work engagement of employees at public universities in Amhara Regional State, Ethiopia.

Literature Review

Theoretical Underpinnings

Kahn (1990) was one of the pioneer thinker theorized work engagement (Arnold, 2011). Kahn considered engaged workers as being wholly connected with their work roles cognitively, emotionally, and physically (Anitha, 2014; Bedarkar & Pandita, 2014; Arnold, 2011). Employees' engagement is a vital paradigm in a body of research as an engaged workers are not only rendering better services but also they are motivated, satisfied, and happier in the work environment (MacDonagh & Orla, 2017).Worldwide, many companies struggle to be the winner of today's stiff competition to this end, the healthiness of the workers is one of the paramount factors

that the leaders should know and give due attention. Henceforth, a worker engagement is considered as an influential weapon to gain a competitive advantage in today's competitive era (Bedarkar, & Pandita, 2014). Work engagement denotes a job related psychological state that comprises absorption, vigor, and dedication to the task and organization (Kahan, 1990; Bakker & Leiter, 2010; Arnold, 2011). Today's implication of job engagement is involvement, commitment, enthusiasm, passion, energy, absorption and focused effort (Bakker & Leiter, 2010).

There are three types of workers in organizations; actively disengaged workers, not engaged workers, and engaged workers. Actively disengaged workers are very dangerous worker who are not only do not execute well but also depress the higher performer in the organization. Engaged employees are builders who persistently struggle to give excellence within their roles. They do what they are told to do. (Gallup., 2002). An employee engaged is aware of his or her responsibility and inspires his coworkers for the organizational goals (Anitha, 2014). The general idea on the concept is that engaged employees give more of what they have to offer and as a result an engaged staff is simply a more productive one (Macey, Schneider, Barbera, & Young, 2009).

Empirical Studies

Significant consideration has been given to association of worker engagement to rewards of organizations (Bedarkar & Pandita, 2014). Studies founded that for attracting candidates' compensation and reward package increasingly becomes important factor (Sange, 2015). Workers expect acknowledgement for their offerings and contribution (AbuKhalifeh & Som, 2013). Many organizations often offer formal rewards and recognition packages in exchange for workers contributions. In addition to this, many workers still expect day-to-day informal praise. The absence of adequate reward has been identified as a key factor for work engagement (Anitha, 2014 & AbuKhalifeh & Som, 2013). Indemnification is a compulsory feature workers engagement that inspires workers to accomplish more and hence focus more on task. Compensation embraces financial and non-financial indemnifications

(Anitha, 2014). To have a benefit in attracting and retaining talented employees, organizations should focus on their employee's value (Sange, 2015). As noted by the research findings of Despoina, Arnold, Evangelia, & Wilma (2009), Jane, Mike, & Namusonge (2012), Anitha (2014), Zainol, Hussin, & Bintiothman, (2016) adequate compensation enables the workers to be more engaged, satisfied, and happier in the work environment.

As noted by the research findings of Bedakar Pandita (2014), Anitha (2014), Wuttaphan (2016), Zainol, Hussin, & bintiOthman, (2016) there is a positive e correlation between leader behaviors and follower job engagement. According to Anitha (2014), leadership is one the fundamental factor that influences employee engagement. The contribution of leadership in enlightening workers could not be separated with work engagement (Sugianingrat et al, 2019) Leaders are responsible to a pay a major role in utilizing the worker's efforts for overall organization success. When the workers job is considered meaningful and important, it leads obviously to their interest and engagement (Bakker, Albrecht, & Leiter, 2011).

Besides affecting work motivation, work engagement, can also be influenced by interpersonal relationship. Workers felt safer in working environment characterized by supportiveness and openness (Kahn, 1990). Coworker is one of important elements of working environment variables that focuses explicitly on the interpersonal harmony aspect of employees' engagement (Anitha, 2014) According to Kahn (1990) supportive and trusting interpersonal relationship as well as a supportive team promotes employee's engagement by creative conducive work environment.

One of the factors affecting the work engagement is work motivation. There must be a motive for workers to wholly invest their vigor during work time. To have this kind of devotion the degree that works are high on intrinsic motivation that they inspire engagement (Macey, Schneider, Barbera, & Young, 2009).Engaged workers are most likely to prefer to stay with the institution and perform 25% better than their coworkers and act as an advocators of the organization

(Gemma & Carl, 2009). According to Kahn (1990) engagement could lead to intrinsic stimulation, creativity, attentiveness, authenticity and ethical behavior. Engagement helps to have better effort and more productive and happy workers (Gallup, 2006) Engagement could empower the workers to exert themselves wholly in their work, with improved self-efficacy and a positive influence upon the workers' wellbeing which in turn induces better employees support for the organization (Gemma & Carl, 2009) engaged workers are most likely to work better through strengthen level of effort than those who are disconnected (Arnold, 2011)

Empirical studies have found that work engagement and organizational support as a key job resource that enables employees to be adaptable with their job demand (MacDonagh & Orla, 2017). Alike supportive interpersonal relationships organizational support allows the workers to try and to fail without fear of the consequence. Workers also engaged when they had some control over their work (Kahn, 1990). A study conducted by Dai and Qin (2016) shows that there was a positive association between organizational support and work engagement. According to Arnold (2011), organizational feedback, skill variety, autonomy given by the organization and social support from coworkers and supervisors, leads to more work engagement and consequently to higher performance.
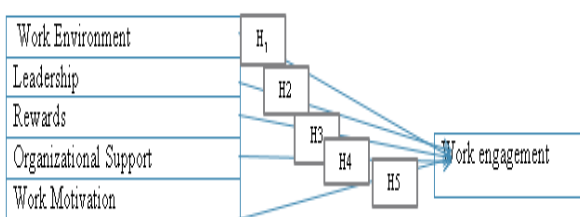
Figure 1: adopted from Conceptual framework of the research

Methods

Research Design: A blend of descriptive and explanatory research designs had been used.

Population and Samples: Population of the study was all academic staffs working in the Amhara regional sate public universities of Ethiopia. There are 10 public Universities in Amhara regional state. To this end, all public Universities were targeted in the current study.

A total of 320 survey questionnaires distributed, 282 questionnaires were returned and used for the data analysis purpose representing a response rate of 88%.

Survey Instruments: an online survey questionnaire was developed to this study to investigate the influence of variables such as organizational support, work motivation, leadership, rewards, and work environment on work environment. Work engagement of academic staffs measured by using a standardized questionnaire, called Utrecht work engagement scale The elements of workers engagement used in this study were dedication (3 questions), vigor (3 questions), and absorption (3 questions). Moreover, the respondents were asked to rate each item on five point likert scale question ranging from strongly agree (1) to strongly disagree (50 in relation to the five variables influencing academic staffs work engagement.

Statistical methods for data analysis: to analyze the collected data both descriptive and inferential statistical tools have been used. To test the hypotheses, Pearson correlation analysis used. Regression was also used to analyze the level of influence made by independent variables (organizational support, leadership, work motivation, rewards, and work environment) on dependent variable (work engagement). All the data analysis was done by using Statistical Package for Social Science version 24 (SPSS24).

Reliability Test: Cronbach's alpha is the most commonly used tool for measuring the effeteness of instrument (Zikmund & Babin, 2010). According to Zikmund & Babin, (2010) the range of reliability test that is above 0.7 is Good. Accordingly, the internal consistency of the survey instruments used in this study was reliable in the given population as shown in table 1.

Table 1: Cronbach's Alpa result

Item-Total Statistics	
Variable	Cronbach's Alpha
Engagement	.753
Work Environment	.683
Leadership	.701
Reward	.768
Organizational support	.743
Work motivation	.796
Overall	.778

Source: Own survey, 2021

Discussion and Result

Table 2: Education level

What is the highest educational degree you earned?				
Educational level	Frequency	Percent	Valid percent	Cumulative percent
Bachelor's degree	12	4.3	4.3	4.3
Master's degree	265	94.0	94.0	98.2
Doctorate	5	1.8	1.8	100.0
Total	282	100.0	100.0	

Source: Own survey, 2021

Considering the respondents education level (4.3%) of the respondents are bachelor's degree holder, 265(94%) are master's degree holder and the remaining 5 (1.8%) are hold doctor of philosophy. This implies that almost all respondents are master's degree holder.

Table 3: Universities

University	At which university you are working in?			
	Frequency	Percent	Valid percent	Cumulative percent
Bahir Dar University	38	13.5	13.5	13.5
University of Gondar	40	14.2	14.2	27.7
Debre Markos University	51	18.1	18.1	45.7
Debre Berhan University	22	7.8	7.8	53.5
Wollo University	21	7.4	7.4	61.0
Debre Tabor University	51	18.1	18.1	79.1
Woldia University	22	7.8	7.8	86.9
Debark University	20	7.1	7.1	94.0
Injibara University	12	4.3	4.3	98.2
Mekdela Amba University	5	1.8	1.8	100.0
Total	282	100.0	100.0	

Source: Own survey, 2021

Regarding participants of the study 51 (18.1%) were from Debre Tabor and similar number of respondents were taken from Debre Markos University. 40 (14.2%) from University of Gondar, 38 (13.5%) Bahir Dar University, and 22 (7.8%) were from Debre Berhan University and similar number of respondents were taken from Woldia University. 21 (7.4%), 20 (7.1%), 12 (4.3%) respondents were from Wollo University, Debark University, Injibara University respectively. Small number of respondents 5 (1.8%) were from Mekdela Amba University.

Table 4: Year of Service

Year of service at university				
	Frequency	Percent	Valid percent	Cumulative percent
Less than 1 year	11	3.9	3.9	3.9
1-3 years	85	30.1	30.1	34.0
4-6 years	81	28.7	28.7	62.8
7-10 years	83	29.4	29.4	92.2
Above 10 years	22	7.8	7.8	100.0
Total	282	100.0	100.0	

Source: Own survey, 2021

Considering the year of experience of the total respondents 85(30.1%) has 1-3 years of experience at a higher institution. 83 (29.4%) of the respondents has 7-10 years of experience at University. 81(28.7%) of the respondents has 4-6 years of experience a higher institution. 22(7.8%) of the respondents have more than 10 years' work experience and the remaining11 (3.9%) of the respondents have less than 1 year work experience.

As depicted in Table 5 all independent variables such as working environment, leadership, reward, organizational support, and work motivation are positively related to the dependent variable instructors work engagement. Pearson product Correlation of working environment and engagement was found to be statistically significant (r=0.719, p=0.01). Hence, H1 was supported. This implies when the work environment improved the instructors work engagement also increase. The work of Arnold (2011), Anitha (2014) and Brad, Kobena, Drea, & Kim, (2017) evidenced

the significance correlation between working environment and engagement.

Table 5: Pearson Correlations

Correlations		Engagement	Working Environment	Leadership	Reward	Organizational	Work Motivation
Engagement	Pearson Correlation	1	.719**	.241**	.185**	.428**	.743**
	Sig.(2-tailed)		0.000	0.000	.002	0.000	0.000
Working Environment	Pearson Correlation	.719**	1	-.050	.032	.326**	.848**
	Sig.(2-tailed)	0.000		.402	.592	0.000	0.000
Leadership	Pearson Correlation	.241**	-.050	1	-.010	.215**	.060
	Sig.(2-tailed)	0.000	.402		.863	0.000	.315
Reward	Pearson Correlation	.185**	.032	-.010	1	.108	.163**
	Sig.(2-tailed)	.002	.592	.863		.071	.006
Organizational support	Pearson Correlation	.428**	.326**	.215**	.108	1	.269**
	Sig.(2-tailed)	0.000	0.000	0.000	.071		0.000
Work Motivation	Pearson Correlation	.743**	.848**	.060	.163***	.269**	1
	Sig.(2-tailed)	0.000	0.000	.315	.006	0.000	

**. Correlation is significant at the 0.01 level (2-tailed)

Source: Own survey, 2021

Pearson product Correlation engagement and leadership was found to be statistically (r=0.241, p=0.01). Hence, H2 was supported. This implies when the leadership practice is good, the instructor's work engagement also increase. In this regard, the current finding is in line with the finding of Bedarkar & Pandita, (2014) and Emiko, Reiko, & Kazutomo (2017) that provide evidence for correlation between leadership and instructors work engagement. Pearson product Correlation of reward and engagement was found to be statistically significant (r=0.185, p=0.01). Hence, H3 was supported. This implies if the reward given to instructors increase, the instructor's work engagement also increase. Studies done by Arnold (2011), Ala`a Nimer & Ahmad, (2013), Anitha (2014) and Sange (2015), and show that rewarded workers are motivated to be engaged at work.

Pearson product Correlation of organizational support and engagement was found to be statistically significant (r= 0.241, 0.01). Hence, H4 was supported. This implies if the organizational support increase, the instructor's work engagement also increase. The present finding is in line the Kahn, (1990), Kailiang & Xinyu (2016), Ida Ayu Putu, et al (2019) finding which states that a significant correlation between engagement and organizational support. Pearson product Correlation of work motivation and engagement was found to be statistically significant (r=0. .428, p=0.01). Hence, H5 was supported. This implies if the work motivation increase, the instructor's work engagement also increase. In this regard as the findings of Orla & Joe, (2017) shown that engaged workers not only accomplish better in their works but also more motivated in the workplace.

Table 6: Model Summary

Model Summaryb					
Model	R	R Square	Adjusted R Square	Std.Error of the Estimate	Durbin Watson
1	.817a	.668	.662	4.75524	1.768
a. Predictors: (Constant), Work motivation, Leadership, Reward, Organizational support, Working environment					
b. Dependent Variable: Engagement					

Source: Own survey, 2021

Multiple regressions was carried out, it was found all the variables studied were identified as a predictors of employees engagement with an adjusted R^2 value of 66.2% of the variation as depicted in table 6 which is statistically significant. Therefore, 66.2% of the variation in employees' engagement can be explained by five independent variables such as working environment, leadership, reward, organizational support, work motivation in the model. Thus, it can be concluded that the above-mentioned independent variables share 66.2 % of the influence on employee engagement. This means that 33.8% of the influencing factors of employee engagement cannot be explained by this study variable, which may require further investigations by other researches

Table 7: ANOVAa result

ANOVAa						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	12547.406	5	2509.481	110.979	.000b
	Residual	6240.995	276	22.612		
	Total	18788.401	281			
a. Dependent variable: Engagement						
b. Predictors : (Constant), Work motivation, Leadership, Reward, Organizational support, Working environment						

Source: Own survey, 2021

Table 7, reveals the ANOVA result, that reveled a statistically significant probability value (p= 0.000) and shows that all the variables of leadership, working environment, reward, organizational support, work motivation explain significantly employee engagement.

Table 8: Coefficientsa

Coefficientsa								
Model		Unstandardized coefficients		standardized coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	13.922	2.140		6.505	.000		
	Working Environment	.727	.138	.372	5.264	.000	.241	4.151
	Leadership	.437	.078	.206	5.599	.000	.891	1.122
	Reward	.165	.060	.100	2.754	.006	.914	1.094
	Organizational Support	.236	.058	.156	4.076	.000	.822	1.216
	Work motivation	.733	.142	.357	5.143	.000	.249	4.009
a. Dependent Variable: Engagement								

Source: Own survey, 2021

As shown in table 8 the t-values indicates that leadership (t =5.599), working environment (t =5.264), and work motivation (5.143) are the most influential factors on workers engagement as they're statistically significant at 0.01 level of significance. B values also tells that the working environment effects up to 37.2 percent as determinants of workers work engagement and work motivation as about 35.7 percent influence on instructors work engagement. Leadership, reward, organizational supports have 20.6 per cent, 10.0 per cent, 15.6 per cent influence on instructors work engagement.

Conclusion and Implication

This study focused on examining the antecedents of employees work engagement and also it detects five antecedents that have a significant effect on it. Moreover, this study

also discloses all the independent variables have statistically significant correlation with employees work engagement. The multiple regression analysis result predicts that out of several statistically significant factors that have an influence on employees work engagement were working environment and work motivations. Working environment and work motivations were found to have significant t value in relation with employees' engagement. This implies that creating a healthy working atmosphere for instructors could help the

Universities to have engaged employees. This replicates job motivation that could be leads to vigor, dedication and absorption. Employees would be highly engaged in their work when the Universities give considerable support attention in terms of the determinants being addressed. Therefore, universities are advised to give considerable emphasis on creating sound work place environment, employees' motivation and they have to work to create better leadership.

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TESTING FOR OVER- AND UNDER REACTION OF EQUITY RETURNS: EVIDENCE FROM THE ASEAN PLUS SIX COUNTRIESAND US INDICES

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ABSTRACT

The sentiment or non-fundamental theory supports that it is not only the fundamentals that influence the real economic or financial indices. This study focuses whether past performance affects the Indian equity returns or past relations or ties among the studied countries having weighton the equity returns. The study is conducted from the sample of ASEAN plus six active trading partners, and the US. It is found that there is evidence of representative heuristics which in general states that past performance represents the future returns rather this study showed that past relations are affecting the financial indices' subsequent returns

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Introduction

The study on the financial markets are extensively found to have gained the attention of the researchers around the world. Even more so, due to the globalization and the open trade which has created one world and one market, panel data analysis or cross-country financial market analysis is found necessary to understand the different countries' investor behavior (Tai, Yu-Nan, 2014). The objective of the study is to understand whether the equity returns are resultant of its past performance or is it the past relations or ties that are affecting the equity returns from a sample taken on the ASEAN trading partners (Malaysia, Philippines, Singapore, Thailand, Brunei, Vietnam, Laos, Myanmar, Cambodia, Australia, China, India, Japan, New Zealand, South Korea), which is now also recognized as Regional Comprehensive Economic Partnership (RCEP) since its inception in the 2011 and US. Literature on the reaction in the returns of cross-country financial markets have not paid attention to the selected countries under study and no work were found relating with the past ties of a country having found itseffect on the equity returns. This study adds on to the most neglected yet important sample taken under consideration as RCEP accounts for a third of the world's gross domestic product and almost half of the world's population (Business Standard, 2021) and has potential to grow in trade among the countries under study in the future.

Therefore, the author has felt the need to explore the chosen parameters to study the cross-country relationships of India onthe ASEAN countries including its active trading partners and US (which is taken as a proxy to represent the developed country's financial market).

Various sections of this study includes; I-Introduction, II-Review of Literature, III-Research Methodology, IV-Data Analysis and interpretation which is followed by the last section; V- conclusion of the paper.

Literature Review

It is widely acknowledged by researchers around the world that the equity price or return variance from its fundamentalswere due to the irrational or emotional drivers or cognitive bias effect on the prices or returns in the financial markets. Metawa, et al., (2018) who investigated the relationship between investors' demographic characteristics and influence of behavioral factors in investment in the Egyptian stock market also supported the deviation of the returns from its fundamental due to emotion. They have collected primary data and found investor sentiment, overreaction and under-reaction, overconfidence and herd likebehavior significantly affecting investment decisions. Guo et al. (2017) also studied the behavioral factors influence in investment during the financial crisis and the subsequent

recovery. Jiang, and Zhu (2017) study showed existence of short-term under-reaction in the US equity market and stated information shocks due to limited investor attention has led to such variance. Hammami and Abaoub (2008) acknowledged that people tend to overreact to unexpected news and underreact to ordinary or non-desirable new events. They supported their claims with mean-reversion followed by overreaction and momentum due to under-reaction in the investor's decision making. Kuttu,Saint, (2014) examined the returns and volatility dynamics in Ghana, Kenya, Nigeria and South Africa. They that Nigeria appears to be the source of volatility innovations in Ghana, Kenya and South Africa including findings of volatility persistence in all the four markets under study.Tai, Yu-Nan (2014) focused on different time scales in the United States stock market S&P 500 and Chinese stock markets. It was found that in the short-term, the momentum strategy is significant in Taiwan, Hong Kong, and Singapore, but not in S&P 500 and that it was insignificant especially during financial crisis. Yet the existence of the momentum strategy did provide significant profit in the uncertain economic period in the U.S. market. The contrarian strategy is significant in the long-term except in the S&P 500, that is not significant in the crisis period. Durand et al. (2013) and Ramiah and Davidson (2007) said that anxiety and nervousness are associated with greater levels of activity.Fang, Yong (2013) stated that investors underreact to good news and overreact to bad news in the Chinese stock market. Fabozzi (2013) found loser portfolios outperform winner portfolios. Aguiar and Sales (2010) found a strong influence of overreaction in the American stock market. They stated that overreaction is suitable for contrarian strategy while under-reaction is for the momentum strategy. Lam at el. (2010) stated that an investor uses behavioral biases while making investment decisions. The inefficient market led to the unpredictable drift in stock prices (Loh, K., Roger, 2010). Spyrou et al, (2007) found market reaction shocks for the large capitalization stock portfolio is consistent with the Efficient Market Hypothesis whereas Medium and small capitalization stock portfolios under-reacts to

both positive and negative shocks for many days subsequent to a shock. Under-reaction is not explained by risk factors, calendar effects, bid-ask biases, or unique global financial crises. Kaestner, Michael (2006) stated that investors are exhibiting under-reaction in the short-term over the earnings announcements with contradicting response for the long-term over unexpected earnings leading to overreaction. They concluded stating the overreaction might be due to the representativeness bias. Soares and Serra (2005) supported the overreaction hypothesis stating that there is negative correlation in stock returns that is robust to risk and non-risk controls. Antoniou and Galariotis (2005) indicated that contrarian strategies produce statistically and economically significant profits, which are neither due to risk, nor can they be fully explained by market frictions due to the firm-specific component of returns.Larson and Madura (2003) found that new information when its publicly released causes overreaction. Akhigbe, Aigbe at el. (2002) concluded that the degree of under-or overreaction of technology stocks varies according to firm-specific characteristics. Schnusenberg and Madura (2001) stated that the focus on stock indexes avoids the potential bias due to firm size and the bid-ask spread. Dreman and Lufkin (2000) stated that good and bad news affects the "best" stocks in the opposite way, for example, good news is taken for granted and bad news would plummet the stock's price. They felt that overreaction is due to the Representative Heuristic, and under-reaction is a result of a cognitive bias known as the Conservatism Bias.

Research Methodology:

The sample period studied ranges from 2007 to 2020 financial year and monthly data. The variables under study were: S&P 500, ASX, SHH, Nifty 500, Nikkei 400, S&P NZX, KOSPI, JKT, FTSE, PSI, LSX, FTSE, VN Index, MYSX, SET, and CSX. The countries under study consisted of ASEAN (Malaysia, Philippines, Singapore, Thailand, Brunei, Vietnam, Laos, Myanmar, and Cambodia) countries along with its six major trading partners (Australia, China, India, Japan, New Zealand, South Korea), they are also known as

the Regional Comprehensive Economic Partnership (RCEP),in addition to RCEP; US stock index returns is also studied as a proxy to represent the developed financial market. The focus is given on India and its relationship with the rest of the countries under study. Out of the countries in the RCEP, Brunei equity market returns are not included under study as it does not have a stock exchange platform of its own as of 2020.The secondary data is collected from the database of RefinitivEikon, and Yahoo Finance.

The raw or unconditional return of index i on day t ($r_{i,t}$) is taken as the difference between today's and the previous day's closing price:

$$r_{i,t} = log\frac{P_1}{P_{t-1}}$$

The returns of the equity indices represent sentiments of the investors as it is more or less affected by good or bad news or sentiment at present affecting the subsequent returns in the future (Schmeling, 2009).

The following empirical analysis is used after conversion of the series into logarithmic returns from the historical prices which are correlation analysis as a basis to track the multicollinearity problem (Malaysia, and South Korea were excluded for the data analysis due to the high correlation value of more than .8), the panel unit root test, and the bivariate EGARCH model based on Normal Gaussian distribution. The best EGARCH model (2, 6,4) on RCEP with US and EGARCH model (1,6,6) on RCEP are selected based on the Akaike Info Criteria and Schwarz Information Criterion.

EGARCH model of Nelson (1990, 1991) is used in this study which helps in estimating volatility, as well as in capturing the asymmetry, which are the different effects on conditional volatility of a positive and negative correlation between returns, shocks and subsequent shocks to the volatility.

Data Analysis:

Table 1: Descriptive study:

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-8.0656	0	16	2609
	7			
Null: Unit root (assumes individual unit root process)				
ADF - Fisher Chi-square	1268.28	0	16	2609
PP - Fisher Chi-square	1417.48	0	16	2624
			Cross-	

Note: ** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality. Authors' own

Table 1 gives detail depiction on the stationarity and the summary of the different stationarity test which shows the panel series are stationary at level. The data is also found to have normality (normality test output can be shared on request).

Table 2: Correlation analysis:

	LAUS	LCAM	LCHINA	LINDIA	LINDO	LJAPAN	LKOREA	LLAOS	LMALAY	LMYAN	LNEWZ	LPHILL	LSING	LTHAI	LUS	LVIET
LAUS	1															
LCAM	0.52	1														
LCHINA	0.38	0.26	1													
LINDIA	0.63	0.37	0.43	1												
LINDO	0.66	0.54	0.47	0.66	1											
LJAPAN	0.31	0.17	0.16	0.16	0.33	1										
LKOREA	0.63	0.47	0.51	0.66	0.77	0.22	1									
LLAOS	0.07	0.06	-0.02	0.04	0.02	0.06	0.03	1								
LMALAY	0.04	0.01	-0.10	0.05	0.14	0.15	0.04	0.02	1							
LMYAN	0.01	-0.08	0.03	0.11	-0.08	0.03	-0.09	0.03	-0.04	1						
LNEWZ	0.04	0.02	-0.02	0.05	0.02	-0.04	0.01	0.01	0.01	-0.01	1					
LPHILL	0.46	0.29	0.33	0.55	0.53	0.16	0.51	0.00	0.07	-0.07	0.04	1				
LSING	0.67	0.54	0.47	0.66	0.70	0.33	0.77	0.02	0.14	-0.08	0.02	0.53	1			
LTHAI	0.64	0.44	0.38	0.66	0.74	0.17	0.73	0.02	0.08	-0.07	-0.05	0.58	0.75	1		
LUS	0.65	0.56	0.31	0.36	0.62	0.37	0.55	0.01	0.11	-0.00	-0.06	0.29	0.62	0.46	1	
LVIET	0.05	0.06	-0.18	0.07	0.02	0.11	-0.08	0.01	0.98	-0.03	0.01	0.02	0.02	0.04	0.03	1

Note: Author's own

From **Table 2**, Malaysia, South Korea, and Vietnam has correlation value of more than .8 so the author has randomly removed these variable and conducted correlation analysis. It was found that if Malaysia and South Korea series are removed from correlation analysis than there is no multicollinearity problem.

Table 3: EGARCH

i.   EGARCH MODEL: (2,6,4)on RCEP with US

$Log(h_t)=a+\beta_1$ $p+\beta_2$ $\theta+\beta_3\lambda+\beta_4$Australia$+\beta_5$Cambodia$+\beta_6$China$+\beta_7$Japan$+\beta_8$Laos$+\beta_9$Myanmar$+\beta_{10}$New Zealand$+\beta_{11}$Philippines$+\beta_{12}$Singapore$+\beta_{13}$Thailand$+\beta_{14}US+\beta_{15}$Vietnam… (1)

ii.   EGARCH MODEL: (1,6,6) on RCEP

$Log(h_t)=a+\beta_1$ $p+\beta_2$ $\theta+\beta_3$ $\lambda+\beta_4$Australia$+\beta_5$Cambodia$+\beta_6$China$+\beta_7$Japan$+\beta_8$Laos$+\beta_9$Myanmar$+\beta_{10}$New Zealand$+\beta_{11}$Philippines$+\beta_{12}$Singapore$+\beta_{13}$Thailand$+\beta_{14}$Vietnam … (2)

Model	(2,6,4)		(1,6,6)	
Variable	Coefficient	P-value	Coefficient	P-Value
C	0.01	0.09	0.02	0
LINDIA(-1)	0.02	0.79	0.01	0.83
	Variance Equation			
α	-1.48	0.60	-3.53	0.40
P	-0.52	.38	0.35	0.19
Θ	0.71	0.00	0.67	0.00
Λ	0.90	0.04	-0.43	0.37
Australia	-12.65	0.00	-17.94	0.00
Cambodia	5.99	0.01	4.88	0.01
China	0.09	0.97	-3.01	0.12
Japan	0.29	0.91	3.96	0.16
Laos	-0.55	0.68	-3.70	0.03
Myanmar	0.42	0.00	0.30	0.26
New Zealand	-0.47	0.07	-0.38	0.03
Philippines	-4.33	0.21	-1.05	0.73
Singapore	8.89	0.03	7.23	0.07
Thailand	2.47	0.46	1.96	0.55
US	-8.16	0.13		
Vietnam	291.60	0.90	1616.98	0.70
R-squared	0.00	0.00	-0.02	0.01
Adjusted R-squared	-0.00	0.07	-0.03	0.07
AIC	-2.73		-2.75	
SIC	-2.22		-2.24	
Durbin-Watson stat	1.89		1.90	

Note: Author's own

From both the models in **Table 3,** it is found that the external shock on the Indian equity returns is persisting from countries with whom Indian has a close cultural tie or established relationships like that from Singapore, Cambodia, New Zealand, and Australia (they all share political, economic, security, lingual and sporting ties with India). Out of which under close scrutiny, it is found that the bad news is found to have overreaction on the Indian equity returns in particular from New Zealand and Australia. Hofstede (2001) and Paldon, T (2020) have stated that the variance in the equity returns in India is due to the cultural or personal relationships shared in the Indian community. In this study, it is found that cultural influence of the Indian investors can be extended to outside of India with which India shares common cultural traits from history or from the past.

Conclusion and future scope of study:

This paper not only challenges the classical view of sentiment driving the equity returns, but tries to find out the reason behind such variance in particular of India and the ASEAN countries (ASEAN plus six of its trading partners) and the US. From the empirical analysis, it can be concluded that equity returns are indeed influenced by the sentiments when there exists a close cultural ties from the past that can extend outside the borders of the country. The evidence of Indian investors' sentiment being influenced by common cultural traits or ties with other countries is a new finding and it adds to the existing documented literature on understanding the investor sentiment. Therefore, this paper not only validates the influence of the representative heuristics which generally is applied to past performance to be representative of the future returns rather it is found that past relationships or ties are representing the future returns of the financial indicators. The evidence of past relations affecting the future equity returns of India can be used as a basis to validate on the other sample country's equity indices or returns.

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ASSESSMENT OF DEPRESSION AMONG ADOLESCENTS

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ABSTRACT

The focus of this research was to find out how common depression is among adolescents. Assessment, comparisons, and evaluation were employed for descriptive approach. A total of 1500 adolescents from private and public schools were assessed. Equal numbers of male and female adolescents were picked from government and private schools by using convenient method. The depression level was assessed by using the T. Aeron Beck depression. For statistical test and to determine if there was a noteworthy significant difference in the level of depression, the mean, coefficient of variation, and t-test were used. As per statistical analysis of score, 13.53% adolescents are facing severe level of depression. 31.4% are facing moderate depression and 43.6% are facing mild level of depression. Male adolescents are having higher level of depression (44.93%) as compared with 40.47% female adolescents. Total 17.07 % adolescents in government schools are facing higher depression as compared with 10 % adolescents of private schools. It is observed that more adolescents of government schools are fronting higher depression than with adolescents of private schools. Substantial difference is perceived in the degree of depression among adolescents learning in private a government school and between male and female adolescents. It is suggested that corrective measures should be taken by schools to improve mental health of adolescents..

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Keywords: Adolescents, Depression, Private schools, Government schools.

Introduction

Education is valued in Indian culture because of its set of historical values. The integrity of the system has been praised, and it is firmly linked to social importance. The educational framework is more workbooks focused, with a concentration on cramming lessons, which necessitates studying for lengthy periods of time and on a daily basis. This demanding routine of studying from morning to night provides little or no time for socializing and pleasure. Individual or occupational quality is not used to identify who is a good student. Instead, academically brilliance is used to determine who is a great student. This might make parents' worry that their children may fail to achieve this level, and this fear of failure, which creates a continual pressure, resulting in adolescents experiencing chronic strain and poor academic performance which creates a continuous anxiety among adolescents ending in depression. It is found from some studies that the adolescents studying in government schools are less prone to face depression than the adolescents of private schools and vice-versa. A comparative assessment of depression of adolescents studying in private and government school will explore the fact in present time. The current research was thus commenced to evaluate the prevalence and grade of depression among adolescent of class 11th and 12th studying in various schools affiliated to CBSE Boards in Dehradun city.

Review of literature

Depression disturbs on an average 10 percent population of India; nonetheless daily concerns are driving more Indians over the edge, according to physicians before World psychological state Day (Iyer, 2013). Depression is amongst the most common disorders on the globe, and it is a major consideration when it comes to psychological issues (Sarokhani et al., 2013). The topic of student psychological health is a worldwide subject that distresses all established and emerging countries, as well as contemporary and traditional civilizations (Bayram, 2008). Young individuals confront numerous conflicts and demands to achieve during the academic careers, particularly at university (Arslan et al, 2009). It's critical to be aware of issues about adolescents' mental health. Adolescents' mental health issues are widely researched at many didactic levels, including college and university. (Bayram, 2008). Several studies found that students

had a higher frequency of psychological disorders, such as depression, than the rest of society. (Yusoff et al.,2013).

In psychology, depression can be a sign of a mood illness (Wolpert, 2000). Despondency significantly lowers people's choices and their communities' quality of life, may be a peril cause for suicide, and can exacerbate effects of various chronic well-being issues. (Worley, 2006). Depression is third greatest reason of worldwide illness encumbrance, contributing for 4.3 percent of entire mental illness life ages in terms of public health importance. By the year 2030, if present trends persist, it will be the major cause of illness impact. (Üstün et.al, 2004; Thirunavukarasu, 2010). In India, a comprehensive relatively large investigation using stringent techniques revealed a 15.9% absolute prevalence of depressive symptoms (Poongothai et al, 2009). Males and females differ considerably in mental stability, a component of emotional intelligence, according to Kumar B. (2018), even those with late intellectual capacity are more likely to experience depression. There has been some speculation that the rate of hypertension has risen in recent decades (Nandi, et.al, 2000) Depression was detected in 21-84 percent of all patients in studies conducted in India's healthcare facilities (Amin et al, 1998).

Research Problem

To assess the degree of depression among adolescents.

Objectives

1. To investigate the degree of depression among adolescents.
2. To investigate the degree of depression among adolescents based on gender.
3. To investigate the levels of depression among male adolescents based on school type.
4. To investigate the levels of depression among female adolescents based on school type.

Hypotheses Of Study

1. There is no statistically meaningful difference in the level of depression among adolescents based on gender.

2. There is no statistically meaningful difference in the levels of depression among adolescents based on school type.
3. There is no statistically meaningful difference in the levels of depression among male adolescents based on school type.
4. There is no statistically meaningful difference in the levels of depression among female adolescents based on school type.
5. There is no statistically meaningful difference in the levels of depression between adolescent based on gender studying in private schools.
6. There is no statistically meaningful difference in the levels of depression between adolescent based on gender studying in government schools.

Research Methodology

Tools Used For Data Collection To analyze the level of depression, BDI II, standardized psychological scale developed by Aaron T. Beck (1996) was used.

Population For present study, the population is the adolescents studying in class 11th and 12th 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: 1).

Table: 1 Sample Layout

School Category	No. of Schools	Number and Location of Schools in Dehradun City					Adolescents	
							Male	Female
		North	South	East	West	Centre	25+25 from each school	
Private	15	3	3	3	3	3	375	375
Government	15	3	3	3	3	3	375	375
Total	30	30					750	750

Statistical Analysis of Data On the basis of the scores obtained, sample was divided into four categories. Percentage, mean and standard

deviation were calculated for different categories of depression level (Table: 2). t-test was applied to compare depression scores with regard to gender and types of schools.

Table: 2 Depression Scores Of Adolescents

Category of Depression	Adolescents		Male Adolescents				Female Adolescents			
	Total	%	N	%	Mean	SD	N	%	Mean	SD
Minimal	172	11.47	73	9.73	10	2.354	99	13.2	9.20	2.587
Mild	654	43.6	302	40.27	16	1.605	352	46.93	15.30	1.390
Moderate	471	31.4	240	32	26	2.904	231	30.8	24.22	3.078
Severe	203	13.53	135	18	54.67	8.403	68	9.67	52	7.769
Total	1500	100	750	100	25.554	15.208	750	100	20.888	11.671

Depression Profile of Adolescents Based on Gender and Type of Schools Out of 750 male adolescents, 18 % have severe depression. 32 % adolescents have moderate depression. 40.27 % adolescents have mild level of depression and 9.73 % have minimal level of depression. Among female adolescents 9.67 % have severe depression, 30.8 % female adolescents have moderate depression. 46.93 % female adolescents have mild level of depression and 13.2 % have minimal level of depression (Table: 2). It means more male adolescents are facing higher level of depression as compared with females.

Table: 3 Depression Scores Of Adolescents Based on School Type

Category of Depression	Adolescents							
	Private Schools				Government Schools			
	N	%	Mean	SD	N	%	Mean	SD
Minimal	106	14.13	9.35	2.58	66	8.8	9.44	2.79
Mild	345	46	15.74	1.363	309	41.2	15.72	1.20
Moderate	224	29.87	24.88	2.962	247	32.93	25.14	2.356
Severe	75	10	53.76	4.832	128	17.07	54.09	4.528
Total	750	100	21.78	12.449	750	100	24.29	13.65

Table:3 reveals that adolescents studying in government schools are facing higher level of depression as compared with those studying in private schools. 17.07 % of government school adolescents are facing severe level of depression as compared with 10 % of private school adolescents while at minimal level of depression, 14.13 % adolescents of private schools are present as compared with 8.8 % of government school adolescents. At moderate level of depression very less difference is observed between adolescents of private and government schools but greater difference is observed at sever and minimal level.

Comparison of Depression Scores of Male Adolescents Based on School Type Table: 4 shows that more male adolescents of government schools are facing severe depression (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 depression as compared with 37.07 % adolescents from government schools. More male adolescents of private school 12.53%) have minimal level of depression as compared with adolescents of government schools (6.93%). It's clear that more male adolescents of government schools are facing high depression as compared with adolescents studying in private schools.

Table: 4 Depression Scores of Male Based on School Type

Category Of Depression	Male Adolescents							
	Pvt. School				Govt. School			
	N	%	Mean	SD	N	%	Mean	SD
Minimal	47	12.53	9.47	2.418	26	6.93	9.62	3.251
Mild	163	43.47	15.57	1.431	139	37.07	16.26	1.385

Moderate	111	29.6	24.40	3.016	129	34.4	26.36	2.322
Severe	54	14.4	53.61	5.126	81	21.6	56.70	4.265
Total	375	23.6	23.06	13.799	375	100	28.01	16.163

Comparison of Depression Scores of Female Adolescents Based on School Type Table: 5 reveals that out of 375 private schools female adolescents, 59 of them come under minimal depression (15.73 %), 182 adolescents have mild depression (48.53%). 113 adolescents have moderate level of depression (30.13 %) and 21 adolescents have severe level of depression (5.6 %). While out of 375 female adolescents studying in government schools, 40 have minimal depression, 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 depression as compared with female adolescents of private schools, while difference at moderate level is not too high. In this way high depression can be observed among government school female adolescents as compared with female adolescents studying in private schools.

Table: 5 Depression Scores Of Female Adolescents Based on School Type

Category Of Depression	Female Adolescents							
	Private School				Government School			
	N	%	Mean	SD	N	%	Mean	SD
Minimal	59	15.73	9.22	2.742	40	10.67	9.25	2.329
Mild	182	48.53	15.91	1.295	170	45.33	15.18	1.015
Moderate	113	30.13	25.35	2.908	118	31.47	23.92	2.389
Severe	21	5.6	53.91	4.538	47	12.53	51.49	4.791
Total	375	100	20.50	11.099	375	100	20.57	11.137

Analysis of Depression Scores of Adolescents Based on Gender Type

At a 1% significance level, the value of t is 6.6572, which is higher than the tabulated value. As a consequence, we could rule out the null hypothesis and conclude that a meaningful statistical difference in depression level exists among adolescents based on gender. (Table 6).

Table: 6 t-Value Table for Depression Of among Adolescents Based on Gender

No. of Adolescents		t value	Df	SED	P Value	Result
Male	Female					
750	750	6.6572	1498	0.700	<0.0001	Extremely significant

Analysis of Depression Scores of Adolescents Based on School Type

At a 1% significance level, the computed t value is greater than the table value for depression scores of adolescents in private and government schools. This indicates that a big disparity exists. As a result, the second the null hypothesis is rejected, and it is determined that there is a meaningful statistical difference in the extent of depression experienced by adolescents attending private and government schools in the Dehradun. (Table: 7)

Table: 7 t-Value Table of the Level Of Depression Of Adolescents Based on School Type

No. of Adolescents		t value	Df	SED	P Value	Result
Pvt.	Govt.					
750	750	3.7208	1498	0.675	0.0002	Extremely Significant

Analysis of Depression Scores of Male Adolescents One aim of this research was to associate male adolescents studying in private and government schools with respect to their depression level.

Table: 8 Significant Differences in Depression Level Of Male Adolescents

Type of School		t value	Df	SED	P Value	Result
Pvt	Gov					

	.	t.					
N	3 7 5	37 5	4.5 14	7 4 8	1. 0 9 7	<0. 000 1	Extre mely Signi fican t

From table 8, at a significant level of 1%, the t-value is 4.514 which are higher as compared to table value. As a result, the t-value is crucial. So, the third null hypothesis is rejected, and it may be inferred that there must be a considerable difference in the severity of depression among male adolescents attending private versus government school in Dehradun.

Analysis of Depression Scores of Female Adolescents Table:9 reveal that t-value for total depression scores is 0.0899 that is not momentous at 1% level of implication. Hence 4th null hypothesis is acknowledged. So it can be established that there is nearby no noteworthy difference in degree of depression between female adolescents learning in private and public schools in Dehradun city.

Table: 9 t- Value Table for The Level Of Depression Of Female Based on School Type

	Type of School		t val ue	Df	SE D	P Val ue	Resu lt
	Pv t.	Go vt.					
N	37 5	375	0.0 862	74 8	0. 81 2	0.93 13	Not Signi ficant

Analysis of Depression Scores of Adolescents Studying in Private Schools As per data of table 10, t-value is 2.795 which is significant at 1% level of significance. Consequently the 5th null hypothesis is vetoed. It mean a significant difference exist in the depression level of adolescents based on gender attending private schools.

Table: 10 Significant Differences in Depression Level Of Adolescents Studying in Private Schools

No. of Adolescents		t value	Df	SE D	P Valu e	Result
Mal e	Fema le	2.795	748	0.91 5	0.005 3	Signific ant
375	375					

Analysis of Depression Scores of Adolescents Studying in Government Schools

As per t-value mentioned in table 11, the t-value for overall depression score is 7.337 which is greater than p-value at 1% level of significance. So t-value is significant. As a result, the sixth null hypothesis is ruled out. It mean a significant difference exist in the depression level of adolescents based on gender attending government schools.

Table: 11 Significant Differences in Depression Level Of Adolescents Studying in Government Schools

No. of Adolescents		t valu e	Df	SE D	P Valu e	Result
Ma le	Fem ale					
375	375	7.33 7	748	1.0 14	<0.0 001	Signifi cant

Interpretation And Discussion

1. Among male and female adolescents, more males have higher level of depression as compared with females.

2. Adolescents studying in government schools are facing more depression as compared with adolescents studying in private schools.

3. Male adolescents studying in government schools are facing higher depression level as compared with those studying in private schools.

4. Among female adolescents, those studying in government and private schools, no specific difference are in the level of depression than those studying in private schools.

Conclusion

According to the outcomes of this learning, there is a substantial variance in depression levels between male and female adolescents, as well as across different types of schools. As a result, it is critical to engage with those adolescents who have greater levels of depression in order to fulfil all of the educational goals. The study revealed that the adolescents of government schools of Dehradun are more prone to face higher levels of depression. Adolescents studying in private schools have better condition of depression levels. All the adolescents had not enjoyed the

lower level of depression. Therefore, necessary facilities should be made available for increasing quality of education to lower down the depression and creating an effective teaching-learning environment in every institution of the state.

Limitations

- Study is limited to 1500 adolescents studying in private and government schools of CBSE board located in Dehradun city.

Suggestions

- Anxiety levels of middle school students and college level students could have been assessed to make it a comparative one.
- It is suggested that study could be directed in other cities to increase completeness of its conclusions.

- A study may be conducted on large sample to search very definite conclusions regarding anxiety and Depression.
- Anxiety and Depression of the adolescents of various disciplines like natural sciences and social sciences can be measured and compared.
- A study should be conducted to find out the remedial measures for the anxiety.

The investigation was not sponsored by any organization.

Conflict Of Interest

Author has acknowledged that no contending attentiveness occurs.

Acknowledgements

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THE STUDY OF RELATIONSHIP BETWEEN FDI AND STOCK MARKET AND THE REAL ESTATE SECTOR

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ABSTRACT

The diversity and complexity of Property Market, its linkages with economy and investment sphere has necessitated a closer study on its dynamics and movement. This paper attempts to find out the role of real estate in a multi-asset portfolio and need of its securitization in order to be investible in Indian context. Johansen cointegration test and Granger's Causality Test in the VAR block exogeneity on Quarterly data (Q 2009-10 to Q3 2016-2017) for HPI (Real estate index) and NSE 50(Stock market index) shows that there is no long run as well as no short run relationship between these markets. Segmentation exists between the stock market and the real estate market, and so these two assets can be held in a portfolio for diversification purpose. Descriptive statistics prove it as desirable asset class for investment. It further proves that Direct real estate investment is sufficient to be defined as an asset class and does not require standardization through securitization in order to be investible. Findings are relevant for policymakers as well as for market traders. This study contributes to the alternative investment literature for emerging markets.

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Keywords: Direct Real Estate Investment, Cointegration, Granger causality, Securitization.

Introduction

Foreign Direct Investment (FDI), apart from being a significant engine of global growth, has become a major non-debt financial resource for India's economic progress. Global businesses invest in India to benefit from lower salaries, exclusive investment benefits such as tax waivers and so on. For a nation where foreign investment is made, it often means technological know-how and work creation.

The favorable policies and the robust business climate of the Indian Government have ensured that foreign capital continues to flow into the region. Over recent years the Government has taken many steps such as relaxation of FDI standards through fields such as security, refineries, telecoms, energy exchanges and stock exchanges among others. The variety and sophistication of the property market and its ties with economy and investment also demanded a closer analysis of its dynamics and movement (RBI, 2008, 2010). Posts have become explosive about the complexities with respect to the United States and the United Kingdom (McDonald, 2002; Barras, 2009; Brooks & Tsolacos, 2010). In the developing markets the character of the property sector has not been extensively studied (Ciarlone, 2015). Very few studies are conducted in Indian sense, e.g. Halbert and Rouanet (2014) and Newell and Kamineni (2007). Since the advantages of including real estate in a portfolio differ across countries (Hoesli,

Lekander, and Witkiewicz, 2004), the position of the property in the Indian sense must be understood.

The purpose of the present analysis is to examine the long-term and short-term relationship between the real estate and the stock market. The presence and segmentation of an association between the financial market and the real estate market. This thesis explores the interaction of the equity market with the real estate market using the co-integration examination suggested by Johansen (1988) and Johansen and Juselius (1990). In dismissing the null hypothesis that no co-integration takes place, it assumes that these two economies will maintain a long-term equilibrium and suggests that the financial market is merged into the real estate market. It may also be inferred that the fund portfolio replaces these two investments well. Conversely, if the null hypothesis of no cointegration is acknowledged, there is a dividing line between the investment market and the real property market, which may be kept in a fund for diversification. Toda and Yamamoto (1995) Granger causality in the erogeneity of the VAR block is used to diagnosis long-term equilibrium.

We are looking at a massive amount of US$ 90 billion. This is what Merrill Lynch anticipates the growth of the Indian real estate market by 2015. Because industry is excited about this number, RBI has expressed its concern. It is justified that the portfolio inflows could affirm the FDI standards in the market. In analysts'

opinion, rather than curbing portfolio inflows, the central bank should examine FDI criteria.

Like they say, you will have two ends, no matter how small you slice. An increasing market has its own responsibility generating infrastructure and real estate demands. When we glance at the following figures, the relevance of real estate also increases:

1) It is India's second largest employer (including construction and facilities management)

2) It is related to about 250 auxiliary industries such as cement, brick and steel through reverse and forward linkages.

3) The multiplier benefit of a unit rise in spending in this field and the potential to produce revenue up to five times.

Therefore, numerous concessions and incentives have been provided to the sector to promote expansion. This will lead to changing the present allocation of housing and immovables to India's GDP at 1% against 3-6% for developed countries.

Money can be obtained by interest, equity or a combination of the two. Debt finance may be collected from outlets like banks, NBFC or foreign commercial borrowing (ECB). Participation of equity would require participation at the level of the business or at the project level. FDI is one way to fund the ventures of a business. Immobiliary FDI is allowed under some project requirements in building and project creation pertaining to both residential and industrial development in housing cities and commercial offices. Investing in India definitely is a strong choice, with rates of about 11.0% for offices that hit 20-25% in greenfield ventures. A research by ASSOCHAM in November 2006 reports that the share of property in FDI is rising to 26% by the end of 2007 from some 16% last year. Table 1 displays the spending rate in the first quarter of 2007.

Many investors are seeking to look west since listing on local markets (BSE/NSE) is challenging. The Goal with its simplified criteria was one of the easiest international shores where different players raised cash (Table 2). These funds are used in FDI (Foreign Direct Investment) compliant mega-projects spanning from suburban townships across the world.

There have recently been several flags and issues posed in this sense. As assets have soared, values and the strong concern of a real estate bubble. No clear methodology or guidelines on valuations have been developed, but the imperative fear of bulls hunting bears and shattering many dreams has been generated.

Some of the questions posed or fixed are –

1) In terms of pre-IPO placements, the Ministry of Finance noticed that the transaction can be listed as a foreign direct investment or FDI subject to a protracted duration of lockout, so that the uncertainty on these assets would be avoided if FIIs desired to invest in pre-IPO placement of real property firms.

2) SEBI issued guidelines on valuations which suggest that real estate valuations should be focused on their development plans, not on their land banks. There is also a plan for the registry of valuers with the SEBI.

This industry offers its participants great opportunities – be it developers, companies, FII's or institutional investors – with the introduction of Real Estate Mutual Funds (REMFs), corporate governance problems, tighter enforcement by players, sophisticated transactions and improved accountability. The Tier III towns, with less access obstacles in the form of affordable land rates and the availability of land banks, will also be a new place for the developers.

The aunch of Commercial Real Estate Assets under the type of REIT in India is a significant move towards securitizing the Indian immobiliary industry. It is therefore necessary to decide if direct real estate investment is adequate to be identified as an asset class, and does not involve standardization by means of securities to be invested. The statistical properties in the sample log return sequence (Brooks & Tsolacos, 2010) are used to assess if direct immovable property counts as an alternate asset class with respect to its risk-return characteristics.

It is essential to recognize such relationships for both investors and policymakers. It indicates future benefits of long-term diversification as buyers own direct real estate and stocks concurrently. Their total income, usage, aggregate demand and jobs could all be impacted. Local municipalities are seeking to

deliver effective tax and development policies in response to this possible chain reaction (Lin & Fuerst, 2014; Kiohos, Babalos, & Koulakiotis, 2017).

Literature Review

Many researches have analyzed the connection between stock and the real estate industry, but the findings which vary because of variations in sampling, data quality or economic conditions (Ambrose, Ancel, & Griffiths, 1992; Chaudhry, Myer, & Webb, 1999; Liow & Yang, 2005 and Lin & Fuerst, 2014).

The presence and segmentation of an association between the financial market and the real estate market. Geltner studies (1990); Wilson and Okunev (1996), Ling and Naranjo (1999), Quan and Titman (1999), and Lu, Chang and Wei (2007) demonstrate proof in support of two consumer segmentation. Knight, Lizieri, and Satchell (2005), Hoesli and Lizieri (2007) and Adcock, Hua and Huang (2016), on the other side show that there is a relationship of convergence within the two asset markets under investigation.

Baum (2009, p. 5) notes that The direct implication of property being different is its diversification potential, and hence the justification for holding it within a multi-asset portfolio." Direct property assets have proven to provide valuable advantages in terms of diversification of a portfolio comprising stocks (Hoesli et al., 2004 and MacKinnon & Al Zaman, 2009). However, relatively few research have explored the impact of direct real estate markets on alternate conventional capital markets.

International diversification has been found to be much more effective in the Asian real estate industry than in the European real estate sector (Bond, Karolyi & Sanders, 2003) and there are long-term prospects for diversification through investing in property in many Asian countries (Garvey, Santry & Stevenson, 2001) (2007).

The launch in India of Commercial Real Estate Properties in the form of REIT is a significant move towards securitising the Indian Immobilien Sector (Das & Thomas Jr, 2016). Pai and Geltner (2007) have demonstrated that less systematic risk indirect real estate continues to give better returns. The Swenson Model defines immaturity and non-

transparency as he desirable aspects of an asset class. According to Hoesli and Oikarinen (2012), Indirect Immobilien provides liquidity and clarity of knowledge, yet is strongly interrelated with a broader stock sector. In this scenario, it cannot function as a fund mix diversifier. It is therefore necessary to decide if direct immovable investment is appropriate to be described as an asset class and does not need standardization through securitization to be investible.

Data And Methodology

3.1. Research Objectives

To find out whether direct real estate investment in terms of their risk-return characteristics qualify as an alternative asset class.

To examine the relationship (long run as well as short run) between equities and real estate in India.

To test whether there is cointegration relationship between stock and real estate markets.

To examine whether a causality relationship exists between the stock and real estate markets.

To find the impact of FDI in real estate on employment, income inflation and interest rate and thus affordability of real estate (SEM)

3.2. Research Approach

The effects of an asset, which an individual would like to hear about before contemplating investment in securities, are stated in four stylised facts, i.e., return (average specimen), uncertainties (standard deviation), whether or not severe returns are over predicted value (positive skewness) and the relative likelihood of extreme returns (kurtosis). These statistical predictive properties of the survey log returns sequence are used to evaluate if direct real estate counts as an alternate asset class in terms of its risk-return characteristics.

ADF (Increased Dickey Fuller) test controls the stationarity of results. The methods used to analyze a long-term association between capital markets and immobilization markets is Johansen Cointegration. Although Granger causality was used for VAR block erogeneity for short-haul diagnosis for long-haul equilibrium relationships by Toda and Yamamoto (1995).

Minimum	-0.011797	-0.281496
Std. Dev.	0.021689	0.116715
Skewness	-0.224946	-0.220334
Kurtosis	2.489109	5.358695

3.3. Sources of information:

In India, the CPI(UNME) and CPI(IW) rental data were historically only the source of data on housing prices1. There are currently three separate methods for monitoring house prices, i.e. NHB's RESIDEX, Indian Reserve Bank Housing Price Index (HPI), and residential property prices index (RPPI). This analysis uses HPI details, as the coverage of registry data is more comprehensive than that obtained from the banks/HFCs (for RESIDEX and RPPI) since all domestic transactions are not supported by banks/HFCs.

The secondary details was obtained from inventory and real estate indexes (NSE 50 Index) (HPI). Quarterly statistics was obtained for both Q 1 2009-10 and Q3 2016-2017 indexes, and 31 data points are thus available. But from Q 9 2008-09 to Q 3, the HPI series is usable. 2016 – 17, although two base years results, viz. 2008-09 and 2010-11, are available. The time series developed with the Laspeyres formula as the base year for 2008-2009 would not agree with the time series built with the base year for 2010-2011. The current research then uses Splicing (Hill & Fox, 1997) to merge these two time sequences. Eviews are used for methodological purposes.

Results And Discussion

Continuously compounded returns (log returns) are used for study. Log returns of the NSE and HPI series are denoted respectively by LNRNSE/lnrnse and LNRHPI/lnrhpi. Initial delay four was used for model formulation as a quarterly data and data frequency may be used according to Brooks and Tsolacos (2010, p. 380) to assess delay.

Table 1 reveals that the mean the predicted return is higher for immovable return, the normal risk variance for real estate return is smaller, Kurtosis (relative likelihood).

Table 1: Descriptive statistics of log return series of real estate market and stock market

	LNRHPI	LNRNSE
Mean	0.037280	0.017662
Median	0.040711	0.022772
Maximum	0.077338	0.350972

Extreme returns occur) are poor for a desirable return on immovable assets, as investors favor returns similar to projected returns. For all asset groups, skewness is detrimental, which is unwanted. Beside skewing, other metrics are beneficial for immovables, which show that they are a suitable investment asset type. It demonstrates further that direct real estate investment is necessary to be described as an asset class, and that securitisation does not need standardization to be investmentable. This is compatible with the Swenson Paradigm, which defines immaturity and openness as the desirable characteristics of an asset class. Here the illiquidity premium and underlying inefficiency result in the desirability of direct real estate investment. The premium liquidity and the actual portion of immovables are adding to portfolio performance (Ang, Nabar, & Wald, 2013). Direct real estate investing provides liquidity and clarity of knowledge but is still closely connected to a larger financial markets (Hoesli & Oikarinen, 2012).

The ADF (Augmented Dickey Fuller) test mentioned in table 2 shall be used to study the root of variables before performing statistical studies. The findings reveal that the two variables are non-static at their respective stage and stationary at their first difference..

Table 2: Augmented Dickey-Fuller test statistic

	CNX NIFTY		RESIDEX	
	t-Statistic	Prob.*	t-Statistic	Prob.*
Unit root estimation at level	2.70533	0.0867	1.41763	0.5581
Unit root estimation at first difference I	4.45191	0.0018	5.24906	0.0002

Table 3: Result of Johansen Cointegration Test

Series: LNRHPI LNRNSE
Lags interval (in first differences): 1 to 4
Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None	0.274799	12.07211	15.49471	0.1535
At most 1	0.133251	3.718161	3.841466	0.0538

Trace test indicates no cointegration at the 0.05 level

denotes rejection of the hypothesis at the 0.05 level **MacKinnon-Haug-Michelis (1999) p-values
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None	0.274799	8.353950	14.26460	0.3439
At most 1	0.133251	3.718161	3.841466	0.0538

Max-eigenvalue test indicates no cointegration at the 0.05 level
denotes rejection of the hypothesis at the 0.05 level **MacKinnon-Haug-Michelis (1999) p-values
Again the long-term partnership was tested using Johansen Cointegration Technique. Table 3 shows the findings for the Johansen Cointegration Exam. The trace and max test is done to evaluate the maximum number of cointegrating vectors. Both the trace test likelihood value and the overall self-equivalence test are greater than the 5% statistical significance essential value, which indicates that there is no mixture of HPI and CNX NIFTY. Thus there is no long-term association between real estate and the equity market, which also confirms the diversifiers of both.
There are no long-term partnerships, so it is possible that the Toda Yamamoto Granger's Causality Test would test a short-term dynamic relationship.
Exogeneity of the VAR block. The result is reported in table 4.

Table 4: VAR Granger Causality/

Dependent variable: LNRHPI			
Excluded	Chi-sq	Df	Prob.
LNRNSE	4.033758	4	0.4015
All	4.033758	4	0.4015
Dependent variable: LNRNSE			
Excluded	Chi-sq	Df	Prob.
LNRHPI	4.420597	4	0.3521
All	4.420597	4	0.3521

As the p value is more than 5%, it is concluded that there is no causal relationship between Real Estate Market and Stock Market.

Data Analysis Using SPSS

4.1 Introduction
This chapter presents the results of data analysis of the collected data from the field. Data for the study was exclusively gathered from secondary sources and the analysis was done with the aid of Statistical Package for Social Sciences (SPSS). The findings were presented using Figures, Tables, Means and standard deviations.

4.2 Data analysis and presentation
The gathered data covered the period 2005-2015. Secondary data was presented in excel spreadsheet and analyzed with the aid of SPSS version 2.0.

4.3 Descriptive Statistics
The study sought to investigate the effect of Foreign Direct investment on the performance of the real estate sector in India. The findings were presented with the help of standard deviation and means.

Table 4.1: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Performance of the real estate sector	44	.00	9.40	2.5068	2.02558
FDI	44	4.46	9.60	6.5412	1.09947
Inflation rates	44	3.33	29.13	10.5495	6.79438
Interest Rates	44	12.22	20.21	15.2643	2.08404

From Table 4.1, the maximum value of performance of real estate sector in India was 9.40% while the minimum value was 0.00% with a mean of 2.5068% and standard deviation of 2.02558%. The findings indicated that real estate sector in India is still growing. Foreign direct investment on the other hand had a minimum value of 4.46% while the maximum was 9.6% with a mean of 6.5412% and standard deviation of 1.09947%. The inflation rate had a minimum value of 3.33%, a maximum value of 29.13% with a mean of 10.5495% and standard deviation of 6.7943%. The interest rate on the other hand had a minimum value of 12.22% with a maximum

value of 20.21% while the mean was 15.2643%and standard deviation was 2.084%.

4.4 Trend Analysis

The study adopted trend analysis so as to analyze the trend of real estate performance, Foreign Direct investment, inflation and interest rate in the period 2005 to 2015. The findings are summarized in subsequent sections.

4.4.1 Foreign Direct Investment FDI

The study sought to determine the trend of foreign direct investment expressed as a percentage of GDP in India over the period of study. The findings are summarized byfigure.4.1
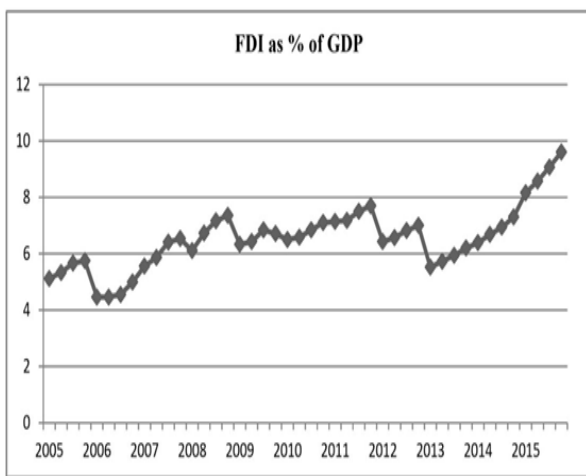

Figure 4.1: Foreign Direct Investment FDI

The findings from Figure 4.1 indicate the trend in the growth in Foreign Direct investment. The findings indicate that Foreign Direct investment growth has generally been fluctuating over the period under consideration. The year 2006 had the least value of Foreign Direct investment as determined by % of GDP of 4.995%. This was followed by a sharp consistent increase in value of Foreign Direct investment reaching a peak in 2007.Between 2010 and 2012 and between 2013 and 2015 there was a consistent growth in FDI stock with FDI stock reporting the highest value in 2015.

4.4.2 Interest Rate

The study further sought to determine the behavior of interest rate during the period of study. The findings were presented in Figure 4.2
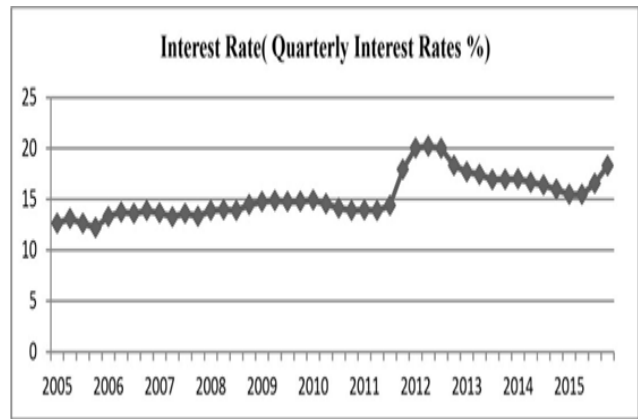

Figure 4.2: Interest Rate

From Figure 4.2, the interest rate has been increasing from 2005 reporting a slight dip during the last quarters of 2005 and 2007. Between 2010 and 2012 and between 2013 and 2015 there was a pronounced decrease in interest rate presenting a suitable environment for borrowing. The decrease can partly be explained by the introduction of Credit reference bureau in 2010 that enhanced credit sharing mechanisms and therefore reducing the cost of credit represented by interest rates. The highest increase in interest occurred between 2011 and 2012.

4.4.3 Inflation Rate

The study sought to investigate the change in inflation rate during the period under study in India. The findings of trend analysis were presented in Figure 4.3

Figure 4.3: Inflation Rate
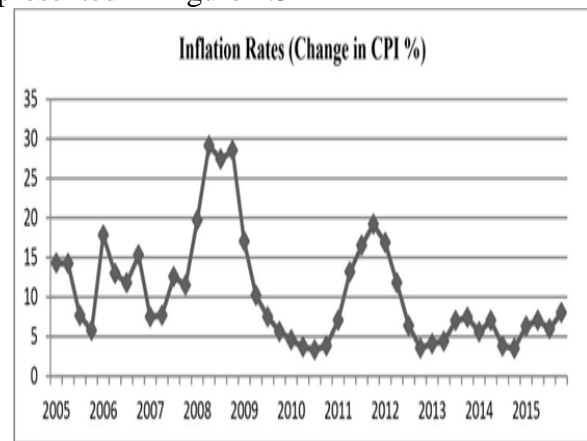
From figure 4.3 Inflation rates have been fluctuating within the period under review. However, between 2009 and 2011 and between 2012 and 2013 a pronounced dip in inflation rates was witnessed. These were conducive operating environment for businesses. The year 2008 and 2011 on the other hand witnessed the highest rise in inflation rates with 2008 reporting a rise from 19.70% in quarter one to

28.50% in quarter four and 2011 reporting a rise from 7.05% in quarter one to 19.19% in quarter four. This could partly be explained by the effect of the post-election violence that was witnessed in India after the 2007 disputed elections and uncertainties in relation to 2012 elections outcome.

4.4.4 Performance of Real Estate Sector
Finally, the study sought to establish the trend in the performance of real estate sector in India as measured by growth in real estate investment. The findings of the trend analysis were generalized in Figure 4.4.

Figure 4.4: Performance of Real Estate Sector

According to figure 4.4, the efficiency of the property fluctuated from 2005 until 2015. The fastest increase was recorded between the 2005 three and 2006 three thirds, the 2006 three and the 2007 one the 2007 two and the 2007 fourth and quarters, the 2010 two, and the 2010 two and the 2009 fourth quarters, the 2013 three and 2014 one the 2014 two and 2014 fourth quarters, and the 2015 one and fourth quarters. The largest drop in output has been recorded between 2007 quarters 4 and 2009 quarters 3,2010 quarters 1 and 2010 quart 3 and 4,2011 quarters 1 and 2013 quarters 3,2012 quarters 1 and 2013 quarters 1 and 2013 quarters 3 and 2014 quarter 4 and 2015 quarter 1. The decrease in immovable sector results between the first and fourth quarters of 2008 and between the third and fourth quarters of 2012 can be due to the violence and uncertainty of the 2012 elections of 2008. The immovable industry's output was the strongest in the fourth quarter of 2014, and its lowest in the third quarter of 2013.

4.5 Regression Analysis
The dependent variable performance in real estate sector was examined against three variables namely Foreign Direct investment, inflation and interest rates. The analysis was carried out at 5% confidence level. The significance of the three variables in the model was examined by comparing the probability value obtained against the confidence level of 0.05. The variables were considered significant if the probability value was less than confidence level. Additionally, F-table value was compared with the F-value of regression analysis. Variables were considered to be significantly associated with any change on the dependent variable if the F-table value was less than the regression analysis value.

4.5.1 Model summary
To ascertain the level of performance in real estate sector that is attributable to Foreign Direct investment, inflation and interest rate, coefficient of determination arising from regression as depicted by table 4.2 was used. Coefficient of determination presents the degree by which changes in dependent variable can be explained by change in the independent variables under study.

The findings of multiple regression analysis conducted to ascertain relationship between Foreign Direct Investment and Performance of real estate sector in India was summarized in subsequent Tables.

Table 4.2: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.70[a]	.49	.45	0.04791

From Table 4.2, the value of R is 0.70, R square is 0.49 and adjusted R square is 0.45. These findings indicated that the three variables contributed to 49% change in the performance of real estate sector in India. Further, a strong relationship between the variables was revealed by the coefficient of determination (R) of 0.70.

4.5.2 Regression coefficient
Analysis results resulted into a model coefficient and statistics depicted in the table 4.4 below

Table 4.3: Regression Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.379	2.754		.501	.619
FDI	.427	.305	.232	1.400	.169
inflation rates	-.014	.047	-.048	-.306	.761
Interest Rates	-.099	.164	-.102	-.604	.549

The results of the regression analysis presented the below equation to explain the relationship between performance of real estate sector and Foreign direct investment, inflation, interest:

$$Y = 1.379 + 0.437X1 - 0.014X2 - 0.099X3 + \varepsilon$$

Y is an Equity Supply Sector Output X1 X2 X3 is respectively the foreign direct investment, interest rate and inflation rate whereas ε is an error word. The above model will reflect 1,379 real estate results if all other variables remain unchanged. The improvement in the output of the real estate market, as a function of the adjustments in any independent variable is equal to the coefficient of each independent change, implying that the rise in unit performance by FDI, keeping other variables unchanged, will increase the performance of the real estate by 0.437. The positive value of the investment coefficients for Foreign Direct indicates a clear positive correlation between the real estate results and foreign direct investment. Both p values were higher than 0.05, suggesting that the three variables were not statistically important. These results are compatible with Moronge's findings & Loyford (2014) concluding that the efficiency of the real estate business declines whether there is a shift in acquisition prices, interest rates or the unit of inflation in their analysis of economic indicators such as the housing market, interest rate, transaction costs, inflation and the performance of the real estate sector.

4.5.3 Test of Regression Model Significance

Analysis of variance was undertaken to test the significance of the model.Table 4.4: ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	86.71	3	28.90	6.89	.004[b]
Residual	167.757	40	4.194		
Total	176.428	43			

The findings of the ANOVA revealed a probability value of 0.004 making it a significant model in predicting the relationship between the variables under study as it was less than the confidence level of 0.05. This was further echoed by F-test statistic calculated value of 6.89 which was more than the F-critical (from table) value of 2.32. Since F calculated was greater than F critical (6.89>2.32), this was a clear indication that the overall multiple regression model was statistically significant.

Conclusion

This paper seeks to decide the position of immovable in a multi-asset portfolio and the need to securitize them for investment in the Indian context. Direct real estate investment is sufficient to be classified as an asset type, and does not need securitisation standardization to be investable. This is in keeping with the endowment model (Swenson, 2000). In this respect, the desirability of direct investment in immovables derives from its premium liquidity and intrinsic inefficiency. The premium for illiquidity and the actual portion of immovables as a contributor to portfolio performance (Ang et al., 2013). The launch of REITs in India, however, opens the way for more comparative analysis between Direct and Indirect Immobilien Investment.

The analytical results show that there is no short and long-term association between the investment market and the real estate market. There is segmentation between the equity market and the immovable market and all of these securities should be retained for diversification in a fund. The explanation for this segmentation is that the systemic danger of the immovable economy is regulated by rules that vary from equity markets. It gives a real advantage of diversification by serving as an inflation shield.

The results are relevant both for policy makers and for market traders. It is essential to recognize such relationships for both investors and policymakers. It reveals that there are future benefits from long-term diversification if buyers own direct property and inventories at the same time. Their total income, usage, aggregate demand and jobs could all be impacted. Local municipalities are trying to

propose effective tax and development policies in response to such an imminent chain reaction. While investigating relationships is vital, it remains important to find the underlying forces that drive. Further study should also be carried out in this area.

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MOBILITY PREDICTION BY STATIC NEURAL NETWORKS IN AD-HOC NETWORK

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ABSTRACT

The major challenging issue of ad hoc network is to know in advance random node mobility time series patterns which response positive or negative on network performance. Having an accurate mobility prediction provides a very positive impact on various challenges and issues such as limited bandwidth, dynamic topology, routing overhead. In this paper, we used static neural networks to predict node trajectory time series by selecting optimal model complexity. MLP and RBF neural networks are used to solve this problem and their results are compared and analyzed. Using trial and error method we search optimal model complexity based on MSE, in MLP model lowest error scored at 18 hidden units by tansig transfer function and Bayesian Regularization learning algorithm and in RBF model the optimal model error at spread 1.0. The prediction results reveal that MLP model is better prediction accuracy then RBF in terms of MSE, RMSE and MAE prediction metrics.

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Keywords: Ad-Hoc Network, Mobility Prediction, MLP, RBF

Introduction

Ad-Hoc networks are popular network technology deploy in several real-life application due to its flexible and adaptable characteristics. This network can establish quickly at anywhere any time with in the range cover area without depending on existing infrastructure network. As the network communication medium is wireless network can set be up at/ any remote area. Each nodes are portable, small in size, limited processing power and battery operated, so the network are constrain in bandwidth as well as battery. Nodes are self-autonomy can joint and leave the network at any point or any time, network has dynamic topology and multi-hop topology changes frequently. As nodes are self-autonomy each nodes of the network are able to work as router as well as host, there are no central controller of the network, the network control and management by distributed among the nodes. Routing are multi-hop used one or more intermediate node to send data, if source and destination nodes are out of range. Thus taking advantages of ad hoc network the trends to deploy in real life such as in disaster rescue operation, army battle field, hospital, smart vehicular, robotics, smart home etc. [7] [8]. In contrast with the advantages, ad hoc network has major issue and challenges is continuous node movement or node mobility which impact on reliable routing, continuity connectivity and

to make available network resources. Mobility prediction of next position before leaving one position to next network can enhance with more reliable network performance. However, there are several prediction techniques linear and non-linear, as node positions (coordinates) are changes varying time, thus the node positions are non-linear a kind of time series positions. The emergent trends of time series prediction technique are Artificial Neural network (ANN) and suitable for non-linear prediction. Several researchers apply ANN for mobility prediction in ad hoc network some related works are as follow. In [1] used three layers RNN with back propagation through time (BPTT) learning algorithm to predict node location time series. Test the predictor model according Random Way Point (RWM) mobility model data patterns. In [2] proposed Adaptive Neuro-Fuzzy Inference System (ANFIS) predictor model to predict node location trajectory. RWM mobility data patterns are used to examine the prediction accuracy and compared with two model name as RNN and ELM, the ANFIS outperform then these two models. In [3] exploited three layer feedforward neural networks to predict future coordinates using previous and present point node speeds and coordinates making data patterns in batch size. To examine the performance of predictor RWM mobility data patterns are used and the results shown the proposed model suited for location prediction.

In [4] used Multilayer perceptron (MLP) and Extreme learning machine (ELM) to predict the node location in MANET and compared between the predictor model using several synthetic and real-world data patterns, the results shown that ELM has outperformed then MLP. In [5] proposed deep learning by adding more layers in hidden layer to predict node mobility using RSS data patterns. RWM location data patterns were used to test perform prediction accuracy. In [6] proposed Long-Short Term Memory (LSTM) and Encoder-Decoder LSTM to predict single user single step and multi user multi steps user location. The user location data patterns are used Geo-life project location trajectory. In literature survey shown that ANN is suitable to predict future node position. However, maximum researchers where used RWM position data patterns which is less realistic then Gauss Markov model and static neural networks like MLP and Radial Basis function(RBF) still popular in the application approximation, classification and time series prediction, in this paper we used MLP and RBF neural network to predict future node position in ad hoc networks. The rest of this paper is organized as follows. Section II presents the problem formulation of mobile node positions. Section III introduces the architecture of MLP and RBF. Section IV we give the experimental results and discussion. Finally some concluding remarks are presented in Section V.

Problem Formulations

Eligibility of node mobility in ad hoc network is the great extension of easy installation of network as well as major challenges in ad hoc network to adapt node mobility in network. So an accurate mobility prediction will help to reduce challenges, the mobility prediction in ad hoc network means to compute the future geographical coordinates of the mobile node which is varying on time, thus the main focus is to predict node coordinates which is recorded in a fix interval of time between two adjacent position and it is known as node position trajectory or time series node positions.

Assume that the trajectory $T = (P_1 \ P_2 \ . \ . \ . \ . \ .)$, where T is node position trajectory and $P_t = (X_t, Y_t)(t = 1, 2, \ . \ . \ . \ .)$

is geographical coordinate of mobile node at time t. Let previous and present trajectory node position are known as $P_n = (P_1 \ P_2 \ . \ . \ . \ P_n)$ of length n, our main target is to compute the next k steps node position points [6]. The problem can be represented as

$$\hat{P}_k = (P_{n+1} \ P_{n+2} \ P_{n+k-1} \ . \ . \ . \ P_k), \text{ where}$$
$$P = (X_n, Y_n)(n = 1, 2, \ . \ . \ . \ k) \qquad (1)$$

Static Neural Network

Artificial neural networks basically two types based on connection and memory holding capabilities such as static and dynamic neural network. Static neural network is a feedforward connection network which can pass network parameters forward direction only. In contrast with static network dynamic network has tapped delay line and feedback connection which is able to hold previous signal, in this study we focus on two types of static feed forward neural network namely Multilayer Perceptron (MLP) and Radial Basis Function (RBF) to predict mobile node positions in ad hoc network.

A. Multilayer Perceptron (MLP)

Multilayer perceptron is a static feedforward neural network which is consists of three layer name as input, hidden and output layers as shown in figure 1, the signal propagated forward through layer by layer from input layer to output layer trough hidden layer and received desired output [9].
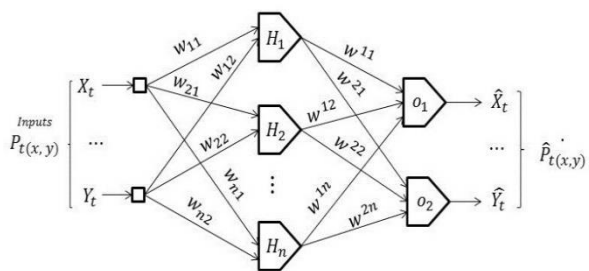

Figure: 1 Multilayer perceptron (MLP)

Input layer received the node trajectory position patterns as input and feed to the first hidden layer. The input patterns are GPS traces X and Y coordinates, with varying time positions coordinates are changes and recorded with a fix interval of time and provide as node position trajectory.

Assume that $T = (P_1, P_2, \ . \ . \ . \ .)$, T is the node position trajectory, where $P_t = (X_t, Y_t)$ is the position coordinates at time t. So the

input series to the network is (X_1, Y_1), (X_2, Y_2) . . . . of position P_t coordinates.

The hidden layer placed between input and output layer and it is not accessible by outside world, in this layer neurons are extracted the important features from the node position trajectory as per learning method and forward to next layer. Let the jth and ith are input and hidden neurons , then the input node position to the network are multiply by jth input with ith hidden neurons weight and summed the inputs to get net input to the ith hidden neurons as
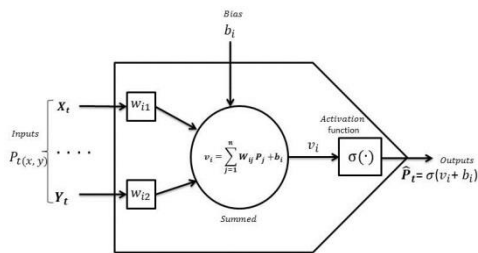
$$u_i = \sum_{j=1}^{n} W_{ij} P_j \qquad (2)$$

Figure: 2 artificial neuron models

Where W_{ij} is the synaptic weight, n is number of neurons, P_j is net input and b_i bias respectively. The net input to the hidden neurons is transfer using non-linear transfer function. The output of the hidden neurons is multiply by connection weight parameters W_{ij} and summed of over the hidden neurons to get output of ith neuron (illustrated in figure 2)

$$v_i = \sigma(u_i + b_i) \qquad (3)$$

Where σ is a transfer function, generally the transfer function is used log sigmoid function (equation 4) and tan sigmoid function (equation 5)

$$\sigma(v_i) = \frac{1}{1+e^{-v_i}} \qquad (4)$$

$$\sigma(v_i) = \frac{e^{v_i} - e^{-v_i}}{e^{v_i} + e^{-v_i}} \qquad (5)$$

Output layer neurons compute the desired output extracted features received from the hidden layer

$$\hat{P}_t = \sigma(v_i + b_i) \qquad (6)$$

Learning algorithm: MLP neural network uses backpropagation training algorithm, the entire learning process is in two phases forward and backward.

Forward phase, the input signal in this phase propagates layer by layer through the network and computed of an error as $E_t = O_t - \hat{P}_t$ (7)

where n O_t target response and $\hat{P}_t$ network output of input P_t

Backward phase, the error signal in this phase propagates by network backward from the output and reduced error by adjusting weight parameters.

B.   Radial basis function(RBF)

Radial basis function is very simple static feed forward neural network which is suitable for approximation, classification and time series prediction [9] [11]. RBF usually constituted with three layers input, hidden radial basis and output layer as shown in figure 3
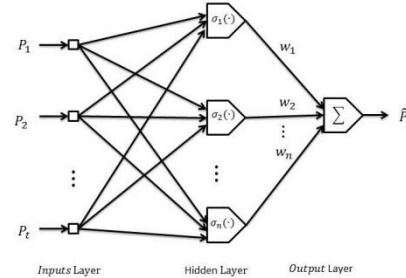

Figure: 3 Radial Basis Function (RBF)

Input layer is the sources of input patterns which supply input to the network and it has t dimensional input vector of P_t.

Hidden layer units constituted with radial basis function which provides freely basis for input, used non-linear transformation from input space to hidden space. The number of neurons in this layer are same with number of input samples i.e. n. Each unit of radial basis function in neuron can represented as

$$\sigma_i(P_t) = (\|P_t - c_i\|), \quad i = 1,2 \ldots \ldots, n \qquad (8)$$

Where c_i defines the center of the radial basis function in ith input data point and P_t is the input vector supply to the input layer. In contrast with MLP the connection between inputs layers to the hidden layer is direct connection with no weights.

Output layer consist only single unit to compute output but no bar for output, summed all weight parameters and output network. The output of the network presented in equation 9

$$\hat{P}_t = \sum_i^n \sigma_i w_i \qquad (9)$$

Where σ_i is radial basis of unit neuron and w_i is weight of ith center. Among the several types of radial transfer function we focus on Gaussian function to predict formulated problem. Each unit of hidden layer computed by Gaussian transfer function and it is define by

$$\sigma_i(P_t) = e^{-\frac{1}{2r_i^2}\|P_t - c_i\|^2} \qquad (10)$$

Where r_i is measure width or radius of ith Gaussian function with center c_i

Experimental Results And Discussion

In this paper for both predictor models we used synthetic data patterns based on Gauss Markov mobility model, the node position trajectory of X and Y coordinates series are generated by using BonnMotion tools [10]. Series of coordinates position(X, Y) recorded every 2.5 second varying nodes speed 0 to 20 second apply in 1000m X 1000m area for 4000 second. 300 positions data patterns are selected and normalized for experimental work to test predictor performance [12]. Out of 300 positions 210 (70%) positions is used for training rest of 90 (30%) position are used for testing.

A.   Results based on MLP predictor

To find optimal model complexity trial and error method are used and search optimal network parameters based on MSE. The network parameters such as hidden neurons ranging from 2 to 20, two transfers function i.e. log sigmoid and tan sigmoid and three training algorithm available in Matlab namely as Levenberg-Marquardt, Bayesian Regularization and Scale Conjugate Gradient are used for trial and error [12]. The chart presented optimal scored of trial and error results in figure 4(a), (b) and the based on trial and error the optimal model architecture of MLP is given below in table 1
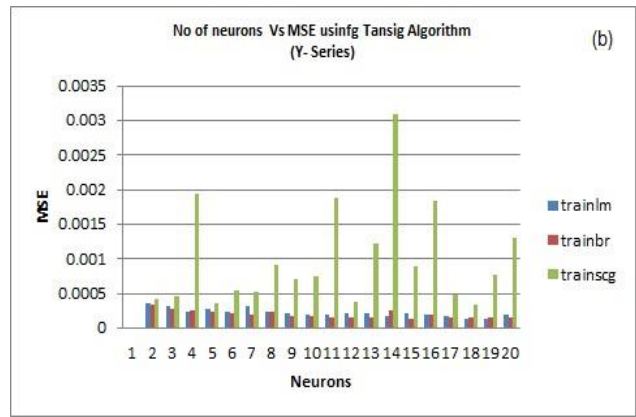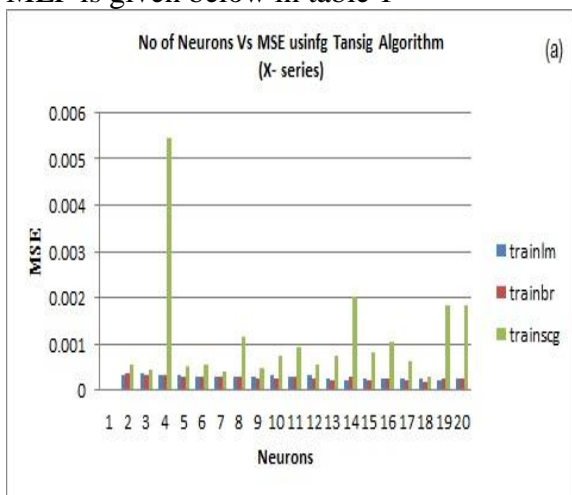

Figure: 4(a),(b) chart of optimal network parameters (trial & error) in MLP model (a) for X series, (b) for Y series

Table: 1 optimal MLP model

Network parameters	Optimal value
Number of hidden neurons	18
Training Algorithm	Bayesian Regularization
Transfer function	Tan sigmoid

B.   Results based on RBF predictor

In contrast with MLP the RBF is very simple network according to architecture, the only optimal parameters search by trial and error is spread and it is achieved (x = 0.0002110, y = 0.0003978) in 1.0 spread presented in a chart in figure 5
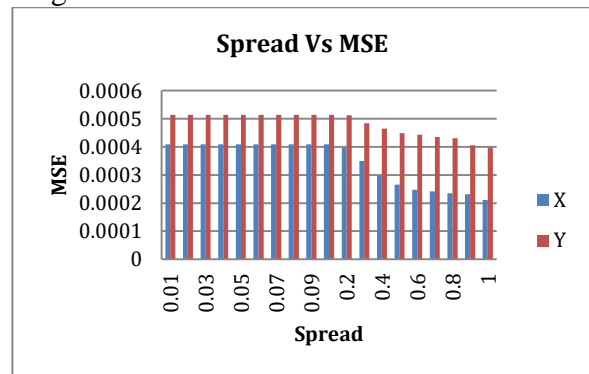
Figure: 5 chart of optimal spread (trial & error) in RBF model

Using optimal model complexity we developed MLP and RBF based predictor model to predict future node position coordinates in ad hoc networks and compared the prediction accuracy based on MSE, RMSE and MAE presented in equation 11, 12, and 13.

$$MSE = \frac{1}{n} \times \sum_{t=1}^{n}(P_t - \hat{P}_t)^2 \qquad (11)$$

$$RMSE = \sqrt{\frac{1}{n} \times \sum_{t=1}^{n}(P_t - \hat{P}_t)^2}$$

(12)   And

$$MAE = \frac{1}{n}\sum_{t=1}^{n}\left|P_t - \hat{P}_t\right|$$
(13)

Where P_t and $\hat{P}_t$ are observed and predicted position respectively. n is length of sample size. The result reveals that the MLP based predictor model better accuracy than RBF predictor model, the comparative analyses between MLP and RBF models based on prediction accuracy and the prediction plot are presents in table 2 and in figure 6(a), (b) respectively.

Table: 2 comparative analyses between MLP and RBF models based on prediction accuracy

Error Metrics	ANN Model			
	MLP		RBF	
	Training (x, y)	Testing (x, y)	Training (x, y)	Testing (x, y)
MSE	0.000199, 0.000146	0.003813, 0.005394	0.000211, 0.000398	0.0633620, 0.0523772
RMSE	0.014112, 0.012101	0.061752, 0.073447	0.0145 28, 0.0199 46	0.2517181, 0.2288607
MAE	0.008435, 0.008032	0.042015, 0.055775	0.000210, 0.015347	0.1293535, 0.1166266

MLP based Mobility Prediction
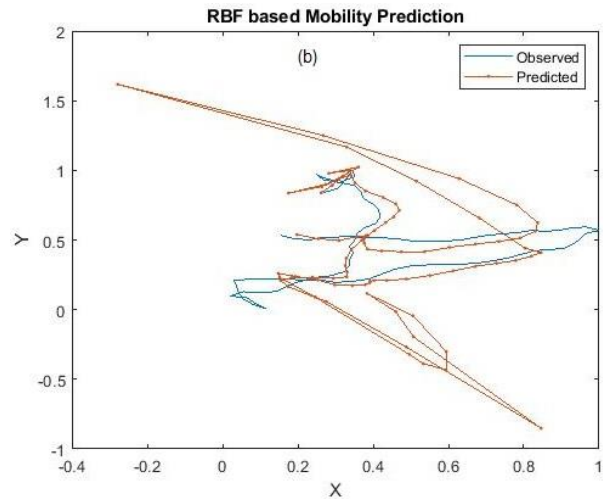

RBF based Mobility Prediction
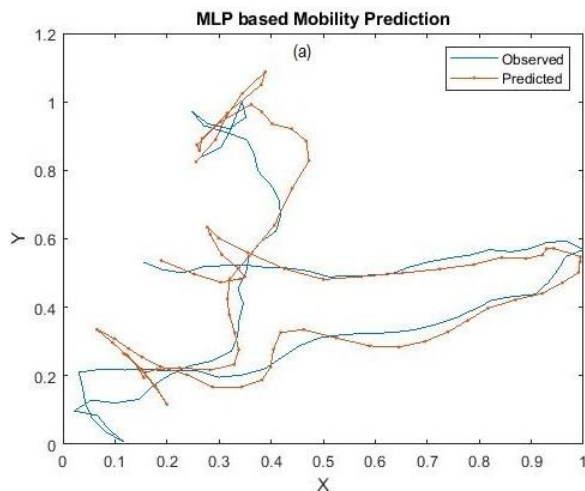
Figure: 6(a), (b) prediction plot between observed and predicted

Data patterns, (a) MLP based model and (b) RBF based model

Conclusion

In this paper we focus modeling a predictor model to predict node position in ad hoc network with optimal model complexity in order to obtain better prediction results. First we explored two static neural networks MLP and RBF to find out optimal network parameters and implement for mobility prediction using optimal parameters. To examine the network prediction accuracy we consider Gauss Markov mobility model data patterns, the results reveal that the MLP based predictor model provide better prediction accuracy then RBF model and suitable to predict position trajectory..

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COMPARISON OF TRANSFORMERLESS INVERTERS FOR PHOTOVOLTAIC APPLICATIONS

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ABSTRACT

Renewable energy systems are being used increasingly in the power sector in the last few years. Solar power can be harnessed through Photovoltaic (PV) systems using Single Phase Transformerless Inverters. Conventional inverters with trans- formers possess a variety of demerits, namely reduced power distribution, large size of the inverter due to a bulky transformer, large footprint, more losses and a higher overall cost. Alternatively, transformerless inverters are: low weight, cost effective, low volume and high efficiency. These inverters utilize electronic switching instead of mechanical switching, therefore minimizing the heat and humidity produced in the inverter. Comparison and evaluation of various transformerless topologies on the basis of efficiency, total harmonic distortion, semiconductor losses etc for photovoltaic applications were performed using MATLAB Simulink Software

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Keywords: comparison, efficiency, inverter, photovoltaic, transformerless

Introduction

In order to reduce dependence on fossil fuels, research in fields regarding the usage of renewable resources has increased abundantly [3]. Solar energy is one of the most predominant form of renewable energy. It generates power using irradiation and angle of sunlight on photovoltaic (PV) cells. PV cells are clean, with low cost of operation. In PV systems, a transformer can be utilized to provide isolation and voltage transformation. It is also used to alternate the output voltage on the basis of grid frequency. Conventionally used iron and copper based transformers are heavy, expensive and reduce the overall efficiency and power density of the system. However, the transformer is an integral part of the PV grid as the lack of transformers leads to drawbacks such as leakage currents between the solar panel and earth. These leakage currents pose a risk for humans who may come in contact with the panel and they accelerate the aging of these cells. Inverters for PV grids must satisfy the standards such as efficiency over 90%, lower switching stress, lower total harmonic distortion (THD) below 5%, and lower leakage current. Various transformerless inverters

have been recently designed to remove the problem of leakage current using different methods like decoupling the DC from AC side and also clamping of the Common Mode (CM)

voltage at the time of freewheeling, or use of common ground configurations [4]. Transformerless (TL) inverters employ computer facilitated process and electronic components to convert DC into AC of high frequency and then to DC, and finally to AC of standard-frequency level. For smaller power systems of only a few kilowatts, transformerless inverter topologies are used. The output is connected directly to the local household grid (230 V). These single-phase topologies are based on the commonly used full bridge or half-bridge inverter topologies.

This paper aims to present a clear comparison of various transformerless inverter topologies through software simula- tions and further comprehensive analysis. The various param- eters up for comparison are efficiency, THD, voltage stress and number of switches. The values have been tabulated and graphs have been plotted to aid in comparison of the topologies.

Types of inverter topologies:

A. Full Bridge

Full Bridge is a commonly used inverter topology for producing single phase AC voltage. The circuit comprises of 2 basic half bridge circuits to provide twice the output of a half bridge circuit.

The full bridge inverter circuit can operate in both bipolar and unipolar modulation. In the unipolar modulation, both the arms are

switched with higher frequency with sinusoidal waveform as output. The implementation of the unipolar mode is much simpler and is more feasible, however it also has high common mode voltage (CMV) and this leads to high leakage currents. Whereas, in the bipolar modulation, the opposite arms are switched on simultaneously (i.e) switches S1 and S3

are closed in the positive half cycle and the switches S2 and S4 are closed in the negative half cycle [10]. The main advantage of the bipolar modulation is that it has constant CMV which also reduces the leakage currents. However, this method also induces large ripple currents which reduces the power quality and also its efficiency [10]. Nowadays, the features of the bipolar modulation (constant CMV) and unipolar modulation are combined to get an improved output. The full bridge circuit   is shown in Fig.1
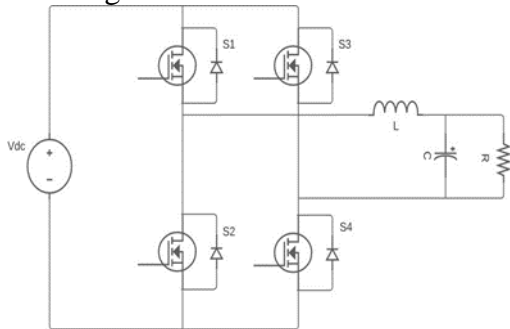

Fig. 1. Full Bridge Inverter Circuit

C. Heric

HERIC topology includes a DC link capacitor, a filter ca- pacitor and two inductors as filters at the grid side. The circuit is illustrated below in Fig.3. It has 2 extra switches to isolate the panel from the grid and eliminate reactive power exchange between the filtering inductors and capacitors. HERIC stands for Highly Efficient and Reliable Inverter Concept. It consists of an H-Bridge inverter with a bypass AC leg parallel to the output filter. It has the advantage of both bipolar and unipolar modulations of H-Bridge inverter.

Similar to the unipolar mode, there is a three-level output voltage across the filter. Whereas, the CMV is constant in the bipolar mode which causes very low ground leakage current and electromagnetic interference. The switches S1, S2, S3, S4 operate in the switching frequency while the switches S5 and S6 operate at the grid frequency. The switches that control the grid frequency are switched on in the positive

and negative half cycle respectively. The switches S1 and S4 are switched on with switch S6 so that it generates a positive voltage [9].

B. Half Bridge

A half bridge inverter, as seen in Fig.2, provides the result as half of the input voltage in AC. It is the simplest of all the circuits, in terms of number of switches. Half bridge inverter utilizes two diodes and two switches which are connected in anti-parallel. The two switches are complementary meaning that when the first switch is closed, the second switch opens. Similarly, when the second switch is closed, the first switch   opens. In Case 1, switch S1 is closed from a time period of 0 to T / 2, the diodes D1 and D2 are in reverse bias condition and S2 switch is opened and output voltage is V0 = Vs / 2 .

D. H5
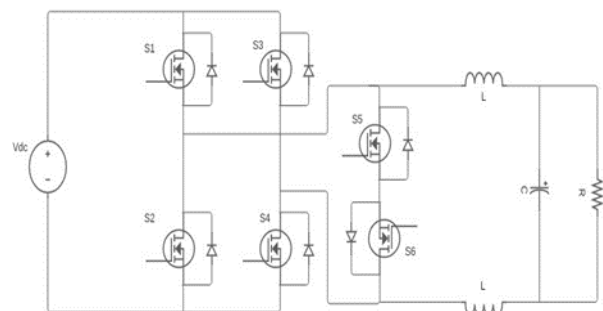
Fig. 3. Heric Inverter Circuit

In Case 2, switch S2 is closed from a time period of T / 2 to T, the diodes D1 and D2 are in reverse bias condition and switch S1 is opened and output voltage is V0= -Vs / 2.
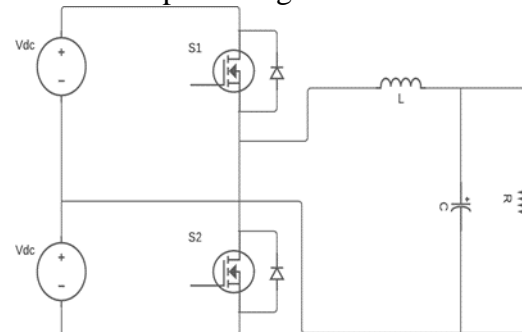
Fig. 2. Half Bridge Inverter Circuit

H5, as seen in Fig.4, is a classic H-Bridge circuit with an additional fifth switch in the positive bus of the dc-link and provides two important functions. Firstly, it prevents the exchange of reactive power between the inductor of the LCL-filter and capacitor CPV during the zero voltage state, thereby increasing efficiency.

It is similar to an H-Bridge but has an extra switch on the dc-link and also serves two important features. It helps prevent the reactive power exchange between the LCL-filter and capacitor CPV during the zero voltage state which eventually results in increase in efficiency. Another advantage of the inverter is that it helps to isolate the PV module and the grid during the zero voltage state thus preventing the leakage current. The switches S1 and S3 are switched at grid frequency and the switches S4 and S5 are switched on at high frequency [9]. Some of the disadvantages of the H5 inverter is that it possesses one additional switch and the three switches conducting during the time of active vector leads to higher conduction losses. However, this loss does not affect the total efficiency of the system.

Fig. 4. H5 Inverter Circuit

E. Flying Capacitor

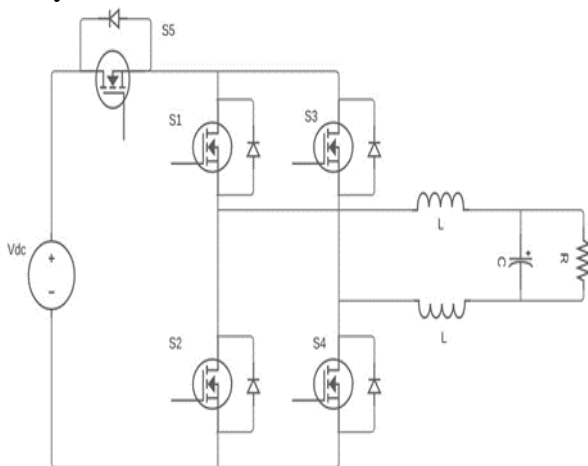The flying capacitor is a multi-level inverter having a lower number of switches and gate drivers. It contains a voltage balancing property, increased DC source surges, twice the output voltage levels and better frequency range. All the components in this topology have the same voltage stress as the dc-link voltage.

In the flying capacitor circuit shown in Fig.5, the charging and discharging of the capacitor takes place in two different cycles. In the first position, the capacitor charges up to the input supply voltage. In the second position, a negative voltage which is equal in magnitude to that of the supply voltage appears on the output side. This process is repeated at an higher frequency so that the voltage across the load is constant. Each of the switches S1, S2,

S3, S4 consist of a power semiconductor switch and an antiparallel diode. Switches S1 and S4 are complementary with each other, similarly switches S2 and S3 are complementary with each other [8]. The capacitors consist of a DC-link whose voltage is required to be regulated externally.
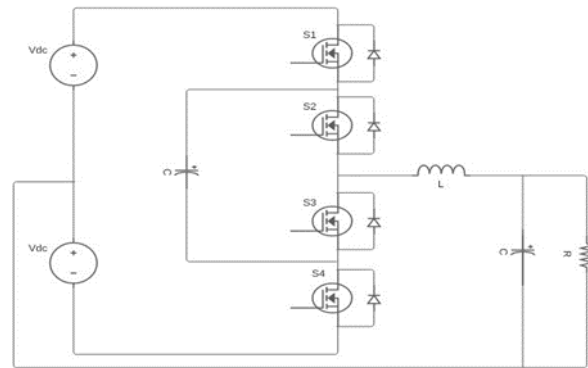
Fig. 5. Flying Capacitor Inverter Circuit

Comparison Criteria

The factors chosen for comparison of various inverter topologies are efficiency, total harmonic distortion, voltage stress and number of switches

A. Efficiency

Inverter efficiency is the ratio of the AC output power that is usable to the sum of the DC input power and AC input power. Efficiency changes in accordance with AC output power, DC voltage, and even inverter temperature. High quality sine wave inverters are in general rated at 90-95% efficiency. Lower quality modified sine wave inverters are not as efficient with rating at 75-85%. High frequency inverters are usually more efficient than low-frequency. Inverter efficiency depends on inverter load.

B. Total Harmonic Distortion

The total harmonic distortion is a measure of the harmonic distortions present in a signal and is defined as the ratio of the sum of the powers of all harmonic components to the power of the fundamental frequency. The limits on voltage harmonics are therefore set at 5% for THD. There are various problem due to the increased THD in the inverter output voltage or current are: Increased losses, reduced life of the equipment, increased electromagnetic interference issues, large vibrations in motor drive fed with inverter, malfunction-ing of the equipment, voltage distortion in grid voltage for grid-connected inverters.

C.   Voltage Stress

The voltage stress is the amount of voltage which appears across the switches. When there are less number of switches
, the stress across each switch is more. The topology must be designed in such a way, so that some switches are not subject to more stress than other switches.

D.   Number of Switches

When there are fewer number of switches in the circuit, there will be a reduced number of gate driver circuits and also in effect lesser switches will be conducting for specific intervals of time. Another benefit of inverter topologies with fewer switches is that it produces fewer harmonics and also the overall cost is reduced. There will also be a reduced complexity and simpler control in the circuit.

Simulation Parameters

The previously referenced topologies are simulated using MATLAB Simulink, the inverters are designed employing a switching frequency of 10 KHz producing 450 W of output power with a 230 V AC output, as is the common household requirement. Table I indicates the filter requirements of the various inverter circuits. It can be observed that the filter requirements to obtain sinusoidal output of the Half Bridge and Flying Capacitor Inverter are higher than that of HERIC, H5 and Full Bridge. This is another drawback of these topologies as it increases the size and cost of the circuits.

Table I Filter requirements for inverter topologies

Topology	Inductor (L) in mH	Capacitor(C) in μF	Resistor(R) in ω
Heric	18.6	1.6	108
H5	18.6	1.6	108
Full Bridge	18.6	1.6	108
Flying Capacitor	62.5	105	70
Half Bridge	100	100	75

MATLAB/SIMULINK ANALYSIS OF TRANSFORMERLESS INVERTER TOPOLOGIES
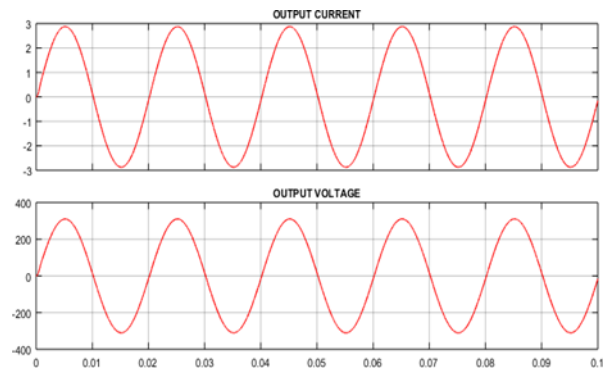
Fig. 8. HERIC Topology Output Characteristics

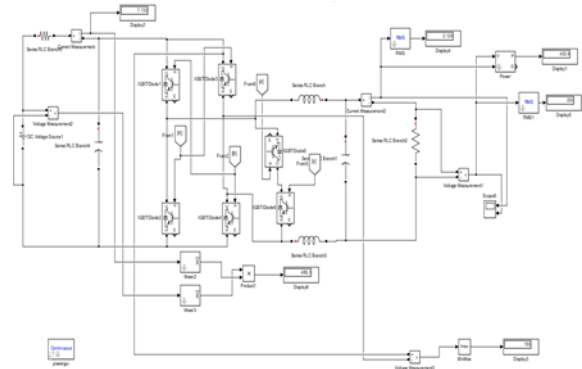**Fig. 6. Simulink Schematic of HERIC Topology**

The characteristics of HERIC inverter is analyzed using MATLAB software. The Fig.6 shows the Simulink model of the HERIC Inverter circuit. Similarly, analysis of H5, Full Bridge, Half Bridge and Flying Capacitor topologies have been done using MATLAB software.
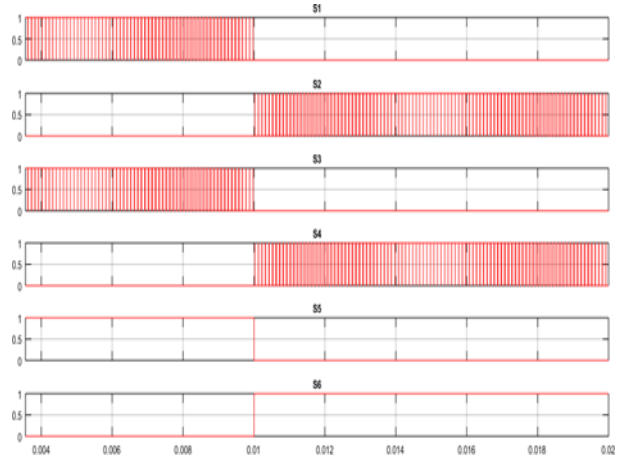
A. Simulation Results

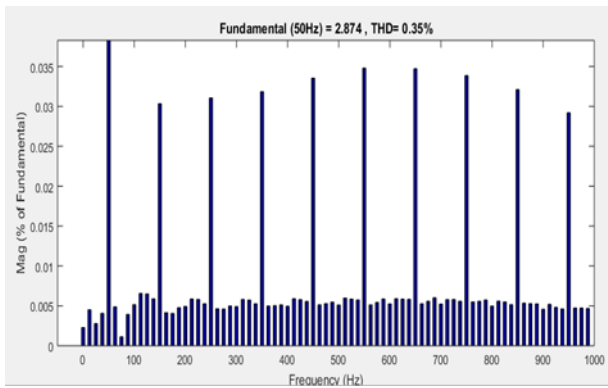**Fig. 7. Input PWM Gate Pulse for HERIC Topology**

Fig. 9. FFT Characteristics of HERIC Topology

The figures shown above illustrate the simulated waveforms of one of the five topologies (HERIC). The Fig.7 shows the sinusoidal pulse width modulation (SPWM) and square wave gate pulses that control the electronic switching of the inverter switches. The Fig.8 displays the sinusoidal output voltage and current of the inverter circuit. Finally, Fig.9 is that of the THD results obtained using Fast Fourier Transform (FFT) analysis.

B. Comparison of Parameters

From the below Table II, on comparing the values, it can be observed that HERIC, H5 and Full Bridge Inverter Topologies have the highest conversion efficiency of the inverters under study. Since H5 and Full Bridge have a relatively higher voltage stress on the switches, it can be inferred that HERIC is the most ideal photovoltaic inverter topology for the required application when taking into consideration the efficiency, THD, voltage stress and number of components of the inverter topologies.

Table II Parameters of transformerless inverters

Topology	Efficieny	THD	Maximum Voltage Stress	Number of Switches
Heric	93.51	0.35	155	6
H5	93.63	0.32	202	5
Full Bridge	93.55	0.30	310	4
Flying Capacitor	80.49	6.51	118	4
Half Bridge	77.96	3.25	230	2

Conclusion

To meet the current requisites of electrical energy and to   fulfil the future load, it is of vital importance that the variety   of renewable energy technologies is broadened. However, the primary issue with the emerging power source are reliability, system security and stability due to its dynamic behavior. Hence, it is the main requirement to study the power electronic converters for the purpose of integration of solar PV power to utility grid as per grid code of requirements specified by grid operators when injecting current with low harmonics as well as analyze requirements of a stand-alone system. The authors expect that this comparative study will prove as a benchmark for researchers, creators, engineers and designers working in the field of transformerless PV inverters. Furthermore, it will aid users in selection of relevant topologies for their specific applications.

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LITHIUM BASED BATTERIES CHARGED BY REGENERATIVE BRAKING USING SECOND QUADRANT CHOPPER

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ABSTRACT

In this modernized world, nowadays, the Electric Vehicles (EVs) scope is continuously increasing. The main problem which is in the path of the good implementation of the EVs is batteries as they incurs much of the cost in them due to its their problem of efficiency, short life time, ageing effect, charge-discharging process etc.. In this paper, the regenerative braking technique for lithium-based batteries using second quadrant chopper is presented. The regenerative braking technique recovers the energy which gets lost in the form of heat due to the friction between land and wheels while braking. The simulation is performed in MATLAB. The DC motor is used in this paper which is given negative torque using step function to indicate the braking mode. The lithium-ion battery with 50% SoC is taken so that the energy recovered can be feed in the remaining capacity of the battery. The MOSFET switch operates with the feedback mechanism provided using a system. As it uses only one switch, so, the losses are reduced and results in efficiency improvement. The energy gets recovered and results in increase in state of charge (SoC) of the battery. The analysis shows that the rate of change in SoC increases with the change in speed which shows the regenerative maximum effect while on slopy areas..

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Index Terms: Electric Vehicles (EVs), Regenerative Braking,

Lithium Battery, Second Quadrant Chopper.

Introduction

In coming future, the scope of emerging technologies is quite large. As, there is a lot of development going on nowadays yet there are some major areas which are lagging behind. The conventional vehicles which are based on the ICE engines is one of the major area. These vehicles even are improving in terms of producing pollution but the pollution produced even now produces much of toxic gases like SO_2 very much. Government institutions and various national and international institutions are showing their efforts in this respect. So, in order to resolve these issues, the research in the area of EVs is increasing at a high rate. So, even now, there are not sufficient but some EVs particularly e-rickshaws are available. There are various reasons for its less development like charging stations, structure for light weight electric vehicles, charging and discharging process, efficiency of the battery etc. [1]. But as we can see most of these factors are related to battery only. So, in this paper, research is based on lithium battery using regenerative braking, one of the technique of battery developments.

In this era of technology, where there is progress in every field, there the battery development field is even lagging behind

now. The area of research is also too vast in this field but due to slow progress we are facing the problems like high cost. Battery in the EVs takes almost 45%-50% cost of the EVs. So, today, there is large research going on battery optimization techniques. As, today, the focus is on lithium-ion based batteries which have high energy & power density, low self-discharge and high efficiency [2]. But besides of all the advantages, these batteries have major disadvantages also like high cost, lithium plating at low temp., sensitivity to temp., exposure due to overcharge. So, to maintain all of these factors for lithium-ion based batteries, it requires to implement battery optimization techniques [3]. One of the battery optimization technique is Regenerative Braking. Regenerative Braking achieves the increase in SoC of the battery by recovering the kinetic energy of the vehicle during the vehicle braking. In city areas, where there is a problem of traffic always, there most of the energy of the battery gets consumed in braking and braking [4]. Regenerative braking can be proved to be useful in these situations to charge

the battery using this kinetic energy of vehicle and in this way, it can increase the range of vehicle and can also increase the life of the battery. Flywheel can also be implemented in this system to increase the effectiveness but it suffers from various limitations of space, mech. strength etc.[5].

Some papers are there on regenerative braking control system. The recovery of the energy can be achieved by predictive controller with non-linear model [6]. Using fuzzy control by using the displacement of the brake pedal, variation rate of the brake pedal, vehicle speed & wheel slip rate error as input [7]. Criteria in paper [8] took the input as vehicle speed and the desired force of motor. However, the above research did not take the State of Charge (SOC) of energy storage device into consideration, which is a significant point that affects energy recovery efficiency, and it may cause damage to the battery. Most of the papers are using inverter as a controller to achieve the strategy of recovering the energy.

This paper uses the chopper as a controller to recover the energy while braking. It uses the second quadrant operation of the chopper to recover the energy i.e. second quadrant chopper is a regenerating mode of quadrant where the forward braking takes place. It also uses a closed loop control system where the reference speed, actual speed of the dc motor and armature current of the dc motor are taken as input to the subsystem of closed loop system.

Designing And Working Of Converter

The converter used here is second quadrant chopper. This quadrant shows the operation of transfer of power from output side to input side i.e. it shows the mode of regenerative braking in case of motors.

At the secondary end, i.e. load side, the DC motor is connected which shows that the motor which we are trying to use in EV is DC motor. There can be various types of DC motors used like brushed DC motor, brushless DC motor. But here only the simple DC motor is used to show the effect of both the ctrl. system and to compare them easily. The designing is done in such a way that at the input side Li-ion battery is connected while at the output side, the DC motor is connected. The motor used is actually separately excited. So, for the field supply, a separate dc source is used. Fig. 1 shows the schematic of second quadrant chopper.
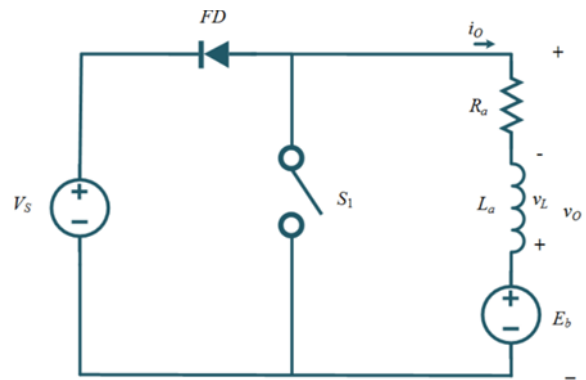
Fig.1-Schematic view of Second Quadrant Chopper

Vo-Io Plane and Operation of Model

As it works in second quadrant which is also shown in Fig.2, so, in this quadrant, it works as a generator. In first quadrant, motor takes the power from the source (Battery used here), while in second quadrant, the same motor will start releasing its kinetic energy which starts storing in the inductor first and then will be supplied to the battery. In forward braking, the torque becomes negative, while the speed remains positive. So, using the product of torque and speed involved, the power becomes negative.
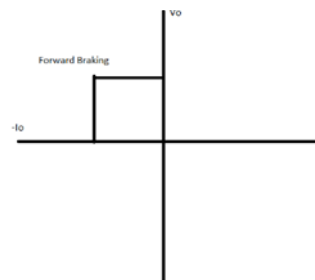
Fig.2-V_o - I_o Plane of Chopper

Below the two modes of operation are explained in brief:

Mode 1: In Mode 1, the switch S1 get closed or we can say that it becomes ON. After closing the switch, the circuit become something like shown below in Fig.3. The closed loop shown in Fig.3-, becomes the only conducting path.

The current starts flowing in negative direction as compared to the forward motoring mode of operation in first quadrant. Now, the negative current makes torque also negative. The energy released by motor is given by:

$$= 0.5Jw^2$$

which gets stored in inductor as :

$$0.5Li^2$$

In this way, motor releases its energy and inductor stores it in   form of magnetic energy.
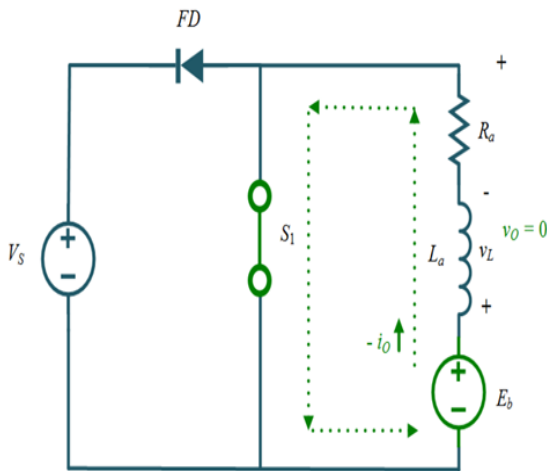
Fig. 3-Mode 1 of second quadrant chopper

Mode 2 : In Mode 2, Switch S1 becomes OFF. After turning OFF the switch, the circuit becomes something like as shown below in Fig.4. The closed loop shown in Figure 33 becomes the only conducting path. In this way, energy stored in inductor in Mode 1 i.e.

$$\alpha = 0.5Li^2$$

will now be stored in battery.
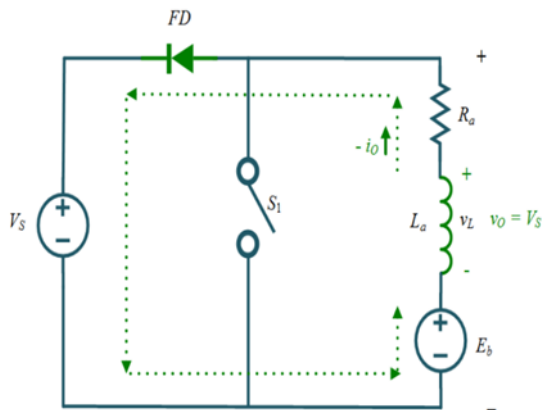
Fig.4-Mode 2 of second quadrant chopper

Mathematical Analysis

The output voltage of circuit is given by:

$$Vo = Vs\left(\frac{Toff}{T}\right) \qquad (1)$$

where,

$$\frac{Toff}{T} = 1 - \alpha \qquad (2)$$

using eqn.(2) in eqn.(1),

$$Vo = Vs(1 - \alpha) \qquad (3)$$

This eqn.(3) describe the relationship between the supply voltage and avg. output voltage.

The regenerative power is given by :

$$= VoIo$$
$$= (1 - \alpha)VsIo \qquad (4)$$

PWM Signal to MOSFET

The PWM generator is used here using the step function for the switching of MOSFET which is shown in Fig.5.
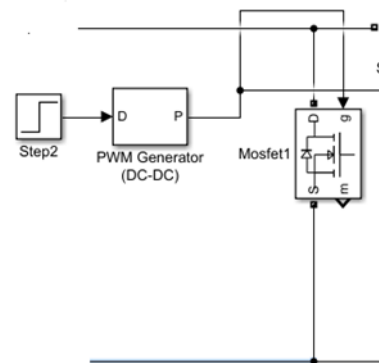
Fig.5-PWM Signal to MOSFET

So, the system made is actually open-loop controller.

Addition of closed-loop subsystem

In this designing of controller, an additional loop will be added. The performance parameters like speed (in rpm), armature current (in Ampere), field current (in ampere), torque (in N-m) are feedbacked. These parameters are feedbacked to a subsystem as shown in Fig.6.
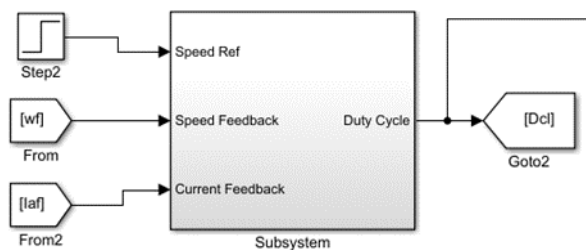
Fig.6-Subsystem of closed-loop ctrl. system for regenerative braking using second quadrant chopper as converter

The explored subsystem is shown in Fig.7 below.
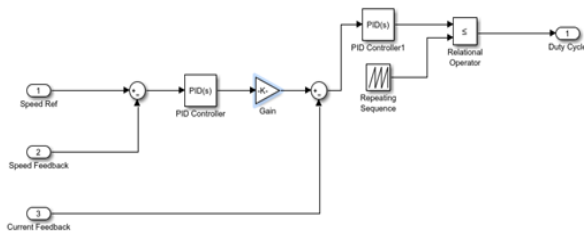
Fig.7-Explored Components of Subsystem used

The value of gain is adjusted at 0.76277.

The output of subsystem which is from Goto block no. Goto 2 is send to MOSFET using From block From1 as shown in Fig.8.
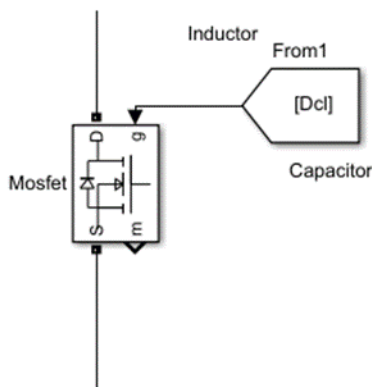
Fig.8-MOSFET switching in closed-loop ctrl. system for proposed system

So, in this way, the ctrl. system is designed for closed-loop ctrl. System.

Parameters and their values used

Parameters	Values
Battery Initial SoC	50%
Battery Nominal Voltage	240V
Battery Rated Capacity	20Ah
DC Motor Power	5 Hp 1750 rpm
DC Motor RPM	1750 rpm
DC Motor Voltage Rating	240V
Initial value of (-ve) torque	-20 N-m
Final value of (-ve) torque	-15 N-m
Gain value (K)	0.76277
Diode Resistance	0.001 ohm
Diode Forward Voltage	0.8V
Diode Snubber	500 ohm

Resistance	
Diode Snubber Capacitance	$250*10^{-9}$ F
Filter Inductance	5 mH
Filter Capacitance	$150*10^{-6}$ F

Table 1-Parameters and their values of components used in regenerative braking

SIMULATION RESULTS

The simulation for the proposed system is performed in MATLAB Simulink. The components for the simulation of the proposed system are taken from the Simulink library browser.

The DC Motor of 5 Hp is taken. The DC Motor selected is of separately excited type. That's why, for its performance, a separate source is provided. The Li-ion battery is taken here with 50% SoC. The switching in the circuit is provided through MOSFET switch which is controlled using the output of feedback control transfer function by the subsystem used as shown in Fig.6.The figures of result in the form of graph describe various types of current and voltage in the circuit. They describes power and SoC of battery also. The explanation of the result in this case of regenerative braking using second quadrant is like this that at the time of 3 sec when the change in current is from 100rpm to 150rpm as shown in Fig.9, then there is a increase in power flow in the circuit as shown in Fig.11.

Fig.9- Graph of Speed and Torque

But here, the voltage across the input terminals of the circuitry i.e. at battery terminals remains same while there is a increase in the current flowing at the battery terminals side to show the increase in power while increase in speed. The increase in speed can indicate the factor on slope type land.
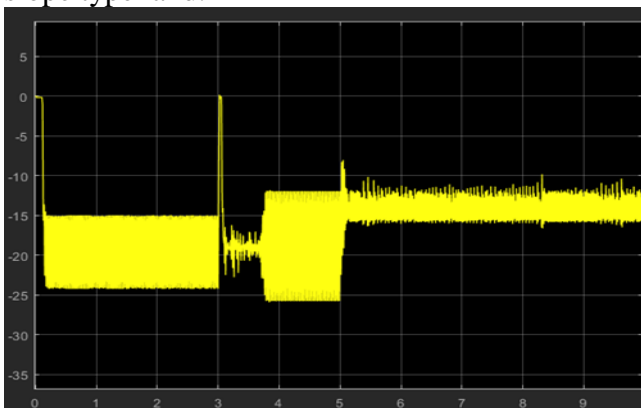
Fig.10- Graph of Armature current
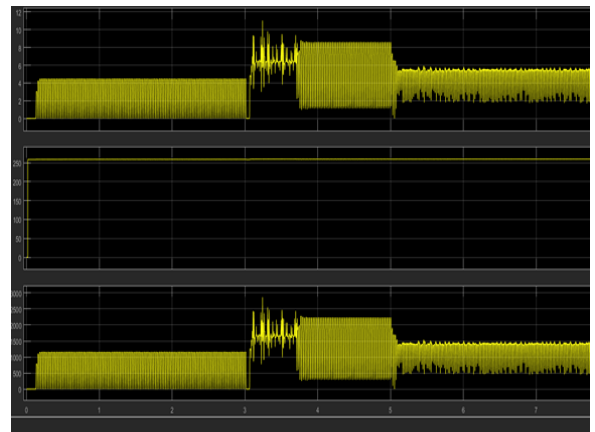
Fig.11-Graph of current, voltage and power at the battery terminals of model
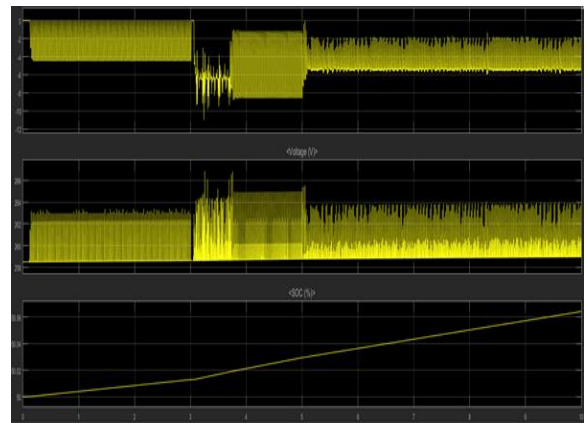
Fig.12-Graphs of current, voltage and SoC in battery

Now, as there is increase in power in circuitry, so, there will increase in charging of the battery to simulate that as there is increase in speed while on slopy areas or due to some factors

may be, then there would be increase in the state-of -charge (SoC) of the battery. And that's why there is a increase in slope of the SoC of the battery as shown in Fig.12.

Conclusion

Regenerative Braking using second quadrant chopper has been proposed in this paper. In this paper, the battery is charged with the kinetic energy of the electric vehicle produced during braking. The energy which was previously lost due to the friction between wheel and brake is now used to charge the battery. ItIt necessitates only one switch. The circuit proposed is modelled in MATLAB using 5Hp, 240V, 1750rpm separately excited dc motor and 20Ah lithium-ion battery. The proposed tech. is fast in operation & also quite simple and economical. It is easy to implement. It helps in

improving the efficiency, less charging necessities and increasing the vehicle range.

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ANALYSIS OF SUCCESSFUL ENTREPRENEURS IN NETWORK MARKETING FROM AMWAY INDIA ENTERPRISES

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ABSTRACT

Network Marketing has not been able to develop itself, despite being in the industry for more than 100 years old and successful for the individuals (usually known as distributors), as a company or a major business. The purpose of the analysis is to identify, evaluate and determine key success factors in the industry. That is why Amway distributors in North Indian Rajasthan were considered,for a case study, as sample respondents. These dealers were part of Britt World Wide, the largest education system of Amway in the world. A research was carried out to quantify and finally evaluate the activities of distributors, which are promoted by the system as major actions, to assess their business success relationship. The 10 major steps had been designed to be a 100% products user, retailer, strategy demonstrators, audio streaming listeners, book-readers, associating through meetings, accountable to their words, teachable, communicators and believers. The analysis looked at the distribution companies' output about the revenues generated by the company. The study also examined whether such key actions led to additional variables, which could help a dealer build financial success skills in Amway. The study led to the harmonization of activities considered by distributors to have the greatest impact on their incomes. It was the strategy that had the most influence on revenues, bonds amongst teams, meetings, retail and showed that this was essential for the success of Amway. This study focuses on the marketing practices of direct sales companies and offers suggestive steps to increase direct sales in the field of study and to highlight the benefits and challenges associated with direct sales in India. Then 300 samples were carefully selected, taking the specific groups consisting of active direct sellers of Amway into account.

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Keywords: Direct selling, evolution in India, Global market, Multi-level marketing, Amway in India, etc

Introduction

Network Marketing is an industry that encourages people's immediate interest when listening to the word. Amway, Tupperware, Avon, are household names that draw a variety of answers. Some people swear about their faith while others consider it illegal. The sector is more than 100 years old, but it has gained a reputation over the last few decades. Whether it is one aspect of network marketing or not, everybody has an opinion. Some of them say that they use relations to sell, while others believe that network marketing companies can wash their distributors by convening meetings, etc. Everyone believes that the quality of goods is high, but they are expensive. Another assumption is that in a structured network marketing company, it is exceedingly difficult to succeed, but it is also known that although it is still possible to succeed, that is not the same. The research aims to determine the key elements of network marketing performance to increase the performance rate by providing a predictable roadmap for distributors involved in the industry.

The present direct sales industry could be considered a revolutionary in the US with the creation of Avon in 1886. In addition to skincare, personal care, home care, healthcare, consumer sustainable care, etc., the success of this model increased the portfolio and reduced sales and distributive costs as well as more direct interaction with the consumer. The movement was supported by female direct salesmen, who considered this a way of empowerment and independence. The implementation of multilevel compensation marketing plans was another chapter in the history of direct sales (MLM plans). The strategy was first developed in the middle of the 20th century and allowed buyers to take advantage of the success by becoming a partner in the direct sale of the company. The MLM plans have been generally implemented and several companies have implemented the same, including world leaders like Avon, Tupperware, and Amway. India is an important

hub for most direct sales companies around the world, as its population is an important factor in the sector's growth and will be one of the largest in the world. Amway started operations in India in 1998. In India. It has 145 offices in 80 cities and 4 regional mother warehouses and 65 warehouses. When the company began in India it was imported. Here, 90% of its products are currently being produced by their manufacturing plant in Madurai, Tamil Nadu, and Contract Manufacture. The distribution and home delivery network developed through independent logistics partners support more than 11500 zip codes throughout the region.

Members of the Indian Direct Selling Association (IDSA) include an organized and structured industry in the Indian Network Marketing industry like AMC Cookware (India) Pvt Ltd, Avon Beauty Products India Pvt. Ltd, Amway India Enterprises Pvt Ltd., CNI Embassy (India) Pvt. Ltd., Trading Dähsan (India) Pvt. Ltd., Elken International India Pvt Ltd. Forever Living Pvt. Ltd., Altos Enterprises Ltd, Life Trading India Pvt. Ltd, Jafr Ruchi Cosmetics India Pvt. Ltd., Max Life Insurance Co., Mary Kay Cosmetics Pvt. Ltd., Oriflame India Pvt. Ltd. Ltd., Tupperware India Pvt. Ltd. , Max Life Healthcare (India) Pvt. Ltd., Herbalife International India Pvt, etc. Multi-Level Marketing (MLM): Multi-Level Marketing (MLM), provides the sales force not only with the reimbursement of sales directly created but also other hires' sales, creating an interior distribution line and a multi-level compensation hierarchy. It is a kind of marketing network or branches. The multi-level term is derived as part of the company's distribution team from the idea of recruitment and training distributors.

1.1 Significance of the Study

Network Marketing would encourage India's economic growth to speed up economic reform and liberalization. Most famous multinationals are already strongly competitive. Therefore, direct sales have a major impact on world growth in the country, like India.

Hypothesis:

The industry of MLM has no major impact on prospects for work.

There is no direct effect on consumer orientation and marketing organizations of the demographic variable.
There are no correlations between HRM skills and female entrepreneurs' success in network marketing.

Review of literature

To study the research objectives, various researchers have analyzed work on similar topics to learn more about the study. In the field of network marketing, no research has been conducted. This can be attributed to many reasons: one, it was not considered to be an important and legitimate business choice until recently, and the other was that Network Marketing Organizations (NMOs) are quietly performing without hype or hurrah. However, the small analysis is rich in thought and substance. These studies, together with some surveys and annual reporting, have proved extremely useful for study design.

2.1 Distribution Channels, Disintermediation & Technology:

Robert T. Kiyosaki (2010) forecasts in his bestsellers' book, Business of the 21st-Century, that the largest companies will be those focused on disintermediation, among them the best being Network Marketing, by mid-21st century. He details why Network Marketing is a future industry.

Ferrel et al. (2010) have researched the increased use of direct sales technology. They decided to explore how to direct salespeople to use technology, to link the company with their customers and how technology is used to improve the experience of salespeople. In a field, traditionally characterized by face-to-face meetings and personal connections, they explore opportunities in the modern world of Direct Sales created by the digital revolution. They concluded that technology has become a driving force for direct sales. New social networking platforms have the potential to extend and expand existing social networking networks. As younger sales representatives and customers come to market, contacts said that social network platforms are more comfortable to use than the conventional social network. Although the use of these emerging technologies is still at an early stage, direct sellers still need to talk about the future

effectiveness of sales efficiency and the long-term increase in consumer interaction.

Jiang and Ruan (2010) claimed in their study on agricultural products that marketing networks would provide farmers with round-the-line market information that allows them to evaluate the market and to make suitable choices.

The paper also proposes countermeasures and suggestions to improve the marketing of Chinese agricultural products by network marketing, to improve farming conditions in the area.

The renowned economist Christopher, Meng & Han (2013) took note of the fact that, in the current volatile marketing competition, demand is no longer on the seller side but the buyer side. Some companies have benefited greatly from the worldwide critical and hot topic of corporate management and supply chain management. Network Marketing is an important form of marketing used by businesses to counteract the current management climate, given the increasing growth of the network economy. They analyzed the impact of network marketing on the growing relevance of IT and concluded that both matches perfectly.

Research methodology

3.1 Research Purpose and Approach:

The objective of this study is the identification and of key success factors. The Britt World Wide (BWW) affiliate distributors of Amway India have conducted causal research. This is Amway's world's largest education system to support businesses. Amway has been selected as the world's largest, $2.5 trillion direct sales business, as discussed in this introduction. It is also India's largest direct sales company and the 14th largest FMCG company in the Indian market, having a yearly turnover of 2236 Crores (2020). It is considered the leading market in the United States, China, Australia, Japan, Korea, and India, and operates in more than 100 countries all over the world. Britt World Wide (BWW) is the largest affiliate of Amway, and it is present in around 40 countries around the world. At Amway, BWW highlights nine key success measures. After observing the active steps promoted in various training systems affiliated with major

international NMOs, it was demonstrated that BWW is the most detailed of all the core steps. Almost everyone, in the perfect training method manual, takes these important steps:

1. 100 percent use of Amway goods.
2. Retail clients.
3. Show the schedule at or above 20 times a month.
4. Listen to the recommended business audio of popular retailers every day.
5. Read the recommended positive books for at least 15 minutes daily.
6. The participation of all BWW activities.
7. Accountability.
8. Learning.
9. Communication.
10. Attitude of Gratitude to God.

3.2 Selection of Sample and Sample size:

Gurgaon office of Amway was contacted which directed towards the Gurgaon based Founders Executive Diamond Council (EDC), Sumeet and Tanya Bahadur, since Amway distributors associated with the BWW education system were the sample group. They were listed as clusters of their nine Founders Platinum Level Groups (expert Amway distributors) operating in various states. Around 1000 independent distributors were led by each of the nine Founders Platinum. The objective of this research is only those, out of nine clusters of distributors, who have followed key steps in a longitudinal study lasting one year. It was not clear from the start how many distributors in a cluster are to take the main steps and how the analysis is limited to manageable time and financial limitations. Likewise, all these nine clusters have had similar codes of conduct and have attended meetings, meaning that each cluster has equal representation to the population, in that they operate within the same system of training as Amway and BWW. The random sampling method selected one of the clusters and was established as an Emerald leader in Jaipur. He chose a few leading figures from his party to list the dealers who followed the main steps in the cluster. Nine such leaders were named who finally chose all their distributors who met the requirements of the two main measures:

1. Were 100% consumers (used in their families all the products of Amway)

2. Be accountable (practiced financial and work ethic accountability)

3.3 Data Sources, Statistical Tools, and Data Collection:

The primary and secondary data were obtained to carry out the analysis. The figure below shows the various data sets obtained and used for the analysis.
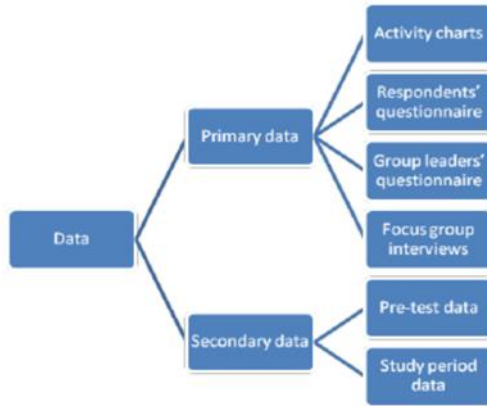
Figure 3.1: Various datasetscollected.

The different testing methods used in testing are:

1. Monthly activity map: The activities of distributors were reported weekly through this chart. This table calculated a variety of important variables, such as the shown number of business plans, number of product presentations, number of meetings per week, per month, etc.

2. Regular Activity Plotter: This diagram has calculated the four main steps. Show your schedule, read a book, hear a CD and talk to your team every day. It should be noted that you are listening to business audio, reading a suggested book, guidance, and letters.

3. Focus Group Interviews: All samples selected were analyzed to obtain data on their activities before the evaluation. Some qualitative details such as secondary results were often investigated.

4. Questionnaire: The respondents reported their population and their perception of the study to complete the questionnaire. Select group leaders have completed an additional questionnaire to provideinsights, within their groups by answering the recipient.

4. Data analysis and interpretation

Comparison of skills and income status amongst people:

The study attempted to determine if distributors' skills are linked to their Amway performance. The distributors have been classified into three revenue regions, low, middle, and high earning. The earning status of their respective skills was then compared to their group leader, to identify a trend between distributors. As shown in the following table, starting from people's skills:

Table 1: Earning Status and People Skills Comparison

	Extremely low (1)	Row %	Low (2)	Row %	Average (3)	Row %	High (4)	Row %	Extremely high (5)	Row %	Total count	Wt. Value	Wt. Mean
Low earning	1	2.5	10	25.0	7	17.5	13	32.5	9	22.5	40	65	3.48
Mid earning	0	0.0	0	0.00	0	0.0	2	33.3	4	66.7	6	74	4.67
High earning	0	0.0	0	0.0	0	0.0	1	25.0	3	75.0	4	47	4.75
Total	1	2.5	10	20.0	7	14.0	16	32.0	16	32.0	50		

Table 2 provides fascinating observations in relation to the table of oratory skills relative to their earning status in the Amway business:

	Extremely low (1)	Row %	Low (2)	Row %	Average (3)	Row %	High (4)	Row %	Extremely high (5)	Row %	Total count	Wt. Mean
Low earning	4	10.0	7	17.5	15	37.5	9	22.5	5	12.5	124	3.10
Mid earning	0	0.0	0	0.00	0	0.0	2	33.3	4	66.7	28	4.67
High earning	0	0.0	0	0.0	1	25.0	0	25.0	3	75.0	18	4.5
Total	4	8.0	7	15.0	16	32.0	11	22.0	12	24.0		

Looking at this one can see a quite different story, with the most oratory abilities of mid-earning distributors according to group leaders followed by high earnings and finally low earnings. This means correlation of people's talents and oratory skills. An intelligent people distributor cannot always be intelligent.

Table 3: Relationship between prospects for growth and distributors' net profits

Relationship Between Success Chances and Net Income		Net Income
	Pearson Correlation	.479**
Success chances	Sig. (2-tailes)	.000

The success opportunities were compared with the real income received by the distributors in Table 4 below, to detect further how delightfully the groups' leaders felt towards

their respective groups. The connection was supposed to be extremely relevant.

	Extremely low (1)	Row %	Low (2)	Row %	Average (3)	Row %	High (4)	Row %	Extremely high (5)	Row %	Total count	Total Wd value	Wt. Mean
Low earning	7	46.7	7	46.7	1	6.7	0	0.0	0	0.0	15	24	1.60
Mid earning	3	27.3	4	36.4	0	0.0	3	27.3	1	9.1	11	28	2.55
High earning	2	8.3	0	0.0	3	12.5	3	12.5	16	66.7	24	49	4.29
Total	12	82.3	11	83.1	4	19.2	6	39.8	17	75.8	50		

Table 4: Skill Status and Success Chances Cross Tabulation

S. No.	Factors	No. of respondents	Percentage
1	Male	228	76
2	Female	72	24
	Total	300	100

Table 5: Gender of the Respondents

Table 5 shows that 76 percent of respondents are male, while 24 percent belong to female groups in the field of research. Most respondents are thus analyzed as male groups in the field of study.

S. No.	Factor	No. of respondents	Percentage
1	20-30 years	126	42
2	31-40 years	72	24
3	41-50 years	78	26
4	Above 50 years	24	8
	Total	300	100

Table 6: Distribution based on Age.

Table 6 indicates that 42 % of respondents have age groups of 20-30 years, while 24% have age groups of 31-40 years and 26% have age groups of 41-50 years and 8% have age groups of more than 50 years in the subject field. Most distributors have their ages in the

field of analysis from 20 to 40. It is therefore evaluated.

Table 7: Monthly Income of the Respondents

S. No.	Factors	No. of respondents	Percentage
1	Rs 10000-15000	60	20
2	Rs 15001-20000	84	28
3	Rs 20001-30000	108	36
4	Rs 30001-40000	36	12
5	Above Rs 40000	12	4
	Total	300	100

It is depicted from the table 3: 20 % of respondents have their months of income up to Rs 10000-15000, while 28 % of respondents have monthly income up to Rs 15001-20000 and 36% have monthly income up to Rs 20001-30000 and 12% have a monthly income down to Rs 30001-40000 as well as 4% above Rs 40000, respectively. Most respondents, therefore, are evaluated to have their monthly income in the study sector up to Rs 20,001–30,000.

Table 8: Educational Qualification of the Respondents

S. No.	Factor	No. of respondents	Percentage
1	Higher Secondary level	48	16
2	Diploma	30	10
3	Graduation	144	48
4	Post Graduate	66	22
5	M.Phil., PhD	6	2
6	Others	6	2
	Total	300	100

Table 8 indicates that 2 percent of respondents are Ph.D.,and MPhil, while 16% of those graduated at higher secondary school and 10% of those graduating with a diploma, 48% of whom are graduates and 22% have their qualifications as postgraduates. Most respondents are thus evaluated at the graduate level.

Table 9: Selling Area of the Distributors

S. No.	Factors	No. of respondents	Percentage
1	At workplace	84	28
2	At home	174	58
3	A temporary place	42	14
4	Total	300	100

It reveals from table 9: 28 % of respondents did their business at their places of employment and 14% made temporary locations, while 58% did their business at home. Consequently, it is analyzed that most people did their business at home in the field of research.

Table 10: Level of Income of consumers

S. No.	Factors	No. of respondents	Percentage
1	Limited	198	66
2	Unlimited	102	34
	Total	300	100

It is transparent from table 10, 66 % of respondents have reported that their income from their clients is limited and 34% of them have unrestricted income in the field of research. Most respondents are analyzed as having minimal income in the field of research.

Table 11: Bonus and Incentive

S. No.	Factors	No. of respondents	Percentage
1	Yes	300	100
2	No	0	0
	Total	300	100

Table 11 says clearly: 100 % of the respondents said they got bonuses and benefits from that organization in the field of research.

Table 12: Relationship Between Management and Employees

S. No.	Factors	No. of respondents	Percentage
1	Satisfied	222	74
2	Dissatisfied	54	18
3	Neutral	24	8
	Total	300	100

It is transparent from table 12, 74 percent of respondents expressed management satisfaction, with 18 percent of respondents expressing Management disappointment, while 8 percent did not express management satisfaction or satisfaction. The analysis thus reveals that most respondents favored the satisfactory element in the field of research more than ever.

Table 13: Consumer attitude towards the product

S. No.	Factors	No. of respondents	Percentage
1	Satisfied	252	84
2	Dissatisfied	18	6
3	Neutral	30	10
	Total	300	100

It is transparent from table 13, 84 percent of respondents expressed product satisfaction to their customers. 6 percent expressed product dissatisfaction while 10 percent did not express product satisfaction. Most respondents are thus tested in terms of product satisfaction.

Table 14: Success from Direct Selling Business

S. No.	Factors	No. of respondents	Percentage
1	Yes	210	70
2	No	60	20

3	Neutral	30	10
	Total	300	100

Table 14 makes it clear that 70 % of respondents have achieved success in direct marketing, while 20% in direct selling in the field of research have not succeeded. In direct sales, 10 percent of the respondents are neutral, i.e., no loss of benefit. It is also found that most respondents in the field of direct sales have succeeded.

Conclusion

Direct sales are so common in our country because it provides everyone with a chance to succeed and to win. Given the growth perceptions of Direct Sales Companies, the growth prospects of the industry have been evaluated. Although the direct sales industry is now at a slow pace, the sector has brilliant growth prospects, powered by a solid customer base and expanding markets. However, the expected growth pattern can be stepped up even further through constructive policy measures in the coming years.

Direct sales are a new phenomenon and vary significantly from conventional companies. This definition is now embraced around the world in all developed countries. It allows an individual to earn passive income through the desired scheme. But there is still little clarification in India about the idea of direct sales: even a gigantic direct sales business like "Amway" in India is misunderstood. Top Business Schools like "Harvard University" run a university course called "Amway Fellows," where even China's delegates go to explore the huge direct selling company.

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AGRICULTURE IN BHUTAN: FEATURES AND CHALLENGES

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ABSTRACT

For any third-world country, the agriculture sector plays a prominent role in shaping the lifestyle of its people as well as the economy of the country. Bhutan as a landlocked and the tiny state of the Himalayan region to depend on its agricultural sector to generate employment and revenue. Since 1961 Bhutan has started to come out of its physical and political isolation and as a result of this, the traditional farming practices were replaced with the modern technologies borrowed from India and Japan. Bhutan's economy has a completely agrarian base and the population of the country is solely dependent on the agriculture and forest for their day to day activities. This paper tries to understand the agricultural system of Bhutan by focusing on the fact that geographical location, climate, and limited access to the connectivity to the outside world has affected the agricultural growth of the country. The article also outlines the responsibilities that the Bhutanese Government should undertake to modernize the country's agricultural practices. The paper then highlighted the positive aspect of organic farming in Bhutan along with the efforts of the Bhutanese Government during the Covid-19 pandemic to achieve self-sufficiency in food production.

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Keywords: Agricultural, Bhutan, Farming, Government, Sector

Introduction

Bhutan is a tiny and a landlocked Himalayan country also known as the last Shangri-la of the earth. The country is famous for its unique concept of Gross National Happiness (GNH) which gives emphasis on measuring happiness. Bhutan's development approach is holistic in the sense that it is not only related to the monetary gain rather it emphasis more on well being of its citizens. The country is popularly known for practising the age-old monarchical system. However, of late the monarchical system has taken the form of constitutional monarchy to introduce the democratic element among the citizens of the country. Bhutan has an area roughly of 38,394 square kilometres. Bhutan is divided into 20 dzongkhags (districts), and further into 205 gewogs (village blocks), its population in 2021 is 779,171 which is equivalent to 0.01% of the total world population. As Bhutan is rich in forests and biodiversity, its national policies and plan emphasises on conservation and sound management of forests and the environment. Today, Bhutan is known as the only carbon-negative country in the world. The Constitution of Bhutan mandates the government to maintain at least 60 percent of land area under forest cover for all time.

If we talk about the economy of Bhutan then we have to understand that till the 1960s the country was under the self-imposed isolation from the world in the name of safeguarding its unique and age-old social and cultural heritage. Bhutan's economy was found to be more self-sufficient with heavy dependence on agricultural production. Bhutan's economy was not monetized by then and taxation was mainly imposed in the form of labour, farm products, and other products such as textiles. However, in 1961 Bhutan had decided to end its self-isolation and with the help of its neighbouring country India, it launched its first-ever five year plan. With the first five year plan infrastructural development took place in Bhutan and main emphasis had given for construction of roads and dams. These kind of developmental activities gradually helped Bhutan in achieving the goal of monetization of the economy. A civil service was established to replace the Buddhist theocracy, and in 1972 the Department of Agriculture was formed. Bhutan had also opted for help from Japan to develop its agricultural sector and as a result of this machinery, tools, seeds, techniques have been imported.

Nature of Agriculture

Before going further it is important to know what agriculture is. Agriculture is the art and science of cultivating the soil, growing crops and raising livestock. It is also called farming or husbandry. The economy of Bhutan, as one of the small and landlocked country of South-Asian region is heavily depends on its agriculture and forestry. Approximately 80% of the population of Bhutan are involved in the agriculture sector. Like the features of any agrarian society of the world where we witnessed a major role of women in the cultivation process, the Bhutanese women are also playing their part effectively to uplift the economy of the country. Agriculture sector in Bhutan works as the backbone as well as the development engine for the country. As of the latest data, the agriculture sector of Bhutan has contributed 15.89% to the country's GDP.

Temperature, precipitation, and vegetation in Bhutan vary dramatically with elevation, making the country suitable for a variety of crops and animals. Baes on these aspects Bhutan witnessed six agro-ecological zones amongst which wet subtropical zone with the altitude of 150-600 m is the lowest and the alpine zone with 3,600-4,600 m altitude is recorded as the higher one.

Table 1: Details about the agriculture in the agro-ecological zones of Bhutan

Agro-ecological Zone	Altitude (m.a.sl.)	Rainfall (mm/annum)	Farming Systems, major crops and agricultural produce.
Alpine	3,600-4,600	<650	Semi-nomadic people, yak herding, dairy products, barley, buckwheat, mustard and vegetables.
Cool Temperate	2,600-3,600	650-850	Yaks, cattle, sheep & horses, dairy products, barley, wheat & potatoes on dryland, buckwheat & mustard under shifting cultivation.
Warm Temperate	1,800-2,600	650-850	Rice on irrigated land, double cropped with wheat and mustard, barley and potatoes on dryland, temperate fruit trees, vegetables, cattle for draft and manure, some machinery and fertilizers used.
Dry Sub-tropical	1,200-1,800	850-1,200	Maize, rice, millet, pulses, fruit trees and vegetables, wild lemon grass, cattle, pigs and poultry.
Humid-Subtropical	600-1,200	1,200-2,500	Irrigated rice rotated with mustard, wheat, pulses and vegetables, tropical fruit trees.
Wet Sub-tropic al	150-600	2,500-5,500	As for the humid zones - irrigated rice rotated with mustard, wheat, pulses and vegetables, tropical fruit trees.

Source: Nine plan, Renewable Natural Resources Sector, Ministry of Agriculture, Bhutan.

The major crops cultivated in Bhutan are maize and rice. Maize accounts for 49% of total domestic cereal cultivation, and rice accounts for 43%. Rice is the major staple crop. Agriculture in the country includes the cultivation of wheat and other minor cereal crops. Paddy is the primary crop in those regions where proper irrigation is available. Amomg the agricultural products, Bhutan also produces wheat, barley, oilseeds, potato, and different vegetables according to the climatic zone of the country. As mentioned earlier, forest in Bhutan is safeguarded in accodarnce with the constitutional norms, it works as the source of livestock fodder and organic materials to develop fertility.

Among the total agricultural lands in Bhutan an estimated 20.57% are wetland. Wetlands are categorised as terraced fields, traditionally irrigated where paddy cultivation is done with a large amount. However, optional crops such as wheat and some vegetables are also cultivated according to the convenience of the farmer and the location of the land. 69.19% of the total land of Bhutan are dryland. Drylands are known for steeper slopes and in this land the scope and amount of irrigation is relatively less. Besides horticultural crops, wheat, maize. Buckwheat and millet are found best for this type of land. Another important category of land is "cash cropland" commonly known as "orchard" that is used only for fruit production. Among the cultivated land total 10.24 percent is used for orchards.

Table 2: Land used in the agricultural sector in Bhutan

Classification	Percentage	Area (ha)	Percentage of land holdings
Wetland	20.57	19,522.81	51.81
Dryland	69.19	65,665.44	86.01
Orchards	10.24	9,714.32	17.37
Total	100	94,902.57	155.19

Source: RNR Census 2009, Volume 1, MoA, Thimphu.

If we see the pattern of landholding among the population of Bhutan then it has been found that it is fairly and evenly distributed. According to the RNR Statistics 2009, the majority (54.25%) of the rural households owned less than or up to 3 acres (1.2 hectares) each, 39.04 percent of the households owned above 3 to 10 acres (1.21- 4 hectares) each and 356.92 percent of the households owned more than 10 acres (4.01 hectares) each of agricultural land. On average, the rural households owned about 4 acres (1.6 hectares) of agricultural land. The landless rural households were recorded to 1.05 percent sporadically distributed across all 20 districts of the country. Besides these, many landless farmers of Bhutan also practice farming as their source of livelihood by either renting land or share-cropping with absentee landowners.

While discussing the agricultural system, we have to highlight the aspect that while modernising the country, Bhutan is found to be very cautious in safeguarding its cultural heritage as well focusing more on the environmental aspect. It has followed a balanced way to promote economic development and taught a lesson to the developed countries of the world about modernization with limited use of natural resources and protection of the environment. Bhutan's approach towards development can be termed as holistic one as it considers people at the centre of development and focuses that along with economic prosperity, happiness is most important for people. The agriculture system of Bhutan carries the following features-

➢ The main objective of agriculture in Bhutan is to achieve self-sufficiency among its population. It also focuses on raise of the life standard of the people living in the rural areas of the country.

➢ In earlier days, the farmers of Bhutan had faced the hurdles such as limited access to the farm road, limited information about the market and limited variety of seeds for farming. The geographic location of the country also limited the possibilities of advanced farming. However, of late modern technologies have been introduced in the agricultural sector to boost the cultivation process which has helped in shaping the economy of the country as well as raising the life standard of the people.

➢ As a part of modernising the agricultural system of the country efforts have been made to increase food self-sufficiency, for which high-yielding varieties seeds are introduced to intensify the food production. Bhutan is quick, though carefully, entering into the global agricultural and food product market, which is materially and symbolically re-ordering agricultural practices, as people's consumption patterns and priorities change.

➢ Amidst changing nature of the agricultural market and the demands of the consumers, Bhutan has also adopted the practice of Organic farming in 2007. The International Federation of Organic Agriculture Movements (IFOAM) defines organic agriculture as a"production system that sustains the health of soils, ecosystems, and people" through taking advantage of ecological

processes and cycles adapted to local conditions, rather than the use of inputs with adverse effects. However, the concept of organic farming is still new to the many people of Bhutan and government initiatives are necessary to realise this dream.

➢   Bhutan has started to give more focus on the cultivation of cash crops such as potato, cardamom, apple, citrus, and arecanut as it is more profitable and has a foreign market. In Bhutan the potato season falls between the month of September and October. Among the vegetable cash crops, potatoes are most demanded and exported in a huge quantity to the neighbouring states. Other important cash crops targeted for export mainly grow at lower altitudes and include citrus (5,490 ha), cardamom (3,600 ha) and arecanut (1,200ha). Apple is the main cash crop (2,080 ha) grown at high altitudes.

➢   It is also important that Government of Bhutan realizes the importance of agriculture in enhancing the GDP of the country and efforts has been given on market development programmes, research on crop diversification, development of irrigation sector, etc. In short, these efforts has created a positive approach towards the farming system of the country.

➢   In comparing to its neighbour states like India and Bangladesh, Bhutan has a positive aspect related to the production of summer vegetables such as radish, cabbage, broccoli, cauliflower, peas, potatoes, beans, fresh chillies, beans etc. These vegetables have an enormous market value in India and Bangladesh. The demands of these vegetables in the foreign markets during summer have motivated the farmers of Bhutan to produce more and to uplift their economic conditions. Bhutan also produced high-value products like mushrooms and lemongrass oil, which has a great value in the markets of Asia and Europe.

➢   Various auction yards operated by the Food Corporation of Bhutan, a state governed trading company has helped the farmers to directly sell their products This process has been started to give the farmers their adequate due as they spent a large amount of money during farming. This action yards also delimit the power of the middleman who works as a bridge between the farmers and the traders to sale the product. Generally, it is witnessed that the middleman always has a nexus with the traders and as a result the farmers are always deprived of getting the actual value of the product.

➢   The capacity development programs undertaken by the government of Bhutan have been instrumental in raising crop productivity and in planning various enterprise developments. Through training, demonstrations, and study tours, farmers are making attempts to adopt better farming practices like the use of high yielding varieties (HYV), timely weeding, proper irrigation, crop rotation, and the likes. Leaflets are being distributed to educate the farmers and various programs are initiated to make farmers aware in matters related to the production of various crops.

Problems Associated with the Agriculture in Bhuta

In comparison to the other developing countries, the problems that are associated with the agriculture sector of Bhutan are both unique and complex. Geography and topography of Bhutan have limited the amount of the cultivable land in the country. Most of the farmers of Bhutan are still practicing the age old farming techniques and as a result the country is facing the problem of shortage of food. Lack of widespread mechanisation and skilled manpower has limited the rate of productivity. The vast majority of the farmers use animal power for soil tillage and cereals are often harvested by hand. Again import of modern equipments from the neighbouring state is related to the investment of heavy amount which a farmer can not effort. The landlocked position of the country and depending on the port of India to carry any heavy equipment and high-yielding variety seeds for farming is also expensive.

In Bhutan, there are numerous rivers, and with a proper planning Government can diversify the water in the farming process. However, Bhutan has failed to establish a proper irrigation facility and it has limited the production of rice and vegetables at mid and high altitudes.

In his paper, "Agricultural Diversification in Bhutan", S. Tobgay (2005), argued farming in Bhutan is a challenge because of small land

size holding and rugged topography with steep slopes of most agricultural land, making farm labour intensive and mechanization difficult.

Tayan Raj Gurung's (2012) study of, "Agricultural transformations in a remote community of Kengkhar", Mongar, states that Bhutanese agriculture is still largely based on the traditional subsistence-oriented mixed farming systems that integrate cropping, livestock rearing, and use of forest products.

Ministry of Agriculture and Forests (MoAF) of Bhutan (2013) has also evaluated the drawbacks of the agricultural system of the country, it has been found out that limited amount of landholdings, lack of high yield varieties of crops, uncertain climatic conditions, wildlife damage, pest and shortage of farm labour has severely affected the cultivation process.

As Bhutan has followed the path of modernisation and its impacts have been realised in every sphere of society. With the introduction of television and the internet the youths of the country are now more aware about the opportunities of the outside world. The agriculture sector of Bhutan has taken a shift from traditional to the monetization of farming and the earlier form of cooperation has been replaced with economic intensives. Unlike the other countries of South-Asia, Bhutan suffers from the problem of labour shortage and its results are clearly visible in farming as the amount of fallow land in Bhutan is increasing day by day. Bhutan's heavy dependence on the hired labours from India causes a huge cost in the agricultural productivity.

Due to the political and economic pressures, the Government has initiated a programme of rapid agricultural development. Owing to institutional inexperience and the lack of trained manpower this programme is uncritically based on imported ideas and technology. The technological underdevelopment of Bhutan is also reflected by limited research infrastructure with five research centres on natural resources (RNR) and only one agricultural laboratory. Academic libraries in Bhutan still have a low standard.

In most of the underdeveloped agrarian societies the concept of rural credit and micro-finance have turned to be a myth since the farmers are not aware or unable to provide security to lend money from a bank or finance institutions. For Bhutan, the problem is similar as most of the farmers are uneducated and hardly have any knowledge of fund transition and all. So, before formulating any policies about providing subsidies or loan to the farmers, the government must have to ensure to include all sections of farmers and to reduce the amount of difficulties to obtain a financial grant. However, for Bhutan the issue is more crucial as it has been evident that the grants provided by the government have made many farmers solely dependent and thus create a hurdle implementing of various development projects.

The government of Bhutan should carefully study its environment policy with that of economic development. As discussed earlier the geography of Bhutan has limited the amount of land for cultivation. Again the policy of maintaining 60% land as reserved forest areas is definitely influencing the quantity of food product. So, the strong policy of environment conservation is definitely conflicting with the idea of productivity, food sufficiency and economic prosperity.

Despite being a predominantly agrarian economy, the share of the Bhutanese agriculture sector's (cropping, horticulture, livestock, and forestry) contribution to the GDP is declining drastically. Only 7.8% of the total land cover is used for agriculture and food production. Inequalities in land ownership and tenancy exist significantly. About 14% of the total farming community owns less than an acre of land.

Agriculture serves as the true backbone of Bhutan's economy, contributing 33% of GDP and employing over 69% of the population. Yet close to one-third of the Bhutanese population suffers from food insecurity. Food expenditures represent 40% of the total expenditures of an average person in Bhutan Here, we can highlight the fact that budgetary allocation from government to agriculture and food should be balanced in such way that the fear of hunger and poverty would not exist among the people in the society. In every society, it is the responsibility of the government to provide food security to

its people so as to obey the principles of human rights.

Climate change as a global challenge has touched almost all the countries of today's world. It is basically related to the increase amount of greenhouse gases in the atmosphere. From a human health to agriculture it has created an adverse effect. Though Bhutan is termed as a carbon-neutral or a carbon-negative country, the country also bears the burden of climate change especially caused by the advanced economies of the world. Bhutan is also witnessing the impacts of climate change in the form increased frequency of wind and hail storms, erratic rains, glacier outburst floods and appearances of new diseases and pests However, we can also notice that growing cultivation of cash crops such as potatoes and cardamom has also created a negative impact on the environment of the country. In the name of cultivation of cash crops, huge tress has been removed and same land has been used again and again, which has risked the build up of pests and diseases.

Conclusion and Recommendations

As Bhutan has an agrarian society and the development of the country is related to the advancement of the agricultural sector, so both short and long term policy objectives are needed to bring major reforms in the farming process. To diversify the traditional farming practices, there is a need to introduce alternative and new variety of seeds to increase the production as well as the income of the farmers. Increase of production is related to finding more market opportunities and a source to generate revenue also. For this, more and more land is needed and the government should encourage the farmers to use the fallow lands of the country by providing loans or distributing high-yielding variety seeds to the farmers at a free cost. Government should also evaluate its policy and the constitutional requirement of having a minimum of 60% of forest cover land and frame a policy in a such manner that both the environmental and economic balance is well maintained.

In long term policy objectives, development of adequate infrastructure is needed to make a change in the agricultural sector. In Bhutan, absence of proper infrastructure facilities has compelled the farmers to produce limited food products. So, proper irrigation facility, condition of farm roads, the availability of electricity, knowledge about market, availability of information, etc., works as the major factors to modernise the farming sector. Extensive research on agriculture as well as skilled manpower also helped in bringing change in agricultural practices.

Food security as a concept is popularise in all over the world. Food security is related to having access to nutritious food to live a good life. Bhutan is also focusing on the concept of food security and to achieve these goals it can be suggested that government funding should increase in the areas of agricultural research, extension services, irrigation to improve crop diversification and crop yields.

As discussed earlier, agriculture in Bhutan related with small holding of lands and its an individual engagement. So, there is a need to educate the farmers to form groups or association. It is found that groups or association works as an agent of farmers and raises their demands and problems in front of the government. Similarly, it helped the farmers to evaluate the market value of the products. Currently, each farmer is involved in producing small quantities over a limited production area. To consolidate small holdings into bigger size cultivation, the government should make extra efforts. The concept of land pooling is an attempt to address the concern.

Bhutanese government is well aware about the benefits of the monetization of the agricultural sector of the country. Hence, efforts have been made to connect all the gauges of the state to the capital city and as a result of this localised product not only get a national but international market too. The government is also trying to provide farming supports along with supplying a variety of seeds to the farmers. The RNR sector of the government is engaging itself in providing training, guidance and other additional supports to farmers to grow the lemongrass oil and mushrooms so as to increase the amount of these high value products.

As the concept of organic farming became popular in the recent times, Bhutan is also trying to produce organic products and supplying it into the world market. The

National Organic Policy of Bhutan aims at motivating the farmers to work in harmony with the nature. The country had also targeted that by 2020, it will reach the goal to be a hundred percent organic states. Bhutan still has a long way to go into organic farming and awareness among the rural farmers of the country essential to realise the potentialities of such farming. Though the concept of organic farming in Bhutan is at the initial stage, we can conclude that the policy implementation process is crucial for it to write a success story. The ongoing Covid 19 pandemic has also taught a lesson to Bhutan to overcome its problem of dependency on other states to fulfil the necessities of its native population. To make Bhutan self-reliant in food production, the Bhutanese government wants to use this crisis as an opportunity to boost the country's agriculture sector. As a measure to motivate the farmers' the Bhutanese government is planning to start the cottage and a small industry bank, which would provide loans at the minimum or zero interest rates for land resurfacing and development support and direct inputs such as seeds, electric fences, and technical support. Again With the support of the agriculture ministry, more than 66,000 acres of fallow land are expected to be cultivated to meet the domestic demand for vegetables. A total budget of Nu 944M, the agriculture stimulus plan aims to strengthen food security through domestic production while creating employment and income opportunities.

As the economy of Bhutan is closely related to the development of its agricultural sector, so major reforms are needed. The government should ensure that the excess food produced by the farmers gets a safe storage house and according to their convenience they can sale it. This will help the farmers to generate profit and encourage them to increase the productivity. Location of Bhutan among the mountains has created hindrance in connecting the rural areas to the urban and building of roads and carrying other developmental activities is very difficult, costly and time consuming. In spite of this the tiny Himalayan state is trying to overcome the problems and a holistic developmental approach has been undertaken to develop the agriculture sector of the country. Bhutan is working on establishing a balance between social, economic, ecological factors so as to provide sound development of the farming sector. Bhutan is also emphasising on product specialisation, improvement of trading products, connecting a network between markets, organic farming, and application of internet and other modern facilities to educate the farmers and to integrate the farm practices. Extensive research with the helped of skilled manpower is also related to bringing change in the agricultural practices and to uplift the life standard of the rural population of the country.

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SUSTAINABLE PRACTICES IN BUILT ENVIRONMENT
A STUDY ON CONSTRUCTION & DEMOLITION WASTE-MANAGEMENT (C&DWM)

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ABSTRACT

In the next fifteen years, the construction industry is expected to be one of the most dynamic industrial sectors, and it will be critical to the evolution of rich societies around the world. Infrastructure, transportation, energy, social infrastructure, schools, hospitals, government housing, water, defence infrastructure, and natural resources will be significant areas of construction growth in emerging countries.

Construction operations are thought to utilise around half of all natural resources extracted by mankind. One-sixth of global fresh water use, one-quarter of global wood consumption, and one-quarter of global garbage creation are all accounted for by the building industry.

Man created most incredible, awe inspiring projects and landmark buildings from cradle to grave with his knowledge and innovative technologies. Though these functional wonders provide comfort and safety are well well-known for generating huge waste. More garbage is generated by the construction sector than by any other industry in the world. Building professionals can take a variety of steps to assist decrease waste and make construction sites more ecologically conscientious.

Managing construction waste is possible through minimal usage of resources and materials through strategic planning. It can be manageable through the application and adaptation of strategies while the project in pre-construction stage.

Though it's difficult to manage the construction without waste; subject experts may mentor few strategies to help shrink and manage waste at pre-construction stage itself

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Keywords: Waste, Resources, Guidelines, Strategic Planning, Adaptation

Introduction

A traditional list of basic needs is food (including water), Shelter and clothing. Since the prehistoric period human had shelter in one or the other form to protect himself from climatic conditions like rain and sun. Gradually this shelter run developed in scale and comfort which is in its developed stage now. Traditional building materials such as concrete, bricks, hollow blocks, solid blocks, pavement blocks, and tiles are made from natural resources that already exist (Seto, 2012). Continuous exploration and depletion of natural resources are harming the environment (Seto, 2012). While manufacturing products and construction materials, companies generate different harmful pollutants particles. During the manufacture of construction materials, these are invariably released into the environment. Toxic matter emissions pollute the air and water, affecting human health and generating ecological disruptions.

Q1. What are the strategies adapted for C&D waste management to avoid environmental degradation due to indiscriminate disposal?

Q2. What are the main strategies for technical & cost-effective measures to manage and minimize C&D waste and also to make the use of recycled C&D waste products in construction projects more efficient?

Literature Study

The annual Construction and Demolition waste is estimated as 530 million tonnes by Ministry of Environment and Forests. It is difficult and inevitable to manage construction without waste. Demolition waste is the debris left over after a building has been demolished. Construction and demolition waste (C & D) includes more than just rubble, broken bricks, tiles, and wood. Plasterboard, for example, is hazardous once land is filled because it breaks down under landfill conditions, creating hydrogen sulphide, a deadly gas.

(CENTRAL POLLUTION CONTROL BOARD - Ministry of Environment, 2016))

Activities that generate C & D trash in cities / towns are primarily from (CENTRAL

POLLUTION CONTROL BOARD - Ministry of Environment, 2016))
• Client request at the last minute
• Complex design
• Inadequate communication among architects, contractors, and engineers
• Inadequate design information
• Unexpected ground conditions
• Long project duration

Regardless of the causes cited above, the development boom and growing urbanisation have resulted in huge structures and garbage generation. In the next years, construction activity and garbage creation are likely to increase even more. Dumping the waste on road sides or landfill is a common practice followed all these years and all over the world. The C&D waste comprises of non-biodegradable materials and hazardous to the environment. Globalized awareness on environment and climatic threat due to C&D waste, it is necessary to implement scientific approaches and regulatory mechanism to manage the C&D waste.

Waste Composition

Building materials and components manufacturing process, involves in consumption of raw materials and it is found that the consumption is almost three billion tons every year worldwide. This equates to 40–50% of the world economy's overall material flow. Construction operations are thought to utilise around half of all natural resources extracted by mankind. Additional Resources use garbage creation are all accounted for by the building industry. Natural Habitats and Open Space: If current trends continue, population increase, economic growth, and urbanisation will destroy or alter natural ecosystems on more than 70% of the Earth's geographical surface by 2032. Buildings consume 30-40% of world energy, while construction/demolition operations account for more than half of global energy consumption. Buildings account for 9 Gt of CO_2 emissions globally, out of a total of 44 Gt.
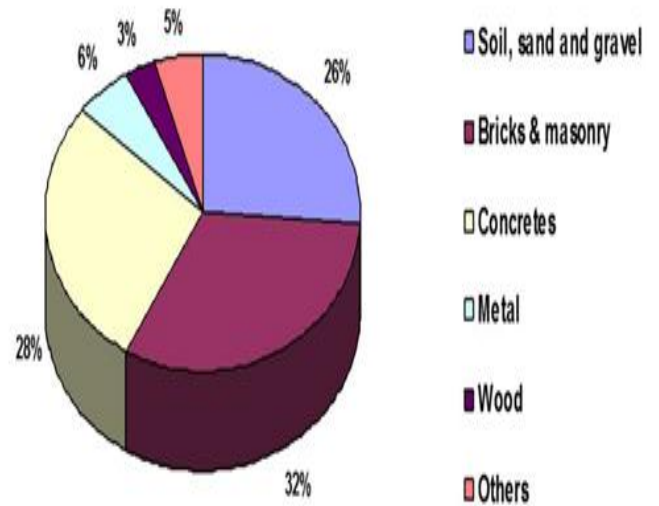
Figure.1 C&D waste composition: Indian urban areas

Constituents	Million Tonnes/yr
Soil, Sand and Gravel	4.21 to 5.15
Bricks and masonry	3.50 to 4.50
Concrete	2.50 to 3.77
Metals	0.70 to 0.83
Bitumen	0.29 to 0.40
Wood	0.28 to 0.40
Others	0.12 to 0.17

Table. 1: Quantity of various constituents generated per year in India

Construction And Demolition Waste Management Strategies

Finding a type or the category of waste generated and disposed of, to a lawful place.
Types of waste generated
        Excavated material such as rock and soil
        Waste asphalt, bricks, concrete, plasterboard, timber and vegetation
        Asbestos and contaminated soil.
        This process of C&D waste management
        Storage and segregation
Collection and transportation
        Reuse and Recycling (Figure.2)
Disposal
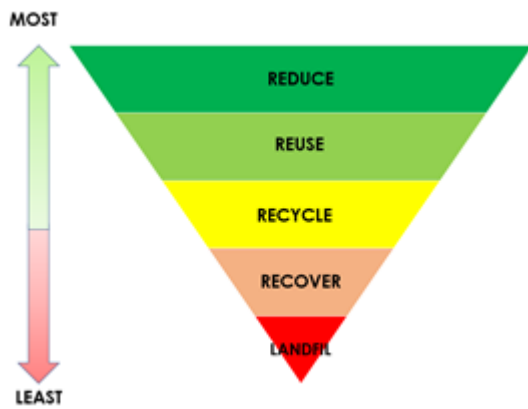
Figure 2. The waste hierarchy of most preferred to least preferred waste management actions. (From Zero Waste Network, 2020)

3.) Reducing construction Site Waste.

3.1) Control at Design stage

3.2) Quantity surveying and procuring material with minimum percentage of waste (expected).

3.3) Proper packaging of materials

3.4) Safe Transportation

3.5) Possibility of package materials with recyclable materials.

3.5.1) The following are all common materials found on construction sites that can be recycled:

3.5.1.a) Asphalt roofing

3.5.1.b) Cardboard

3.5.1.c) Paper

3.5.1.d) Plastics

3.5.1.e) Window glass

3.5.1.f) Concrete

3.5.1.g) Gravel and other aggregates

3.5.1.h) Drywall

3.5.1.i) Carpeting

Any other material that is not listed above also have the possibility of recycling. the Advancement of science and technology made it possible to recycle any kind of material and produce or reshape for reuse of the waste very efficiently. That is Waste to energy and waste to use.

3.5.2.) Use of recycled materials

The following are commonly recycled products:

Carpet and under-cushion

Cellulose insulation

Composition board

Compost

Door mats

Dry wall

Floor Matting

Foundation vents

Gutter guards

Interior wall and ceiling panels

Landscape timbers

Paint

Shingles

Tiles

Wall paper

Wood finish

Construction site reuse and recycling (Levy, May 2021) Steel from reinforcing, wire, containers, and other consist of:

• concrete, which can be broken down and used as a base course in roadways and sidewalks.

• aluminium

• recyclable plastics of grade 1 (PET), 2 (HDPE), and 5 (PP) in New Zealand. (At the moment, there are no feasible markets for plastic containers in sizes 3, 4, 6, or 7.)

• cardboard and paper

• untreated wood that can be mulched or used as firewood

• topsoil

• paint. Unwanted paint and paint containers are accepted by a variety of manufacturers and shops. Deconstruction/demolition site reuse/recycling The following materials can usually be repurposed from deconstruction/demolition sites:

• landscaping and sitework - asphalt paving, chain link fencing, timber fencing, and trees

• concrete, both in situ and precast

• wood – hardwood flooring, laminated beams, truss joists, treated and untreated woods/posts, joinery, untreated wood in general, engineered wood panels

• electrical wires

• terracotta tiles

• wool carpet

• timber – hardwood flooring, weatherboards, laminated beams, truss joists, treated and untreated framing, timbers/posts, New Zealand native timber components are all components that can be reused.

• Fiberglass, wool, and polyester insulation, as well as polystyrene sheets

• carpet and carpet tiles

• plumbing fixtures – baths, sinks, toilets, taps, service equipment, hot water heaters

• electrical fittings – light fittings, switches, thermostats

• linings and finishings – architraves, skirtings, wood panelling, specialty wood fittings, joinery

According to studies, ferrous metals account for around 45.5 percent of total recyclable materials with about 803,190 tonnes, and wood and paper account for about 37.7 percent with about 665,539 tonnes from the massive amount of building trash.
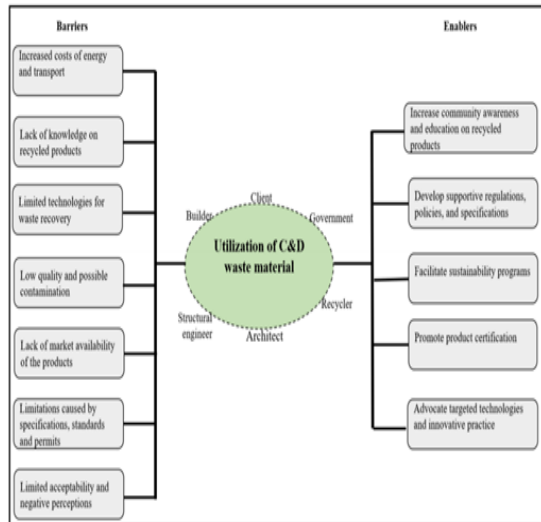

Figure 4. Emergent model on barriers and enablers for using recycled C&D waste products.

Technical & cost-effective measures to manage and minimize C&D Waste:

4.1) Standardization of Materials
This can be controlled at design stage if building dimensions designed to correspond with standard material sizes available in market. This will reduce material wasted and wood accounts for nearly a third of all construction waste. Room sizes in modules of available floor tiles will minimize waste efficiently.

4.2) Minimizing waste at material procurement level;
While procuring construction materials, place your order optimally fit your needs; Excess materials delivered to the project site requires storage, maintenance.

4.3) Package material:
Better always opt for package with recyclable material or suggest for reusable or returnable material.

4.4) Purchases on returnable basis:
Minimizing the waste with minimum purchase of material and buyback any unused material.

So that the left-over unused material may not be dumped at landfill.

4.5) Storage of material in safe condition:
Damaged material is waste and cannot be used in construction. Store the material in safe condition and away from susceptibility of damage.

Employment of trained and technical staff on construction project

As Human being everybody shall have the consciousness to environment and natural resources. Employing trained and technical persons as supervisors and contractors benefits the construction project and helps in minimizing C&D waste with spontaneous decisions whenever necessary.

Energy efficient buildings require more perfection in construction. These buildings Construction practice differs with conventional buildings. Ex. Cold storages etc requires more thermal insulation and any leakage loads on consumption and effects the energy bills.

Precautions may be taken for soil erosion and ground cover while curing the construction projects.

Construction & Demolition Waste (C&DW) recycling plant

CDW is leading to unauthorised dumping on the roadsides, vacant plots or lands. No scientific disposal mechanism is available currently. Since there is no mechanism for handling the C&DW, the government is unable to initiate any action against those dumping the waste illegally. Plans are to be prepared to have a scientific, viable and cost-effective solution for processing of C&DW to curb illegal dumping of such waste.

A state-of-the-art C&DW recycling plants are to be developed by the local bodies or SPCB or CPCB or a public-private partnership model, for processing facility fully equipped to handle the collection, transportation, processing and management of C&DW generated in and around surrounding areas.

Waste to Energy

"While generating energy from waste holds a lot of promise, we need to focus on making items last longer and finding ways to recycle and reuse them when they can't be fixed. We should only use waste-to-energy when all other

possibilities have been exhausted." (trust, 2021).

Figure.3 Waste to Energy plan at Hyderabad

Direct and indirect benefits of Waste to Energy Plants
Reduction of burden on landfill
Control of emissions from dumpsite and other fugitive emissions
Reduction of Greenhouse gas GHG Emissions
Better Hygiene
Prevention of surface and ground pollution
Prevents bird menace

Results

This Paper has been constructed on the basis of Dissertation study as a part of the research. Depending on the case studies and interpretation of data, the above following parameters have been prioritized for further analysis.
The study needs to be extended with the above parameters on a local site and there by analysing the utmost and ultimate possible methods for minimizing and recycling C&DW.

Conclusion

All states (including municipalities, ULBs) in India and also globally have been facing the problem of construction and demolition waste and dumping the waste on the road sides illegally. There by effecting the landcover and narrowing down the roads and traffic congestion. This will be possible only when the estimation of projects with approximate consumption of materials and expected waste before initiation of project. The 3Rs reduce, reuse, recycle system and segregation of waste and transporting to lawful places is safe to environment. To estimate the net environmental impacts of different waste management strategies such as recycling, traditional landfilling, and burning, specific measurements must be devised. Recycling C&D trash and converting it to aggregate may have the dual benefit of reducing natural raw material extraction for new construction operations, resulting in more sustainable development. Sustainable and optimal recycling systems must be created while taking into account both environmental and economic factors. We should only use waste-to-energy when all other possibilities have been exhausted

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A CRITICAL STUDY OF THE LIMITATIONS OF WRITS IN INDIA

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ABSTRACT

Writs through the ages have developed and taken many a different forms. Their use and methods of implementation have also gone through many changes in various mannerisms. The writs as we know of today were not merely used to enforce remedial measures for discomfort caused due to administrative matters or otherwise but was instead used to settle matrimonial and other family disputes. Writs are meant as prerogative remedies. When ordinary legal remedies seem inadequate, in exceptional cases, writs are applied. But the same however, are not free from any limitations; it has been observed that these writs have proved to be inadequate in order to ensure complete justice and provide sufficient relief. The Indian legal framework has provided the writs with definitely more flexibility and the ability to enforce fundamental rights and not just the legal ones, making it more effective than the English system.

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Keywords: Writs, prerogative, judicial activism, mandamus, Jurisdiction

Introduction

The practice of writs has grown in the recent times but has had significant importance which dates back to centuries. In the earlier times writing was considered as a rare art, and writ being the form of a written command than some hastily spoken words by the politically superior head was something that distinguished it from the latter.

Writs through the ages have developed and taken many a different forms. Their use and methods of implementation have also gone through many changes in various mannerisms. An interesting factor over here is with regards to the position of the "writs original" which were in vogue post the twelfth century whereby the normal method of commencing a civil action in the King's courts soon became de cursu or in other words "ministerial" under which the relevant writ could be obtained by anyone who chooses to pay the prescribed appropriate fee. It is therefore brought to attention that Medieval forms talked about "purchasing" a writ.

In the English system via the Act of 1938 the prerogative factor of the writs was done away with and the earlier known prerogative writs of certiorari, prohibition and mandamus were now given a statutory form. This change was however a mere façade as the change of this designation concerned itself only with the simplification of procedure whereas the substantive law remained the same. Thus the writs remained more or less prerogative in nature so to say.

It is pertinent to mention here where and how did these writs come into and become a part of the Indian legal system. The simple answer for it being that these writs are a part of the colonial legacy left behind by the British in India as the same was imposed by them during the colonial rule. These writs came into existence as a measure by the English legal system to impose order on the Crown's remedies, sought only on the suit of the Crown (although they have been available to the person who has been aggrieved by the decision of the inferior court or administrative body since the very beginning).

The writs as we know of today was not merely used to enforce remedial measures for discomfort caused due to administrative matters or otherwise but was instead used to settle matrimonial and other family disputes. Habeas Corpus for instance became an important tool for the assertion of popular liberties against the Crown. It was further observed that such a writ which was originally conceived to further an ordinary step in judicial proceedings had become, by the end of the seventeenth century, one of the most powerful engines of popular liberty.

It would however not be wrong to state here that the political importance of Habeas Corpus has somewhat obscured the almost equally suggestive history of the other "prerogative" writs.

Writ Remedies Available Under Article 32 and Article 226

Quo Warranto and the Prohibition are said to be "prerogative" in the strictest sense. Quo Warranto came into existence to test the validity of the feudal franchises. It finds its presence in the Statute of Gloucester of 1278, which initiated the reforms of the English Justinian. It eventually came as an established form, "to be awarded as an original out of the chancery," when the old reformer was passing to his grave.

Prohibition has been the weapon of the King against the ecclesiastical tribunals. It has made its appearance in the Register of Originals. Further, what separates it from the other "prerogative writs" is the fact that Prohibition has always been, according to better opinion, ex debito justitia, when the excess of jurisdiction is clear. Further, it is also well known that the origin of the writ of Mandamus could be said to be the Bagg's case.

Relying upon the popular passage in Bracton's great work , writs are classified as either:

a.   Originals; or
b.   Judicial

"Originals" are either:

a.   Patent; or
b.   Close

Or they are

a.   "of course" or
b.   "magisterial"

Or they are

i. Real
ii. Personal
iii. Mixed

Writ remedies are supervisory in nature and are completely different from the appellate or revisional jurisdiction of the Courts. The court here merely engages in enforcing a right and not in the creation of one. If a petition challenging a particular action is brought to the attention of the court via a writ petition then the validity of that action is what is examined by the Courts and not the validity of the law under which such action is taken. The proceedings followed in writ petitions are summary in nature as there are no procedure norms that are prescribed to be followed in the same. This is what constitutes the specialty of writ petitions and these are entertained in the form of affidavits and decided on the basis of pleadings and after hearing the arguments of both the parties.

It is an interesting fact to note here that the judgments of the High Courts and Supreme Court can however not be challenged via the writ jurisdiction as it is assumed that the Courts in their judicial functioning cannot be held to have violated the fundamental rights of any individual.

Limitation Of Writs

It is a well-known and an established procedural rule of convenience for the Court that in the event of a matter pending before the Supreme Court the High Court does not have the authority to entertain the same petition under Article 226 of the Constitution.   The writ procedure is however not bound by any hard and fast procedure which is what makes it so convenient for people seeking relief not just in the matters of violation of fundamental rights but anything.

The writ remedies as provided in the Constitution however suffer from the following limitations:

Alternative Remedy

Writs cannot be resorted to when the statute itself provides for adequate and specific legal remedy. An illustration of the same would be the writ of Mandamus which is of a supplementary nature and is used in the case that a party has a clear legal right without any other avenue to resort to, so as to avoid the failure of justice. These writs in no way supersede the remedies that are provided for in the statute but instead supply the want of such a remedy.

The determinant factor for the propriety of the writs is the inadequacy and not the mere absence of all other legal remedies and an existing danger of the failure of justice and where nothing but a specific relief will do what is required. In certain cases of foreign jurisdiction it is well established that these writs will not be issued when the ordinary remedies provided are adequate and available. Further, if the statute contains its own remedy then resort must be had to that remedy and no other.

But in India, the situation is a bit different wherein the Courts have time and again held

that in the event that a fundamental right of a person has been infringed then in that case the mere presence of an alternative remedy would not deny the applicant the benefits of the writ and time and again many decisions of the Supreme Court have upheld the same. It is further to be clarified that the presence or mere existence of any alternative remedy does not affect the jurisdiction of the Court to issue writ. It is construed more of like a rule of convenience rather than a constitutional bar to the filing of writ petitions.

Delay, acquiescence and estoppel

Delay is a pertinent factor in determining whether the court will entertain or refuse to hear the writ application for the grant of relief. This factor becomes all the more important in the case where the grant of such a writ after the said delay would work to prejudice a certain party and affect their rights. The writs of Mandamus although does not find itself covered by the statute of limitation but is subject to the equitable doctrine of laches.

It has been held by the Supreme Court that, "it is imperative; if the petitioner wants to invoke extraordinary remedy available under Article 226 of the Constitution then he should come to the court at the reasonable possible opportunity." Further the court has also state that in case the applicant does not approach the court in a reasonable time after the cause of action arose and if this delay is solely attributable to him then the court has the discretion to deny the relief to the said person.

Illustrations of delay condoned

Although the relief sought under Article 226 might be due to the cause of action arising in the remote past but the same shall be granted under Article 226 and is definitely a matter of judicial discretion to be covered by the doctrine of laches. It can be compartmentalized as a rigid formula of sorts and must depend on a case to case basis. Further the courts have also come to the conclusion that the provisions of the Limitation Act would not apply to the grant of relief under Article 226. But the same statute is however used as a standard to provide for what constitutes a reasonable timeframe. Thus, it is safe to say that a delay would not fatally affect a writ application when the fundamental rights of the applicant are affected.

Illustrations of delay not condoned

In a certain case it was seen that there inordinate delay in the filing of writ application and in the intervening period the respondent who had a license to manufacture had constructed, built and purchased plant and machinery towards the setting up of a distillery, then in that case the delay was not condoned. Further in another case of alleging discrimination and grievance towards promotion of a junior was not condoned as the delay alleged was that of thirteen long years.

Further in a case where a writ petition was moved in 1972 that challenged a 1959 notification based on the ground that particulars of public purpose were not specified was rejected on the ground of laches and delay. It is not wrong to say that any rule which states that a court may not inquire into stale claims is not a rule of law but a rule of practice which is based on the sound and proper exercise of discretion.

It is also to be kept in mind that any party moving the court after delay ought to keep in mind the fact that in alleging a claim for the violation of its fundamental rights, it must not harm the innocent parties if they have accrued rights due to the delay on part of the applicant. To condone or not to condone the said delay is something that is an absolute prerogative of the Courts and is decided on a case to case basis.

Suppression of material facts

Writ petitions are decided on the basis of affidavits. If the petition contains misleading and inaccurate statements or there is apparent suppression of facts then the courts can very well choose not to entertain the said petition. The prerogative writs are not a matter of course the applicant must come to the court in the manner prescribed and must be honest with the court. It has been further held by the Indian Courts that no rights accrue for a petitioner who comes to the court with a petition containing misleading and inaccurate statements. Further, in a case refusing the grant of the writ of Mandamus the Court held that the applicant had misled the Court and that the purpose of the writ was to remedy a wrong and not to promote one. In short, the courts do not grant any relief to any person who does not come to the court with clean hands. There are additional interpretation of the same and if the

person acts with any ulterior motive, not discloses all relevant points and fails to take point that was reasonably close to him then it would result in the court not accepting the said writ petition.

Res judicata

Apart from the above discussed grounds on which the writ petitions may be dismissed, it must be stated at the onset that the petition can be dismissed in limine also by the High Court under its discretion. But this discretion is not available to the Supreme Court with respect to the Fundamental Rights. If any matter involves the violation of fundamental rights then the Court can't dismiss the same without considering it on merits. It would thus not be wrong to state that the principle of res-judicata cannot be applied if the High Court has not decided the matter on merits. In the interest of public at large, finality ought to be there to the binding decisions pronounced by the Courts having competent jurisdiction and that the individual should not be vexed twice over the same kind of litigation. These are the relevant considerations that should be taken into mind while deciding the cases involving alleged breach of fundamental rights.

Role of the Indian Supreme Court In Expanding The Scope Of Writs

The courts have been very flexible in issuance or grant of such writ remedies and have allowed this "prerogative" to become flexible by any measure anyhow. The observations of Mukherjea J. in the case of Basappa are very important in that regard to understand the psyche of the Supreme Court in allowing for such writ remedies and the flexibility that they adopted in their respective approaches, it was stated that "that it was open to the Courts to issue any appropriate writ to any aggrieved party, and his application for a writ would not fail because he had applied for the wrong kind of writ."

The Indian Supreme Court while emphasizing upon the significance of writs as a means of remedies have made it abundantly clear that Article 32 exists itself as a form of fundamental right and the mere existence of an alternative remedy would not make up for a good ground for dismissing any remedy that

effect the very essence of the Fundamental Rights (prima facie). Article 32 provides for a right which is not just procedural but is also substantive in nature. It thus is not marred by the presence of an alternative remedy as it seeks out to serve a high public policy.

As usually alleged that the powers of the Supreme Court under Article 32 are not wide enough, it is pertinent here to point out the fact that mere existence of an alternative remedy is not a good enough ground to dismiss a petition under Article 32 if there exists a fundamental right and a breach, actually or threatened of such a right is prima facie established.

It was also clarified by the Supreme Court that when the alternative remedy is of an onerous or burdensome character then its presence shall not affect the petition alleging infringement of a fundamental right.

It is thus the activism of the Indian Supreme Court and their expansive interpretation that has granted a wider interpretation of rights, maybe even more than what the drafters had conceived.

Concluding Remarks

It can thus be said that the position of writs in India is definitely in a better position than that of England due to the vision of our Constitution makers. The Indian legal framework has provided the writs with definitely more flexibility and the ability to enforce fundamental rights and not just the legal ones, making it more effective than the English system.

Credit must be given to the drafters of the Indian Constitution who were aware of the problems of the prerogative remedies and therefore drafted the provisions related to writs in a manner that it provided for flexibility when being claimed by the aggrieved party.

It is clear from the suggestion above that the writ remedies even though come with their own set of limitations but the same have been awarded such a status in the constitutional framework that it cannot be taken away or amended by anything less than a constitutional amendment.

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NOISE IDENTIFICATION IN SPEECH DATA BY MULTI FRACTAL DE-TRENDED FLUCTUATION ANALYSIS

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ABSTRACT

The effect of different types of noise on human speech data and its identification by multi fractal de-trended fluctuation analysis is studied in this paper. The Malayalam vowel data base consisting of 100 Malayalam native speakers of same age group is utilised for the study. The pink noise ,red noise and white Gaussian noise , are added to the data base and the variation in the singularity spectrum width and the extremum values of Holder exponent(αmin and αmax) are estimated. It was observed that the shift in singularity spectrum width (δα) is an indication of the type of noise. The spectrum width increases with increase in SNR, and show saturation for the clean signal. A Support Vector Machine Classifier (SVM) is utilized to classify the noise types with δα, αmin and αmax as feature vectors and an accuracy of 98% is obtained in predicting and measuring the noise type and noise level..

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Introduction

The speaker's voice is always mixed with background noise when it is received by the listener through any means. Identification of the noise kind and SNR will aid in the removal of noise from voice data for improved perception. Since there is a lack of information on the type and amount of noise, it is difficult to eliminate it. Speech augmentation, speech processing, and crime investigation are all applications of noise identification. Background noise can be used to pinpoint a possible location during communication. Many studies based on linear methods are reported recently for noise identification[1], [2].Feature extraction is a challenging task under environment noise conditions[3], [4].

Nonlinear tools have evolved as an alternative tool in speech and image applications in recent years[5]. Many data pre processing techniques for handling time series data has been proposed[6]. Multifractality in speech time series data has been used in a variety of speech research, including speaker identification, emotion recognition, sentiment analysis[7], speech synthesis, and speech processing. The Linear Predictive Coefficients (LPC) and Mel Frequency Cepstral Coefficients (MFCC), in conjunction with multifractal variables, provide good speaker recognition accuracy [8]. In noisy situations, a combination of Gammatone Frequency Cepstral Coefficients (GFCC) and MFCC is used to verify speaker's identify [9]. Both the correlation dimension and correlation entropy of human voice signals exhibited a statistical reduction after surgical removal of vocalpolyps, according to Zhang et al.[10] ,and both metrics are good approximations of the pathological voice analysis. For the investigation and detection of voice disorder, Huang et al.[11] employed correlation dimension and correlation entropy at the minimal embedding dimension. It has been demonstrated that combining MFCC with vector quantisation improves back ground noise estimation[12]. Sarkar et al. [13] used multifractal detrended fluctuation analysis to resolve the language dependency in speaker recognition with Bengali. Audio magnetotellaric signal noise identification has recently used multifractal spectrum analysis and matching pursuit [14]. In recent years, multi scale chaotic speaker recognition systems and its accuracy issues have become a hot topic of research[15]. Despite the fact that a significant number of prameters are employed to estimate noise in speech, the multifractality of noisy time series has yet to be exploited.

The effect of noise on speech data may be linguistically dependent, and features developed for one language model may not be equally applicable to other language models.Various studies on language processing are reported in various Indian and foreign languages[13], [16], [17]. This study uses the Malayalam voice data base to extract nonlinear features for noise identification. At various SNRs, pink noise, red noise, and white Gaussian noise are mixed to the speech signal. The effects of these forms of noises on the environment have been extensively researched[18].It was obvered that the nature of the shift in the singularity spectrum indicates the type of noise in the data, and that the spectrum width shows a reasonable decline with SNR. For noise detection, the spectrum width ($\delta\alpha$) and extremum values of holder exponents (α_{min} and α_{max}) can be employed as feature vectors. With, $\delta\alpha$, α_{min} and α_{max} as feature vectors, an SVM classifier[19] is used to predict noise type with 98 percent accuracy. The paper is organised as follows: Section II covers the database and categories of noise utilised in the study. Section III explains the details of MFDFA. Section IV discusses the MFDFA data results, statistical analysis and SVM classifier outcome. Section 5 concludes the work.

Database and noise

Short vowel phonemes from the Malayalam audio database were used in this study[20] . The study is based on time series corresponding to short vowel phonemes of speakers sampled at 16kHz, 32kHz, and 44.1kHz. Various age groups are represented in the samples. Table 1 summarises the samples utilised in the analysis.

Table.I
Malayalam Data base and noise types used for study

Age Group	Sampling frequency	Vowel PhonemeIPA	Noise Types	SNR
20-25	16kHz	ആ /a/ ഇ /i/	Pink Red	0dB 3dB 7dB 10dB 14dB
	32kHz	എ /e/ ഒ /o/	White	17dB 20dB
	44.1kHz	ഉ /u/		

Multi fractal de-trended fluctuation analysis (MFDFA)

The MFDFA , a procedure to analyse a biomedical time series, was introduced by Kantelhardt et al. "It is a generalisation of the de-trended fluctuation analysis and can be obtained in five steps"[21].
(a) The profile of the time series x_k of length N and average value $<x>$ is determined by the relation

$$Y(j) = \sum_{k=1}^{j} |x_k - < x >|$$

$$j=1,2,3, ... \tag{1}$$

(b) The profile is divided in to Np segments from both sides to obtain 2Np segments each of length p (=N/Np).
(c) The variance of the time series is determined after least square fit of the time series with appropriate polynomial function.

$$F^2(p,\epsilon) = \frac{1}{p}\sum_{j=1}^{s}\{Y[(\varepsilon - 1)p + j] - Y_\epsilon(j)\}^2 \tag{2}$$

for ε=1,2, ...N_p and

$$F^2(p,\epsilon) = \frac{1}{p}\sum_{j=1}^{s}\{Y[N - (\varepsilon - N_p)p + j] - y_\epsilon(j)\}^2 \tag{3}$$

for ε=N$_p$+1, Np+2, ...,2N$_p$
Where $y_\varepsilon(j)$ is the polynomial used for least square curve fitting. The order of polynomial will be different for different time series and the best fit should be used in order to eliminate local trends in time series. The ε should selected such that $\varepsilon > m+2$,where m is the order of polynomial function.
(d) The q th order fluctuation function is evaluated from the equation

$$F_q(p)$$

$$= \frac{1}{2N_p}\left\{\sum_{\varepsilon=1}^{2N_p}[F^2(p,\varepsilon)]^{q/2}\right\}^{1/q} \tag{4}$$

(e) From th log $F_q(p)$ versus p plots the behaviour of the fluctuation function can be predicted.The $F_q(s)$ can be expressed as a power law

$$F_q(p) = p^{h(q)} \tag{5}$$

Where h(q) is the generalised Hurst exponent.The generalized mass exponent and singularity spectrum can be calculated from the relations

$$\tau(q) = qh(q) - 1 \tag{6}$$

$$f(\alpha) = q\alpha - \tau(q) \tag{7}$$

$$f(\alpha) = q[\alpha - h(q)] + 1 \tag{8}$$

α is the singularity strength or Holder exponent. The width of singularity spectrum (δα) can be calculated by taking the maximum and minimum α values in the f(α) spectrum.

Experiments and Results

A. MFDFA features and analysis

Fifty The analysis is based on a Malayalam speech vowel data set uttered by 100 speakers of the same age. MATLAB code is used to obtain the multifractal spectrum of each sample from the time series[22].The generalised Hurst exponents were varied between -10 and 10, and the best least square fitting polynomial was found to be three. Figures 1-5 show the outcome of multi fractal analysis of five Malayalam vowels.
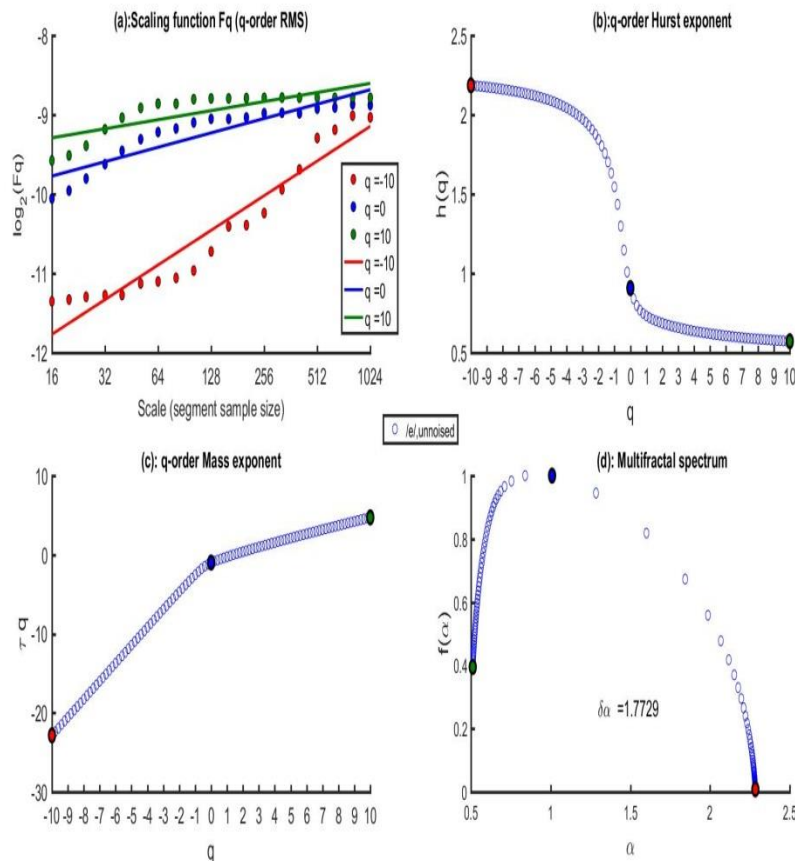
Fig.1. Multifractal analysis of Malayalam vowel ആ /a/
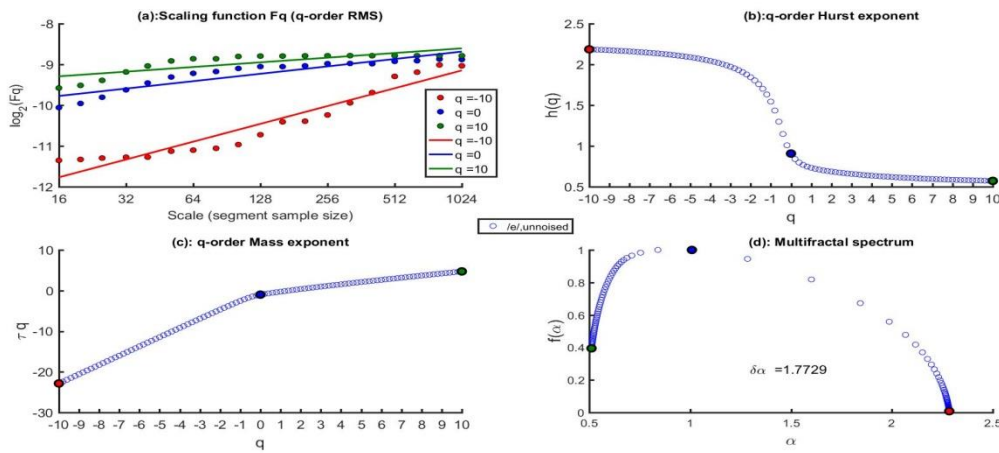
Fig.2. Multifractal analysis of Malayalam vowel എ /e/
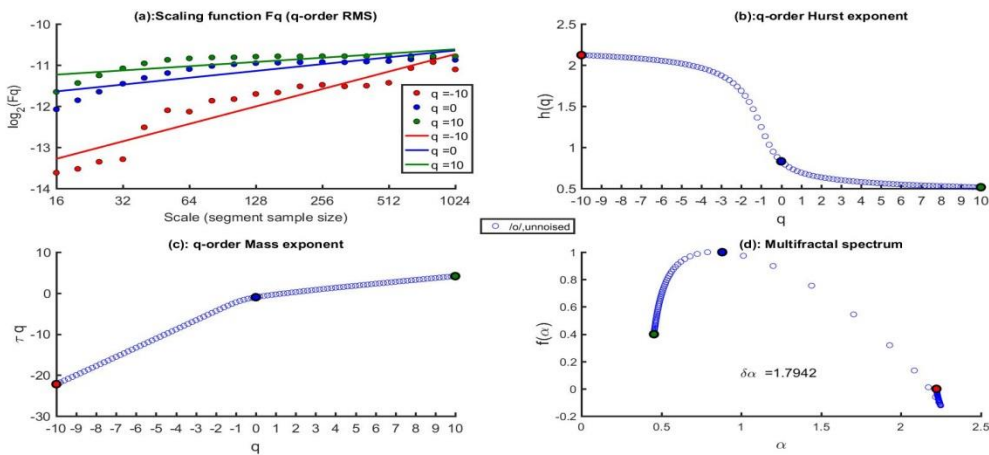
Fig.3. Multifractal analysis of Malayalam vowel ഇ /i/
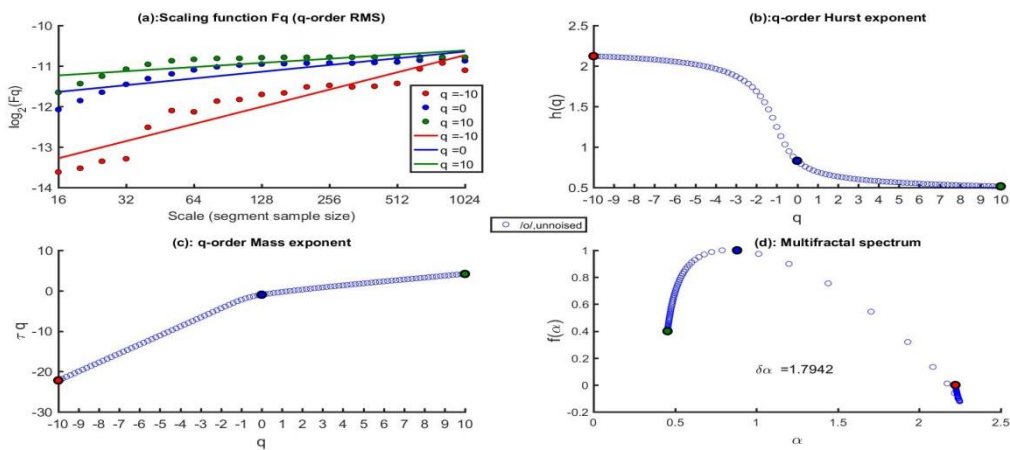
Fig.4. Multifractal analysis of Malayalam vowel ഒ /o/
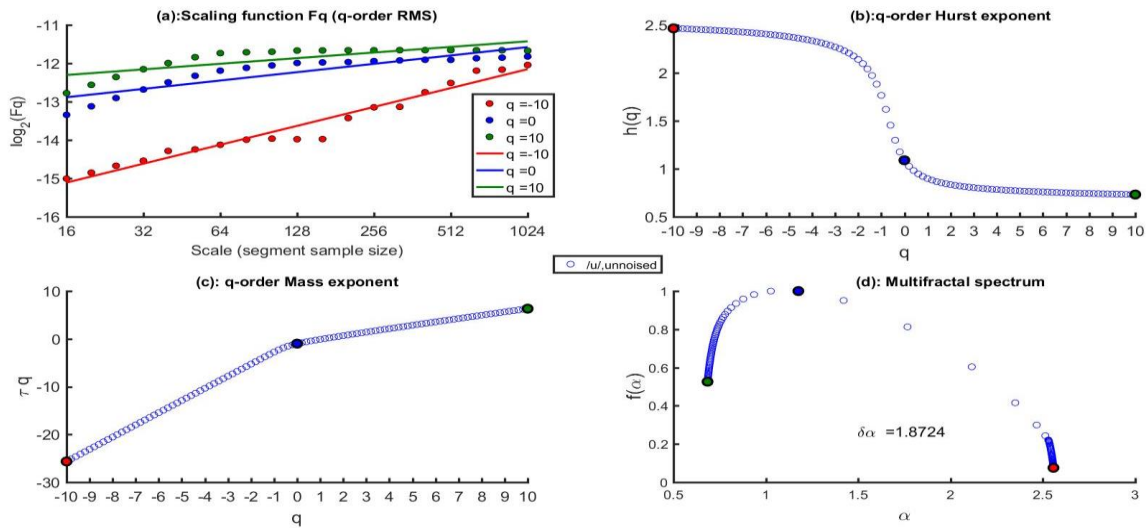
Fig.5. Multifractal analysis of Malayalam vowel ഉ /u/

As demonstrated in figures 1(a) - 5(a), the log of F(q) varies linearly with segment sample size for extremum and null values of q , for all the studied samples. Figures 1(b)-5(b) demonstrate how the q order Hurst exponent decreases with q value for all samples. As shown in figures 1(c)-5(c), the mass exponent(τ(q)) has a curved q dependency. It denotes a multifractal spectrum with exponents that follow a power law.The variation of the generalised hurst exponent shows a unique structure for all vowels and the singularity spectrum width varies from speaker to speaker or even with different emotions of the same speaker.It is evident from figures 1(d)-5(d) that the minimum α for the given speaker is 1.7729 and maximum is 1.9839. When the entire database was examined, it was observed that the spectrum width for almost all samples falls between 1 and 3, and the structure and behaviour of the spectrum appears to be same. Some times the value shows a severe heik may be due to the change in emotion during the utterance.

Three forms of noise are added to the speech data samples to explore the noise impacts in the data: pink noise, white Gaussian noise, and red noise. By combining the three types of noises, samples with signal to noise ratio of 0dB, 3dB, 7dB, 10dB, 14dB, 17dB, and 20dB are created. The effect of noise on all vowels is essentially identical, hence the effect can be used to detect the presence of noise in any speech data. The multifractal spectrum for SNR 0dB in the vowel /a/ of a particular speaker for three different noises is shown in figures 6-8 accordingly.
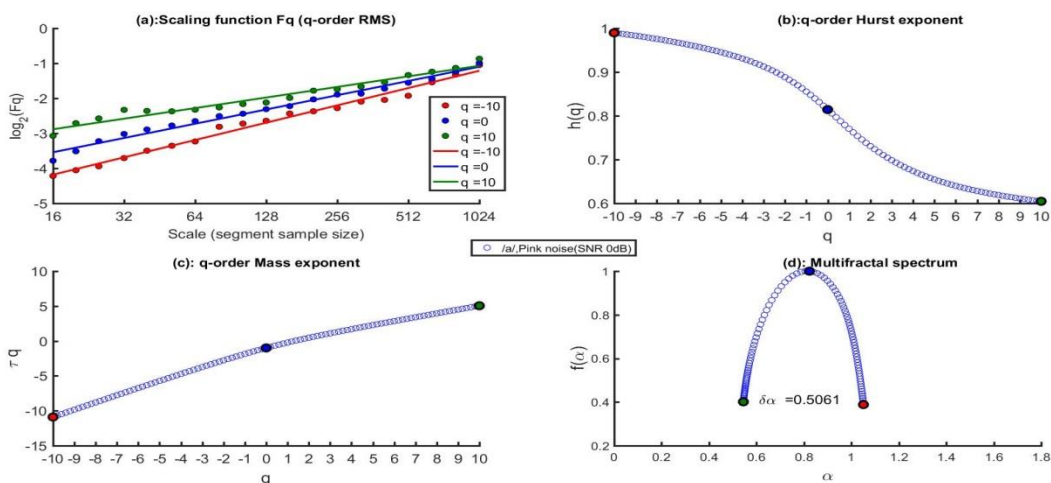
Fig. 6. Analysis of Malayalam vowel /a/ with 0dB pink noise
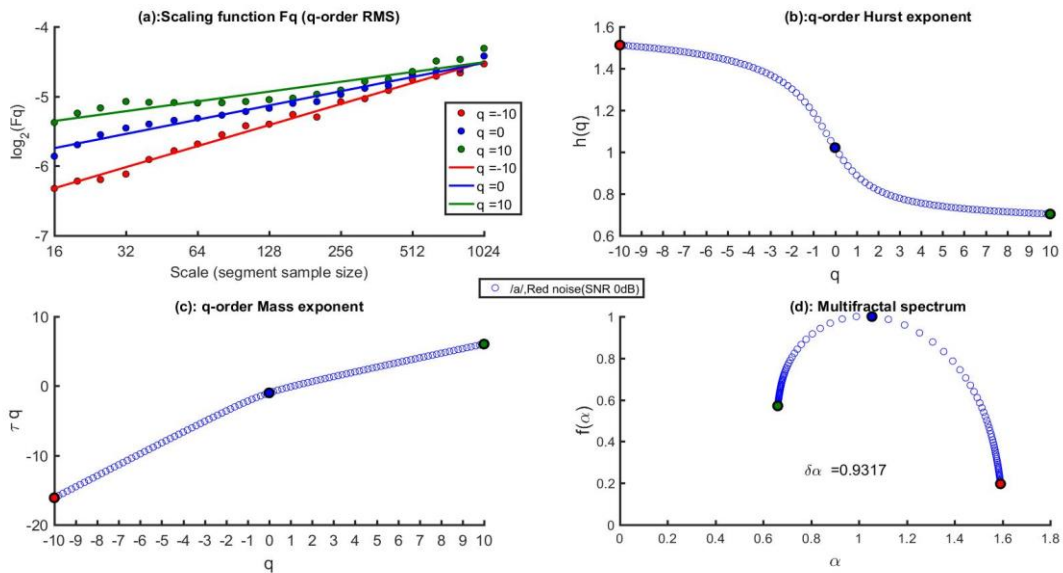
Fig. 7. Analysis of Malayalam vowel /a/ with 0dB red noise
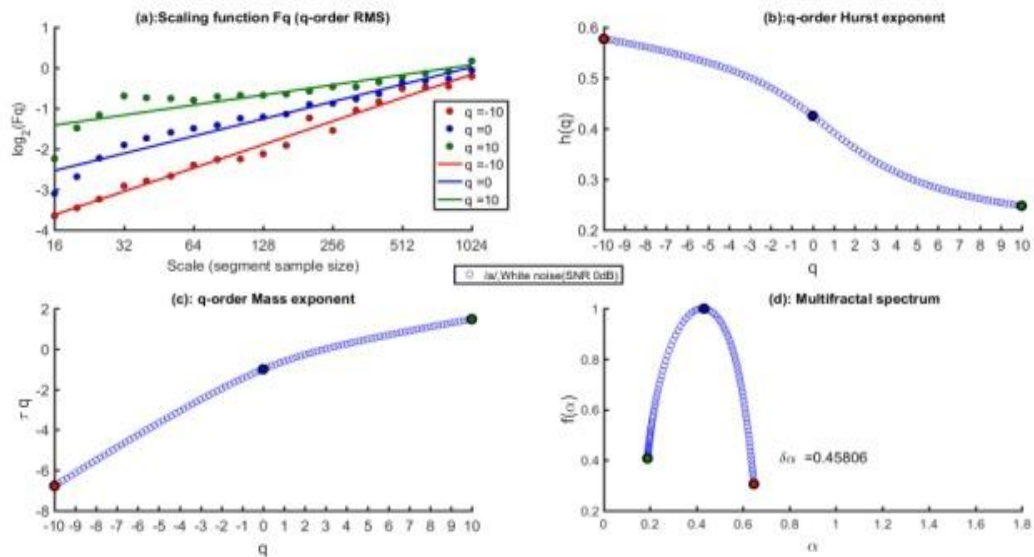
Fig. 8. Analysis of Malayalam vowel /a/ with 0dB white noise

The log plots show a linear relationship even with the addition of different kinds of noise, and the corresponding generalised Hurst exponent also shows the same behaviour. The mass exponent has a curvy dependence on q, and the qth order fluctuation shows a power law relationship with the generalised Hurst exponent. As can be seen in figures 6–8, δα decreases due to the presence of noise in the data. The decrease varies depending on the type of noise. It is highest for white noise and lowest for red noise.

The effect of noise causes the singularity spectrum to shift and, as a result, the values of the minimum and maximum of the Holder exponent modifies. The minimum shifts to the right and the maximum shifts to the left for all cases (Figures 6 -8).

Despite the fact that both signals have the same SNR,

the amount of shifting differs.Figure 9 depicts the f(α)

spectrum with additive noises ranging from 0 to 20 dB.
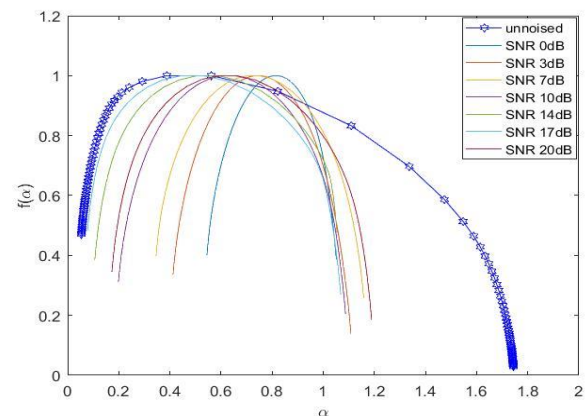
Fig.9(a) Singularity spectrum with additive pink noise
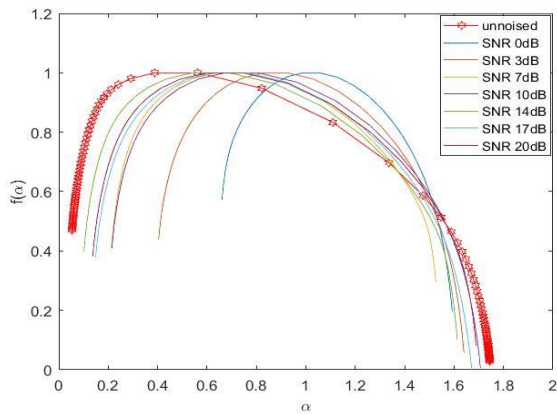
Fig.9(b). Singularity spectrum with additive red noise
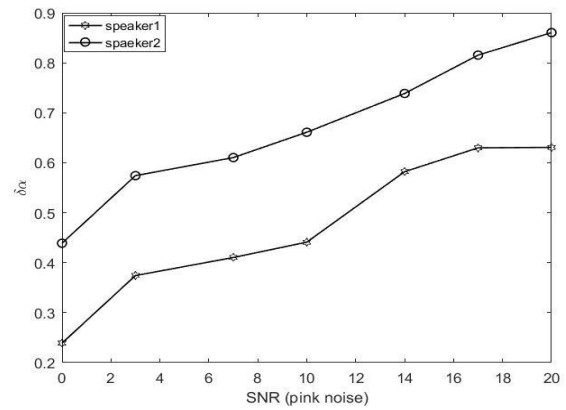
Fig.10(a) Singularity spectrum width of two different speakers for pink noise
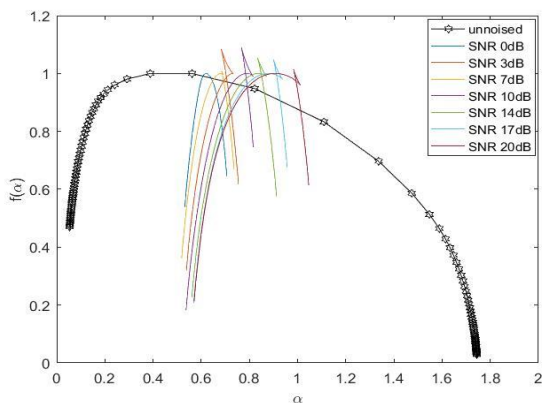
Fig.9(c). Singularity spectrum with additive white noise
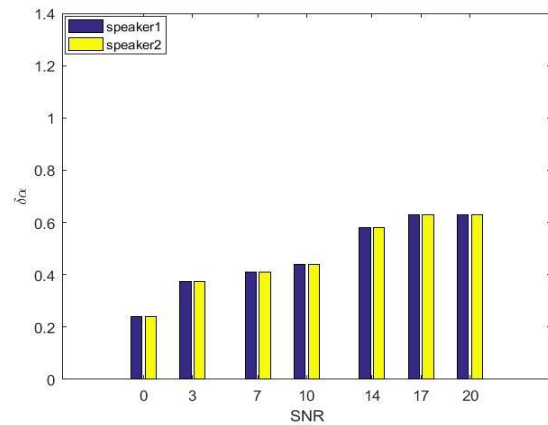
Fig.10(b). Singularity spectrum width of two different speakers for pink noise

With SNR, there is a systematic reduction in $\delta\alpha$, but the reduction is not the same for all types of noise. For a given SNR, the decline is greatest for white noise and lowest for red noise. The asymptotic value of the $\delta\alpha$ tends to the value for unnoised data.

The fall in samples show the same pattern evenif the value of $\delta\alpha$ varies from sample to sample. The reduction in the $\delta\alpha$ shows a particular pattern. Figures 10-12 show the values of $\delta\alpha$ for various sorts of noises for two different speakers.
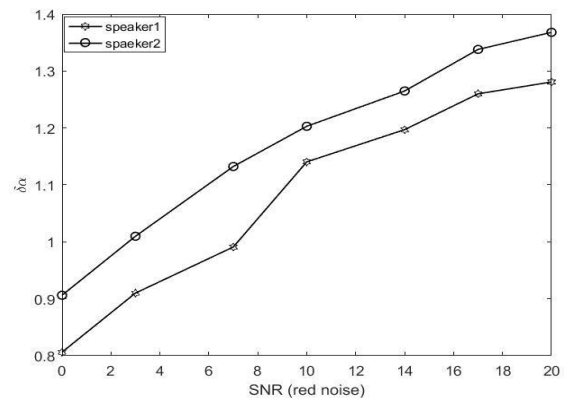
Fig.11(a). Singularity spectrum width of two different speakers for red noise
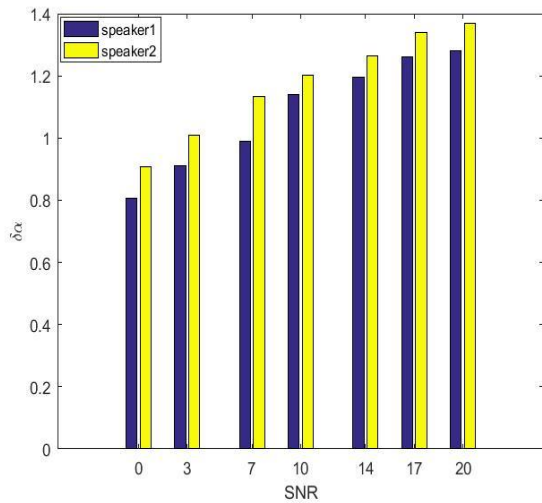
Fig.11(b) Singularity spectrum width of two different speakers for red noise
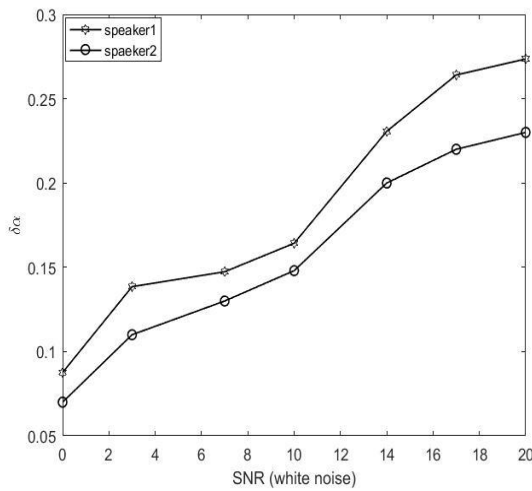
Fig.12(a) Singularity spectrum width of two different speakers for white noise
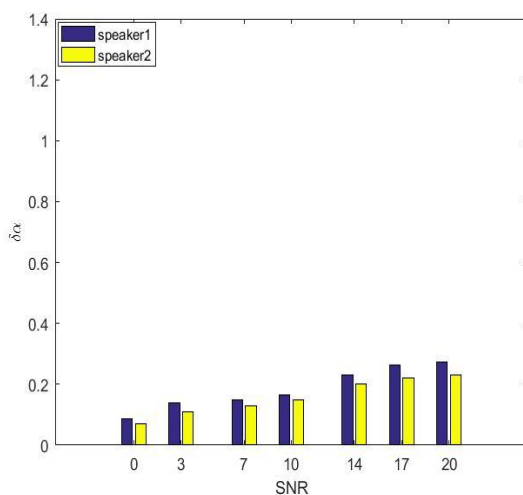
Fig.12(b). Singularity spectrum width of two different speakers for white noise
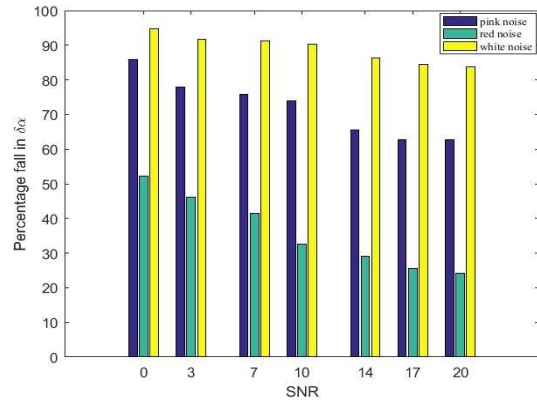
Fig.13. Average percentage reduction in singularity spectrum width with SNR

Figure 13 shows the average percentage reduction in $\delta\alpha$ for samples from 100 speakers for the three types of noises with SNR 0dB,3dB,7dB,10dB,14dB,17dB and 20 dB.

Table II summarises the average percentage of rise in α_{min} and fall in α_{max} with error limit due to the addition of 0dB noises in the samples. The % accuracy of noise identification is measured by an SVM classifier with singularity spectrum width, and extremal holder exponents as feature vectors. The best accuracy percentage is 98 percent for the Gaussian kernel.

Table II
Nonlinear features used for noise identification

	Pink noise(0dB)	Red noise(0dB)	White noise(0dB)
$\delta\alpha$	85±20	50±15	95±18
α_{min}	400±38	550±50	100±20
α_{max}	8.57±2.3	3.71±1.1	62.85±8.8

B. Support Vector Machine(SVM) classifier
To differentiate the speech signals of the pathological voices from the normal subjects, SVM classifier is employed in this paper. SVM, developed by Vapinic[23], is a binary classifier and is a strong and robust classification technique in the statistical learning field[24], [25] and is used for effective classification[26] .The SVM uses a discrimination function given by Eq(9)

$$f(x) = sgn\left(\sum_{i=1}^{N} \alpha_i y_i K(x_i, x) + b\right) \quad (9)$$

The kernel function is K(xi,x) in this case. The training set data is xi, and the corresponding labels are yi. Linear functions, Gaussian functions, polynomial functions, and

sigmoid functions are the most popular kernel functions in SVM

Table III
Results of SVM classifier for various kernels

Feature	Accuracy %			
	K1	*K2*	*K3*	*K4*
$\delta\alpha$	64%	53%	58%	53%
α_{min}	60%	55%	61%	60%
α_{max}	61%	58%	59%	68%
α_{min} and α_{max}	71%	75%	78%	76%
α_{min} ,α_{max} and $\delta\alpha$	97%	91%	98%	94%

K1-Linear kernel
K2-Polynomial kernel
K3-Gaussian kernel
K4-Sigmoid kernel

The % accuracy of noise identification is measured by an SVM classifier with singularity spectrum width, and extremal holder exponents as feature vectors and the result is illustrated in Table 3. The best accuracy percentage is 98 percent for the Gaussian kernel.

Conclution

In Multi fractal de-trended fluctuation analysis of voice samples, a reduction in the singularity spectrum breadth and the extremal Holder exponents was observed due to the presence of additive noise. These characteristics can be used as feature vectors to distinguish between different types of noise in speech data. According to the results of a sample of 100 Malayalam native speakers, the feature vectors can be utilised to distinguish pink, red, and white noises. SNR has an effect on the reduction, and the SNR rate can be computed by measuring the percentage reduction in the parameters. Noise types are recognised using feature vectors and an SVM classifier, with a noise prediction accuracy of 98 percent.

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FILIPINO CULTURAL VALUES, PRACTICES, AND OTHER REALITIES MIRRORED IN THE SHORT STORIES OF NVM GONZALES

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ABSTRACT

This paper is part of a bigger paper that investigated how Filipino culture is expressed and portrayed through Philippine English using nativization devices. It is anchored on Benedict's Patterns of Culture which speaks of the paramount importance of learned behavior in human existence. Language is the medium through which the culture of a place is reflected. Thus, this present study examined how Philippine English is appropriated to express Filipino culture. This holds in any language culture. This study, therefore, probed how Filipino culture is reflected in the short stories written by a Filipino author through Philippine English. Further, this study adopts cultural studies which assume that the human consciousness is not entirely autonomous and that what appears to it on the first impression as the truth is most frequently the result of naturalization and appropriation of unexamined impressions. Things are not as self-evident as one believed. And this is because man is always in relation and under the power of the structures in the midst of which he exists, as culture affects people's behavior. People think or speak words, but in fact, their words speak them – because they do not create them. People inherit them from their way of life, and they determine how they think. Socio-cultural and even historical features come into play in the creation of literary texts for the effective communication of their messages. Filipino cultural values, practices, and other Philippine realities were clearly illustrated in the short stories. Filipino cultural values, practices, and other Philippine realities are clearly expressed through the use of nativization devices.

Keywords: : *Filipino culture value, practice, NVM Gonzales, short stories, nativization devices*

Introduction

The chosen short stories were written by a multi-awarded Filipino writer, a national artist internationally recognized. Critical reviews of his works here and abroad all helped raise his reputation as a writer. Moreover, these short stories were chosen based on their having won a literary award, having been anthologized, and having been compiled by the author. Gonzales's short stories capture the slow pace of life and the cadences of the Mindoro dialect of the Tagalog language. His first story collection, *Seven Hills Away*, won him a fellowship to Stanford and identified him as the first Filipino writer to appear on the post-World War II literary scene. Since the publication of *Seven Hills Away* (1947), a number of his stories have been anthology-hopping.

Some short stories in *Mindoro and Beyond* like *Serenade* won the Philippine Press Award in 1964 and *The Tomato Game*, originally published in Asia-Philippines Leader, was a winner of the 1972 Carlos Palanca Memorial Award for Short Story in English. Gonzales published his stories in magazines in the United States, England, and Australia as well as in the country. These stories have been translated into Chinese, Indonesian, Malay, German, and Russian.

Since his winning a Rockefeller Foundation fellowship in Creative Writing in 1948, N.V.M. Gonzales received other awards including the Philippine Republic Award of Merit for Literature in English, The Republic Cultural Heritage Award for Literature, and the Rizal Pro Patria Award. He was named National Artist for Literature in 1997 and was an International Writer-in-Residence at the University of the Philippines in the '90s.

Language and culture are closely intertwined as posited by Whorf (1991). He argued that language influences how individuals think and perceive the world. Several researchers have attempted to test this assumption with a variety of approaches. One of these is the cultural accommodation hypothesis, which posits that individuals adjust their responses (or behaviors) in a way that corresponds to the culture with which they have an encounter (Ralston et al. 1995a). Cultural accommodation specifically suggests that individuals think and act differently depending on the language they are using (Ralston et al. 1995a).

This present study investigated how Filipino culture is expressed and portrayed through Philippine English by the use of nativization devices. It is anchored on Benedict's *Patterns of Culture* which speaks of the paramount importance of learned behavior in human existence. Benedict posits that culture provides patterning. Benedict's first chapter, "The Science of Custom" (1934) is beautifully written and crystal clear:

"No man ever looks at the world with pristine eyes. He sees it edited by a definite set of customs and institutions and ways of thinking. Even in his philosophical probing, he cannot go behind these stereotypes; his very concepts of the true and the false will still have reference to his particular traditional customs. John Dewey has said in all seriousness that the part played by the custom in shaping the behavior of the individual as over against any way in which he can affect traditional custom, is as the proportion of the total vocabulary of his mother tongue over against those words of his baby talk that are taken up into the vernacular of his family."

This holds in any language culture. This study, therefore, probed how Filipino culture is reflected in the short stories written by a Filipino author through Philippine English. Further, this study adopts cultural studies which assume that the human consciousness is not entirely autonomous and that what appears to it on the first impression as the truth is most frequently the result of naturalization and appropriation of unexamined impressions. According to Foucault (1997), "things are not as self-evident as one believed …" And this is because man is always in relation and under the power of the structures in the midst of which he exists, as culture affects people's behavior. People think or speak words, but in fact, their words speak them – because they do not create them. People inherit them from their way of life and they determine how they think (Hornedo, 2002).

Language is the medium through which the culture of a place is reflected. Thus, this present study examined how Philippine English is appropriated to express Filipino culture.

Hans-Robert Jauss' Reception Theory is a version of reader response literary theory that emphasizes each particular reader's reception or interpretation in making meaning from a literary text. Reception theory is generally referred to as audience reception in the analysis of communications models. The cultural theorist Stuart Hall has been one of the main proponents of reception theory, having developed it for media and communication studies from the literary and history-oriented approaches. His approach, called the encoding/decoding model of communication, is a form of textual analysis that focuses on the scope of "negotiation" and "opposition" by the audience. This means that a "text" — be it a book, movie, or other creative work — is not simply passively accepted by the audience, but that the reader/viewer interprets the meanings of the text based on her or his cultural background and life experiences. In essence, the meaning of a text is not inherent within the text itself but is created within the relationship between the text and the reader.

Methodology

Hans-Robert Jauss' Reception Theory is a version of reader response literary theory that emphasizes each particular reader's reception or interpretation in making meaning from a literary text. Reception theory is generally referred to as audience reception in the analysis of communications models. The cultural theorist Stuart Hall has been one of the main proponents of reception theory, having developed it for media and communication studies from the literary and history-oriented approaches. His approach, called the encoding/decoding model of communication, is a form of textual analysis that focuses on the scope of "negotiation" and "opposition" by the audience. This means that a "text" — be it a book, movie, or other creative work — is not simply passively accepted by the audience, but that the reader/viewer interprets the meanings of the text based on her or his cultural background and life experiences. In essence, the meaning of a text is not inherent within the text itself but is created within the relationship between the text and the reader.

A close reading and textual analysis of the short stories were employed to crystallize the devices utilized by N.V.M. Gonzales in indigenizing his creative process. The short stories were read several times over before they

were analyzed and summarized. The devices were categorized into lexical and syntactic levels and rhetorical patterns. Lexical items that contextualize the Filipino culture were identified. From the words used, the study moved on to the sentence and paragraph levels. Culture-bound features were listed down by categories and were explained. The present study adopts some of the concepts of Hermosa's and de la Rosa's studies like the investigation of the linguistic devices used by the creative writers in writing the short stories, the identification of Filipino cultural values, and the determination of socio-economic and socio-political realities of the country as reflected in the short stories. Filipino cultural values and practices were ascertained as well as the socio-political and socio-economic realities reflected in the short stories.

Results and Discussion

Language and culture are closely intertwined as posited by Whorf (1991). He argued that language influences how individuals think and perceive the world. Several researchers have attempted to test this assumption with a variety of approaches. One of these is the cultural accommodation hypothesis, which posits that individuals adjust their responses (or behaviors) in a way that corresponds to the culture with which they have an encounter (Ralston et al. 1995a). Cultural accommodation specifically suggests that individuals think and act differently depending on the language they are using (Ralston et al. 1995a).

Philippine literature in English has continued to flourish, giving rise to new generations of writers. The problem among Filipinos writing in English on native Filipino soil is to come up with new themes which are authentically Filipino, seen in such writers as Cirilo F. Bautista, Isagani Cruz, Ophelia Dimalanta, Marjorie Evasco, and F. Sionil Jose, who write with genuine Filipino voices in English. Such writers are contributing to an identifiable corpus of Philippine literature in English and are being published and translated internationally as writers in English. These authors write from their background as Filipinos not in exile, but as bicultural internationally-oriented personalities in the Philippines (Gonzales 2008). Likewise, this study analyzed the short stories written by another Filipino writer, NVM Gonzales, if he can portray the Filipino way of life through the nativization devices used in coming up with Filipino flavored fiction.

Gonzales welcomes the idea that Filipinos have finally appropriated English within their cultural needs, thus emancipating themselves from the clutches of American English. Filipinos have taken the language for their creative uses, emancipation which is bound to result in novelty in the creative uses of the patterning of English at the lexical and syntactic level, in addition to semantic and phonological innovation (Tupas 2004). This form of linguistic emancipation gives Filipino writers just like NVM Gonzales, whose short stories are the subject in this present study, the chance to change the patterns of English to be able to reflect local realities.

Kachru (1997) laid down this proposition: "Once a language establishes its autonomy, it is liberated." To which Filipino poet Gemino Abad (1997) exuberantly and memorably responded in a writer's forum: "English is now ours. We have colonized it too." This has been manifested in the writings of the Filipino writers whose works have been recognized locally as well as internationally.

A linguist commented on the motivations of Filipinos for learning English:

"Contrary to predictions, positive attitude towards

Americans were not crucial in the Filipinos desire to learn

Rather, feelings of satisfaction with the Philippine community were associated with the integrative motive and

English language achievement. This association suggests that

English is perceived in part as a Philippine language, and

that the integrative motive to learn English in the Philippines

derives from an identification with a set of Filipinos, and

this particular set is believed to constitute a Filipino English

speaking community." (Bautista 2000)

And a quote from fictionist, poet, and foremost figure in Philippine letters Nick Joaquin in 1964, (Hermosa 1986), shows that he had

observed the same "nativizing" tendency in Philippine literature.

"All these very young writers today are doing something with the English language. It no longer is simple English. These young boys are making it their English. It's some sort of terrifying English ... It couldn't be expressed by an American, British, or Indian."

This study is also supported by De la Rosa's study (1985) where she investigated the linguistic and rhetorical devices that a creative writer employed to portray an indigenous culture categorized into lexical levels such as borrowing, hybridized items, and calquing and syntactic levels such as the use of simile and metaphor, translation equivalence or Filipinisms, and nativized imagery as well as rhetorical patterning.

Another finding in this study is that Filipino cultural values, practices, and other Philippine realities were clearly illustrated in the short stories. This finding is in accord with Hermosa's study which showed that the Filipino short story writers have expressed their national or cultural identity by addressing themselves to the politico-socio-economic events or issues of their day, enshrining their sociocultural values and national aspirations in their work, and by using devices of contextualization which have made the English language a code for articulating the thoughts and sentiments and the experiences of the Filipinos. It has been proven that English can be used locally to fit cultural, economic, and socio-political needs. In general, English has been nativized to reflect the local culture.

Conclusion

The thirty short stories of NVM Gonzales which made use of nativization devices, ably reflected aspects of an indigenous way of life,

particularly that of Mindoro. It gave a distinctive Filipino cultural identity to the texts. These short stories have shown how the writer has appropriated the English language to interpret his native sociolinguistic environment. Socio-cultural and even historical features come into play in the creation of literary texts for the effective communication of their messages. A full appreciation of the use of words and their meanings in any literary text can come only if situated in the proper sociolinguistic context.

The domestication of the English language and its pragmatic use to mirror a unique culture show that Philippine English has entered the realm of world Englishes contributing to the dynamism of language as it confronts communication problems. Filipino cultural values, practices, and other Philippine realities were clearly illustrated in the short stories. Of the 30 stories, 24 of which are rich in cultural values and the most cited value is hard work/industry. The most popular practices are the offering done to ward off evil spirits to produce a good harvest, the warm accommodation of visitors, and the celebration of feasts. Likewise, the pragmatic bases for localized innovations are expressed vividly in the texts most of which are usually found in stories set in the hinterlands.

Filipino cultural values, practices, and other Philippine realities are clearly expressed through the use of nativization devices. This implies that the English language can be used as a code for articulating the thoughts and the experiences of the Filipinos; that though an alien code, it is capable of verbalizing Filipino cultural identity when flavored/colored by local features, meanings are intensified.

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SEROEPIDEMIOLOGICAL DETECTION OF CATTLE ANAPLASMOSIS IN WESTERN SAMAR, PHILIPPINES

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ABSTRACT

This study detected the presence of Anaplasma antibodies using the Card Agglutination Test (CAT) and morphologically identified Anaplasma spp. through Blood Parasite Examination (BPE) in the 200 cattle sampled in 15 municipalities of Western Samar. A Chi-square test was used to determine the difference in the infection rate among age group and sex of cattle sampled. The CAT result revealed 52.5% seropositive and 47.5% seropositive to Anaplasma spp. infection. This result confirmed, for the first time the presence of this disease-causing organism among cattle in Western Samar. The disease was present in all age brackets; with age groups, 0-12 months and 13 months and older found to have a higher infection rate; and prevalent in both females and males with the male having a slightly higher seropositivity rate. However, no significant difference was found when the samples were grouped according to age brackets and according to sex. The disease was found to be most prevalent in Calbayog City; and Daram, Jiabong, Marabut, Motiong, Tagapul-an and Sto. Niño with more than fifty percent of the samples found to be positive with the Anaplasma spp. The Blood Parasite Examination positively identified morphologically both Anaplasma marginale and A. central, with A. marginale causing the greatest number of infections among cattle. BPE also showed positive results parallel to the trend in the result of the CAT as a serological test. Concerned agencies in the province and the region should take the necessary steps to prevent and control the spread of the disease to protect the health of the cattle population as well as the health of the people in the said area

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Keywords: Anaplasma spp., Card Agglutination Test, Blood Parasite Examination

Introduction

Anaplasmosis is an infectious transmissible disease of cattle, sheep, and goats caused by bacterial pathogens of the genus Anaplasma and characterized by progressive anemia (Smith, 2002). Anaplasmosis is a vector-borne, infectious disease in cattle caused by the rickettsial parasites Anaplasma marginale and A. central. It occurs primarily in warm tropical and subtropical areas (Kieser et.al.,1990; Burton and Engelkirk, 2002, Stoltsz, 1993). The disease is not contagious but is transmitted most by ticks. It can also be transmitted via contaminated needles, dehorning equipment, castrating knives, tattoo instruments, and biting flies and mosquitoes. The intracellular parasite destroys red blood cells. It causes anemia, fever, weight loss, breathlessness, uncoordinated movements, abortion, and death. Diagnosis is based on clinical signs and the examination of blood under a microscope for evidence of the parasite 9Richey et al.,1996; McElwain and de Vos, 2000)

In the Philippines, anaplasmosis has been reported to affect the cattle industry in Biñan, Laguna; Bondoc Peninsula, Quezon; Negros Oriental; Masbate, Batangas, and Bulacan (Molina and Montenegro, 1976; Derrota et al, 2002) Despite in detection in Northern Samar (Amit and Ramis, 2005) the occurrence and prevalence of anaplasmosis in cattle needs to be ascertained in Western Samar since no scientific study has been conducted yet to this end where native cattle species exist in the province along with imported breeds following the national goal of improving the native stock. Importations come mainly from Australia and several neighboring provinces, especially in Masbate, which have been reported by Derrota (2007) to had confirmed outbreaks of Anaplasmosis in 1993 and 2003.

In the study of Amit (2019), it was revealed that Anaplasmosis is present in 33% of the cattle in the province of Northern Samar on the Card Agglutination Test (CAT) result of the blood samples taken from the experimental animals in the area during the study period. The age and sex of the animals are not considered factors in the prevalence of the disease since cattle of all ages and sexes are susceptible to the disease. In another study by Amit (2019), the prevalence of Babesiosis

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infection was also present in the cattle in the province of Northern Samar.

This study was done to establish baseline information regarding the prevalence of anaplasmosis among cattle in Western Samar using the Serological Card Agglutination Test.

Methodology

This study was done in Western Samar province located in the western part of Samar Island, within the eastern part of Visayas. One of the responses of the government to the very low productivity condition of the farmers is cattle dispersal. In the last decade, a total of 198 head cattle was distributed to selected municipalities in Samar province. The stock for cattle dispersal mostly came from Masbate. But since some farmer-beneficiaries would swap their cattle with carabao as they believe it to be essential in farming activities than cattle. Thus, cattle usually end up in slaughterhouses. This practice accounted for the dwindling cattle population in the province. During the conduct of this study, the province has 1240 head of cattle based on the report of the Provincial Agriculturist Livestock Section. From this reported population, 200 heads were selected for blood sampling analysis.

Animal Sampling

Fifteen (15) municipalities of the Province of Western Samar were pre-identified where the sample population of cattle was randomly selected for this study. Out of the total cattle population, 200 heads (regardless of age, sex, and breed) were chosen for blood sample collection examined for the presence of the parasitic disease under study. The sample size is only 200 because of limitations in the Card Agglutination Test (CAT) Kit from the Philippine Animal Health Center. This study is different from Wen et al. (2016) as they have utilized Loop-mediated isothermal amplification (LAMP) as a DNA amplification technology to target the DNA of Anaplasmosis.

Collection of Blood Samples

After identifying the animals at the barangay level, blood sample collection for each of the cattle was done. The animal was first properly restrained. When the animal was already at ease, the site of blood collection was sterilized with cotton soaked in 70% ethyl alcohol. Blood collection was accomplished by using a 9 mL heparinized vacutainer with an attached needle and special adaptor. The jugular vein was anchored by placing the thumb of the left hand in the jugular furrow to oculate the vein, while the vacuum tube was manipulated by the right hand. Once the needle was in the vein, blood flowed into the tube.

Immediately after blood collection, a blood smear was prepared by putting a drop of blood from the needle of the vacutainer on a glass slide. The remaining collected blood remained in the tube. Both the tube with the blood sample and the prepared blood smear were labeled with the animal identification. The blood smear was air-dried, after which it was fixed with 10% methanol for 10 seconds, and again air-dried and placed in a slide box. These were stored in a container with cracked ice and transported to the CVM Diagnostic Lab where serum from each of the vacutainer was pipetted and transferred to sterile serum vials for further storage at 20^0C until such time that the 200 blood samples were completely collected and prepared. These serum samples were packed in the air to PAHC Parasitology Lab for serological test using Card Agglutination Test. The prepared slides were then brought to the CVM Parasitology Laboratory for the identification of the characteristics of anaplasma bodies. Microscopic findings were tabulated according to the anaplasma species seen in the smear.

Data Analysis

Prevalence rate of anaplasmosis was determined through CAT and BPE, with the formulas:

CAT Prevalence Rate

$$= \frac{Number\ of + sera}{total\ number\ og\ blood\ sera\ examined} \times 100$$

BPE Prevalence Rate $=$

$$\frac{Number\ of + blood\ smears}{total\ number\ of\ blood\ smears\ examined} \times 100$$

Seropositivity rate, an indicator that the animal was infected through CAT, was determined as the proportion of animals positive for anaplasma antibody using the formula:

Seropositivity Rate

$$= \frac{Number\ of\ positive\ sera}{total\ number\ of\ serum\ samples\ examined} \times 100$$

The results of the CAT and BPE were recorded on prepared datasheets. The data gathered were

also analyzed using percentages and were presented in tabular forms with a graphic representation of data.

Results and Discussion

Prevalence Rates of Anaplasmosis among Sampled Cattle and its Distribution by Representative Municipalities using CAT and BPE

Out of the 200 samples, 105 or 52.50% were seropositive to anaplasma infection; thus, this study confirmed the prevalence of this infectious disease in Western Samar. However, 95 or 47.50% of the sampled animals were seronegative to CAT. On the other hand, the BPE resulted in 81 or 40.50% positive and 119.59.50% positive. The researcher believed that this finding was more serious when compared to the study of Amit (2019) in Northern Samar where the prevalence rate was only 37.50%.

The data in Table 1, graphed in figure 2, shows that CAT and BPE had parallel results in detecting anaplasma infection among cattle. However, CAT detected a higher prevalence rate than BPE. This means that CAT was more efficient than BPE in detecting anaplasma

infection in the bold samples from cattle in the study area.

Among the 15 municipalities, Tagapul-an showed the highest seropositivity of 16.00% through CAT and 11.00% using BPE, followed by Jiabong of 13.00% through CAT and 11.00% through BPE. The seronegative result for CAT, on the other hand, may not mean an absence of the disease in these cattle samples. In an area where seropositivity to Anaplasma spp. is prevalent, the seronegative result does not mean non-infection on the animal, referred to as "false negative" (Mollo, 1999). Molloy further explained that this observation could be explained by some biological sources such as the animal has recently been exposed to the organism and has not yet formed a detectable quantity of antibodies, the animal was exposed to the organism and became infected, but never formed detectable quantity of antibodies; the animal in the early phase of infection; the tissue or fluid supplied contains only small, the undetectable quantity of the antigen, the animal has produced a large number of antibodies that are saturating the antigen, preventing binding of antibodies in the test.

Table 1. Prevalence Rates of Anaplasmosis among Sampled Cattle and its Distribution by Representative Municipalities using Card Agglutination Test (CAT) and Blood Parasite Examination (BPE)

Municipality		Sampled Cattle		CAT Positive		Negative		BPE Positive		Negative	
		N	%	N	%	N	%	N	%	N	%
1.	Almagro	8	4.00	4	2.00	4	2.00	2	1.00	6	3.00
2.	Calbayog city	7	3.50	6	3.0	1	0.50	4	2.00	3	1.50
3.	Catbalogan	5	2.50	2	1.00	3	1.50	2	1.00	3	1.50
4.	Daram	9	4.50	5	2.50	4	2.00	4	2.00	5	2.50
5.	Gandara	5	2.50	2	1.00	3	1.50	0	0.00	5	2.50
6.	Jiabong	44	22.00	26	13.00	18	9.00	22	11.00	22	11.00
7.	Marabut	18	9.00	10	5.00	8	4.00	9	4.50	9	4.50
8.	Motiong	8	4.00	2	1.00	6	3.00	2	1.00	6	3.00
9.	San Jorge	6	3.00	2	1.00	4	2.00	2	1.00	4	2.00
10.	Sta. Margarita	2	1.00	0	0.00	2	1.00	0	0.00	2	1.00
11.	Tagapul-an	59	29.50	32	16.00	27	13.50	22	11.00	37	18.50
12.	Villareal	8	4.00	3	1.50	5	2.50	3	1.50	5	2.50
13.	Zumaraga	14	7.00	7	3.50	7	3.50	6	3.00	8	4.00
14.	Paranas	2	1.00	1	0.50	1	0.50	1	0.50	1	0.50
15.	Sto.Nino	5	2.50	3	1.50	2	1.00	2	1.00	2	1 .00
Total		200	**100.00**	105	**52.50**	95	**47.50**	81	**40.50**	119	**59.50**
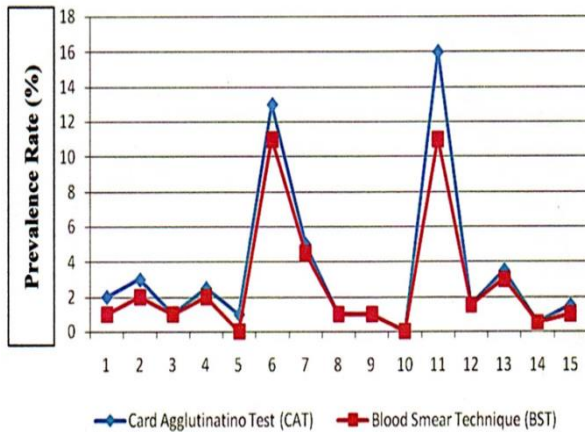
Figure 1. Prevalence Rates of Anaplasmosis in Selected 15 Municipalities in Western Samar

Legend: Municipalities
1 – Almagro6 – Jiabong11 – Tagapul-an
2 – Calbayog city7 – Marabut12 – Villareal
3 – Catbalogan8 – Motibong13 – Zumaraga
4 – Daram9 – San Jorge14 – Paranas
5 – Gandara10 – Sta. Margarita15 – Sto. Nino

Prevalence Rate of Anaplasmosis According to Sex and Age Groups, using CAT and BST

When the sampled cattle were grouped according to sex and age, the CAT and BST results consistently showed that the prevalence rate of anaplasmosis was highest among the female in the age group 25 months and older. On the other hand, the 0-6 months old age group had the lowest prevalence rate. As Mensalvas and Garcia (1958) reported, they have confirmed in their studies "earlier observations by investigators that calve below one year of age seldom get the disease." Regarding all age groups, the prevalence rate in male cattle was 14.00% using the CAT while only 9.00% using the BST; among females, the prevalence rate was 38.00% using the CAT while 31.50% using the BST.

Table 2 presents the prevalence rate of anaplasmosis, through CAT and BST, among cattle in Western Samar.

Table 2. Prevalence Rate of Anaplasmosis According to Sex and Age groups, using CAT and BST

CARD AGGLUTINATION TEST (CAT)										
Age Group (mos.)	Sampled Cattle		Male				Female			
			Positive		Negative		Positive		Negative	
	N	%	N	**%**	N	%	N	%	N	%
0-6	5	2.50	1	0.50	2	1.00	1	0.50	1	0.50
7-12	18	9.00	6	3.00	6	3.00	4	2.00	2	1.0
13-24	40	20.0	9	4.50	7	3.50	8	4.00	16	8.00
25-Above	137	68.50	12	6.00	9	4.50	63	31.50	53	26.50
Total	**200**	**100.00**	**28**	**14.00**	**24**	**12.00**	**76**	**38.00**	**72**	**36.00**
BLOOD SMEAR TECHNIQUE (BST)										
Age Group (mos.)	Sampled Cattle		Male				Female			
			Positive		Negative		Positive		Negative	
	N	%	N	%	N	%	N	%	N	%
0-6	5	2.50	1	0.50	2	1.00	1	0.50	1	0.50
7-12	18	9.0	2	1.00	10	5.00	1	0.50	5	2.50
13-24	40	20.00	5	2.50	10	5.00	9	4.50	16	8.00
25-Above	137	68.50	10	5.00	11	5.50	52	26.00	64	32.00
Total	**200**	**100.00**	**18**	**9.00**	**33**	**16.50**	**63**	**31.50**	**86**	**43.00**

The data further showed that anaplasmosis can occur in all age groups and both sexes of cattle but seroprevalence could be higher in females in the older age group.

Figure 2. Prevalence Rate of Anaplasmosis According to Sex and Age of Cattle

Species of Anaplasma Prevalent in Western Samar Demonstrated by Blood Parasite Examination (BPE)

To determine the prevalent species of anaplasma organism, a Blood Parasite Examination (BPE) was done and the data of which is presented in Table 3. The data revealed that *Anaplasma marginale* caused 34.00% of the infection rate among the sampled cattle, 3.50% was caused by *Anaplasma centrale* and 3.00% was due to mixed infection of both *A. marginale* and *A. centrale*. BPE also reveals a 59.50% non-infection rate for *anaplasma spp.*, which is slightly higher than the seronegative result using CAT of 47. 50%.

The difference could be due to the non-detection of the organism in the blood smear during the microscopic examination; that is, the organism may be present in the blood sample but was not present in the sample for microscopic examination. The serologic CAT, on the other hand, can detect the antibody produced by the cattle during anaplasma infection, whether such infection has occurred in the past (old infection) or is current (new infection).

For purpose of this study, BPE confirms the specific anaplasma organisms that cause the infection among sampled cattle in Samar. This study is an adjunct to the study on the seroprevalence of anaplasmosis that was prevalent in the said province (Amit, 2019). However, this study differs from the study of Amit (2019) since this undertaking further determined the prevalent type; that is, the causative agent, of anaplasmosis in cattle in Western Samar.

Table 3. Distribution of the Prevalent Species of Anaplasma in Western Samar as shown by the Blood Parasite Examination (BPE)

Anaplasma Species	F	%
Seropositive:	**81**	**40.50**
Anaplasma marginale	(68)	(34.00)
Anaplasma centrale	(7)	(3.50)
Mixed infection (A. marginale & A. centrale)	(6)	(3.00)
Seronegative	119	59.50
Total	**200**	**100.00**
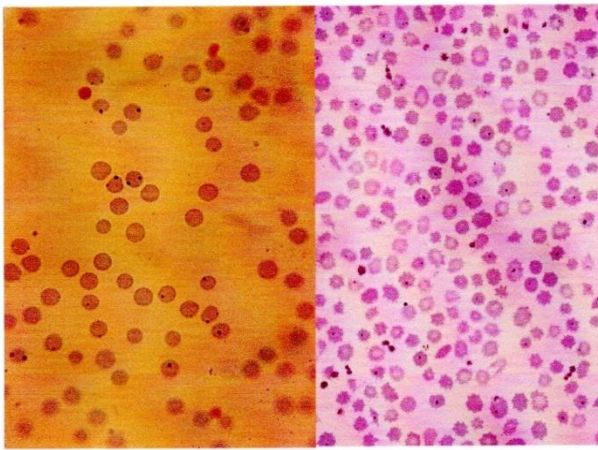
Figure 3. The Characteristic Morphology of
***Anaplasma marginale* (right)**
and *Anaplasma centrale* (left)

Conclusion

The result of this study revealed that the prevalence of anaplasmosis was prevalent in Wester Samar province. The prevalence rate of anaplasmosis was highest among the female in the age group 25 months and older cattle. Between CAT and BPE test analysis, CAT was found with higher results than BPE. Nevertheless, it is sought that in the next research, LAMP detection must be utilized to predict the high specificity and sensitivity of the test objective. With this result, the Department of Agriculture in Western Samar must act on the prevalence of this disease, the agency must increase their testing and prevention campaign to reduce the anaplasmosis disease.

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LOCATING SURVEILLANCE AND PRIVACY IN THE CAPITALIST SYSTEM OF THOUGHTS

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ABSTRACT

The technological explosion of Covid-19 era and the subsequent increase in the dependence on surveillance technology has amplified the privacy and surveillance debate. To a large extent the current sensibilities appear to present the debate as a contest between surveillance and privacy, driven by the presumption (both in popular and academic circles) that surveillance is either an aberration or antithetical of privacy. This segregation of surveillance and privacy misses two significant points. One, on a discursive level privacy and surveillance share the genealogical trajectories as both operates within the larger system of informational control. Second, surveillance, like privacy is an abstract notion and could only be understood under the condition and the context in which it operates. This article argues that the ideals of privacy and surveillance as professed and practiced are deeply entrenched in the institutional structure of capitalism, which rather than segregating, necessitates a certain kind of mutuality between the two. Furthermore, in this paper we explore how privacy protection is not the counter to surveillance, rather how both co-exist in the Capitalist discourse and how individuals participate in it

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Introduction

Among the pronounced features of our lives in the time of the Covid-19 pandemic and the crisis leading from it has been the excessive dependence of modern communication technologies and rise in the surveillance (Haggerty and Ericson, 2000). Even though this dependence was overwhelming in the pre-covid world, the enormity of it in the last one year is that it has engulfed almost every aspect of human communication and widened the scale of surveillance to an unprecedented level. For instance, education, where emphasis was on the brick-and-mortar system, where interaction between the teacher and the students was considered, at least in institutions worth the grain, as necessary for collaborative learning as well as instant feedback of learning has been impacted severely due to measures of physical distancing, mandated to reduce the risk of infections. The shift to online mode seemed very smooth and pedagogues ended up suffering from a problem of plenty insofar as the pretty much off-the-shelf made available, free of cost, at an instance. Excessive use of such software can be also seen in other spheres where previously such rampant use was not practiced.

Software and applications available for video conferencing saw a steep rise in their usage in various sectors. Mention may be made of a popular video conferencing application Zoom, run by a company based in the United States. According to a report in the Business Today Magazine, Zoom's daily users ballooned to more than 200 million in March from a previous maximum total of 10 million (Business Today, 2020). This figure is important here to highlight the greater dependence of such applications. So in other words, COVID 19 is forcing us to be more dependent on modern communication technologies than ever before. Along with its excessive use, it also brought the issues of surveillance and privacy breach into the forefront.

Kari Paul, technology reporter of the Guardian, in his article published in April 2020, warns that the application is prone to 'Zoom bombing' "in which hackers can infiltrate video meetings, often shouting racial slurs or threats. One of the other major drawback of the application is the lack of end to end encryptions, a feature that secures communication so that it can only be read by the users involved. Paul also claims that the

app indulges in selling user data for advertisement purposes and pointed to the security flaws in the app. One can also add the proctoring apps used for online exam monitoring to the list. These apps monitor student behaviour during the exams have come under lot of flak for the total disregard of the privacy and promoting insensitive practices by imposing control over student's environment (Monica, 2020).

Similarly, the explosion of contact tracing applications to contain the spread of Covid-19 have also raised concerns over privacy and data management. The much immediate concern is the lack of transparency offered by such apps over the collection, storage and usage of personal data. Such concerns are more pronounced in nations where there is a lack of data protection law, therefore making it much easier to enforce mass surveillance.

The point at issue here, certainly, is not to discuss a particular software or to single out a nation and its vulnerability for data theft and surveillance either by the state or private companies. The attempt, in this article, is to try and understand the issue of data protection and the individual actions and the manner in which privacy and surveillance operates within the larger Capitalist system of thoughts. So the question that needs to be asked is how citizens themselves perceive the idea of privacy and causes of their willingness to accept modern-communication technologies, risking exposure of their personal data both knowingly an unknowingly? The fact, in other words, is that we live in times where a cross section of the people are willingly sharing such data, sometimes without being forced to by any order or any law mandating it, in their day to day life and the law or orders are only one part of the story. Why does this lack of care for the protection of personal data also known as the Privacy paradox exist (Barnes, 2006)?

The quest for the answer to this question, however, becomes much easier if we limit our discussion to present situation. One can argue that Zoom at present with the option of limited free version is one of the few available means to conduct online classes. In any case, educational institutions which need to make sure that students do not lag behind in their studies have to use one or the other of such

application. And regarding contact tracing apps, one can say that the surveillance and privacy breach hold no significance when factored against the risk of being contaminated with the virus, which in popular perception is a fatal one.

However, if we go beyond the present crisis the question becomes much more difficult to answer due to the complexities that are involved. These complexities exist because in recent times both surveillance and privacy vis-à-vis modern communication technologies in both the academic and non- academic spheres of our present lives are being discussed and debated in a state of isolation and paranoia, inflating the social values that are attached to both surveillance and privacy. Even though, there is a tendency to approach privacy and surveillance with an authority of universalism, in practice both concepts are often assigned certain specific social values. For instance, privacy is embraced as a historical product of democracy, (as an entitlement) a value that is essential for the functioning of democracy. This privacy centric approach largely perceives privacy as an exceptional product of modernity and as is the case with other institutions believed to be integral to the emergence of modernity, privacy is also imagined under a certain hegemonic conception. It ignores the intricate history of privacy and different ways in which privacy is conceptualised. For instance, the feminist critique of privacy denounces the liberal theory of privacy as it conceals and shield the historical domination of women to men (Gonzalo, 2019). The feminist scholars have long argued that the right to privacy as practiced and understood in the liberal democracies leads to an insistence to non- interference leaving the private domain outside of the public scrutiny. The privacy paradox therefore exists because of the unequal power equation between the citizen and those who exercise the control over their data. Ideally any control over the data should be exercised with the consent of the user, in reality such exchange is carried out in state of disempowerment and with a very little understanding of the complex algorithms involved in the production and dissemination of data. As Frank Pasquale puts it,

"Important corporate actors have unprecedented knowledge of the minutiae of our daily lives, while we know little to nothing about how they use this knowledge to influence the important decision that we- and they- make" (Pasquale, 2015).

Similarly, surveillance is largely seen in a negative light as an instrument of mass control an increasing expansion of state and private network of surveillance use to repress and discipline (Poster, 1990) (Robins and Webster,1990). Ironically those, who support surveillance as a necessity also present it as a key requirement for the functioning of pluralistic democracy (Marx, 2015). Having said that, we do not deny the need to scrutinise the ever expanding surveillance practices as the danger of coercion and imposition of structure of dominance is real, though the extent of power and the ability to discipline, is often exaggerated. More importantly, we create more discrepancies as we attempt to understand the issue of data protection through the prism of liberal hegemonic conception of privacy by placing surveillance and privacy in opposition to each as product of different historical process. The point being that rather than forcing a choice between privacy and surveillance there is a need to interrogate the links between the information control and the capitalistic system of thought.

For this, it is important to go beyond the present crisis and try to understand the issues of surveillance by interrogating the complex links between capitalist ideas and the information control and not to study either privacy or surveillance in isolation. By doing so, paper will attempt to show how privacy protection is not the counter to surveillance, rather how both co-exist in the Capitalist discourse and how individuals participate in it.

Literature Review

In the first section, two select texts that may be held as existing literature on surveillance -- Orwell's 1984 and Foucault's Discipline and Punish: The Birth of the Prison -- will be discussed. This is being done not just for the purpose of familiarisation but also to identify useful tools from these that will help us in contextualization of the discourse on the topic. The second section will be about the individual participations in the surveillance through existing literature.

2.1 Theorizing Surveillance

One of the earliest illustrations of the modern surveillance system in literature is theorised in George Orwell's 1984. In this fiction, Orwell presented a prescient vision of a surveillance system which uses modern mass-communication medium, the telescreen, controlled by the central authority known as *Big Brother*. These telescreens are installed in every residential flat and official building. They are a two-way medium; alongside feeding the party propaganda to the people, these also enable the watchers and the *Big Brother* to view and surveil upon the individuals.

1984 is based on a society under a totalitarian regime which had divided the population in a three tier hierarchy. At the top are the small group of Inner Party, comprising the top officials and the *Big Brother* himself; at the lowest level are the *proles*, the common citizens; and between them are the Outer Party members who are also employed in bureaucratic jobs to help in the governance and therefore subjected to surveillance as well. The fear of revealing anything that would be considered anti-party or anti-regime is such that even when Winston Smith, the protagonist, keeps his back turned to the telescreen "he well knew, even a back can be revealing" (Orwell, 1984). As Rehnquist (Rehnquist, 2004), in his review of the book, puts it "they are drones who simply obey the commands of unknown party leaders. Originally, their submission may have been through fear of expressing any doubt or ideas of their own, but later they simply have no doubts, nor any ideas of their own." It is to be noted that the docility of the mental faculty of these Outer Party members was achieved through the hybrid use of surveillance, propaganda and other repressive state apparatus like the Thought Police.

The idea of the surveillance system, which Orwell puts into his futuristic nation of Oceana, came from "Europe right after the end of World War II, and at the philosophical debate which was going on at the same time in England and the United States" (Rehnquist, 2004). This was also the reason why the book was considered an anti-communist manifesto in

the western bloc as much as it was held as "a grim warning precisely to bourgeois society, bourgeois civilization, bourgeois democracy" (The New York Times 1984) in the eastern bloc, both at the same time. Nevertheless, without delving into this debate we can say that Orwell identified and revealed a particular kind of surveillance system where the totalitarian state as a central power of an undemocratic nation is the major agent in monitoring individuals. Written in the year 1949, before the development of the communication technologies to the levels we find them today, it is understandable that the surveillance system in Orwell's 1984 is limited to the designs of an oppressive state. Haggerty and Ericson while differentiating the historical nature of surveillance in the book from one that exist today wrote:

"In the intervening decades, however, the abilities of surveillance technologies have surpassed even his (Orwell's) dystopic vision. Writing at the cusp of the development 'of computing machines, he could not have envisioned the remarkable marriage of computers and optics which we see today. Furthermore, his emphasis on the state as the agent of surveillance now appears too restricted in a society where both state and non-state institutions are involved in massive efforts to monitor different populations". (Haggerty and Ericson, 2000)

Foucault, writing almost 45 years after Orwell, in *Discipline and Punish: The Birth of the Prison* (Foucault, 1995), underscores the reforms that the penal system (in the West) underwent, ultimately leading to the scrapping of capital punishment from the penal code; Foucault points to the fact that the capital punishment, as carried out in the 18th and 19th century was more a spectacle meant for its 'effect' on society. He argues that the removal of (capital) punishment as a spectacle was less due to the humanistic concerns and more due to the desire to avoid its unwanted or unexpected corollaries.

The body of the condemned man in the public execution was the target of the penal system in that order. It was also the domain on which the authority (king) displayed his sovereignty. However, many of the times, the condemned body also became the domain of public

sympathy and in situations like this the executioner and the authority were then viewed as oppressors inflicting cruel violence on individuals. Sometimes, public execution led to mob violence and protests. Because of these complexities, new ideas and concepts about the penal system emerged during 18th and 19th century. One such idea was that of Jeremy Bentham (Bentham, 1995).

Bentham proposed the panopticon penitentiary structure composed of an annular building with a tower at its centre. The inmates were supposed to be kept isolated inside the cells of this annular building, whereas the authorities (or guards) would be stationed in the tower. The significant feature of this structure was that the tower was to be designed in such a way that it would be impossible for the inmates to say whether it was occupied. The lighting design, while maintaining the invisibility of the supervisors makes sure that the cells and the inmates inside them are constantly visible.

In this new penal system, the 'soul' became the target rather than the body. As the soul became the target, the idea of correcting the corrupt soul (criminal) emerged. So the new professionals like warders, doctors, chaplains, psychiatrists, psychologists and educationalists started getting involved in the penal system.

By tracking the philosophical and the epistemological changes in the penal system during 18th and 19th centuries Foucault was trying to show how Sovereign power (of capital punishment for our example) started being undermined by the disciplinary power (educate and correct the corrupt soul). His discussion on Jeremy Bentham's proposal of the Panopticon architectural design for prisons, schools and hospital was to explain how modern disciplinary power functions.

With the explosion of internet and the expansion of new information and communication practices, Foucault's enunciation on the panopticon metaphor became more significant to understand modern surveillance system. The initial rigor in the academia was still to investigate the monitoring capabilities of the watchers and prominent among those were scholars like Mark Poster (1990), Robbins and Webster (1999) and Fiske (1999). In that sense idea of surveillance conceptualised by these and other

scholars was not very different from the one discussed in Orwell's 1984. Ivan Manokha, notices a common feature in these works wherein

"the emphasis has been placed mostly on the enhanced capacity of intrusion into the lives of individuals, on the increased ability to know more about their actions, and on the implications of this growing capacity to exercise power over individuals-that is, on power as domination-those new technologies of surveillance have rendered possible." (Monokha, 2018)

Most of these interpretations suffers from an Orwellian zeal as they introspect only the oppressive aspect of modern surveillance system. In the process offering a one dimensional understanding of panopticon as an institution of repression or domination. A position, which Foucault himself has clarified to a large extent through some of his lectures and later works expanding the understanding of panopticon from a mere instrument of repression by adding the other dimensions of self-restrain and self- censorship (Manokha, 2018).

In other words, Foucault's work on surveillance marks a significant departure from the Orwell's 1984, as Foucault's panopticon metaphor and the theoretical concepts on surveillance that employed render the individuals' as participants which could be voluntarily or involuntarily and even that of docility. This perhaps is the most far reaching and the fundamental innovation in the surveillance studies. However, the scepticism around panopticon and it utility as a concept to understand the much more complex system of surveillance have continued and laid the foundation of post -Foucauldian or Post-panopticon conceptualisation of surveillance. What is crucial to understand here is that while the concept of panoptican is still relevant in understanding the modern surveillance system but it may not be sufficient. In fact, we argue that Foucault's work on governmentality is essential aid in understanding exercise of power beyond the concept of panopticon.

2.2 Individuals in surveillance studies

Thomas Mathiesen points out that "To Foucault, panopticism represents a fundamental movement or transformation *from the situation where the many see the few to the situation where the few see the many.*" (emphasis original) (Mathiesen,1997). In his view, modern mass medium like newspapers and the telegraph supported by the modern forms of transportations like the trains and the steam ship have facilitated the possibility of many seeing the few which he termed as "synopticism".

It is important to point out here that Mathiesen did not reject the idea of "few seeing the many" for the purpose of controlling the society but reminds that for Foucault it was necessary to omit the existence of synopticism because acknowledging it would "have changed his whole image of society as far as surveillance goes." In fact, he argues that panopticism and synopticism together "serve decisive control functions in modern society."

What Mathiesen did through his synopticism was to allude us towards recognizing the participation of individuals in the process of modern surveillance system which was made possible due to the emergence of modern mass medium.

Haggerty and Ericson through their conceptualisation of "the surveillant assemblage" accentuates how modern technologies are used to capture, store and monitor various data of individual human bodies for the purpose of surveillance (Haggerty and Ericson, 2000). Taking theoretical inspiration from Deleuze and Guattari, Haggerty and Ericson discuss in detail the surveillant assemblage which "operates by abstracting human bodies from their territorial settings and separating them into a series of discrete flows. These flows are then reassembled into distinct 'data doubles' which can be scrutinized and targeted for intervention."

An important distinction, so to say, in the manner in which the surveillance system of surveillant assemblage is different from that of Orwell's; in other words, Foucault does not approach the body directly "as a single entity to be moulded, punished, or controlled." Rather, through the use of biometrics, call records, online footprints, etc. individual bodies are divided into separate data. These data are later used by forensic laboratories, statistical institutions, police stations, financial

institutions, and corporate and military headquarters.

"In these sites, the information derived from flows of the surveillant assemblage are reassembled and scrutinized in the hope of developing strategies of governance, commerce and control." (Haggerty and Ericson, 2000)

One of the interesting points about the surveillant assemblage is the interface between the human body and technology. Haggerty and Ericson talks about the literal hybridity "as tagging the human body so that its movements through space can be recorded…" Living in the years after the emergence of smart mobile phones with Subscriber Identification Module (SIM) cards we can say that this interface has been achieved.

Today, hardly anyone is unaware of the fact that mobile phones through features like internet browsing history and location tracker are being used to record and store individuals' private data by private and governmental institutions. Therefore, making it much more difficult to avoid being recorded in some or the other way. Another known fact is that these data are then used for the purpose of control, censorship, surveillance or for systematic advertisements. Yet, why do individuals ignore privacy? Or perhaps, a better way of putting the question would be *can we protect our privacy at all*?

3. Analysis and Discussion

In the first section, the complexities about the issues of privacy among the people will be highlighted by using the San Bernardino, California incident of 2015 as a case study. In the second section, it will be argued that individuals' participation in the discourse on surveillance and privacy should be located in the Capitalist system of thought.

3.1 Individuals and privacy

On December 2, 2015, two individuals Syed R. Farook and Tashfeen Malik allegedly killed 14 people and left 17 wounded in San Bernardino, California. Both of them were gunned down by the police officers. What followed this violent incident was the drama between Apple Inc. and the Department of Justice, California, after the investigators found Farook's iPhone. Since they were "unable" to unlock a 4-digit password, the government of the United States

pleaded Apple Inc. to develop a software which would help them to unlock the phone, a plea which the company refused. For some, the company's refusal in this case was "a defense of civil liberties" (The Guardian, 2016). A not so anticlimactic denouement of this drama, however, came when it was announced that the U.S. government has been able to unlock the phone without the company's help.

Those who are familiar with iPhone's advertisement campaign would know that privacy protection is one of its Unique Selling Point. In this sense, the refusal to help the U.S government was one of its campaign strategies, particularly when Apple Inc. itself was under charge of indulging in "unlawfully disclosing and selling information about people's iTunes purchases" (Bloomberg 2019) and allowing other applications to collect data in its iPhone operating system (The Atlantic 2019).

However, Apple Inc., a private corporation, was not the only winner in that case. According to research conducted by Pew Research Centre (2016), 51 percent of the respondents out of 1002 adults in America agreed with the government and said Apple should unlock the iPhone. It is apparent from this case; privacy is not necessarily a counter-discourse to surveillance as suggested by some scholars (Romele et al 2017). Rather it is the part of Capitalist thought system and larger information control which intends to preserve both surveillance and privacy. Thinking of privacy as a counter-discourse of surveillance is to ignore the law, system or condition in which both of them manifest and co-exist. From our discussion of the literature on surveillance above, we can discern two aspects of surveillance

1) Surveillance has moved beyond the monitoring of a particular section (Orwell's 1984 and Foucault's panoptic metaphor) of the population to each and every individual (Haggerty and Ericson); and

2) It is not just the authorities but also the individuals themselves who are actively participating in the surveillance practices.

It is to be noted here that the individual participation however is far broader and overarching than what Thomas Mathiesen has suggested as "many seeing the few" (Mathiesen, 1997). His synopticism is

significant in understanding the relationship between the few who control and the many who are controlled. When new victorious military leaders enter the city, the population are able to see them. Cognitive thinking occurs in the mind of individuals who witnessed the defeat of their former rulers and entry of new one in their lives. This leads to the realisation of the relationship that they have now with their new rulers or masters. This realisation will then make individuals discipline themselves according to the wishes of the few whom until this time they gave no significance to.

However, this approach still offers a narrow analysis of individuals' participation because individuals are not only seeing the few to discipline themselves but are also seeing and disciplining their fellow humans. and in this process the issue of privacy protection or the larger logic of data collection either overlooked or do not occupy their minds. In other words, they see themselves as participant who feel rewarded or seek reward for their participation.

3.2 Capitalist Spectacle and Realism

Guy Debord begins his book with the line "In society where modern conditions of production prevail, all of life presents itself as an immense accumulation of spectacles. Everything that was directly lived has moved away into a representation" (Debord, 1983). Living in the post-world war II Europe, Debord experienced and perceived the early use of mass medium for propaganda, advertisement and entertainment. Written in the year 1967, Society of the Spectacle, is one of the earliest examples of how the spectacle has become "a social relation among people, mediated by images". While Debord presents us with the world of spectacle where the spectacle itself becomes the reality, Mark Fisher introduces us with the dominant view of Capitalist Realism (Fisher, 2009). Capitalist Realism is the view similar to that of Francis Fukuyama's *End of History* where it is believed that no alternative remains except existing Capitalist system (Fukuyama ,1989).

The surveillance system, the discourse and the thought about privacy among the individuals and their participation should be located in this condition of thought. Capitalist spectacle and realism is the new *art of the government* or

what Foucault calls as "Governmentality". Indeed, this new art of the government gives freedom to individuals but as Jason Read points out

"*These freedom, the freedom of the market, are not the outside of politics, of governmentality, as its limit, but rather are an integral element of its strategy. As a mode of governmentality, neoliberalism operates on interests, desires, and aspirations rather than through rights and obligations*" (Read, 2009)

Mark Andrejevic points out how *digital enclosures* like "cloud" computing and "free" Wi-Fi zones being developed by Google and Earthlink would undermine the security for private information not just because they will be secretly stolen by these companies but also because individuals themselves would give it to them in exchange of accessing the services they provide. He writes,

"*The more ubiquitous such enclosures are, the more willing users will be to store an increasing range and quantity of personal data on them, from personal correspondence, to online journals and multi-media files.*"(Andrejevic, 2007)

So, to answer the question raised earlier regarding the increasing impossibility to escape data disclosing behaviour. While, on one hand, the monopolistic control of state and private corporations over the data algorithm offers a little choice to the individuals, who can either trust or reject the privacy practices offered to them by the government or corporations in a highly asymmetric relation. But besides this ingrained vulnerability in privacy practices, it is the system of reward which offers individuals the possibility to partake and express their desires. In the process, they not only put themselves to self- discipline but also mould the behaviours of others. This, indeed is what create the discrepancy between the desire to preserve privacy and how we actually behave when exposed to an online world. This new art of the government encourages individuals to participates as competitors to aspire and achieve success in their lives. And while they are competing they are also encouraged to display their participation through social media platforms like facebook.com and twitter.com. Success at the end is not the point, rather display or what

Debord calls "spectacle" is. Many of the times, this is also done through online voting where non-participating individuals are encouraged to vote for their favourite beauty pageants, singer or dancers at international, national or regional level.

Newspapers and TV channels which are owned by same industrialists who sponsor such contest promote these achievers, so that they gain enough traction or popularity among the population, that they can act in the advertisements which will be later displayed or broadcasted in the same newspapers and channels. The rest of those who are not the participants or the others who participated but did not win these contests are forgotten with no one to blame but themselves. But even though the other participants and the voters could not achieve any visible or direct "success" they are made use of, through their participation in making their own participation a spectacle. This from of display or spectacle is not unique to reality shows but at a larger level use of digital and online services permeates this social relation, where people disclose data as part of everyday desire and aspiration.

Display or spectacle is necessary for the present capitalist system because when participants display their participations through social media it increases the possibility of expanding the reach to a much larger population. As the reach expands to the new levels, the spectacle reaffirms the trust and believe on the system. It nurtures a certain kind of conformity with the existing way of thoughts, builds aspirations for their own participations and display. And when they respond to such display of participations, through likes, comments and share or sometime with the mere download of an app, it reaffirms the trust and belief in the minds of the participants too. This overpowers any doubt or any second thought in their minds about their participation, making them a complete being of capitalist spectacle and realism.

In addition, while "*neoliberalism operates on interests, desires, and aspirations rather than through rights and obligations*" it cannot completely ignore the population's rights and obligations. In such situations, the existing art of government dictates individuals to target "others". Sometimes this "other" is a particular religious or ethnic group, sometimes a particular gender, sometimes a particular race and class.

For those 51 percent of respondents in America who thought Apple should unlock the iPhone of Syed R. Farook, privacy did not mean a counter-discourse to surveillance because their fear of terrorism has been shaped by the post 9/11 war on terror discourse.

Conclusion

Based on the above discussion, it can be argued that surveillance is intrinsic to the capitalist system and also a beneficiary of it. But unlike the typical understanding of capitalism that feeds on labour, we can argue that the present form of capitalism feed on human experiences. Several instances of non-state surveillance have created buzz in many democratic nations. Mentions may be made of the controversies regarding the involvement of facebook.com in the case of Cambridge Analytica and allegations of data theft. Since the dependence of digital platforms have increased manifold and has almost overwhelmed our existence for individual, social and economic conduct due to the covid19- outbreak. It becomes imperative for the debate on surveillance to be carried forward on the intricacies of the Individuals, Surveillance and Privacy.

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EVALUATING THE FRAMEWORK OF GREEN FACTORIES IN CHINA

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ABSTRACT

China is the leading supply chain of the world and feed the whole world. The evaluation of Green Factories of China is very important. Traditionally, the factories are evaluated on specific aspects; energy conservation, efficiency, and environmental concerns. There are hardly any reports which emphasize on comprehensive and systematic evaluation methods for green factories. This study analyzes the current scenario of various countries and regions; and on the basis of emerging scenario, this research paper precisely understands the framework of Chinese Green Factory. This research paper highlights the relevant and updated research regarding the evaluation of Chinese Green Factories. This research paper assesses the effects of Chinese Green Factories and suggests future perspective and guidelines for making them more effective.
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Introduction

Resources constraints, depletion of water table, pollutant air problem and other environmental degradation are the major problems for industrial development. Sustainable development becomes the main concern of all over the world. The companies and businesses started to adopt conservation of resources, environmental protection, green marketing, green manufacturing mechanism, recycling of wastages, and production of green product. Low carbon emission is one of the main aims of green factory concept. The adoption and implementation of green practices is the main factor for solving these problems. It takes into account external environmental problem, political will power and economic factors to find out the solutions of the problem. Factories are responsible for environmental problem as wastages, dust, smoke, and other particles are released by factories while making products and items. Factories are main point where green manufacturing and green practices are implemented. The essential way of optimize industrial structure is to establish green factories and making the whole system eco-friendly from production to distribution. It leads to transformation and upgrading as well as improvements in qualities and efficiency. The evaluation of framework of green factories facilitates for setting standards in the industrial

world, guiding and standardization of the implementation of green manufacturing process. It facilitates corporation to take up responsibilities for implementing the green framework. China is the hub of manufacturing industry and accounted for 20% of the world's annual manufacturing total. This research paper study the green framework of Chinese industry and trying to find out how its green factories should be evaluated.

The Concept of the Chinese Green Factory (CGF)

The factories all over the world has started to pay attention to the problems of limited resources and environmental degradation in 21st centuries. The concept of Green factories revolves around Zero-emission or low carbon emission. The factories are adopting different types of green practices in terms of "energy-saving factory," "low-carbon factory," "zero-emissions factory," "harmless factory," "environmentally protective factory," "ecological factory," "recycling factory," "sustainable factory," and more. However, there are not in agreement regarding the concepts and practices of green, but they are in agreement with adopting of green practices in different manner. Green Manufacturing brings the aspect of sustainability, harmony of economic productivity, safer environment, social benefits, and saving future resources.

The main objectives of green practices to minimize the impact of factory practices on environment, save earth, lessening pollutant level, save resources for future by formulating environmental strategy.

China had designed a comprehensive plan for the implementation of green manufacturing in 2015. The major objective of this policy was the designing and construction of Chinese Green Factories. China has designed the first National Standards for CGFs in 2018 entitled *GB/T 36132-2018 General Principles for the Assessment of Green Factories*. This document has been defined CGFs as factories that engage in "*the intensification of land, the decontamination of raw materials, clean production, waste administration, and the reduction of carbon and energy.*" CGFs should be introduced to Life Cycle Thinking (LCT) to ensure the quality and functionality of products and also maintaining health and safety in the production process. This would facilitate them to choose green raw materials, as well as green processes, technologies and equipment and ensuring that they can continue to meet their requirements regarding infrastructure, management systems, energy, resources, products, environmental emissions, green performance, and more. CGFs should try to make continuous improvement in these areas.

Research Methodology:-

Statement of the Problem: - The purpose of this study is to assess the green factory concepts and practices and framework adopted by the factories.

Scope of the Study

This study was limited to Taiwan, China, European Union, USA, Thailand, Japan, and South Korea to assess the Green Factory Framework and evaluation of Green Factory research and practices in these countries and regions.

Objective of the Study:-This research paper consists of the following objectives:

1. This research paper study the green framework of Chinese industry and trying to find out how its green factories should be evaluated.

2. To study the framework of Green factories framework in Taiwan, China, European Union, USA, Thailand, Japan and South Korea.

3. To find the drawbacks of the Green Factories framework

4. To suggest measure to make it more effective.

Data Collection: - This study is based on secondary data which have been collected from the reports of respective government of different countries. This study has collected the data from journals, magazines, newspaper, books, internet, and other secondary reports published by the international agencies.

Evaluation of Research on Green Practices in Other Countries and Regions

3.1. The Organizational Environmental Footprint (OEF) developed by the European Union (EU)

The Environment and Sustainable Development Department of the European Commission's Joint Research Center investigated the assessment strategy in 2012 known as the Organizational Environmental Footprint (OEF). The European Commission issued *Recommendation 2013/179/EU, on 9th April 2013* officially starting the promotion of OEF assessments for organizations (including manufacturing factories). OEF measures the environmental performance of an organization at multiple stages of its life cycle. Its primary purpose is to reduce the environmental impact related of an organization's activities by considering the entirety of its supply and logistics system (relating to extraction of raw material, development and usage of products, and waste management). This involves many related parties such as manufacturers, public institutions, and more. The OEF can be used for benchmark management, performance tracking, low-environmental-cost procurement, disaster mitigation, and other voluntary or mandatory programs. That said, the OEF system is still not ideal, since the evaluation process is very complex and contains many uncertainties.

3.2 The Green Certification System in South Korea

South Korea approved and introduced in 2010 the *Framework Act on Low Carbon Green Growth* that introduced a green certification system. This system was introduced and implemented by South Korea's Ministry of Industry, Commerce and Resources. It was

carried out in collaboration with eight other ministries and commissions. South Korea promoted four kinds of certifications through the scheme: green technology, green endeavours, green products, and green enterprises. Among them, the green enterprises certification relates to the assessment and accrediting of green factories. However, the core of the green enterprises certification still focuses on green technology and zero carbon emission. It specifies that, if 20% of the products sold by an organization adopt green technology, then the organization can be called a green enterprise.

South Korean Enterprises that obtain a green certification benefit from a number of preferential policies, including green industry financial support, awards for environmental protections issued by the government, green manufacturing performance testing concessions, priority dispatch for overseas talents and senior talents, priority transfers for technologies, introductions to investment, consulting services, government procurement benefits, and more. As a result of the certification system, South Korea has greatly improved its energy conservation and reduced its emissions. South Korean Government provides lots of relief and benefits to those industries or enterprises that follow green practices in strict manner.

3.3 Environmental Accounting and Environmentally Protective Factories in Japan

As early as 2000, Japan put forward the idea of establishing a zero-waste society and adopted relevant environmental protection measures as a result. Japanese government develops and implements Environmental Accounting as one of measures to adopt the green concepts and practices. The Japanese firms prepare the Environmental Accounting report which shows how many these firms adopting the practices of green concepts and practices. In terms of evaluation methods, Japan implemented the *Environmental Accounting* system to measure, analyze and publicize investments in environmental protections and their resulting economic benefits. This system focused on seven costs related to environmental protections, such as business costs, upstream/downstream costs, management

activity costs, R&D cost, social activity costs, costs from environmental damages, and other miscellaneous costs. Japanese enterprises also actively promote various works for the protection of the environment. For example, in 2011, the Hitachi Group implemented the *Excellent Environmental Protection Factory* certification system. In this system, factories could be certified every year and awarded a "crystal heart." After gathering five crystal hearts they would become a excellent environmental protection factory.

3.4 Eco-factory Certifications in Thailand

The Federation of Thai Industries introduced the eco-factory certification in 2011. The certification documents include details about the framework, scope, definitions, standards, rules and guidelines for the development of eco-factories. They state that there are five aspects that make up an eco-factory: zero emissions; efficient resource and energy use, effective environmental management systems; product activities that are green, safe, and transparent; and community cooperation. There are also 14 specific evaluation indicators: raw materials, energy, water and wastewater, air pollution, greenhouse gases, waste management, community, chemical management, health and safety, transportation, and green supply chains. They measure the green factory concepts and framework on the basis of fourteen specific criteria. These criteria measure the impact of these practices on green house effect.

3.5 Green Factory Mark in Taiwan, China

In January 2012, the Taiwan Ministry for the Economy released a list of key points for promoting its *Green Factory Mark* system. It officially launched its program for evaluating green factories in April of the same year. Taiwan designed a framework of integrated system which addresses energy conservation, reducing wastages and minimizing pollutants, green production and operating system. In Taiwan, a green factory is defined as: A series of mechanisms integrating green building and cleaner production, aiming to reduce the energy and resource consumption and environmental impact of factory buildings in construction and operation, as well as in all stages of a product's life cycle. This is intended

to improve the environmental friendliness of industries and products, thereby creating low-carbon industries. The key requirement points of the Green Factory Mark include the green building assessment system and the clean production evaluation system. Organizations can obtain the Green Factory Mark only if they pass both the two evaluations above.

Research on the Evaluation Method for CGFs

In the past, the evaluation of CGFs has tended to focus on one specific aspect, such as products, management systems or buildings. The evaluation modes have tended to be one-sided, as was the case with the following three environmental directives of the European Union: the *Waste Electrical and Electronic Equipment (WEEE) Directive (2002/96/EC)*; *Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (2011/65/EU)*; and *Energy-related Products (ErP) Directive (2009/125/EC) (Formerly EuP)*. In the United States, the energy star program and the Electronic Product Environmental Assessment Tool (EPEAT) for rating green electronics are similar. The same could be said of China's system for labeling products as energy efficient and non-pollutive, as well as of its control certification system, its environmental management system, its energy management system certification, and its green certification system for civil buildings. Although the European Union, Japan, South Korea, Thailand, Taiwan and other countries and regions have carried out green factory evaluations, some of their evaluation methods are too cumbersome and have limited operability, as these frameworks are too difficult to implement and does not consist of simple steps to be implemented in the simple manner. Furthermore, some are too simplistic for carrying out a systematic evaluation of green factories. In order to develop a comprehensive and systematic framework of evaluation, it is necessary to establish a common green factory evaluation model which can be adapted to the entire manufacturing industry. The whole world also needs to have a comprehensive and global perspective framework which can be adopted by the entire world in the same manner.

First, in order to build a model that is widely applicable, it is necessary to identify the common elements of the manufacturing industry. All industrial manufacturing is a process that moves from input to production through to output.

Figure 1. The Basic Model for Manufacturing

With regard to resources and the environment, the production activities of all kinds of manufacturing factories can be summed up as follows. Based on its infrastructure and management system, a factory puts energy and resources into production and manufacturing. This leads to the creation of products and causes certain environmental emissions.

We can divide the general model for CGFs into six modules: infrastructure, management system, energy and resource input, products, environmental emissions, and overall performance. Previously, evaluations of CGFs have been one-sided, based either on products, processes, or services. The CGF assessment model presented here develops comprehensive and systematic requirements from the six modules outlined above. By analyzing the factors related to green manufacturing involved in each dimension, it is possible to develop a comprehensive CGF assessment system. The framework for this is shown in Table 1.

Table 1: CGF Assessment System Framework

No.	Dimension	Green Factory Factors
1	Infrastructure	Construction, lighting, special equipment, General equipment that uses energy, Measuring equipment, Pollution treatment equipment, etc.
2	Management System	Quality management system, Environmental management system, Occupational health and safety management system, Energy management system, Social responsibility, etc.
3	Energy and Resource Input	Energy input, Resource input, Green purchasing management, etc.
4	Product	Eco-design, Harmful substances use, Energy saving, Carbon footprint, Recycling, etc.
5	Environmentalism	Wastewater control, Exhaust control, Industrial solid waste control, Noise control, Greenhouse gas control, etc.
6	Performance	Land intensification, Raw materials decontamination, Clean production, Waste utilization, Energy and carbon reduction, etc.

Dimension 6, "Performance" refers to the overall results, corresponding to the objectives of CGFs. These results can be expressed through a series of quantifiable indicators (see Figure 2) such as the intensification of land, the decontamination of raw materials, clean production, waste administration, and the reduction of carbon and energy. These represent the achievements of a CGF during the evaluation period. The other five dimensions are process-oriented, concerning infrastructure, management system, energy and resource input, and product and environmental emissions. They include a series of qualitative or quantitative indicators, showing the characteristics of the various processes and helping CGFs to meet their requirements. CGFs should also be set certain basic conditions, such as basic compliance, requirements for relevant parties, management responsibilities, and more.
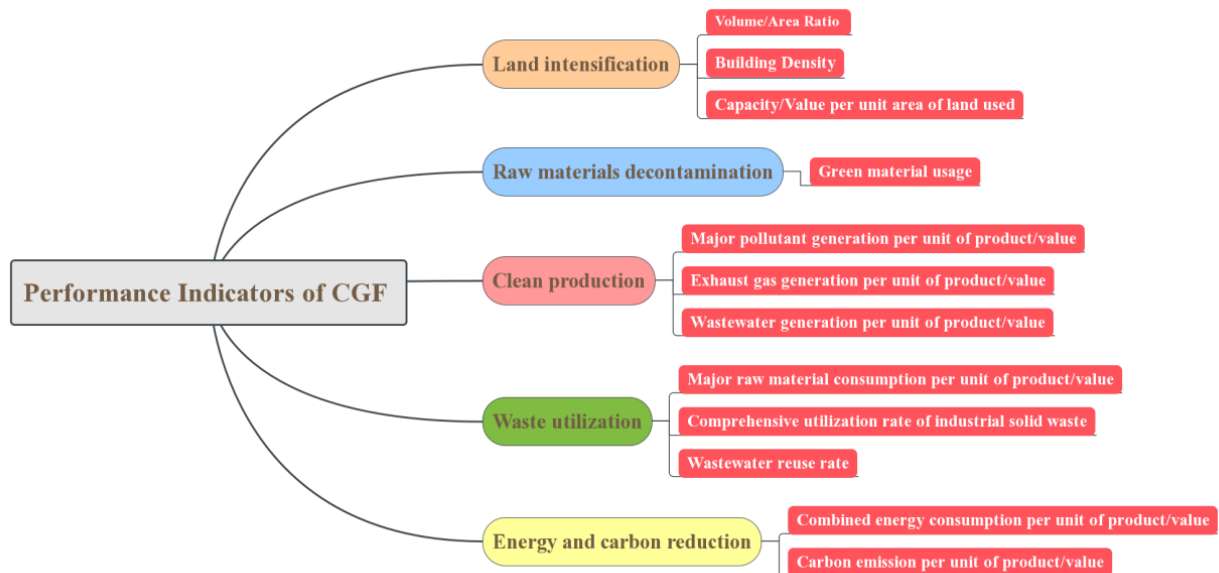
Figure 2:- CGF Performance and Detailed Indicators

When carrying out specific evaluations, the evaluator should formulate the evaluation scheme according to the different characteristics of each industry or enterprise. The evaluation scheme should include, at least, the basic requirements and the six dimensions (namely infrastructure, management system, energy and resource input, products, environmental emissions, and performance). The evaluation scheme should also track scores based on the requirements of the different dimensions to provide a comprehensive evaluation. This will demonstrate to industries or companies how they can achieve an advanced level.

The CGF evaluation would make it possible to obtain for a comprehensive evaluation result covering all the dimensions. This avoids the incompleteness of a one-dimensional evaluation. A one-dimensional evaluation, as is well known, does not ensure that every factor of a company or industry is green.

On the one hand, the green factory model provides a benchmark for constructing new factories. At the initial stage of factory construction, considering all of the relevant factors helps factories make a good start to obtaining their green goals. On the other hand, the green factory model could also help improve already existing factories. By using a CGF index, factories could know the overall green level of their entire industry. They could keep striving for improvements. From the overall perspective of the manufacturing

industry, the construction and evaluation of CGFs would generate experience that could be used for reference, thereby improving green manufacturing levels in the future.

Evaluation the framework of CGFs in China

Due to its rapid industrialization, China's overall industrial level has significantly increased. In a list of its 500 major industrial products, over 220 of them rank first in the world in terms of output. In other words, China has become a real industrial power. However, this rapid and large-scale industrialization also consumes a lot of resources and energy, which has placed great pressure on the environment. In 2018, China's total energy consumption was 4.64 billion tons of coal equivalents, 70% of which resulted from industrial energy consumption. In order to make its manufacturing factories more green, however, China has carried out a lot of useful work to try and develop CGFs in recent years.

5.1 The Construction of the CGF Standard Technology System

Standards help to support the overall establishment of CGFs. At present, under the leadership of China's Ministry of Industry and Information Technology (MIIT), CGFs have been increasingly standardized according to a three-level CGF evaluation system made up of general principles, guidelines, and detailed rules. The general principles are set out in *GB/T 36132-2018 General Principles for the Assessment of Green Factories*, drafted by the

Chinese Electronics Standardization Institute (CESI) and officially released on May 14th, 2018. This document outlines the standard indicator system and technical top-level framework for CGF evaluation. In terms of the guidelines, the standards for key industries such as electronics, machinery, steel, synthetic ammonia, automobiles, and building materials have all been regulated. Based on the general principles laid out in *GB/T 36132*, the characteristics of various industries have been further highlighted separately, for example in documents detailing industry standards such as *SJ/T 11744-2019 Specification for the Assessment of Green Factories in the Electronic Information Products Manufacturing Industry*. Finally, through the overall planning of the Green Factory Promotion Alliance of China (GFAC), as well as other organizations, detailed rules for CGF evaluations have been formulated for some specific industries.

5.2. The Activities of CGFs

In the second half of 2016, China issued *The Notice on The Construction of a Green Manufacturing System,* which clearly defined the principles, requirements, contents and evaluation methods for CGFs. It also successively carried out several CGF evaluations and selected some companies as CGFs.

According to relevant specifications, the framework for evaluating CGFs in China is divided into six dimensions: infrastructure, management system, energy and resources input, products, environmental emissions and performance. This is a systematic and comprehensive system, meaning that the establishment of CGFs is not unsystematic. That said, it could still be optimized.

By August 2020, the MIIT of China had organized four batches of CGF evaluations listed 1402 factories as CGFs. The industry distribution (Figure 3) shows that electronics (230), machinery (210), chemical (137), building materials (136) and food (124) make up the largest proportion of CGFs. They account for 16.41%, 14.98%, 9.77%, 9.70% and 8.84% of the total, respectively. Among them, the electronics industry and machinery industry are representatives of the discrete manufacturing industry CGFs, while the chemical industry and the building materials industry are representatives of the process manufacturing industry CGFs.

From the regional distribution (Table 2), it can be seen that Jiangsu Province (147), Shandong Province (140), Guangdong Province (129), Zhejiang Province (106), Henan Province (86) account for the largest proportions of the total. They account for 10.49%, 9.99%, 9.20%, 7.56% and 6.13%, respectively. As this shows, CGFs are relatively concentrated in the eastern and southern coastal areas of China.

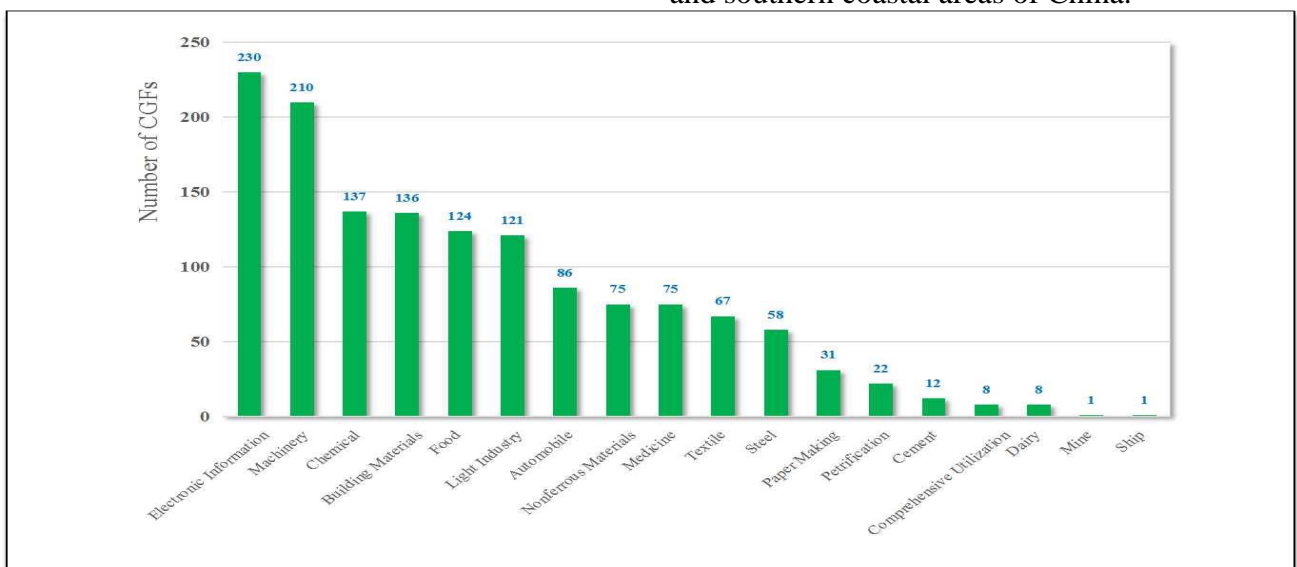**Figure 3: Industry Distribution of CGFs**
Table 2 Chinese Region Distribution of CGFs

No.	Area/Province	Number of CGFs	Percentage	No.	Area/Province	Number of CGFs	Percentage

1	JIANGSU	147	10.49%	20	SHAN(3)XI	26	1.85%
2	SHANDONG	140	9.99%	21	SHENZHEN	24	1.71%
3	GUANGDONG	129	9.20%	22	CHONGQING	22	1.57%
4	ZHEJIANG	106	7.56%	23	HEILONGJIANG	21	1.50%
5	HENAN	86	6.13%	24	LIAONING	21	1.50%
6	ANHUI	79	5.63%	25	JILIN	19	1.36%
7	HUBEI	70	4.99%	26	NINGXIA	19	1.36%
8	HUNAN	48	3.42%	27	NINGBO	15	1.07%
9	XINJIANG	42	3.00%	28	QINGDAO	11	0.78%
10	BEIJING	40	2.85%	29	XIAMEN	11	0.78%
11	SICHUAN	40	2.85%	30	SHAN(1)XI	11	0.78%
12	JIANGXI	33	2.35%	31	GUIZHOU	10	0.71%
13	FUJIAN	30	2.14%	32	QINGHAI	10	0.71%
14	TIANJIN	30	2.14%	33	GANSU	8	0.57%
15	INNER MONGOLIA	30	2.14%	34	XINJIANG CORPS	6	0.43%
16	GUANGXI	29	2.07%	35	DALIAN	5	0.36%
17	SHANGHAI	28	2.00%	36	HAINAN	3	0.21%
18	YUNNAN	27	1.93%	37	TIBET	0	0
19	HUBEI	26	1.85%	_	IN TOTAL	1402	100.00%

5.3. The positive effects of CGFs

The creation of CGFs has left to significantly more efficient energy conservation as well as a reduction in emissions. According to (albeit incomplete) statistics, for those industrial enterprises above a scale designated by the state, the work of CGFs from 2016 to 2019 drove the average water consumption per unit of industrial value-added down by 27.5%. It also drove the energy consumption per unit of industrial value-added down by more than 15% in the same period. Thus, constructing a comprehensive green factory model to create CGFs based on certain model parameters has systematically improved the sustainability levels of several industries. The general green factory model covers the entire manufacturing process from input to output.

For certain specific factories, the green factory model has also produced very positive effects, leading to continuous improvement and enhanced green performance. Take the factory of a world-renowned automobile company as an example. Since 2017, this factory has carried out relevant evaluations and practical activities in accordance with the CGF model, and has been included in list of CGFs issued by China's MIIT. The factory organizes annual evaluations and reviews based on a "Plan-Do-Check-Act" cycle. It uses the results of these evaluations as input for the following year's green development decisions. According to the CGF model, the factory's evaluation scores for the past three years have been: 91.20 points (2018), 92.85 points (2019), and 93.85 points (2020). Thus, while its green manufacturing performance is already at a top level, it nevertheless continues to improve. Details of the factory's CGF scores and green manufacturing flash points for each of the past three years can be seen in Table 3.

Table 3 Summary of the Evaluation Results of a Typical Factory (2018-2020)

No.	Dimension	Evaluation Score 2018	Evaluation Score 2019	Evaluation Score 2020
1	Infrastructure	19.00 / 20.00	19.00 / 20.00	19.00 / 20.00
2	Management System	15.00 / 15.00	15.00 / 15.00	15.00 / 15.00
3	Energy and Resource Input	14.25 / 15.00	14.25 / 15.00	14.25 / 15.00
4	Product	8.80 / 10.00	9.05 / 10.00	9.05 / 10.00
5	Environmental Discharge	8.20 / 10.00	8.30 / 10.00	9.30 / 10.00
6	Performance	27.60 / 30.00	27.25 / 30.00	27.25 / 30.00
	Total	91.20 / 100.00	92.85 / 100.00	93.85 / 100.00
	Flash point	● Combined CGF work with daily production and management process ● A *Plan-Do-Check-Act* cycle used to continuously improve the construction of green factory ● Energy performance continues to improve		

Conclusion and Suggestions

Resources constraints, depletion of water table, pollutant air problem and other environmental degradation are the major problems for industrial development. Sustainable development becomes the main concern of all over the world. The companies and businesses started to adopt conservation of resources, environmental protection, green marketing, green manufacturing mechanism, recycling of wastages, and production of green product. The adoption and implementation of green practices is the main factor for solving these problems. Above all, after nearly four years of development, there have been many positive achievements resulting from the establishment and evaluation of CGFs. The evaluation indicator system has been shown to be scientific, rational and operable across various

regions and industries. Under the impetus of China's MIIT, a number of advanced CGF models have been developed, leading to improvements in China's manufacturing industry, particularly with regards to efficiency and sustainability. At the same time, it has also provided practical experience for green development in manufacturing industries around the world. Therefore, it is suggested that the establishment and development of CGFs be encouraged and improved in the following ways.

1. Study the Threshold Value of Green Factory Related Indicators:- Basic data (regarding, for example, comprehensive energy consumption per unit product and water intake per unit product) should be collected to generate a basic database of energy conservation and emission reduction in each industry. This would provide a scientific basis for the threshold value of relevant standard indicators.

2 Enhance CGFs by Increasing Capacity in Underdeveloped Areas and Industries:-The number of CGFs in developed areas and advanced industries accounts for more than 40% of China's total. However, from the perspective of demand, underdeveloped areas and industries also need to move urgently towards green manufacturing. The establishment of CGFs in these areas would help with this.

3 Learn from the Experience of Various Countries and Increase the Promotion of Government Policies:-China should learn from the experiences of the EU, South Korea and other countries and regions. It should establish a green manufacturing incentive mechanism with positive fiscal and tax policies for CGFs. This would encourage enterprises to assume social responsibility, carry out energy conservation, and reduce their emissions.

4. Strengthen International Cooperation and Promote: It the need of the hour to establish International Standards for Green Factories:- International cooperation and exchange should be improved to develop good practices in various countries. This should involve the establishment of international standards for green factories. This would lead to improvements in green development for manufacturing industries worldwide.

There is need of comprehensive framework throughout the world which address the environmental problems in more strict manner and standards requires to be ne devise in this direction to implement these standards on equal footage. Countries are devising their own standards and framework which suits their industries/factories and strict compliance to be followed. There is no compliance or penalties to be followed in these frameworks. Absence of compliance of standards and practices are the main drawback of green factories/ industries.

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STRESS AND ITS ESCALATION TO CYBERCHONDRIA DURING COVID-19

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ABSTRACT

Stress and Health related anxiety in this ongoing phase of coronavirus pandemic has emerged as a major psychological problem, heightened by the medical unawareness and uncertainty to this disease. Today, the internet has emerged as an important global medium of acquiring health related information. The uninterrupted longer duration's lock-downs unintentionally drawn the attention of people towards the information on social media and other platforms overloaded with the highlighted headings of COVID 19 as a potential threat to the lives. This is all because of easy access to the internet and the available medical information. Cyberchondriacs refer to those individuals who have a high level of vulnerability towards health-related anxiety engage excessively in health-related information search on the internet. They find the information, which push them to more anxiety and distress. During the prevailing pandemic, there are various factors that contributed to cyberchondria. People with high level of neuroticism are susceptible to developing cyberchondria without any age effect. This review is done to explore the relationships among age, gender and education level with cyberchondria and health anxiety with reference to the COVID- 19 pandemic and its psychological effects. This will help in finding out the impact of pandemic on the mental health of the people in Indian region.

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Keywords: COVID-19, Pandemic, Psychological issues, Lockdown, Cyberchondria

Introduction

SARS or Severe Acute Respiratory Syndrome is a contagious and in extreme cases a highly fatal respiratory viral illness caused by coronavirus. It was a frightening disease at the time of its outbreak sometimes back compared to COVID-19. This gave highly frequent progression to severe disease and mortality but since it was not happening at global level, the highly life destructive behaviour pattern of the disease was not felt as much. On the other hand, the novel coronavirus (2019-nCoV) originated from Wuhan, China in December 2019 and reached all provinces in China including more than 20 countries by the end of January, 2020 (Wang et al., 2020; Zhu et al., 2020). With the progression of time, the quarantine was extended to most part of the world. Governments at the national and international level imposed lock down and released guidelines to prevent the spread of coronavirus, leading to a "desperate plea" (Horton, 2020).

Stress and health anxiety during the coronavirus pandemic emerged as one of the serious psychological issues, where stress is the degree of being overwhelmed with the situation (one is facing), anxiety is a feeling of worry or fear about the future. They both can lead to the inability to cope with unmanageable pressures which can be either real or imaginary and can be due to various factors which can be either or both internal and external(Feizi, Aliyari, & Roohafza, 2012) (Table 1.).

Table. 1. Internal and External Factors

Internal Factors	External Factors
Individual's Mental setup	Work
Upbringing	Friends & Colleagues
Language Skills	Peer Pressure
Self-Esteem	Family Expectations
Confidence	Societal Pressures

Previous researches have revealed a series of psychosocial impacts in a profound and broad manner on people at the individual, group, and global levels during outbreaks of an infection. Many studies recorded the psychological impact of such pandemics or community diseases on the non-infected or healthy population. This reveals significant psychiatric morbidities that directly linked to younger age carrying increased tendency of self-blaming attitude (Sim, Huak Chan, Chong, Chua, & Wen Soon, 2010). Individual level experiences consist of symptoms such as, fear of falling sick, feelings of helplessness, and stigma (Hall, Hall, & Chapman, 2008). In a study conducted during an influenza outbreak, around 30% of general population was fairly worried about the risk of possibility of contracting the virus

(Rubin, Potts, & Michie, 2010). Closure of schools and business leads individuals towards experiencing negative emotions in its worsened form (Van Bortel et al., 2016).

There are many disorders due to both these, which includes disassociation, discomfort due to lack of sleep, depression, anxiety, lack of productivity, lack of concentration, poor responses, anger, impairment of quality of life, grouchiness among other(Daley, Morin, LeBlanc, Grégoire, & Savard, 2009; Zammit, Weiner, Damato, Sillup, & McMillan, 1999).Table 2 lists certain common warning signs and symptoms of stress which can decrease or increase based upon an individual's personal characteristics, lifestyle, appraisal of the stressor(s) and socio-demographic characteristics(Feizi et al., 2012).

Table 2: Signs and symptoms of stress overload(Jadoun, Kushwah, Barodiya, & Holani, 2012)	
Cognitive Symptoms	Emotional Symptoms
♣ Memory problems ♣ Inability to concentrate ♣ Poor judgment ♣ pessimism ♣ Anxious or racing thoughts ♣ Constant worrying	♣ Moodiness ♣ Irritability or short temper ♣ Agitation, inability to relax ♣ Feeling overwhelmed ♣ Dissociation &Sense of loneliness/isolation ♣ Depression or general unhappiness
Physical Symptoms	Behavioural Symptoms
♣ Aches and pains ♣ Diarrhoea or constipation ♣ Nausea, dizziness ♣ Chest pain, rapid heartbeat ♣ Loss of sex drive ♣ Frequent colds	♣ Eating disorder ♣ Sleeping disorder ♣ Self-isolation ♣ Procrastinating or avoiding responsibilities ♣Using alcohol, cigarettes, or drugs to relax ♣ Nervous habits (e.g. nail biting, pacing)

The internet has become an important and widely available medium of health information (Jokic-Begic, Korajlija, & U Mikac, 2020) at the global level. According to the survey conducted by National Research Council (2000), the internet facilitates health care providers with quick access to information that can aid in the diagnosis and prognosis of health conditions. This efficiency of spreading information rapidly during the pandemic has

numerous advantages and has prepared the health systems against the epidemic and enabled individuals to perceive the risk of the threat. Also, because of the bunch of incoming information available on internet there is a rise in anxiety, which has diverted the attention of health authorities towards smooth and widespread adoption of safety behaviours.

However, longer lock-downs unconsciously diverted the attention of people towards the information of COVID-19 on social media highlighted as a unique threat (Kim & Su, 2020) as it spreads disturbing images and catastrophic information about the virus (Pulido, Villarejo-Carballido, Redondo-Sama, & Gómez, 2020). Repeated exposure to social media in such a wide and constant way can lead individuals to perceive the disease wrongly as a threat to their own communities (Garfin, Silver, & Holman, 2020). Previous and current experiences pertaining to health crises suggest that consistent media exposure to a community devastation can lead to increased stress and extreme anxiety arousing behaviour that can further develop depreciating effects on health (Garfin et al., 2020; Seyed Hashemi et al., 2020). Also fears about diseases likely to spread rapidly through social networks and social media platforms (Farooq, Laato, & Islam, 2020; Taylor, 2019).

Consumer health focuses to a bunch of actions targeting at providing consumers with the chance to exhibit more precise role in their own health and health care management. This ranges from the development and designing of self-assessment tools and therapies for health risks and handling of chronic diseases to home-based trapping procedures of health status and delivery of health care facilities. This is quite obvious since the internet is fully occupied with websites carrying consumer health related issues. These sites are loaded with the diagnosis, prognosis and management strategies of diseases, that involves promotion of various healthy lifestyles, and intervention strategies to stop the onset of disease. The format involves mailing lists to interactive websites, chat sessions, forums or compilations of online resources. According to a recent survey it is reported that consumers visit these sites to update themselves and accumulate information about diseases, treatment, and

nutrition, as well as to find health care experts and providers or participate in support groups (National Research Council, 2000). This practice or trend somehow raised a new phenomenon that has emerged in recent years, coined in the early 2000s by a British newspaper, as a play on the word *hypochondria*.

Cyberchondria refers to a person's anxiety about health that triggers him to use the internet for medical information search(Maftei & Holman, 2020). Persons with a tendency of health-related anxiety engage in browsing and gathering health-related information on the internet. They find such minute and detailed informations, which push them to more anxiety and distress provoking behaviour. Similar to hypochondria, cyberchondria involves in excessive anxiety about health but cyberchondria is believed to affect people on large community basis irrespective of regional limitations as access to the internet is much widespread(GoodTherapy.org, 2017). The cognitive behavioural model of cyberchondria proposes that primarily people with this condition have health anxiety. Due to their reassurance-seeking tendency, they engage in excessive search of online health information. The online health information, instead of relieving their anxiety and providing them reassurance, worsens the health anxiety (Makarla, Gopichandran, & Tondare, 2019). Since not all the search engines are authentic and reliable, therefore it further complicates the matter with personalized content, which can contribute to some groups of people receiving more inappropriate and unreliable information regarding the pandemic situation than others (Farooq et al., 2020). In one study, in the initial phase of the Covid-19 outbreak, there was a significant increment in cyberchondria and COVID-19 related anxiety and safety behaviours. Previous studies have observed higher levels of cyberchondria association to huge concerns and adaptable safety behaviours. However, this relationship was strongly correlated at the very early phase of the virus outbreak (Jokic-Begic et al., 2020)

During the COVID-19 pandemic, the factors that contributed to cyberchondria are many in numbers (Starcevic, Schimmenti, Billieux, & Berle, 2020). Firstly, there was a heightened perception of threat and fear against the newly identified and poorly understood disease which caused obstruction in developing coping strategies with uncertainty associated with the pandemic. Then there is lack of reliable and authentic sources of relevant health information. The information on the internet was either incomplete, or the information was not valid i.e. the difficulty in coping with abundance of information is often confusing, conflicting, unverified and constantly changing, where filtering of irrelevant information is not happening. And finally, there is no source of the internet to give the essential surety. These factors amplified fear and distress, which increase the perception of the general population in an uncertain and threatened manner that further triggers them to online health searches.

In a survey conducted by the Pew Internet and American Life Project it was reported that 80 percent of American internet users' population make an online enquiry for health-related information. This extends to about 113 million American adults who fall on the age range of 18 years. Two-thirds of health information seekers preferred to make an inquiry about their health information on popular search engines such as Google or Yahoo; however, only 15 percent were concerned about the source and date of the information (Fox, 2006). The research organization also reported that those who rely on social media for updating themselves are less likely to get the facts accurately about the corona virus and politics and more likely to hear some unproven and invalid claims which distorts the stress perception (Mitchell, Jurkowitz. J, Oliphant, & Shearer, 2020).

According to a study (Andreassen et al., 2007) conducted on the general populations of Norway, Denmark, Germany, Greece, Poland, Portugal and Latvia, findings suggest that younger individuals between the age group of 30–44 years are the most active users who seek health-related information via the Internet (Andreassen et al., 2007). A study (Mcdaid & Park, 2011) showed that out of more than 12,000 individuals, almost half of the participants used the Google search engine for self-diagnosis. In another study it was found, more younger women between the age group

of 18 – 29 years, go online than younger men, and conversely, more older men, over the age of 65 years, go online more frequently than older women (Fallows, 2005). Study (Maftei & Holman, 2020) corroborates the above and adds data to stress and associated anxiety. In their study, females encompassed 65% of participants and were aged between 15–67 years. The results showed that neuroticism, age, and females were positively associated with cyberchondria. Although optimism related to cyberchondria was found, but there was found an age effect. Further analysis revealed that the effect of optimism was significant only in the elder age group. Moreover, among these elderly participants, the psychologically protective influence of optimism against cyberchondria was higher than the opposite effect of neuroticism.

According to recent studies conducted to cover COVID-19 and psychological health related trends, some psychosocial factors have been found as a major source of causing and increasing COVID-19 fears that lead to serious health issues (Ahorsu et al., 2020; Chang, Hou, Pakpour, Lin, & Griffiths, 2020; Chen, Chen, Pakpour, Griffiths, & Lin, 2020; Lin, Broström, Griffiths, & Pakpour, 2020). However, the correlation between age, gender, and cyberchondria are limited and conflicting (Vismara et al., 2020). Some studies have found no direct relationship between age and cyberchondria (Barke, Bleichhardt, Rief, & Doering, 2016).

Conclusion and future suggestions

Stress perception by an individual is a function of one's reaction to challenging life events (stressors) in the context of prior experiences, belief systems, and coping mechanisms. Stressors vary in severity & duration and elicit a response (stress) that can be adaptive (beneficial stress) or maladaptive (distress) depending upon individual coping abilities.

What we have to understand is that as the internet is an unsupervised and ever-growing database where miscommunication and thus misinformation often occurs. Misinformation occurs because of two significant reasons: the public nature of the internet and the unsupervised nature of the database. Since the internet is a public domain, wherein users can

upload and download information, both subject matter experts and non-experts are free to upload information about a particular subject. This increase in information leads to a combination of both reliable and unreliable sources, which can lead to misinformation of web users. For example, Inquiry of a benign and chronic symptom into a search engine can return a disproportionately high rate of unexpected explanations, such as a life-threatening diseases (Kanganolli & Kumar, 2020).

Misinformation also happens because of the internet's unsupervised and loosely structured system. Data generated on the internet is available until it is completely removed from the web. The rank of online searches is recorded by the frequency of search made for health related information. This escalation process, in turn, affects the search rankings. Also, individuals who are worried about their illnesses are highly concerned about looking into the authenticity of the source and are more worried of what they see on the web (Kanganolli & Kumar, 2020). Thus, this indicates that blogs, forums, and older or out-dated content is available to users and may resurface at any given time (Espinoza & Ramos-Quiroga, 2019).

Therefore, as individual stresses about their health and want less expensive and instant gratification, more and more internet users are looking for health associated questions on the internet. The individuals or 'Cyberchondriac', due to lack of trust in medical experts, and excessively indulging in online research about health is associated with non-essential medical expenses, which primarily arise out of anxiety, increased psychological problem, and distress (Makarla et al., 2019).

Findings suggest that better socioeconomic conditions are the main determinants of psychological wellbeing. Depending on the age group, sex, economic status and other socioeconomic factors, there can be different causes of stress and anxiety with different types of signs and symptoms of stress overload (Bhargava & Trivedi, 2018).

Although, it has been observed that optimistic attitude towards COVID-19 can decrease possibility of experiencing high levels of cyberchondria by the most vulnerable group of

old age individuals, this finding is in contrast to the people high in neuroticism.

These positive findings are an extension to the previously documented positive influence of optimism on precautionary health-related behaviours, i.e. highly optimistic individuals are not found indulged in excessive online searching for medical informations in general problems related to illness and COVID-19 crisis as well (Krane et al., 2018). Whereas individuals with extreme level of neuroticism are prone to developing cyberchondria irrespective of their age (Bajcar, Babiak, & Olchowska-Kotala, 2019), also with health anxiety and health related behaviours(Lagoe & Atkin, 2015; Fergus & Spada, 2018).

Amongst the limits of these above mentioned studies is that there are very few studies that assess health anxiety which prevents us from exploring how this relationship extends to general population.

Further research investigations are required in order to observe the association between age, gender and education level with cyberchondria and health anxiety in the context of the COVID- 19 pandemic and its psychological effects. For example, educational level produces differences among people in terms of access to information and the level of proficiency in order to gain access to new knowledge. Some studies suggested that due to gender disparity, health conditions for men and women are differently affected by stress like differences in vulnerability, stress response, or coping strategies. Certain longitudinal studies have shown the impact of economic stress on increasing the risk of depression (Fahey et al., 2017). In the Indian context, there is no data available with respect all these factors. Earlier

studies (McMullan, Berle, Arnáez, & Starcevic, 2019) have reported that age might moderate the relationship between health anxiety and cyberchondria.

Moreover, current findings should be extended to further studies that should involve non-convenient and larger samples. Longitudinal approaches might also help to explore about the gradual development and spread of the current pandemic that affects the nature and direction of relationships between health anxiety and cyberchondria.

The practical implications of the present findings are numerous which is mainly important for policy makers, clinicians, and healthcare field experts. Government policies and guidelines can promote increased optimism as a protective measure against cyberchondria in a rapid and strategic ways during and post COVID-19 pandemic. As (Khosravi, 2020) reported in the finding about the important association between neuroticism and cyberchondria, self-report scales can be used initially for the screening of individuals found with high level of neuroticism. Personality-tailored preventive measures to be introduced that might reduce cyberchondria and its deteriorating impact during the pandemic. This may involve sharing information about ways to fight the current crisis, especially among individuals of high neuroticism, using optimistic personality enhancing strategies, and campaigning and warning people about the negative consequences of excessive and consistent indulgence on online searching for COVID-19 related information

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HOW ORGANIZATIONS CAN IMPROVE CANDIDATE EXPERIENCE DURING RECRUITMENT IN B-SCHOOLS AND ENHANCE THEIR EMPLOYER BRAND

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ABSTRACT

Employer brand is the market's perception of a company as an employer. During the recruitment process, the candidate, as a potential employee, perceives and feels about the employer and their recruitment process, leading to candidate experience. It is often said that a positive candidate experience bodes well for the company's employer brand. In this paper, we attempted to understand how companies can make changes in their current campus recruitment activities to ensure students have a positive candidate experience, thereby, enhancing the company's employer brand. We examined three phases where organizations can make the relevant changes to their existing recruitment practices. Those were the pre-placement talk (PPT) phase, the job application phase, and the interview phase. We conducted a primary research survey by interviewing current MBA students studying at top Indian business schools, through questionnaires. We understood the top areas of concern within each of the three phases. We also asked students to suggest recommendations for improving candidate experience in each phase. Based on the survey outcomes, we came up with the top- ranked areas of concerns in each of the three phases and suggested suitable recommendations. This study will help companies, that recruit from Indian business schools, to create a positive candidate experience for students and improve their employer brand

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Keywords: Campus recruitment, employer branding, candidate experience, business schools

Introduction

Employer branding is a new concept which organizations have started taking seriously. Companies worldwide are using employer branding as a tool to enhance their reputation in the market as a great place to work, not only in the eyes of current employees but also for prospective employees. Each company strives to be desirable to work for, helping it not only to attract but also retain top talent. Employer branding mainly consists of 4 main parts:

- Company EVP: Employer Value Proposition, abbreviated as EVP, is specifically targeted towards prospective as well as existing talent. It showcases with clarity, a vision of why anyone would love to work in that company

- Company Culture: It symbolizes what it is like to work for a company

- The People: The mix of talent, diversity, and personality which define the perception of the company from both an internal and external point-of- view

- The Candidate Experience: This is the perception of a job-seeker about an employer, based on the interactions happening at each touchpoint of a company's recruitment process

When an organization provides a great candidate experience, it boosts the employer brand of that organization. Since the employer brand is the perception of potential employees about the organization, it is crucial to provide them with a positive experience right from the recruitment phase to ensure they form a positive impression about the company.

When it comes to campus recruitment, which forms a crucial part of a company's recruitment strategy, talented students prefer to choose organizations that make candidate experience a top priority. Often, companies, in a rush to hire quality talent, fail to focus their capital and efforts towards this aspect. Listed below are some of the reasons why the candidate experience should matter to a company:

- Students generally form an opinion about a company based on their experience while attending the company's recruitment process

- Positive candidate experience will increase the potential talent pool since a greater number of students will be excited to attend the company's recruitment process

- A positive or negative candidate experience of a past student can influence the

application intentions of a current student in applying for the company's recruitment process

• A company providing a good candidate experience gains financially by reducing on the costs of conducting multiple recruitment drives and instead, focus on hiring more quality talent from a select bunch of campuses

Although research has been conducted to know more about employer branding and its impact, there seems to be a gap when it comes to understanding how providing a positive candidate experience boosts employer branding of an organization. This study will help companies coming to business schools for hiring, figure out what can be some of the best ways of providing a positive candidate experience at various stages of the recruitment process, thereby, enhancing their employer brand.

Literature Review

Employer branding, as a concept, is one that has intrigued researchers. A framework was presented to enable further research on employer branding. It combined a resource-based view with brand equity theory. The framework developed testable propositions. The relationship between employer branding and organizational career management was also examined. The research issues that were obtained, which, when addressed, could empower employer branding as a strategic human capital management framework [1].

But with positive employer branding, comes a need for providing a positive candidate experience during a company's recruitment activities. In this regard, a model was developed that would showcase the interactions between the organization that was recruiting, the candidate being recruited, and the organization's recruitment process. Those interactions would determine the candidate experience, whether positive or negative. Based on the framework, if organizations followed the relevant guidelines, it would help them provide a positive candidate experience thereby positively impacting the employer brand and at the same time, giving the organization massive positive business outcomes like stronger relationships with customers and shareholders [2]. Shell, the large oil and gas company, enabled its HR to transform their college

graduate hiring assessments by implementing technological changes and witnessed enhanced candidate experience [3].

While employer branding as a concept pertains to all kinds of organizations, how it is implemented varies according to industry. Large and public organizations in the healthcare industry were examined on how they utilized their respective career homepages to do employer branding. Several themes, which featured in the career homepages of those organizations were found out, of which, stakeholders, industry/organization, and advancement were the most common themes which were present across most of the surveyed organizations in which employer branding helped in communication [4]. Moving from the healthcare industry, luxury hotel brands were examined, which were world- famous for their 4-star and 5-star hotels, on how they could leverage online tools like social media to communicate themselves as a good employer brand to hire potential talent. A comparison was done on the online presence of each luxury brand by evaluating their career homepages, Facebook, and LinkedIn profiles of the respective brands. There was immense scope for improvement for the brands in their online profiles as well as the consistent use of such channels. The companies' social media channels like Facebook, LinkedIn, and career sites were not consistent, which might lead to potential employees losing trust. The companies didn't actively post employee achievements on their social media channels leading to incomplete brand message communication [5].

The power industry was examined to seek motives and practices companies in the power industry had for employer branding. The potential benefits of employer branding and the targeting strategy to current and future employees were examined. It was also examined whether companies in the power industry saw employer branding as a process and if so, what were the processes employed. A better employer image, better efficiency in recruitment, and improved job satisfaction among employees were the primary employer branding motives. Efforts concerning employer branding were different based on whether the target group was existing employees or future employees. While for the future employees, recruitment and educational co-operation were

the drivers behind employer branding, for current employees, training and development were the primary drivers of employer branding [6].

To assess how Governments of other countries are utilizing employer branding, it was examined how organizational support in employer branding impacted employee retention in Government agencies in New Zealand. Perceived organizational support in employer branding played a key role in retaining employees. The employee retention factor was also affected as a result of employees' organizational commitment due to the perceived organizational support. Perceived organizational support and employee retention were related by organizational commitment [7].

Referring to the Indian context, the various employer branding factors that influenced the attraction and retention of employees in the banking industry in Delhi NCR in India were explored. It was examined if differences regarding employee attraction and employee retention existed between genders and Government/private sector employees. While the market and social value of the bank influenced employee attraction, employee retention was influenced by factors like career development and image [8].

The factors IT employees took into consideration when they evaluated IT companies, what were the most important factors among them, and provided recommendations regarding how IT employers could leverage employer branding intelligence to attract and retain top talent to stay competitive in the market, were taken into consideration. It was found out that value propositions like social value, interest value, economic value, and brand image play were the most important to employees in selecting their employer of choice. This enabled companies to streamline their employer branding efforts on factors that mattered the most. However, value propositions like application, work/life balance, or development were not that influential in attracting or retaining talent [9].

It is very important to understand the implications of employer branding towards providing, not only a positive candidate experience but also a positive employee experience which will lead to a boost in employee morale, productivity, and ultimately,

employee retention. It was explained how important it was to manage the employer brand image for the current employees. The difference between the existing and preferred levels of employer attributes to drive home the importance of managing the employer brand image for existing employees was highlighted. The relationship between employer brand attributes and job-related attributes and the impact those attributes had on the current employees were examined [10]. The various avenues of how effective

employer branding practices helped in employee retention were explored. The various internal and external effects of employee branding and the virtuous cycles between them were examined. Strategies to retain good employees in the organization were observed. The top causes for attrition were found out and a strategic framework on how employer branding would help retain employees by recruiting and engaging the workforce, increasing the productivity of employees, developing job satisfaction, and enabling to take organizational decisions was developed [11].

It is also very important on the part of the organization to provide support to employees for their career growth. This too serves as a positive employer branding as an organization that is concerned about the overall development of its employees. It was examined how organizational talent management impacted perceived employer branding. A strong correlation was found out between organizational talent management and perceived employer branding. The eight dimensions of organizational talent management that influenced perceived employer branding were organizations displaying a mindset of talent management, organizations attracting and recruiting potential top talent, identifying and differentiating talented employees, organizations which focussed on the development of others, those companies which strove to maintain positive relations, organizations that provided challenging work as well as remunerated fairly, organizations which could effectively help employees manage work-life balance. Out of those eight predictors, rewarding, and remunerating fairly, enabling employees to manage work/life balance, and attracting and

recruiting talent were key in evaluating the employer branding [12].

Since companies rely a lot on on-campus recruitment for hiring top talent, it is prudent that they invest heavily in employer branding activities on college campuses to broadcast their message of being an employer of choice. Some of the important employer branding dimensions concerning campus recruitment in India were looked at. It also looked at what was that one particular discriminating factor of employer branding which influenced a student's choice of a particular company. Job security was the most influencing variable under the corporate image dimension. Under the student offerings dimension, internship, or project work allotted by the company was considered to be the most important. Under the knowledge dissemination dimension, workshops were rated highly. In the feedback and communication dimension, word of mouth of classmates/batch mates played a crucial role. Concerning the institutional engagement dimension, scholarships and technical sponsorships were considered to be very important. How the companies engaged with students in the pre- selection phase, how was the interview experience in the selection phase, whether or not there were any service agreements in the post-selection phase contributed highly to the final decision-making process of the students about joining a company. But it is only half-done if one looks at only the organization's perspectives [13]. One must also look at the other key stakeholder's perspectives, i.e., the students. The factors that influenced the perception of Indian students studying in Indian colleges about an organization's employer brand, its brand building strategies, and their intention to apply to that organization were examined. Variables like corporate image, activities pre-recruitment, corporate social responsibility involved, internships-workshops-seminars, rewards and recognition, social media presence, etc., were considered. Based on an Indian context, Indian students highly valued organizations with a deep social media presence, and as such companies should focus on building their employer brand based on these lines. Companies that had updated websites, engaged in innovative and interactive pre-recruitment activities as well as had a robust CSR foundation in place, had a strong

positive employer branding strategy to consequently have an effective talent pool [14].

Coming to the students studying at Indian business schools, a multitude of top-notch firms across industry sectors, approach business schools each year to hire talent at attractive salary packages. Students generally get the option of applying to companies of their choosing. The effects employer brand image had on the application intentions of business school students towards applying for a particular organization were examined. Job attributes like job responsibility, job empowerment, compensation, and location to be the primary factors affecting the students' application intentions. The amount of prior work experience had a moderating influence on job responsibility and job empowerment with application intentions [15].

With a multitude of companies visiting campus, it becomes very critical for a company to stand out from the crowd to attract students. The attributes which served as attracting factors of final-year management students towards companies were examined. The already existing employer branding practices adopted by companies and found out the most effective channel to promote employer attractiveness were observed. Students valued organizational culture, brand name, and compensation as the top factors that attracted them to a particular organization. Students preferred job portals as the most effective channel for gauging employer attractiveness. The stronger the brand image, the greater the chances of the students applying to that company [16].

The role of technology adoption in HR is explored. How key HR functions like recruitment are slowly becoming virtual wherein onboarding, documentation, induction, and training are all conducted virtually, such facets are looked upon. The future of HR tech in India is discussed [17]. The pros and cons of virtual onboarding were explored. How virtual onboarding gives companies the benefits of the flexibility of interacting with employees without having a geographical barrier, how virtual onboarding programs can be customized to convert a formal process to more fun and interactive one was explored. Virtual onboarding has eased the daunting task of handling physical documentation. There are some flaws in virtual onboarding too like lack of physical interaction and scope of assumption

among the new hires [18]. How companies like Procter & Gamble, Visa, Mahindra & Mahindra, Flipkart, and RBS India are onboarding new hires through new practices like gamification through a digital induction, organizing online virtual sessions with top leadership, assigning mentors or buddies to guide them on remote working, giving the new hires access to a multitude of learning and development materials was examined [19].

Research Methodology

This study focusses on the factors, which companies visiting Indian business schools for recruitment should focus on to enhance their employer brand. This study takes into account the perspectives of current MBA students and what they think are the most important factors companies coming to recruit should take maximum care of, to provide for positive candidate experience. Thus, the population included all 1st year and 2nd year students enrolled in a 2- year MBA/PGDM program or only the 1st year students enrolled in a 1-year MBA/PGDM degree at Indian business schools. However, the sample included current MBA students from only top Indian business schools. Owing to time constraints and other restricting factors, convenience sampling was followed for reaching out to the target audience for gathering primary data.

After extensive literature review followed by exploratory secondary research, three critical phases during any campus recruitment activity in Indian business schools were identified. These were:

- The Pre-Placement Talk (PPT) Phase
- The Job Application Phase
- The Interview Phase

How well these phases were executed by the companies would greatly impact, either positively or negatively, towards the overall candidate experience and as such, consequently, impact the overall employer brand. Through a mix of interacting with current MBA students, past MBA students, current University Recruitment/Talent Acquisition professionals as well as conducting extensive secondary research, for each phase, some of the most prevalent practices which were used by the companies to provide a positive candidate experience were found out.

For example, when it comes to ensuring a positive candidate experience during the PPT phase, companies employ various practices like communicating to the students about the role being hired for, the work culture of the organization, the types of projects the organization deals with, teaching the students the current market trends, making the talks interactive and engaging, providing goodies to the students, etc.

In case of ensuring a positive candidate experience while filling a job application, companies are providing clear and detailed job descriptions, clear application instructions, single-page form length, mobile-friendly options, etc.

When it comes to the interview phase, companies are instructing interviewers to provide for a warm and welcoming interview environment, asking job/role-relevant interview questions, asking informal questions to create a friendly atmosphere so that the interviewees can be their self and not take undue stress, etc.

Now among this list of best practices at different stages, while some practices can be perceived to give positive experiences to students but it is extremely critical to develop empathy and find out what are the practices which the students themselves find to be the most important that companies need to focus their efforts and resources on to ensure that the students benefit from a great candidate experience. For this very reason, pure secondary research won't divulge the necessary insights, and a thorough primary survey will be needed to be distributed among the sample, i.e., current MBA students from top Indian business schools.

Results And Analysis

A total of 130 participants completed filling the questionnaire. Some of the Indian business schools whose students were a part of the group of participants who filled the questionnaire were as follows:

- Symbiosis Centre for Management and Human Resource Development (SCMHRD), Pune
- Indian Institute of Management (IIM), Raipur
- Symbiosis Institute of Business Management (SIBM), Pune
- Xavier Institute of Management,

Bhubaneswar (XIMB)

- Great Lakes Institute of Management (GLIM), Chennai
- Goa Institute of Management (GIM), Goa

With regards to the pre-placement talk phase of a company's recruitment process, the participants were asked to rank the following 9 factors which they think companies should prioritize more during their PPTs to provide a positive candidate experience. The factors were:

- Communicate how you will fit in as new college graduates
- Communicate about the role being hired for
- Communicate the work culture
- Communicate the hierarchy followed within the organization
- Communicate the types of projects
- Communicate the market and technology trends
- Keeping the PPT short (< 20 minutes)
- Keeping the PPT interactive
- Giving students the chance to win goodies on participation

Tables 1(A), 1(B) and 1(C) show the frequency of ranking of each factor as well as the average overall rank of each factor. Lower the overall average rank, it indicates a greater number of participants kept it as of top importance while filling the research questionnaire.

Table 1(A)

When it comes to a company's pre-placement talk (PPT), rank the following (1-9) on the level of importance companies should give to the following, 1 being the most important, 9 being the least important.

	Average Rank	Rank 1		Rank 2		Rank 3	
		Count	Percent	Count	Percent	Count	Percent
Factor 1	2.29	62	48.06%	26	20.16%	16	12.40%
Factor 2	3.57	15	11.63%	28	21.71%	27	20.93%
Factor 3	3.71	15	11.63%	20	15.50%	28	21.71%
Factor 4	3.71	9	6.98%	30	23.26%	29	22.48%
Factor 5	5.73	5	3.88%	5	3.88%	10	7.75%
Factor 6	5.84	5	3.88%	10	7.75%	4	3.10%
Factor 7	5.95	16	12.40%	5	3.88%	8	6.20%
Factor 8	6.19	2	1.55%	5	3.88%	7	5.43%
Factor 9	8.02	0	0.00%	0	0.00%	0	0.00%

TABLE 1(B)

When it comes to a company's pre-placement talk (PPT), rank the following (1-9) on the level of importance companies should give to the following, 1 being the most important, 9 being the least important.

	Average Rank	Rank 4		Rank 5		Rank 6	
		Count	Percent	Count	Percent	Count	Percent
Factor 1	2.29	11	8.53%	4	3.10%	4	3.10%
Factor 2	3.57	25	19.38%	16	12.40%	7	5.43%
Factor 3	3.71	23	17.83%	21	16.28%	15	11.63%
Factor 4	3.71	18	13.95%	23	17.83%	10	7.75%
Factor 5	5.73	16	12.40%	18	13.95%	22	17.05%
Factor 6	5.84	13	10.08%	21	16.28%	14	10.85%
Factor 7	5.95	6	4.65%	13	10.08%	12	9.30%
Factor 8	6.19	12	9.30%	10	7.75%	34	26.36%
Factor 9	8.02	5	3.88%	3	2.33%	11	8.53%

TABLE 1(C)

When it comes to a company's pre-placement talk (PPT), rank the following (1-9) on the level of importance companies should give to the following, 1 being the most important, 9 being the least important.

	Average Rank	Rank 7		Rank 8		Rank 9	
		Count	Percent	Count	Percent	Count	Percent
Factor 1	2.29	3	2.33%	2	1.55%	1	0.78%
Factor 2	3.57	3	2.33%	7	5.43%	1	0.78%
Factor 3	3.71	4	3.10%	3	2.33%	0	0.00%
Factor 4	3.71	5	3.88%	4	3.10%	1	0.78%
Factor 5	5.73	26	20.16%	17	13.18%	10	7.75%
Factor 6	5.84	33	25.58%	16	12.40%	13	10.08%
Factor 7	5.95	19	14.73%	27	20.93%	23	17.83%
Factor 8	6.19	22	17.05%	24	18.60%	13	10.08%
Factor 9	8.02	14	10.85%	29	22.48%	67	51.94%

LEGEND

Factor	Description
Factor 1	Communicate about the role being hired for
Factor 2	Communicate the work culture
Factor 3	Communicate how you will fit in as new college graduates
Factor 4	Communicate the types of projects
Factor 5	Communicate the hierarchy followed within the organization
Factor 6	Keeping the PPT interactive
Factor 7	Keeping the PPT short (< 20 minutes)
Factor 8	Communicate the market and technology trends

Factor 9	Giving students a chance to win goodies on participation

From Tables 1(a), 1(b) and 1(c), the following analysis can be drawn:

• 104 out of the 130 respondents (80% respondents) considered 'Communicate about the role being hired for' among the top 3 factors companies should give importance to during PPTs

• 70 out of the 130 respondents (~53.85% respondents) considered 'Communicate the work culture' among the top 3 factors companies should give importance to during PPTs

• 63 out of the 130 respondents (~48.46% respondents) considered 'Communicate how you will fit in as new college graduates' among the top 3 factors companies should give importance to during PPTs

• 68 out of the 130 respondents (~52.3% respondents) considered 'Communicate the types of projects' among the top 3 factors companies should give importance to during PPTs

• 20 out of the 130 respondents (~15.38% respondents) considered 'Communicate the hierarchy followed within the organization' among the top 3 factors companies should give importance to during PPTs

• 19 out of the 130 respondents (~14.62% respondents) considered 'Keeping the PPT interactive' among the top 3 factors companies should give importance to during PPTs

• 29 out of the 130 respondents (~22.3% respondents) considered 'Keeping the PPT short (< 20 minutes)' among the top 3 factors companies should give importance to during PPTs

• 14 out of the 130 respondents (~10.77% respondents) considered 'Communicate the market and technology trends' among the top 3 factors companies should give importance to during PPTs

• 0 out of the 130 respondents (0% respondents) considered 'Giving students the chance to win goodies on participation' among the top 3 factors companies should give importance to during PPTs

With regards to the job application phase of a company's recruitment process, the participants were asked to rank the following 7 factors which they think companies should prioritize more to ensure candidates have a great experience filling up a job application. The factors were:

• Have a clear and detailed job descriptions

• Give clear application instructions like documents needed to be uploaded

• Develop an application system that does not require you to create an account/profile to fill up the application form

• Keep the total application form length to a single page

• Make the application process mobile-friendly

• Not restrict file upload sizes and formats

• Make answers 'required' only if they are required

Tables 2(A) and 2(B) show the frequency of ranking of each factor as well as the average overall rank of each factor. Lower the overall average rank, it indicates a greater number of participants kept it as of top importance while filling the research questionnaire.

TABLE 2(A)

To ensure that you have a great experience filling up a job application, rank the following options (1-7) in order of importance companies should give to the following, 1 being the most important, 7 being the least important.						
	Average Rank	*Rank 1*		*Rank 2*		*Rank 3*	
		Count	*Percent*	*Count*	*Percent*	*Count*	*Percent*
Factor 1	1.66	86	66.67%	23	17.83%	10	7.75%
Factor 2	2.95	13	10.08%	47	36.43%	29	22.48%
Factor 3	4.15	16	12.40%	17	13.18%	18	13.95%
Factor 4	4.22	8	6.20%	16	12.40%	25	19.38%
Factor 5	4.55	1	0.78%	17	13.18%	22	17.05%
Factor 6	4.93	1	0.78%	6	4.65%	18	13.95%
Factor 7	5.53	4	3.10%	3	2.33%	7	5.43%

TABLE 2(B)

To ensure that you have a great experience filling up a job application, rank the following options (1-7) in order of importance companies should give to the following, 1 being the most important, 7 being the least important.						
	Average Rank	*Rank 4*		*Rank 5*		*Rank 6*		*Rank 7*	
		Count	*Percent*	*Count*	*Percent*	*Count*	*Percent*	*Count*	*Percent*
Factor 1	1.66	5	3.88%	0	0.00%	3	2.33%	2	1.55%
Factor			15.5		10.0				

tor 2	2.95	20	0 %	13	8 %	7	5.43 %	0	0.00 %
Factor 3	4.15	19	14.73 %	20	15.50 %	18	13.95 %	21	16.28 %
Factor 4	4.22	19	14.73 %	28	21.71 %	17	13.18 %	16	12.40 %
Factor 5	4.55	24	18.60 %	20	15.50 %	25	19.38 %	20	15.50 %
Factor 6	4.93	32	24.81 %	20	15.50 %	23	17.83 %	29	22.48 %
Factor 7	5.53	10	7.75 %	28	21.71 %	36	27.91 %	41	31.78 %

LEGEND

Factor	Description
Factor 1	Have clear and detailed job descriptions?
Factor 2	Give clear application instructions like documents needed to be uploaded?
Factor 3	Develop an application system that does not require you to create an account/profile to fill up the application form?
Factor 4	Keep the total application form length to a single page?
Factor 5	Make the application process mobile-friendly?
Factor 6	Make answers 'required' only if they're required?
Factor 7	Not restrict file upload sizes and formats?

Tables 2(a) and 2(b), the following analysis can be drawn:

- 119 out of the 130 respondents (~91.54% respondents) considered 'Have a clear and detailed job description' among the top 3 factors companies should give importance to ensure candidates have an awesome job application filling experience

- 89 out of the 130 respondents (~68.46% respondents) considered 'Give clear application instructions like documents needed to be uploaded' among the top 3 factors companies should give importance to ensure candidates have an awesome job application filling experience

- 51 out of the 130 respondents (~39.23% respondents) considered 'Develop an application system that does not require you to create an account/profile to fill up the application form' among the top 3 factors companies should give importance to ensure candidates have an awesome job application filling experience

- 49 out of the 130 respondents (~37.69% respondents) considered 'Keep the total application form length to a single page' among the top 3 factors companies should give importance to ensure candidates have an awesome job application filling experience

- 40 out of the 130 respondents (~30.77% respondents) considered 'Make the application process mobile-friendly' among the top 3 factors companies should give importance to ensure candidates have an awesome job application filling experience

- 25 out of the 130 respondents (~19.23% respondents) considered 'Make answers 'required' only if they're required' among the top 3 factors companies should give importance to ensure candidates have an awesome job application filling experience

- 14 out of the 130 respondents (~10.77% respondents) considered 'Not restrict file upload sizes and formats' among the top 3 factors companies should give importance to ensure candidates have an awesome job application filling experience

With regards to the interview phase of a company's recruitment process, the participants were asked to rank the following 8 factors which they think companies should prioritize more to ensure candidates have great interview experience. The factors were:

- Create a warm and welcoming interview environment for the student
- Ensuring the student has prior knowledge about the background of the interviewers
- Asking questions to the student that are relevant to the job applied for
- Asking questions that measure the student's skills and subject knowledge, even if they are not necessarily totally relevant to the job applied for
- Asking questions that evaluate the student's personality
- Having informal conversations with the student about the organization and other common interests
- Allowing the student to ask questions to the interviewers
- Giving prompt feedback to the student irrespective of whether accepted/rejected

Tables 3(A) and 3(B) show the frequency of ranking of each factor as well as the average overall rank of each factor. Lower the overall average rank, it indicates a greater number of

participants kept it as of top importance while filling the research questionnaire.

TABLE 3(A)

Interviews are often considered to be the most critical stage in any recruitment process, both for the employer and the candidate. It is important to provide a positive interview experience so that candidates can perform at their full potential and also companies can get the best talent. Rank the following options (1-8) in order of importance companies should give to the following, 1 being the most important, 8 being the least important.

	Average Rank	Rank 1		Rank 2		Rank 3		Rank 4	
		Count	Percent	Count	Percent	Count	Percent	Count	Percent
Factor 1	2.33	66	51.16%	26	20.16%	12	9.30%	4	3.10%
Factor 2	3.53	15	11.63%	34	26.36%	23	17.83%	21	16.28%
Factor 3	4.44	5	3.88%	11	8.53%	30	23.26%	22	17.05%
Factor 4	4.63	7	5.43%	20	15.50%	18	13.95%	22	17.05%
Factor 5	4.85	8	6.20%	9	6.98%	15	11.63%	21	16.28%
Factor 6	5.05	19	14.73%	8	6.20%	11	8.53%	14	10.85%
Factor 7	5.12	9	6.98%	18	13.95%	14	10.85%	13	10.08%
Factor 8	6.03	0	0.00%	3	2.33%	6	4.65%	12	9.30%

TABLE 3(B)

Interviews are often considered to be the most critical stage in any recruitment process, both for the employer and the candidate. It is important to provide a positive interview experience so that candidates can perform at their full potential and also companies can get the best talent. Rank the following options (1-8) in order of importance companies should give to the following, 1 being the most important, 8 being the least important.

	Average Rank	Rank 5		Rank 6		Rank 7		Rank 8	
		Count	Percent	Count	Percent	Count	Percent	Count	Percent
Factor 1	2.33	6	4.65%	8	6.20%	3	2.33%	4	3.10%
Factor 2	3.53	15	11.63%	7	5.43%	9	6.98%	5	3.88%
Factor 3	4.44	23	17.83%	20	15.50%	11	8.53%	7	5.43%
Factor 4	4.63	12	9.30%	16	12.40%	20	15.50%	14	10.85%
Factor 5	4.85	26	20.16%	18	13.95%	23	17.83%	9	6.98%
Factor 6	5.05	13	10.08%	16	12.40%	17	13.18%	31	24.03%
Factor 7	5.12	14	10.85%	13	10.08%	10	7.75%	38	29.46%
Factor 8	6.03	20	15.50%	31	24.03%	36	27.91%	21	16.28%

LEGEND

Factor	Description
Factor 1	Create a warm and welcoming interview environment for the student
Factor 2	Asking questions to the student that are relevant to the job applied for
Factor 3	Asking questions that evaluate the student's personality
Factor 4	Asking questions that measure the student's skills and subject knowledge, even if they are not necessarily totally relevant to the job applied for
Factor 5	Having informal conversations with the student about the organization and other common interests
Factor 6	Giving prompt feedback to the student irrespective of whether accepted/rejected
Factor 7	Ensuring the student has prior knowledge about the background of the interviewers
Factor 8	Allowing the student to ask questions to the interviewers

From Figure 3(a) and Tables 3(a) and 3(b), the following analysis can be drawn:

• 104 out of the 130 respondents (80% respondents) considered 'Create a warm and welcoming interview environment for the student' among the top 3 factors companies should give importance to ensure candidates have awesome interview experience. It has an average rank of 2.33.

• 72 out of the 130 respondents (~55.38% respondents) considered 'Asking questions to the student that are relevant to the job applied for' among the top 3 factors companies should give importance to ensure candidates have awesome interview experience. It has an average rank of 3.53.

• 46 out of the 130 respondents (~35.38% respondents) considered 'Asking questions that evaluate the students' personality' among the top 3 factors companies should give importance to ensure candidates have awesome interview experience. It has an average rank of 4.44.

• 45 out of the 130 respondents (~34.62% respondents) considered 'Asking questions that measure the students' skills and subject knowledge, even if they are not necessarily totally relevant to the job applied for' among the top 3 factors companies should give importance to ensure candidates have awesome interview experience. It has an average rank of 4.63.

• 32 out of the 130 respondents (~24.62% respondents) considered 'Having

informal conversations with the student about the organization and other common interests' among the top 3 factors companies should give importance to ensure candidates have awesome interview experience. It has an average rank of 4.85.

- 38 out of the 130 respondents (~29.23% respondents) considered 'Giving prompt feedback to the student irrespective of whether accepted/rejected' among the top 3 factors companies should give importance to ensure candidates have awesome interview experience. It has an average rank of 5.05.

- 41 out of the 130 respondents (~31.54% respondents) considered 'Ensuring the student has prior knowledge about the background of the interviewers' among the top 3 factors companies should give importance to ensure candidates have awesome interview experience. It has an average rank of 5.12.

- 9 out of the 130 respondents (~6.92% respondents) considered 'Allowing the student to ask questions to the interviewers' among the top 3 factors companies should give importance to ensure candidates have awesome interview experience. It has an average rank of 6.03.

Discussions

Based on the results and analysis, below are the details of each of the three phases:

Pre-Placement Talk (PPT) Phase: It was seen that the top 3 factors which current MBA students wanted companies to focus on during their pre-placement talks at campus recruitments were as follows:

- Companies need to spend time during their PPTs explaining about the role they have come to hire students for. They need to describe in detail about the overall job responsibilities for that role, the skills required, the career and growth trajectory in that role, both within and outside their company.

- Companies need to communicate in detail about their work culture. This includes a mix of factors like providing insights on the organization's leadership, what are its values, traditions, and beliefs, what are the various interactions, behaviors, and attitudes which would contribute positively to the overall working environment.

- Companies should spend time explaining to students how they will fit into the new role for which they are being hired. Also, the companies need to give insights about the various types of projects that the organization is currently working on as well as projects specific to the role being hired for.

Job Application Phase: While it is very important on the part of the organizations to devise strategies to ensure students have a very positive experience while filling up job applications, let's look at the top three factors which students believe organizations should focus on to provide for an awesome experience filling up the job application:

- The job applications must have very clear and detailed job descriptions. These crystal- clear job descriptions should provide a clear road map of what the student should expect working within the role, as a new employee. They are a means of clarifying expectations immediately. They should communicate the core requirements of the role being hired for. From the employer's perspective, they can also serve as a source of legal defense during employee claims or other internal disputes.

- Students view it positively if clear application instructions are mentioned before filling up the job application. For starters, the application should be simple to understand and easy to fill. Organizations should take extra care to ensure the nitty-gritty is taken care of. For example, if the students have to apply via an online application link, the organization must not forget to attach a link to the specific web page. Students prefer that the job application form mentions what all documents they need to keep in handy while filling up the form, what are the documents that need to be uploaded. It will be great if students are given additional information regarding the application form like the number of questions, the types of questions, and an approximate completion time so that students can better prepare themselves to ensure a smooth application fill-up process.

- Another important factor that students have responded as critical to ensuring a positive job application fill-up process is the provision of not making it mandatory to create an account/profile on a particular web portal while filling up an online job application. Often this process becomes tedious wherein students

need to give personal details (which may or may not be relevant towards the recruitment) to create the account on that portal. Plus, students have to remember passwords to access a portal, which in all likelihood, won't be used after the recruitment process. Students would rather prefer organizations providing a standalone online job application form wherein minimum relevant and important details need to be furnished without the need of remembering multiple passwords.

Interview Phase: Interviews are often the final and the most critical stage of any recruitment process. The organization must provide the students with a positive interview experience

to get the talent they are looking to hire. Based on the results and analysis of this study, here is a look at the top three factors which students think if companies adopt, will help give a positive interview experience to the students:

• Interviews are different from interrogation. The main purpose of an interview is to find out the right fit for a role and not to question someone's intellect. So that's why it is extremely critical that companies create an environment where the student does not feel stressed and bogged down with pressure to perform. Often great candidates flounder due to stress and pressure costing the company to lose out on a potential top performer. So, students want companies to focus efforts on creating a relaxed and welcoming environment allowing for a free-flowing conversation.

• It is very tough to get enough knowledge about a student based on the interaction of a few minutes in an interview. As such, knowing whether or not the student is fit for the role being hired for becomes a challenge. It is here that asking relevant questions that pertain to the actual job role being hired for lets the interviewers know the fit of the student in a short time. On the other side, students also get to understand whether the role for which they are interviewing is something that appeals to them based on the knowledge/skills assessed.

While it is so critical to know the job or role fit of a student based on his/her hard skills and qualifications, what is equally important is to ask questions that evaluate the personality of

the student. Knowing this helps the interviewers gauge whether the student demonstrates values that resonate well with the company culture and would help the student succeed as a full-time employee at the firm. Discussing the students' work habits and interests outside of work creates a more informal environment for the interview and allow the student also to open up and express more. Students feel a sense of growing trust with the interviewer and subsequently with the company when they see the company is invested in knowing them as an individual.

Conclusion and Recommendations

After a thorough analysis, Table 4 summarizes the top three factors under each phase, i.e., the pre-placement talk phase, the job application phase, and the interview phase, which current MBA students think companies need to focus on to ensure a positive candidate experience, thereby enhancing their employer brand.

TABLE 4

Pre-Placement Talk (PPT) Phase	Job Application Phase	Interview Phase
Explain the role of the position being hired for	Have a clear and detailed job description	Create a warm and welcoming interview environment
Explain the work culture	Give clear application instructions beforehand	Asking job-relevant questions
Explain the process of fit of new graduates to the role/organization	Develop standalone application systems that	Asking personality evaluation questions

Some of the recommendations which can be suggested based on insights from the primary research questionnaire and exploratory secondary research are as follows:

Pre-Placement Talk (PPT) Phase

• Companies should focus on going into detail about the skills and competencies required to thrive working in the role being hired for. This helps students start equipping themselves with the required skillsets even before starting with the job. They should highlight some of the key impact areas to the organization by employees working under that particular role. This would give added motivation and a sense of pride in being able to work in that role. A detailed salary breakdown for the role would improve transparency. Finally, bringing current employees working in that role to talk about their experiences and challenges would give the students a first-hand account of life working in that role.

• The best flagbearers to explain the organization culture would be the employees themselves. So, asking current employees (both experienced and freshers who have joined the organization recently) to recount their experience of working in the company, what are the things they like about the company would give a very clear understanding of the work culture. Additionally, while most companies prefer to harp on the positives within the company, mention of some of the areas of improvement within the culture would be a sign of humility which would gain the trust of the students and give them an incentive to work on these areas to further enhance the organization culture.

• Companies should explain about the learning and development opportunities existing within the organization for new graduates as well as the scope of job rotation to take up roles as per fitment. They should also focus on explaining the career trajectory of new graduates within the organization by sharing testimonials, career graphs, and past success stories of new graduates.

Job Application Phase

• Companies must ensure that they provide as much clarity as possible with regards to the job description right there in the job application itself. This starts with getting the job title right and specific. It should also give a short and crisp overview of the job's main function and its impact on company objectives and to the society at large. It should also, apart from mentioning the roles and responsibilities, mention scope for achievement and career advancement. It should also mention the company culture. Companies can take the help of current employees working in that role to frame the perfect job description.

• Clear application instructions are essential to ensure students have a great application filling experience. Companies can attach a sample filled job application form to help students understand in more detail how to fill the application, thereby helping the students complete the process faster. Giving rational reasons behind asking specific questions will give students an idea of what to answer and also maintain transparency.

• Aside from the application instructions, since a majority of job applications are now online, it becomes critical that the application system is user-friendly and comes with minimum hassles for students. Students do not prefer creating a separate account in a portal just to apply for a job. They would prefer a standalone job application portal. These portals must be made simple, easy-to-use, and with zero bugs. Companies can help students by keeping in touch through email/SMS at various touchpoints of the application process instead of making the students log in to the portal to see current application status. Students would also prefer if some information is pre- populated from their LinkedIn profile, if available, thereby reducing time to fill the forms.

Interview Phase

• Creating a warm and welcoming interview environment for students helps ensure that not only do they have a great interview experience where they can perform at their best but also help the organization not miss out on great candidates. In this regard, interviewers can organizations can provide lots of information to the students about the interview process well in advance before they sit for the final interviews. This may include providing testimonials of interviews of past students who got hired by the organizations, how they prepared, what were some of the kinds of questions asked. This helps students get more clarity on the process at hand and helps them feel prepared and relaxed. In the initial few moments of the interview, the interviewer should smile, greet the student by name, break the ice regarding the formality of the process. The interviewer should spend some time, in the beginning, discussing the company, about his/her role within the company, and what the role being hired for entails. This will ensure the student shrugs off the initial nervousness and is well set up for the discussion to follow.

• For an interview to yield the desired results for both the employer as well as the student and at the same time, ensuring providing a positive interview experience, asking the right questions is a must.

Interviewers, in this regard, should not go ahead with a preconceived notion of what a

"right" answer should be. Interviewers should rather focus on evaluating whether the student possesses the relevant characteristics required to succeed at the role being hired for. Asking open-ended questions over close-ended questions can prove to be beneficial in this regard. Open-ended questions allow the students to describe and form a story about questions relating to their skills as well as personalities. Open-ended questions can also help the interviewers understand the student's communication skills, degree of motivation, and interest in the role. Often, close-ended questions, though specific, can lead to gaps in understanding some situations.

schools. Future scope for research may be getting to know the perspectives of alumni or past students of Indian business schools, as well as corporate recruiters themselves, on what they think, can be the possible points of improvement within the current campus recruitment processes to ensure that students have a positive candidate experience and thus, improve the company's employer brand. Further scope of research can be to go to current MBA students abroad, i.e., beyond those studying in Indian business schools

Limitations

This research study has been conducted keeping in mind the perspectives of current MBA students from top Indian business

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THE FUNDAMENTALS FOR B2B FRAMEWORK

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ABSTRACT

i In the span of 4 decades of research in the B2B setting, therei has been a dearth of information on various fronts. Firstly, it is veryi recent that importance of B2B recognised. Secondly, a lot of literaturei even now deals only with the theoretical aspect of thei need of strategies. Thirdly, there have been no studiesi regardingi thei practical application of the strategies.

Methodology –i This study's arguments arei developed in line with MacInnis's (2011)i guidelines on conceptual contributionsi in marketing, alongi with secondary analysis of literaturei focusing on the B2B scenario.

Findings,i if any: Ai frameworki for branding strategiesi for B2B firms will be proposed takingi into consideration the level of collaboration and standardisation required,i varying from organisation toi organisation.

Practical Implications: If the suggested frameworki comes outi toi be in line with thei findings of the research,i B2Bi firms will havei ai much needed outline toi follow during branding decisions.

Originality: The frameworki willi bei uniquei in thei way that it can provide guidelines' for managersi toi follow fori branding strategiesi which were erstwhile dependent on chance or precedence.

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Keywords: Branding, B2B,i Framework, Co-production, Co-development

Introduction

Business-to-Business Situation: Business transaction (B2B or, in some countries, BtoB) is a situation in which one business conducts a trade transaction with another business. This often happens when:

- The business uses the ingredients of its production process to produce (e.g. a food maker who bought salt). Example: raw materials to another company that will produce a product.
- An entity needs the services of another for a variety of operational reasons (e.g. a food producer using a financial company to manage their finances).
- The business re-sells products and services produced by other businesses (e.g. the seller buys the final product from the food manufacturer).

It is a form of transaction that takes place between businesses, such as one involving a manufacturer and wholesaler, or a wholesaler and a retailer. Business-to- business refers to business that is conducted between

companies, rather than between a company and individual consumer.

B2B is often completely separated from business-to- consumer (B2C). In B2B trading, it is often the case that the parties to the relationship have more or less the same

negotiating power, and even if they do not, each side

involves professional staff and legal advice in negotiating policies while in the case of B2C, the environment is highly structured with a degree in the economic consequences of information asymmetry. However, within the context of B2B transactions, large companies can have many trading benefits, resources, and information for small businesses.

Branding: Meanwhile, Branding as a concept uses an idea or image or factors affecting perception of a product or service, provided by a company, which stays in the mind of the customer. It is an emotion or feeling developed by the company specifically for its product/service or it is created by the product/service itself. The entity can be easily copied by other companies but the customer perception remains unique and different from other brands. Brand equity, on the other hand, refers to the value that consumers associate with a brand [1]. There are many examples in our daily

lives like, for example Fanta and Mirinda. In this case, their product is more or less the

same but the product name, logo, tag line, etc. is different. It is a strategy developed by organizations to help people quickly identify and know the type of product, and to give them a reason to choose their products over the competition, by specifying what type of product it is or it is not.

In simpler terms Branding, by definition, is a marketing practice in which a company creates a name, symbol or design that is easily identifiable as belonging to the company. This helps to identify a product and distinguish it from other products and services. Branding is important because not only is it what makes a memorable impression on consumers but it allows your customers and clients to know what to expect from your company.

The ultimate goal is to attract and hold consumers, raise their loyalty, and other stakeholders by placing the product at the right place at the right time.

Brand awareness on the other hand, refers to the ability of the consumer to clearly distinguish or identify the product through recognition or recall [2], in other words brand recall and recognition performance by consumers [3] and [4].

Product/Service has grown to mean more than just the brand. The branding begins with the presentation of the company's identity connected to its consistency in performance. Apart from this it illustrates the company's consistent system that brings the world and is seen as the company's way of doing things

In the B2B context, it is essential to understand the perspective that firms do not really give much weightage to branding. It has been only 4 decades that importance of branding for B2B firms has gained any traction [5]. In that duration, there has been hardly any framework defined to tackle this dearth of attention to branding strategies for B2B firms.

B2B situations, as with other things, have not remained untouched of the Internet. Although brands are slowly shifting focus towards social media as a platform to showcase their products and services, branding as a practice remains yet to be touched. Research has shown that online social interactions do play an important role in facilitating an organization's quest for

advantageous position in the market [6]; even then there exists a huge gap of uncertainty on part of the B2B firms. A lot of managers are unsure of the role that branding can play on their business, especially over the social media platforms.

Branding is not just limited to how a B2B firm is perceived by its customer down at the end of the line, but it also plays a vital role in the stock performance of the firm [7]. Online platforms incorporating positive word of mouth lead to a positive sentiment about the firm in the market, hence leading to much better growth.

While major brands do recognise the role of branding and its importance in day-to-day or other less frequent decision making [8], a lot of smaller brands have not been able to efficiently harness the true perks of their brands. Branding is seen as somewhat a good factor while considering the buyer decision making, with the extent sometimes being limited to only that.

In context to this paper, along with branding strategies of B2B firms we are paying attention to the factors involved with the social exchange theory, to have a clearer understanding of how the different kinds and levels of interactions between two or more firms can have impact on the branding strategies. As defined by (Blau, 1964), Social exchange refers to "a set of organizational actions that is contingent on rewarding reactions from others. It implies a reciprocal and mutually binding relationship between at least two parties in transactions."

Product Co-Development: In legal terms Co-Development means the joint Development of a Collaboration Product in the Field, in the Territory by both Parties under the terms of this Agreement. "Co-Develop," when used as a verb, means to engage in such Co-Development.

Product Co-Development refers to the collaborative process in product development process. Contrary to popular approaches to product development, retailers and consumers are involved in product design, product integration, and problem-solving [10].

In emerging markets, supply chains increasingly serve as critical value chains

through which ideas, practices and knowledge flow to and from suppliers and buyers.

In B2B markets, firms often open their processes for customer participation to get better insights into their current needs and sometimes this process also helps in getting deeper insights into what the future might look like for a particular product/service. Customer participation, although a very tempting thought, is heavily based on the type of offering provided and the level of personalisation or customisation required while designing that offering. Standardisation of offering is often a cheaper alternative, the other alternative being: constant customisation. Nonetheless, depending on the market and its requirement, customisation opens various doors. As mentioned earlier, customer participation in the product development process is probably a faster way to develop and sustain long lasting relationships in the market. It also provides a sense of the customer being a stakeholder and leads to increased loyalty in a B2B firms practices.

Value Co-Production: The second part of co-creation is what can rightly be called co-production. It involves participating in the construction of the core-offering itself. Co-production refers to the involvement of consumers in the various value creating activities through which products and services are made. These activities include the production and distribution processes which are usually performed in the course of manufacturing a product or creating a service for a given target group of consumers.

The trend towards greater consumer involvement has been activated by the substantial changes in technology, consumer sophistication, and regulatory environments. In particular, the development of digital technologies which allow consumers to have instant access to stored information and to create and disseminate text, pictures and voice messages at minimal cost, has contributed significantly to this trend. Consumers are involved in activities such as: i) the production of their own individually designed and planned music compilations, movies and videos; ii) assembling and self-delivering their own furniture bought at IKEA; iii) designing their own travel packages; iv) and

planning their own unique well-being and health maintenance services.

It can take place through shared innovation, or co-design, or shared production of related assets, and may occur through customers and various other partners in the value network [11].

For example: Huge software firms, like Google, Apple, and Microsoft, encourage freelance engineers to find bugs in their offerings and very actively reward them with benefits, both monetary and non-monetary. This creates an environment of give and take, where there is high stakes for the consumer who might not be directly related to or affected by a particular offering. This kind of open-sourcing can often lead to new and better innovative processes to create something new entirely.

Co-Production refers to "customer participation (or other stakeholder's participation) in the core offering. It occurs when there is a joint design, joint production of related products, and collaborative design" [12].

An overview of B2B branding studies: Even if research on B2B branding started in the 1970s e.g. (Saunders & Watt, 1979), the vast majority of studies on this topic have been published in the last two decades [13]. Several aspects of B2B branding have been examined so far. Early studies were mainly intended to evaluate the effectiveness of branding in B2B contexts [8]. In fact, for a long time branding had been judged irrelevant for B2B marketers because industrial buyers were conceived as completely rational and unemotional and therefore insensitive to the

appeal of brands [15]. Therefore, early studies tried to estimate to what extent brands could affect industrial buyers' decisions. One of the most important research works on this aspect was conducted by (Bendixen, Bukasa, & Abratt, 2004), who found that brands could explain up to 50 per cent of buyers' choices compared to only 15 per cent of price. In sum, this stream of studies concluded that "brands are clusters of functional and emotional values that promise a unique and welcome experience between a buyer and a seller, and that this holds true for […] B2B brand"

[17] After these initial studies, researchers have explored the determinants and the consequences of B2B brand relevance and brand equity. As regards the determinants, several factors were identified, such as the likes of purchase complexity, showing that brand impacts are higher in risky purchase situations [18], [19]. Other significant determinants highlighted by multiple studies were: the type of buyers involved in the purchase and the characteristics of decision-making units, the stage of the supplier selection process [17], the type of product being exchanged and the structure of the market [20]. As regards the consequences of B2B branding, available studies agree about its effects 2014; Rong et al., 2015). In sum, these advancements recognise that B2B branding can be conceptualised as a set of multiple-actor, co-creation processes.

Framework

A. The interplay between B2B relationships and B2B branding strategies

The relevance of buyer–seller relationships has been recurrently indicated as a distinctive feature of B2B markets (Baker, 2013; Gummesson, 1997; Håkansson et al., 2009). Buyers and sellers interact frequently both to co-produce (i.e. co-design, define and create) the products being exchanged (Vargo and Lusch, 2016) and to co-create value after the purchase when the customer uses the product and the supplier supports the creation of value-in-use (Ballantyne and Aitken, 2007; Grönroos and Helle, 2012). Therefore, B2B branding strategies should be designed and implemented taking into consideration the relational nature of industrial markets. In other terms, B2B branding should be aimed to support the creation and the reinforcement of these relationships.

In addition, each buyer–seller relationship is unique because on customer loyalty [21] and on the overall competitive and financial performance of the firm (Homburg et al., 2010). Another growing stream of studies has addressed branding strategies and brand implementation. First of all, research has highlighted that branding strategies should be designed together in tandem with the overall marketing strategy of the firm. As Wise and Zednickova (2009, p. 9) noted, B2B brand managers should "pay close attention to how consistently a brand is expressed […] across the key 'touch points' […] from the earliest awareness through a brochure to long years into an after-sales service, for instance".

In addition, to successfully implement brand strategies, both managers and the whole organisation should be extensively brand oriented [22] and internal branding programmes serve for this purpose. In particular, researchers have remarked the strong connections between branding strategies and the behaviour of the salespeople, who essentially act as brand ambassadors. Some studies have also focussed on specifics of B2B branding strategies such as different types of solution branding [21], brand alliances such as both general co-branding strategies and ingredient co-branding strategies with a focus on the strategic options for component suppliers [10], the effects of local versus global brand positioning and the related spill over effects in case of a brand alliance with an unknown brand, brand extensions strategies and their impacts on firm's profitability [7].

In addition, recent studies have opened a new perspective on B2B branding based on co-creation (Chang et al., 2018). This approach draws on several research streams such as: service-dominant logic and value co-creation [11], the service brand logic, business ecosystems [11], and B2B brand experience co-creation. According to this perspective, brands are always co-created by the participating actors and emerge over time. Therefore, B2B brand managers have only limited control over the brand (Bruhn et al., 2014). Another relevant evolution is that the analysis of branding processes is being expanded from a dyadic (buyer–seller) perspective to a multiple-actor perspective at the meso level (e.g. brand communities, supply chains, etc.) (Bruhn et al.,it is the result of specific interactions over time between the two parties (Håkansson et al., 2009). This uniqueness has been indirectly acknowledged in the B2B branding literature, which has highlighted that "Branding is not equally important to all companies, all customers, or in all purchase situations" [8]. Each buyer–seller relationship is unique and requires a unique, customised B2B branding strategy (Payne et al., 2009). Obviously, a firm cannot manage such an infinite number of branding strategies efficiently and effectively. To reduce this level

of complexity, we suggest distinguishing the markets served by a supplier along three dimensions: the intensity of co- production and co-creation, the number of customers served by the supplier and the dyadic vs. multiple-actor view. These dimensions grasp a large share of the complexity of the relationships needed to design the product and support the customers while they use that product.

In detail, the first dimension highlights that B2B products require different intensities of co-production and co-creation. Some products are highly customised, such as in the case of solutions (Matthyssens and Vandenbempt, 2008), which require complex and intense interactions between the supplier and the customer during both the design and the subsequent value creation stages. In fact, the parties have to engage in reciprocal learning (Magno and Cassia, 2015; Payne et al., 2008) and in a practice-matching process to align their processes, resources and competencies to successfully co-create value (Grönroos and Helle, 2012). Some other products are highly standardised and are not adapted to a specific buyer's needs. In this situation, interactions between the supplier and the buyer are less intense.

The second dimension registers the number of the customers served by the supplier, ranging from a few customers (sometimes a very small number of key accounts) to many customers.

The number of customers served by a supplier is directly related to the number of relationships to be managed. The third dimension recognises that B2B markets can be conceptualised at a higher level as networks of actors, with

the results that each buyer–seller relationships is influenced by many other on-going relationships (Håkansson et al., 2009). Taken together, the first two dimensions identify four different types of markets, based on their relational complexity. Markets in which a supplier interacts frequently to co-produce and co-create value with a small number of customers (case 1) are solution-oriented B2B contexts [21], such as those for highly customised IT solutions. Markets characterised by low intensity of co-production and co- creation with a small number of

customers (case 2) are those contexts in which simple, standardised products, such as maintenance, repair and operating items (Sashi and O'Leary, 2002) are exchanged. In this situation, the supplier and the buyer engage in direct interactions for negotiating terms and conditions, and not for adapting the offering. Markets in which the supplier serves a high number of customers demanding intense interactions to co-produce the product and to facilitate its use (case 3) are those with the highest level of relational complexity for the supplier. To reduce this complexity, what the supplier usually does is: they decide to interact intensely only with the most important customers and to establish weak or no personal relationships with other customers (Uusitalo, 2014). Markets in which the supplier serves a number of customers with highly standardised products (case 4) are the context in which a personal relationship between the supplier and the customers is often not possible. In these situations, the supplier and the customers can interact through various platforms such as e- commerce websites or mobile apps (Gregory et al., 2019). Finally, each of the four types of markets can be viewed either at the dyadic level or at the multiple-actor level, depending on the environment.

In sum, each type of market is characterised by a specific relational kind of complexity and requires a specific B2B branding strategy to establish and enhance customer relationships.

In addition, the few available studies on B2B branding have suggested implicitly or explicitly that each industrial supplier usually operates in only one type of market and therefore should implement only one type of branding strategy. However in reality, industrial suppliers often offer their products to customers belonging to different types of markets. This is also the result of the recent popularity of service growth-led strategies among firms (Kowalkowski et al., 2015; Ulaga and Loveland, 2014), that is, the strategies consisting in expanding their offerings from goods to services and solutions. For example, printer manufacturers have moved from selling only printers to selling document management solutions as well. These solutions consist of diagnosing a firm's printing needs, designing the solutions (e.g. defining the number of monochrome and

colour printers and their optimal location based on the office layout), implementing these (e.g. hardware and software installation and customer training) and offering support (e.g. remote support). Therefore, printer manufacturers sell standardised products to a large number of customers (case 4) as well as highly customised solutions to a much smaller number of customers (case 1).

In addition, customers belonging to different industries may purchase a supplier's products. For example, a supplier of car components may target both the automotive industry (car manufacturers or original equipment manufacturers) and the car repairing industry (Cassia and Ferrazzi, 2018).

Interactions with car manufacturers (case 1) are intense and lead to the adaptation or development of components for a specific customer and car model. By contrast, when serving the innumerable car repairing businesses (case 4), the supplier delivers standardised products and establishes only simple, often impersonal interactions.

Therefore, in B2B contexts, typically, suppliers simultaneously serve markets characterised by different levels of relational complexity. Consequently, they need to design and implement not just one B2B branding strategy but a proper mix of such strategies. The next section develops and discusses the specific branding strategy for each type of market.

B.   Reccomendations

The earlier discussion showed that B2B markets are characterised by different levels of complexity of the relationships linking the supplier to its customers and that branding should be aimed to reinforce those relationships. This section presents the different types of B2B branding strategies and discusses their links to the types of B2B markets highlighted in the previous section. In markets characterised by intense co-production and co-creation efforts with a small number of customers (case 1), suppliers should adopt corporate branding strategies [22]. In fact, in these situations, suppliers do not offer clearly identified goods.Conversely,they contribute their resources, experience and capabilities to co-create solutions [11]. Therefore, it is not possible to brand goods but only the intangible resources and capabilities

needed to co-create the solutions. Similarly, recent studies have made a distinction between goods-related and service-related B2B brand images (Cassia et al., 2017). In the solutions markets, suppliers should focus on service-related B2B brand images, that is, on corporate branding strategies. The purpose of these strategies is to reduce a customer's perceived risk [18]; Glynn, 2012; Leek and Christodoulides, 2012). Several cues, such as customer referrals and case histories, may be used to enrich the corporate brand image and reduce perceived risk (Halliburton and Bach, 2012; Lacey and Morgan, 2008). As regards the specific positioning strategies for the corporate brand, Jalkala and Keränen (2014) suggested four alternatives: customer value diagnostic (which focusses on a supplier's capability to identify customers' latent needs, monitor industry development trends and deliver demonstrable value), global solution integrator (which emphasises a supplier's capability to design and integrate systems), high-quality subsystems provider (which draws on a supplier's ability to build and deliver high-quality subsystems that enhance customer operational performance) and long-term service partner (which focusses on a supplier's service excellence, partnership orientation and commitment to its customers).

When serving a small number of customers demanding a low degree of co-production and co-creation (case 2), suppliers should combine corporate branding and product branding strategies (Cretu and Brodie, 2007). In fact, since the delivered products are to a large extent standardised, it is possible to implement a branding strategy for each product or product line. In addition, because the number of customers is small and the supplier can directly interact with each of them, intangible aspects, such as customer orientation, responsiveness and service commitment, may have some effects as well. Therefore, when the corporate

brand and the product brand are used simultaneously, the first contains service-related associations, while the second conveys associations related to the tangible performance of the product (Cassia et al., 2017; Van Riel et al., 2005). Overall, the importance of branding strategies is lower in this type of markets because customers

perceive less risk when purchasing standardised products instead of complex solutions. Moreover, since standardised products are often highly undifferentiated, customers focus on price (and not on brand) as the main purchasing criterion and can easily switch to other suppliers (Vigolo and Cassia, 2014). Therefore, effective branding strategies can help a supplier to be included in a customer's short list of potential suppliers [17]. However, the final choice of the supplier will depend significantly on price. Therefore, personal interactions and negotiation play a pivotal role in this type of markets.

In markets in which a high number of customers demand intense customisation (case 3), suppliers face a level of relational complexity (in terms of number and content of the relationships with customers), which is difficult to manage. As explained in the previous paragraph, suppliers tend to reduce the level of complexity by dividing their market into two segments: one segment has those relationships with the most important customers who deserve intense interactions and the other segment has customers who can be served through more standardised procedures (such as modularisation) and less frequent interactions. In other words, markets like the one highlighted in case 3 are split into two markets, similar to the ones shown in case 1 and 4, respectively. Hence, the branding strategies for case 3 will be a mix of those highlighted for cases 1 and 4. For example, this is the case for large logistics providers serving hundreds of thousands of customers. For the most important customers, specific solutions are co-designed, while the other customers are served through highly standardised services and customer interactions are through IT platforms and call centres.

When serving a highly fragmented customer base demanding standardised products (case 4), suppliers experience difficulty in interacting personally with all the customers in an effective, efficient way. In these situations, B2B brands may be used (at least in part) as substitutes for direct interactions. In particular, previous research shows that B2B brands may be effective to interact with small- and medium-sized customers. In fact, these customers have less time and resources to search for information about suppliers and to personally interact with

them [19]; Shipley and Howard, 1993; Zablah et al., 2010). Therefore, they often rely on brands to select and interact with suppliers. Branding strategies should emphasise the tangible performance of the products. Therefore, a goods-related brand image is more relevant than a service-related B2B brand image (Cassia et al., 2017) and product branding (with or without the support of corporate branding) is the most popular choice. These markets are the most similar to B2C markets, and the communication programmes for B2B brands are similar to those for B2C brands (e.g. the use of television commercials is not rare in this type of markets; Shuv-Ami, 2016).

In addition, for each of the four markets, proper B2B branding strategies should acknowledge that additional actors (beyond the buyer and the seller) would be involved. For example, in the case on B2B brand communities, brand meanings are co-created simultaneously by several actors (Bruhn et al., 2014). Similarly, effective brand strategies often require the cooperation among multiple actors belonging to the same supply chain (Zhang et al., 2018).

In sum, to facilitate the creation and enhancement of supplier–seller relationships it is essential to select the proper B2B branding strategies depending on market type. Most importantly, each supplier should select its proper mix of B2B branding strategies to address more than one market simultaneously. However, researchers and practitioners have often implicitly assumed that in B2B markets, each firm should select only one branding strategy, similar to firms in B2C markets. However, such a uniform strategy is likely to be neither effective nor efficient. In fact, since the importance of brands varies by market type [8], assessing brand effects in each specific context is essential as is adapting branding strategies consequently. In this regard, it should be noted that B2B branding strategies should be carefully designed and implemented by considering further factors in addition to the three dimensions suggested in the framework, namely, intensity of co-production and co-creation, number of customers and dyadic vs multiple actors view. In particular, the interplay between branding strategies and other components of each B2B relationship

should be acknowledged, such as the level of trust and cooperation [22], the level of adaptation of mutual processes and procedures as well as the power-dependence balance (Emerson, 1962). For example, previous research found that a customer's dependence arises when the supplier controls critical resources needed by the customer to achieve its goals and that, in turn, a strong supplier's brand may emphasise the degree of this dependency (Worm and Srivastava, 2014). Similarly Ghosh and John (2009) highlighted that the decision whether to sell branded vs "white-box" components should depend on the level of power unbalance and opportunism between the parties, deriving from the level of relationship-specific investments. In sum, the framework suggested in this study provides guidance to not only select suitable B2B branding strategies from among various but also urges managers to further in-depth examination and selection of the most suitable strategy by considering all the relationship-specific components.

Research Methodology

Conceptualization, as described by MacInnis, is a process of abstract thinking involving the mental representation of an idea. Conceptualization derives from the Medieval Latin "conceptuālis" and from Late Latin "conceptus", which refer to "a thought; existing only in the mind; separated from embodiment" (American Heritage Dictionary2003).

Building on those lines, the analysis of various literatures was done. The aforementioned literatures focused around the B2B scenarios.

Discussion

After almost four decades of research about B2B brands

– the first study dates back to 1979 – it is time to move from the assessment of the importance and antecedents of brands in B2B markets to the detailed development of B2B branding strategies. This study presented a framework that may guide researchers as well as marketing managers in studying and designing effective B2B branding strategies.

The main point highlighted by the framework is that branding strategies should be conceived as tools to establish and enhance supplier–customer (and network) relationships, which are of primary importance in B2B markets. Therefore, depending on the complexity of the relationship in each specific market, different branding strategies are required. In detail, this study has identified different types of markets. However, despite our efforts to reduce the level of complexity, it should be noted that the relationships linking a supplier to its customers are unique, and hence, each supplier should carefully reflect on the branding strategies for its specific situation. In addition, branding strategies require investment [20]. Therefore, such strategies should be both effective and efficient and their returns should be measured and optimised. Recognising that different types of B2B markets require different branding strategies is an important step towards optimal use of marketing resources. Moreover, it must be underlined that several marketing tools other than branding are available to B2B marketing managers, such as key account management programmes and new product development. Understanding when and which branding strategies are effective is fundamental to the optimal allocation of marketing resources among alternative marketing programmes. Finally, this study suggested a framework that may inform future studies about B2B branding strategies. Nonetheless, this is only the starting point and many more studies are needed to advance knowledge on branding strategies. In fact, these issues have been largely overlooked despite their importance for both theory and practice. Moreover, until date, studies have mostly tried to assess the extendibility of branding principles and models from B2C to B2B markets. The time is mature to develop specific B2B branding models. To make a contribution in this area, the paper aims to investigate whether, why and how corporate brand image plays a role in the selection of new subcontractors. This category of firms is particularly challenging to explore from a branding perspective, as their market offering is defined and designed by their customer and, further, not recognized by the customer's customer.

The shift in the respect to the increased sense of importance for branding can further lead to increased gains for a B2B firm through various aspects, such as higher end- customer

trust, higher stock returns, a positive word of mouth for the firm etc.

Limitations

While a theoretical framework may suit the requirement of a broader category of business firms involved in B2B scenario, a quantitative analysis may further provide some basis of truth to the findings of the paper and hence is a very important next step. This will further lead to cementing the requirements of branding strategies as an integral part of the overall business strategy of firms, and in turn how are they perceived.

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ASSAM'S EVER-CARRYING LABEL OF UNDERDEVELOPMENT: EXAMINING THE ROOT CAUSES

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ABSTRACT

Assam's economy can best be defined as undeveloped. Poverty, under-utilized workforce, and untapped natural riches are all signs of an underdeveloped state. Various issues are associated with Assam's economic development aspirations. With its geographical isolation, proneness to natural calamities, sensitive borders, disrupted law and order circumstances, and other considerations, Assam might be classified as a major 'problem state.' Factors hindering Assam's economic growth and development can be classified 0into several categories. In this paper, these factors are mainly categorized into three heads- historical, geographical and economic. Though scholars are mainly focusing on geographical and economic factors while discussing Assam's underdevelopment, the historical factors too are equally important to understand the insights of the state's poor performance. Though several studies have been conducted on Assam's underdevelopment challenges, a comprehensive and holistic approach that covers all of the major causes in one study is rare. This paper intends to fill a research gap by bringing emphasis to the backward indicators when compared to national standing. This paper also aims to provide a complete examination of the factors underlying Assam's underdevelopment.

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Keywords: Underdevelopment, Assam, Factors, Growth, Development

Introduction

The north eastern region of India is a region of resource abundance, whether it is land, water, forest or the hidden human resource. The developmental programs were implemented in the country in a structured manner through various Five Year Plans, with the main goal of improving people's quality of life by supplying basic necessities and improving their social and economic well-being. Socio-economic development is not a pre-determined stage, but rather an ongoing process of raising the living standards. Despite the fact that resource transfers are being carried out in the backward regions, regional differences in terms of economic growth have not decreased over time. The economic and social progress of the state of Assam cannot be discussed without reference to the rest of the country. At the same time, India's planning is decentralized, with distinct functions for the federal government and state governments. The roles of the Central and State governments are defined in the Constitution, and critical development areas including as education, health, agriculture, and energy are included in the 'State list.' Economic development and planning are on the concurrent list, however given the current conditions; the Central Government intends to play a larger role in economic development. Exercises aimed at formulating anything like a comprehensive perspective or even a medium-term organic plan may appear futile in the case of a State like Assam, which is heavily dependent on the Centre for carrying out Plan schemes in the public sector and on industrialists from outside for important projects in the private sector.

According to the 2011 Census, Assam accounted for 2.39 percent of India's land area and 2.59 percent of its population. She is ranked 15th in terms of population and 16th in terms of area among all Indian states. After independence, the state's steady economic and industrial development came to a halt, and Assam is now one of the country's industrially underdeveloped states. The state's human development is equally deplorable. Many factors have been influencing the socio-economic status of the state for a great extent. These causes have various dimensions such as historical, geographical, political, economic and social. Many studies have been done exploring these reasons of backwardness of the state.

Ghosh, A. C. (2020) in his work, demonstrates how Assam's identity conflict and insurgency problem led to underdevelopment stages during the post-colonial era. He also emphasizes the different corruption and unhealthy work (for development) carried out by various insurgency groups, which were founded for the purpose of establishing the identity of their tribe or ethnic group, and how their activities eventually erode Assam's rich position. The state's economic progress has been harmed by identity conflicts and movements. People's expectations grew as a result of their independence. However, the post-colonial Indian state's capitalist development route has fallen short of the people's rising expectations. Lack of economic development has resulted in a scarcity of economic options, which has heightened inter-ethnic competition for resources and livelihood chances. The failure of the Indian state to meet people's expectations and handle identity issues has resulted in the state's insurgency problem. According to Dutta, J. (2016), Assam remained a backward state with growing competition for limited social and economic space among the diverse communities due to the state's geographical location, neglect by the central government, unabated migration, incompetence of state leadership, and unwillingness of Indian monopolies to set up industries in the Northeast. Hussain, M. (1993) founded that the capitalist course of development in independent India has resulted in significant geographical inequities. As a result of its centripetal constitution, Assam's financial responsibilities are primarily reliant on the Centre. For a long time, Assam failed to elicit any systematic response from the Centre. It has been claimed that Assam is a well-endowed region with abundant natural resources, but that these resources have not converted into economic growth and development. Again, Assam is in a strategically vulnerable region, plagued by periodic floods, political unrest, and woefully underdeveloped infrastructure such as roads, trains, communication, power, terminal and institutional facilities, as well as abject poverty. Bhattacharjee and Nayak (2013) attempted to study the relationship between insurgency and underdevelopment in North East India, and they found that the influence of insurgency on infrastructure, industry (including petroleum and tea), and the environment are all examined. The theory of cooperative conflicts explains the origins and persistence of ethnic separatism in the form of insurgency. According to them, breaking the vicious cycle of insurgency and underdevelopment is difficult. Administrative, political, and economic actions alone will not be enough to solve the situation. It necessitates a holistic approach as well as a great deal of patience and knowledge of the many socio-cultural-ethnic groups' challenges. Given the region's high level of tension between equality and efficiency, development programs must receive widespread popular approval at the grassroots level. Furthermore, projects must be environmentally sustainable. To ensure ethnic groups comprehend the dangers of excessive spending and the sense of duty towards nation building, centrally allotted funds to the region must be matched by considerable amounts of resource generation at local levels.

Though various studies are done on the underdevelopment issues of Assam, a detailed and holistic approach to cover all the prime reasons in one study is not much available. By meeting this research gap, this paper aims to draw attention to the backward indicators when compared to national standing. This study also tries to provide a comprehensive analysis for the reasons of underdevelopment of the state of Assam.

Methodology:

This paper is primarily descriptive in nature. The data presented here are collected from different secondary sources which include Assam Development Report, 2002, Economic Survey of Assam, 2017-18, the Human Development Report of Assam, 2014, Statistical Handbook of Assam, 2018 and various research articles, working papers, books and websites.

Results and Discussion:

In this section, the first part provides a brief highlights of some areas where Assam is remaining economically underdeveloped, in the later part the reasons for this underdevelopment, historical, geographical and socio-economic, are explored.

A Brief Highlights of Economic Underdevelopment in Assam:

Six major socio-economic indicators are taken in this section to highlight the status of Assam in comparison to other developed states or the national average. They include gross state domestic product per capita (GSDP per capita), innovation index, human development index (HDI), sustainable development goal index (SDG Index), happiness index and the population below poverty line (BPL population).

GSDP per capita: In this indicator, Assam is having INR 92,533 whereas national average is INR 1,42,328. Goa tops the list with a GSDP of INR 4,76,370. It is clearly visible the unsatisfactory performance of Assam with respect to national average as well as the developed states also.

Innovation Index: In case of innovation index, the score for innovation of Assam is only 7.74 out of 100 which is far below from the scores of some other states like Delhi, Karnataka and Tamil Nadu. Among states and Union Territories, Delhi tops the list with a score of 42.98, followed by Karnataka, Tamil Nadu and Maharashtra. Even among the north eastern and hill states, it stands at 8th rank.

Human Development Index: Assam ranks 30 out of 36 states in the Human Development Report, 2020. Though the score of the index of the state is near the national average, yet it is far below from states like Kerala. Assam has an index of 0.613 while the national score is 0.645. Kerala stands top with a sore of 0.782.

Sustainable Development Goal Index: In SDG index also, Assam is found as one of the most deprived states ranking at 26 out of 28 states. Among the north eastern states also, Assam stands at the bottom. Its composite score in SDG index is 57, while Kerala tops the list of states with a score of 75.

Happiness Index: It is a new measure introduced in India to check the status of happiness from some socio-economic reflections. In this indicator, Mizoram, a neighbor of Assam, tops the list, while Assam is thrown to 22nd out of 36 states and UTs. In happiness index, in top 10, there are three north eastern states namely Mizoram, Sikkim and Arunachal Pradesh.

Population below poverty line: According to RBI data, Assam has 31.98% BPL population, while at the national level, it is 21.92%. This clearly indicates that Assam is far below in poverty reduction. The more the poverty, the more is the other social and economic hardship too creating a vicious circle.

Reasons behind the Backwardness:

In this part various reasons are discussed which leads and foster socio-economic bottlenecks to the state. With its geographical isolation, proneness to natural calamities, sensitive borders, disrupted law and order circumstances, and other considerations, Assam might be classified as a major 'problem state. With its geographical isolation, proneness to natural calamities, sensitive borders, disrupted law and order circumstances, and other considerations, Assam might be classified as a major 'problem state' (Dhar, 2016). The reasons are basically categorized into three parts, historical, geographical and socio-economic causes which are equally significant in the context of Assam's underdevelopment. Typically, the historical factors are ignored by scholars, but it has huge repercussions to foster economic development of a state or a region.

1.   Historical Factors:

In recent decades, the role of history in economic development has received far too little attention. When looking at the global distribution of economic development, the first and most compelling impression is that history and development are inextricably intertwined. In most developed country examples, colonial rule has never been a part of their history, however in poor and developing countries, the opposite is true. Assam's economic development is heavily influenced by historical factors. Various events such as the country's tension during independence and the state's tension after independence, as well as the occurrences of socio-political movements in the 1960s and later years, are some of the important reasons that contribute to the state's economic development.

Assam's industrial history began during the pre-independence period, and the state quickly established itself on the world's industrial map. In the early 1950s, it was considered one of the

country's most prosperous states. Crude oil was discovered in Assam during the colonial period, and Asia's first and world's third oil refineries were built in Digboi, Assam. The colonial period was also when coalfields were first discovered. Tea planting began during the colonial period, and its global export boosted Assam's economy. In the early 1950s, Assam's per capita income was likewise greater than the national average. Assam made significant development in the industrial sector during the nineteenth century, and it wasn't until the middle of the twentieth century that it began to lag behind. "Assam was in the forefront of the country's economic development 100-150 years ago," former Prime Minister Dev Gowda said.

After independence, the state's steady economic and industrial development came to a halt, and Assam is now one of the country's industrially underdeveloped states. The state's human development is equally deplorable. Assam's and India's average per capita incomes were Rs 1702 and Rs 3211, respectively. Between 2006 and 2010, the state had "the worst performance with both males (61 years) and females (63.2 years) in terms of life expectancy at birth." Males had a life expectancy of 71.5 years at birth, while females had a life expectancy of 76.9 years. The state's newborn mortality rate is likewise among the worst in the country, with 55 individuals per 1,000, well above the national average of 44. In 2011, the state's birth rate was 22.8 per 1000, compared to a national average of 21.8 per 1000, while its death rate was 8 per 1000, compared to a national average of 7.1 per 1000. In 2010-11, the state had the lowest gross enrollment ratio in schools (between 6 and 13 years). Assam has a low rate of urbanization, with urban areas accounting for only 14.8% of the total population in 2011, compared to 31.15 percent across India.

The reasons for the state's underdevelopment in the post-colonial period cannot be understood without first understanding the ethnic composition and socioeconomic changes that occurred as a result of the country's independence and partition, the complex problem of migration into the state from Bangladesh, and the post-colonial Indian state's capitalistic development path. To begin with,

as a result of the subcontinent's religious division and the relocation of a considerable chunk of the then-Sylhet District to the erstwhile East Pakistan, the *Asamiyas* became the state's largest language community and began to dominate society and politics. As a result of the influx of immigrants into Assam from neighboring nations, the *Asamiyas* developed a fear psychosis that they would soon be a minority and numerically unimportant group in their own ancestral country and as India's capitalist path of development and modernization solidified after independence, peripheral civilizations such as Assam were forced to contend with severe regional inequities. Within India's federal democratic polity, Assam becomes the poorest state and has remained so for decades. Despite becoming an integral part of the independent Indian Union, the colonial economy appears to operate freely in Assam.

In this situation, Assamese leaders became more vocal about their language, culture, and identity, demanding that Assamese be made the state's sole official language, despite the fact that "society in Assam has historically been multi-racial, multi-religious, multi-ethnic, multi-caste, multi-class, and multi-lingual in composition" (Hussain, 2000). The *Asamiyas*' strong identity assertion, as seen in the Language Movement of 1960, the Medium of Instruction Movement of 1972, and the Assam Movement of 1979-1985, ignores the society's multiple character in Assam. These movements instilled widespread anxiety and fear psychosis among the state's various communities. The Assam Movement, which came to an end in 1985 with the signing of the Assam Accord, served as a model for the *Bodo* Movement. The Assam Accord was seen by the *Bodo* leaders as an attempt to defend Assamese interests. As a result, the *Bodos* were estranged from Assamese society, prompting the All Bodo Students Union (ABSU) and the Bodo Peoples Action Committee (BPAC) to issue a call to "split Assam fifty-fifty" and begin agitation. Furthermore, following the Assam movement, which saw the Indian state as a colonial force, the United Liberation Front of Assam (ULFA), an extremist organization, was formed to push the Assamese out of the Indian Union. The United Liberation Front of Assam (ULFA)

became a rallying place for *Bodo* radicals who feared that the peaceful struggle would be ignored by the governments in Delhi and Dispur. As a result, insurgent actions by *Bodo* militant groups such as the National Democratic Front of Bodoland (NDFB) and the Bodo Liberation Tiger (BLT) began in the state's Bodo-dominated territories.In order to create a majority of their community, the Bodoland Territorial Council began an ethnic cleansing procedure that resulted in the relocation of millions of people. As a response, the Bodoland Territorial Council's minority populations organized their own militant groups, such as the Bengali Tiger Force (BTF), Adivasi Cobra Militant, and others, to protect themselves against the Bodo militants. As a result, the germ of insurrection diffused among the state's various ethnic groups.

The most fundamental factor of post-colonial Assam's economic underdevelopment is the insurgent actions of several insurgent groups. Because security is the fundamental infrastructure of economic operations, and social stability and clarity about the future are prerequisites for investment, rebels have posed a threat to the state's internal security by targeting people's lives and property.

2.   Geographical Factors:

Location:

The geographical location has a significant impact on the development process. Through their influence on transportation costs, disease burdens, and agricultural output, location and climate, among other factors, have substantial effects on income levels and growth (Gallup. et.al., 1999). Assam is influenced by its remote location in relation to the rest of the country, which, according to some activists, is largely responsible for the union government's lack of knowledge in terms of planning and other activities that can lead to growth. Though the central government established a separate ministry to aid in the development of this region, it was not seen as effective as it should have been. Because of Assam's remote location, intellectuals from other regions of the country are less interested in doing a detailed empirical study to learn about the state's genuine challenges and developing the best possible development plan for the state.

Along with its vast geographic isolation, the state is sandwiched between bordering countries from three sides. Because security is the fundamental infrastructure of economic operations, and social stability and clarity about the future are prerequisites for investment, rebels have posed a threat to the state's internal and external security by targeting people's lives and property. Though the state's location between neighboring countries is strength in terms of growing international trade and relationships, it also poses a threat/weakness in terms of attracting foreign investment.

Assam also lags behind in the process of technical dispersion due to her remote location. Technological inputs are critical for increasing productivity and improving the development process. It is clear that modern technological innovation and dispersion are resulting in a plethora of freshly formed pockets around the planet.

Locational factors also hold the state back in terms of raw material supply and finished product marketing; as a result, investors and production companies are hesitant to set up production unit in the state, and there is a lack of diversity in industries within the state, which can be considered a major cause of the state's economic backwardness. Scattered location of resources is another prime issue.

Climatic and physiographic causes:

Some of the most powerful forces in economic development are climate and physiographic factors. Assam's physiography is not uniform. Two river valleys, one plateau feature, and folded hills are all present. The state's socioeconomic development and population distribution are likewise uneven due to the uneven geography. The state's uneven development pattern can be attributed to the uneven geography. In comparison to the other two physiographic regions, the plane valleys are more developed. The valley regions are densely inhabited and have little road and communication infrastructure. Because of its physiographic formation, the state's other two divisions have seen considerable underdevelopment due to its ideal topography, sufficient labor supply, and developed communication system, resulting in

industrialization, modernization, and agricultural development.

Assam's climate is classified as subtropical winter dry mega thermal Gangetic type (Cwa or Cwg of Copen classification), with wet summers and dry winters, mild summer heat and mild winters. During the summer, there is enough of water in Assam, but during the winter, there is a scarcity. As a result, individuals work in agriculture during the summer and are unemployed throughout the winter. Seasonal unemployment is caused by a lack of efficient irrigation systems, and seasonal unemployment has become one of the key causes of the state's economic underdevelopment.

Demographic causes:

Demography and its composition are also factors in a region's socioeconomic development. Demography and its characteristics are significant parameters for assessing the development process since human resources are at the heart of any natural resource exploitation and development process. In terms of demographic composition, Assam is diverse. Assam's ethnic makeup included members of all four major racial families, but the Mongolian and Aryan families made up the majority of the population. Assam is also known for its diverse tribal groups, each with their own distinct identity. Their distinct way of life and fear of losing their identity can sometimes lead to a lack of cooperation with the government and other outside investors, resulting in serious underdevelopment and industrial backwardness.

High dependency ratios and out-of-equilibrium sex ratios are also contributing to the state's underdevelopment. The state's overall working population is 56.75 percent, with a sex ratio of 932 females per thousand males, according to the 2001 census. While significant businesses in the state, such as the Tea industry, are characterized by sex engagement, the high dependency ratio can result in low population productivity and the uneven sex ratio can impact volatility in production.

One of the key causes of the state's economic backwardness is immigration from outside the country. Since several decades, it has become a serious socio-political concern in the state.

During the twentieth century, Assam's population grew at an 8.1-fold rate, compared to 4.31-fold for the rest of India, and this increase was marked by immigration from neighboring nations following the country's split. This unlawful movement is putting additional strain on resources, as well as affecting the state's occupational and socioeconomic composition. Illegal immigration is also a major contributor to the state's economic stagnation.

Assam likewise has a high percentage of unemployed people. More than 2 million educated job seekers are currently looking for work. In the region, educated job seekers made up nearly half of the overall unemployed. Lack of employment in the secondary and tertiary sectors, as well as increasing population pressure, are the main causes of rising unemployment in the state, which has resulted in the state's economic backwardness.

The psychological makeup of the people is also a factor in development. Among the residents of the states, there is a scarcity of entrepreneurship, interests, and skills. The region's enterprise quality, such as proper organization, risk-taking ventures, production planning, marketing of products, and individual money mobilization, which are difficult tasks that demand ambition and commercial acumen, has yet to improve. One of the reasons why most economic enterprises are in the hands of persons from outside the state is because of this. As a result, profit frequently leaves the region.

Although Assam has a high literacy rate compared to the national average, the number of persons with vocational and technical education is low in the state. As a result, there is a severe shortage of semi-skilled and skilled labor in this area. Furthermore, because the general public's level of knowledge is low, little effort has been made to implement innovation and modernization in agriculture and home sectors.

Inadequate Uses of hydrological resources:

Assam is a water-rich state in India. Assam has two major river systems and numerous tributaries with enormous hydropower potential, but due to low population and poor technology, this has yet to be realized. This underutilization of hydrological resources is

manifested not only in low power productivity, but also in limited irrigation facility expansion and waterway use. Assam is a landlocked state where waterways play an essential part in development; nevertheless, despite the potential for waterway development in Assam, the state is unable to reap the benefits.

Natural disasters:

Assam is one of the few states that is frequently struck by natural disasters such as floods and droughts. Experiences and research into the challenges associated with the Brahmaputra and its tributaries indicate that flood concerns will take a considerable time to be fully addressed. Crop losses, animal losses, housing losses, and public institution losses in Assam have risen year after year, from INR 13.2 crore in 1970 to INR 24,6 crore in 1972, and INR 306.6 crore in 1989. Human habitation, standing crops, roads, embankments, irrigation and water supply facilities, and other public amenities have all been severely damaged. Furthermore, the flood caused severe erosion in the Brahmaputra valley's riverine areas, particularly in the districts of Dhubri, Dhemaji, Majuli, Tinsukia (Sadia), Bongaigaon, Barpeta, Lakhimpur, Goalpara, and others. A significant portion of the state's resources have been allocated to repair the damage and provide relief to the victims. If there had not been such a load, more resources would have been available for the growth plan. Further natural disasters in Assam complicate the plan's implementation.

Economic Factors:

The following are the primary economic variables that are causing Assam's economic development issues:

Rapid Population Growth:

Assam is under a lot of population strain. This is a highly concerning element because population growth is a liability rather than an asset. According to census data, Assam has one of the greatest demographic growth rates in the country, with a growth rate of 34.95 percent between 1961 and 1971, compared to 24.80 percent for the entire country. In Assam, the population growth rate was 53.26 percent between 1971 and 1991, with 23.4 percent in 1971-81, 18.92 percent in 1981-91, 21.4 percent in 1991-2001, and 16.93 percent in

2001-11. The infusion of people from outside accounts for a large share of this rise. Assam's rate of occupation and wealth growth cannot keep up with the high rate of population growth, resulting in unemployment, poverty, and income inequality in the state.

High Cost Structure:

Assam has an extremely high cost structure. This is owing to the state's significantly higher pricing level when compared to other states. According to K. K. Bhatia's standard Basket Methods, showing preliminary estimated of indices of comparative costliness of selected centres of different states of India with Delhi as the base, the index for Digboi (Assam) is higher by 18 prcent over Delhi (Dhar, 2016). This index for Digboi is again the second highest in the country following Bombay (Dhar, 2016).

Furthermore, because of the high cost of living, the prospects of rising tax rates and the amount of savings available to fund growth plans are slim, and the cost of administration rises as a result of the high cost structure. As a result, Assam's high cost structure is always working against the state's economic progress.

Capital Deficiency:

Capital deficiency is a defining trait of developing countries. When the entire country is suffering from capital deficiency, this distinguishing attribute is not exclusive to Assam. In Assam, both the volume and rate of saving are quite low. Savings are proportional to per capita income. Because Assam's per capita income is so low, its saving potential is limited. Unfortunately, Assam's marginal propensity to consume is quite high due to the bulk of the population's substandard living conditions, and the state's economy cannot flourish due to a lack of capital formation. According to a recent IDBI study, while commodity flows into and out of Assam are roughly balanced at around INR 200 crores per year, there is a steady outflow of monetary income from Assam of INR 63 crores per year. This large quantity of capital outflows is putting a strain on the state's financial situation while also slowing the rate of development (Dhar, 2016).

Waste of Natural Resources:

Despite having a vast amount of natural resources, the state's economy is still underdeveloped and wastes a big amount of natural resources. Apart from tea, jute, oil, and even 28 percent of potential hydro power reserve, there is a lot of untapped potential. Despite various potentials for usage as a fuel for power generation, coke manufacture, and as a base for several chemical industries, the large coal reserves have not been tapped (save for conventional railway use). Assam's forest resources are also under-utilised, particularly when it comes to non-native species. As a result, Assam's weak economic development is due to insufficient utilisation of natural resources.

Poor Credit Facilities:

Credit facilities, which are part of the infrastructure needed for development, are extremely limited. In 2014, Assam's credit deposit ratio was 37.6%, compared to 78.1 percent for the entire country. As a result, commercial banks' lending policies are far from friendly to Assam's destitute state. Industries in the private sector cannot grow satisfactorily without large-scale financing facilities.

Others:

Besides the above discussed reasons of under-development of Assam, several more economic and non-economic factors work against the growth of the state. They include lake of skilled personel, lack of entrepreneurial and managerial talents and motivations, primitive technology, sensitive borders, disturbed law and order conditions, lack of efficient administrative machineries, social structures etc.

Conclusion and Way Forward:

Since a long time, Assam has faced numerous challenges in supporting its growth and development, but has been unable to draw much moral government attention. Unfortunately, it is carrying the indelible tag of under-developed with it. There is no doubt that Assam has enough potential to overcome its dismal growth; all it requires is some assistance in the process. In recent years, the Assam Government is taking some major steps to reduce these lags through various schemes and programmes. Efficient implementation and proper monitoring is must needed for fostering the development process.

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"ENHANCING VALUE OF INSURANCE MARKET BY PRODUCT BUNDLING"

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ABSTRACT

Indian industrial sectors have been forced out to the surface. Industrial sectors do not find the value of financial services very compelling to being with. Even the financial institutes have not been able to tap into the unorganized sectors due to lack of demand. Financial intermediarieshavetried to increase the value proposition of financial services by bundling it together. Multiple services or products are bundled together and are offered to the consumer with escalated value and optimum price. This method of product bundling has enabled financial institutes and their intermediaries to increase the volume sales of their services. The purpose of this study is to analyse the method of bundling practiceand itsdifferent models. Thispaper has tried to analyse the attractiveness ofthis bundling method by survey and qualitative interviews with various industry personals and onbasis of it, a matrix been constructed to showcase the severity and necessity of value addition to the financial services. The implication of this study is to suggest improving the financial security of other sectors like infrastructure, manufacturing, hospitality. This study also suggests to designing these bundling product method for the financially weaker section and unorganized sectors also

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Introduction

The state's financial stability is necessary for a time frame of any pandemic for its development. Countries with better-developed financial systems tend to grow faster (Levine, 2003). Financial security is the backbone of any country. During the Covid-19 pandemic period, the financial stability of each country and its population was tested. As per the report [1], the COVID-19 outbreak hasspeedup compared to the January'20 and the initial lockdown in India was a success, but later stages of the lockdown were not due to the limited restrictions. It's not the first time that a pandemicoutbreakhas causeda disturbance in the functioning of a country. Witnessing before, the 1918 Spanish Flu, HIV/AIDS, Severe Acute Respiratory Syndrome (SARS), Middle East Respiratory Syndrome (MERS), Ebola. The 20th century had a fair deal of suffering and struggle. India dealt with smallpox, plague & polio, and now COVID 19. As per the report [1], observing the historical growth data during the past pandemic times India had done significantly better compared globally.

Thegrowth intheGDP showsthat India has been less effective during the past. During the march2020 lockdownand itsproceeded lockdown stages had strained the Industry as per [2]. The manufacturing industry which has a 20% part in the GDP [3] was already not in great shape. The unorganized

industry faced the same but was impacted more with the uncertainty. Before this pandemic, demonetization and implication of GST had already drained the multiple sectors. The government had tried to sustain thedamageand manypoliciesreformswere made but eachreformtakestime to make an impact and the investment pumped into the system will follow its course duly but time is of the essence here, the life of Indians hang in by a thread. The regular working-class had maintained as their salary or partial salaries were paid, but the contract labour, fruit sellers, or others who did not have regular sources of income had to surviveontheir savingsofwhatever littleor big they had.

Source- [1]Fig. 1: Historical global and Indian growth rates

Financial Institutes provides a major role in providing financial securities during the pre andpost-pandemictimes.Financial institutes formulate their financial services as per the requirement of the consumers. It's not incorrect to say that financial securityor Insurance is the backbone ofany country. The organized sector is easy to provide insurance but still, the organized sector only has limited insurance security. The unorganized sector is still an untapped market. Organized sector or unorganized sector, both had only a limited number of insurances namely life insurance, health insurance, accidental insurance, and few others. Even these insurances had been taken due to the official requirement or to push down some paper works. Indian industries are considering these insurances has a liability or need of documentation but the realization of its actual value is still not up to the mark.

Insurance is a commodity that has its value and this value is the "end of line" sort of value. When life is on the line or the social & financial security is on the line. During the pandemic time of COVID 19 and the lockdown, many businesses had taken the hit.Manufacturing,Hospitality, Healthcare, and others. A case [4], where few restaurants claimed for a "guarantee insurance" where the bank will be responsible for disruption of work but the financial institute considered this event a force majeure event and the restaurant's owner were denied. The Paris court gives the decision in favor of the restaurant owners and it made a mark in historyand is now considered as an example. This case also set as an example of securing the functioning of the work that we do. "Guarantee Insurance" is another insurance type that has not been able to gain popularityor never understooditsrelevance in the Indian insurance market. The Paris case [4] shows the value of the insurance and the role of financial services in the time of the pandemic.
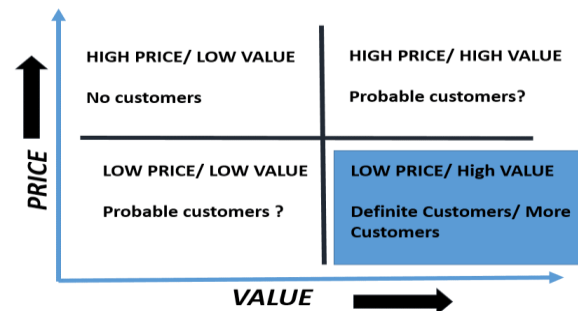

Fig2: Price-Value relation

It's important to understand the relation of price and value for making an impact in a market. This relation could be classified into four sections.

I.High Price/ Low Value: If the price is too but the commodity or product does not seemworthyofthe price or value ofthe product is too high. The consumer will not be interested in it. No sale or minimum sale will be expected.

II.High Price/ High Value: If both the price and the Value are high, this willtargetonlytheselected customers. This is usually happening in the case of luxury items. An only a limited number of customers will participate.

III.Low Price/ Low value: Price minimum and the value is also minimum. In the insurance market scenario, this type is only done to completetheformalitiesof documentation.

IV.Low Price/ High Value: Everyone wants to pay less but get a higher-value end product and this is the marketingstrategiestodrive maximum no. of customers.

Hencedriving fromthegraphthecustomers must value the product and making them understand the value of the product is in itselfa task. Oncetheyunderstand the value of the product then pricing the product is easy. Many times, consumers are even ready to pay a higher price but their only concern is value. To provide this value, a marketing strategy is used called "Product Bundling".

Bundling: It is a term used when two or more products of the same or different kinds are packaged together. The word "Bundle" can be used in many ways and for many things. The concept of bundling was first given by [5]. The

Value of the product can be increased by packaging it with other or similar products. Bundling may include the same type of product for example in the case of Insurance,

Car Insurance + Accident Insurance
Health Insurance + Life Insurance

Financial Intermediaries play a vital role in the bundling process. My objective here is to increase the value of the product financial institutes are selling. It is not necessary that the added product has to be another insurance. For example
Home Insurance+ 1Year Maintenance Services(Plumbing,Electrical, Mechanical)

Health Insurance + Gym Membership Discounts + Daily Health Tips

Shop Insurance + Guarantee Insurance + Inventory Insurance

Every business model will have different sets of value which will enhance the workingcondition orprovidebetter

securityinsurance. FinancialIntermediaries canconnect theconsumersand the financial institutes forthevalueproposition. Selecting the targeted market and putting up the value-added to each product. This will increase the value of insurance in the eyes of the consumers or the organizations who get insurance for the sake of the documentation. Value can be positioned in two ways here

Value Proposition »»» »»» »»» *Target Group*

Target Group »»» »»» »»» *Value Proposition*

Target Group is the selected market or Consumers that will be targeted, and then according to them, the value proposition will be done. The second approach can be value proposition is done and then we look for the consumers who all are ready to consumetheproduct.Whateverthe approach, bundling needs to be classified accordingly.
Table 1. Represents the classification of types of the bundling strategy used in marketing.

Table: 1 Types of Bundling

Type of Bundling	Definition	Example
Bundling	Packaging of two or more types of products in general.	Home Insurance + Car Insurance; Car Insurance + VAS (Free Servicing yearly)
Price bundling	It's the packaging of products or services to reduce the net price to the consumer.	Health Insurance + 30% Gym Membership Discounts;
Product Bundling	In this type of bundling, products are similar or integrated with each other. Each component of the bundle will enhance the functionality of each other.	Health Insurance + Daily Health Tips + Healthy cooking recipes; Car Insurance + Accident life Insurance
Pure bundling	This type of bundling is the grouping of similar categories of products.	Insurance + Insurance; Family Insurance Plan; Home Insurance + Shop Insurance
Mixed Bundling	Packaged productsand services do not need to be integrated or of similar type.	Fidelity Insurance + Life Insurance; Shop Insurance + Stock Investment Tips

Source: Streamers, Telis, 2002

InsuranceRegulatoryand Development Authority of India (IRDAI)

The legality of Bundling: Insurance is very critical and very important in the financial sector. Secondly, financial intermediaries play a critical role in the proper and righteousconductofthispractice. Insurance itself has a very complicated structure and not easy for everyone to understand. Then there is so much documentation and difficult terminology that makes it more complex. It is very important to have a regulatory body to control all these practices for the interest of consumers. This is done by the Insurance Regulatory and Development Authority of India (IRDAI). According to IRDAI, selection of insurance is totally on the consumer and consumer has complete right to purchase the product independently instead of the bundle. Bundling is just an option provided to consumers from a marketing perspective but the consumer is free to buy the product independently or of other brands of his own choice. The present structure of IRDAI allows manufacturers and dealers or retailers to act as agents for financial service providers (Insurance Brokers) regulation, 2002 requiring a business ceiling from a single client under regulation20(1).Thisprovidesthe consumer tohavemultipleoptions available in the market.

Literature Review

Bundling has no particular or standard definition attached to it. To understand "Bundling" & its conceptualization in the insurance market, it was important to understand others' perspectives towards the same. As [5] considered bundling as the packaging of goods. Goods in here didn't mean it has to be an object or quantifiable. It says a firm selling its brand with packaged quality is also a bundling strategy. A car manufacturing selling transportation mode, but there are other modes of transport also, so what difference does it make. The difference is the value packaged with the car. A brand with packaged value. Hence the objective is to increase the value of the prime product. To increase the market participation for insurance, it necessary to highlight the value that insurance. [1] The report showcased the pandemic impact of COVID 19 and past similar incidents. It

presented the performance of India during the economic difficult times and how India performed compared globally. It also discussed the remedial measures that could benefit the situation and improve the coming future. Financial institute like banking services, RBI, and others need to set up and support the system. [6] Focuses on the role of financial intermediaries from the industrial perspective. It's important to understand the perspective of the consumer and the provider. It helps in the mobility of the services of financial institutes into the market. Once the market is understood, the acceptance of the product or service is faster. 1970 Industrialization [7] has been discussed how; the sense of security provided due to these insurance services helped. If the essence of security and being protective is realized, the consumer can invest or participates in other financial activitiestoo.It also discussed the impact of the world indeveloping the market in India. It has always been beneficial when world-class companies start to participate in the Indian market, it brings innovative methods and a world-class scenario. It opens up opportunities on different fronts and supports the economy too. Brand name always brings assurance along with it. It boosts the economic stability of India. The negative impact and ill practices of bundling by financial intermediaries were paid attention by [8] marketing and management book.Manufacturesor product generating company's tie-up with different banks or vice versa, and present product to a consumer with limited option and consumer is forced to buy that product. The complexity of the insurance product gives leverage to the agents and they confuse the policyholder. Consumers are not able to take full benefits oftheir policies because of this. Malpractice by a few of the companies reduces the trust of individuals from the insurance markets. [9] Focuses on financial security as the backbone of social and economic conditioning. Once the consumer gets financially secured, he tends to indulge himself in more financial transactions and investment activities. It has shown concerns about the effective control of the government by regulators. IRDAI playsasignificant hand inproviding financial security and determining the key factors involved in it. [10] Discussed

the satisfaction involved with the value that the consumer seeks. According to Knutsson, bundling is only two or more products sold together. But what is it that consumers seek? Its satisfaction that every one of the consumers seeks when he makes a purchase. The level of satisfaction justifies the bundling is optimum or not. Bundling main objective is to reduce price, provide convenience, and reduce risk. If these conditions are matched, consumers achieve satisfaction [10]. Discussed the effect and degree of attachment of consumers with complementary products. Different degree of satisfaction and attachment was seen towards the complementary products with the primary product. Here, the satisfaction of the customers comes in Value of the complementaryproduct.Thevalue proposition is necessary to market the product in positive terms, [7] discuss the value proposition. It says that it's important to understand the pattern of the value that the customer wants, simplify it so everyone can understand. It's not the product but the root cause. [7] Says that value proposition can have two parts, one is that you understand the value that your customer wants and the second is, how you intend to deliver those values. Understanding the Job, living way, and everything about the customers, then design the product as it fits. Insurance value should be understood from the insurance provider perspective also. Deeper the penetration more would be the claims. [11] Talks about the age groups which insurance maker seeks to sell their insurance to. According to the '20s & '30s arethebest agegroupastheyareat thepeak oftheirhealthand minimum responsibilities and maximum no. of instalments (revenue to the financial institutes). 40's & later age group, their health starts to depreciate, the addition of family responsibilities, and much more. The need for low budget Insurance bundle products and low documentation requirements for the lower class of the society and the unorganized sector has also been discussed by [2]. Multiple works of literature support that bundling has a positive impact on the sale of products but regulation should always be there to secure the interest of common consumers. New marketing strategies need to be adopted to increase the penetration of the insurance market in India.

Research methodology

This study aimed to understand the concept of Bundling in the Insurance market and how bundling as a market strategycould be used to increase the value of the insurance product and produce more innovative bundles of insurance and value-added services. It will help in increasing the attractiveness of the Insurance market because with the financial security of consumers in India will increase. For this report and to understand the mind-set of consumers, I created a questionnaire survey.Asprimaryresearch,the questionnaire aimed to understand the preference of consumers on Bundled Insurance over Individual Product, value over price, and to understand if the consumers are willing to pay more for the product bundled with value-added services. Survey also tried to understand if the consumer wants the freedom to choose its benefits. The participant involved in the survey were of varied age groups.

As part of Secondary research, many literary works were studies to develop a marketing strategy for positioning of the value among the consumers. Different elementsinvolvedinthemarketing strategies that need to be considered. Multiple channels for the distribution of the bundled product and how the pricing of bundles leads to revenue or monetization. Inthe literature work, a lotof intermediaries were involved and how they affect the pricing structure of an Insurance bundle.

Results and Analysis

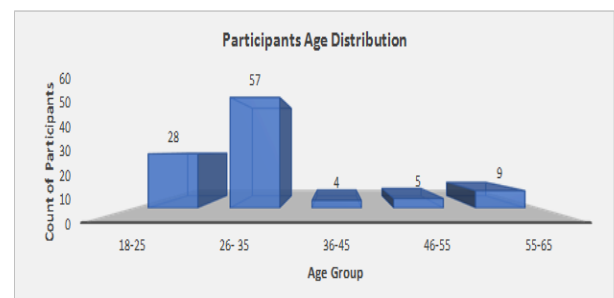For the survey, a sample size of 100 people of varied age groups and professions was taken.

Fig 3: Distribution of Age Groupsecurity.

The maximum participant is in the age group of 18 to 25, the count is 28 and from the age group of 26 to 35 count is 57. This is the peek time; the consumer feels and realizes the need for financial stability and secrutity

•What would you prioritize in Insurance, it's Value (how beneficial it is?), or its price (premium & Covered Sum)? (Fig 4)
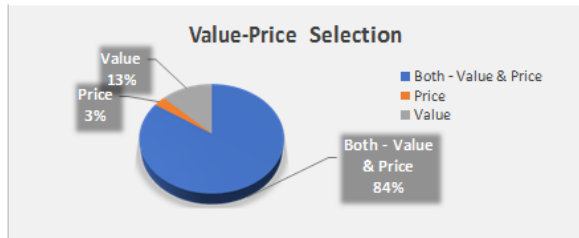

Fig 4: Preference Between Value & Price

The image of pie chart Fig 3: Preference between Value & Price shows that the major population sample wants to give equal preference to value and Price. There isa small13% samplepopulation also gives preference to the Value. This result reflects that is an integral part and is the first thing consumer looks for in a product. But still, the majority considers that there should be a balance between value and price.

Value α Price

The more value you add to the commodity, the greater the price. Lower the price, the lesser is the value ofthe product. Balance is critical in this case, as for the competitive market, it's very risky to offer the wrong price, as the consumer has a wider range of service providers to choose from.

•Are Consumers willing to pay more for more added values in insurance products or will prefer to pay the same price with added values? (Fig 5)

Fig 5: Willingness to Pay More

Once the consumer gives preference to Value & Price both, its understood consumer would want optimum price. The next thing that was required to be understood was that if the consumer is willing to pay more if more value

is added to the bundle. And willingness is when a consumer may pay extra if he gets his desired values in a bundle. What does an Insurance Bundle can have?

Insurance + Insurance + Value added services

If the price is increased, so does the value then the response from the consumers was mixed. Only56% of the surveyedconsumersshoweda willingness to pay more. The rest 26% wanted to pay the same price. Existing products price should not change but values should be added to it.

•For Insurance, would you prefer to bundle your insurance products and typesofvalue-addedservices supporting them, if options are availed to you? (Fig 6)
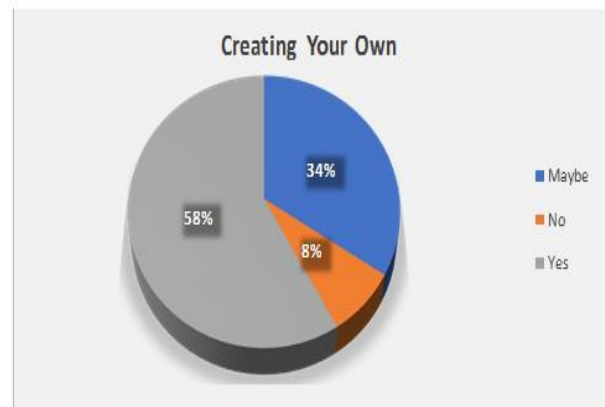

Fig 6: Creating Your Own Bundle

Making consumers feel empowered. Each individual has different needs as per his profession and lifestyle. Each business has different risks involved. Some types of insurance may attract a certain consumer but for others, it may beirrelevant.Toprovide what's beneficial for the consumer, its best to let the consumer decide. To leave it on consumers,it makesthemfeel empowered that satisfied. It also gives them confidence in the service provider since he is only paying for the services he will need. Buts it's not that simple of a deal. Each value-added service and each type of insurance has a certain price allocated to it. Insurance itself has so many conditions and parameters to choose from.

One of the suggested methods is, charge according to the commodity. For example:

Price As per the Policy	**+**	Price Range fixed	Total Price
Insuran ce		Value-Added Service s (selecte d VAS)	Bundle d Produc t

Secondary Research

From primary research, it was noticed that consumers prefer Value. Value has a different meaning for everyone. Insurance is needed by all age groups and for every professional but each has a different perspective towards value. A marketing strategy was derived to establish the value from the bundled product and it's necessary each consumer understand the value. " Pricing" is a concern but "Value" is more important for the Consumer and consumer is important to the company. The price will be derived from the value of a product showcase.

As mentioned in the introduction, a here most important part of marketing is positioning."Positioning"meansthe market available to the brand or the company as per which, the product should be marketed. It's critical to understand the area or the population that will be targeted. It's a two-way process, Value Proposition to the target group or based on the target group value proposition is done. Value Positioning needs to be done in stages:
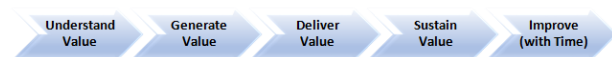
•Understand Value – To understand the value, analysisofthe market needsto be doneand to do that thefollowing factors need to be understood:

I.Customers – It's prominent to understand the customers and what's theirneedis? It's difficult to sell when you don't know, what the customers may like. Demography of the area; age group, Sex, professions, etc.

II.Company- If we are dealing or providing to a company or our own company. Our company's

previous image and value in the market are "A" and we are making a product with value "B", which does not get aligned with the company. May be consumers never related the product with the company. This willimpactthemarketing strategy of the company.

Thepopulationoftheareashould be divided and distributed in the database as per their age, sex, or profession, whichever is relevant, and similarly, the products need to be classified as per the targeted population. This helps the sales team unit to sell the product only to those individuals who need it. This helps in proper resource allocation and a better conversion ratio for the sales.

III.Challengers- There are always productsor individual, who may challenge your product. So, a senseofalertnessand authenticity should always be maintained to survive in the market. It's very difficult to build once reputation and take a lot of time. In the competitive market, it will be difficult to survive.

IV.Co-partners/ Partners – Same setofvaluesshouldbe synchronized withevery individual who is associated with your brand. It could be distributors, vendors, retailers, or any intermediary's body that may relate to the product and consider its own.

V.Context- Product and the brand value should have a similar context. It will create confusion within the organization, to the outside market it could be catastrophic.

•**Generate Value-**
Target Groups Distribution +
=Value Positioning in the Market
Product Classification Based on Targeted Groups

•Deliver Value- Everything is ok until the value showcased to the customers is delivered. Theconsumer should not feel cheated.Oncethewordisthe impression in the market. It shows that the company is trustworthy as what it showed, it delivered.

•Sustain Value- Sustaining the value of your product. If the company can sustainthe value, it willgiveconfidence to the consumer. Here the relation between the consumer and the company is built.

•Improve-Themarketisvery competitive and the population that we targeted will also evolve with time. The requirement may change

according to the time. Once the product is sold, that is not the end line for that company towards thatcustomer. Customers should be offered new and innovative offers. This will complete the relation that wasbuilt astheconsumer isassured that the company will look after him and will hold the value from its end.

Value Classification:

I.Support Services: Services that are provided for increasing the customer experienceand effectiveness of theprimary product. Example tele communication, alert notification, etc. This will improve the experience of the user.

II.ConsultingServices:Medical consultation orteleconsultation. This type of service has been very helpfulduring the pandemic Lockdown. Health checkups or report result discussions are very helpful where the patient does not have to physically go to the doctor or book appointments but online via video conferencing consultation could be done.

III.Personal Support: To make the consumer feel at ease and to build the trust, consumers can directly call on the call center to take help. For example, during the insurance claims process, the consumer may not understand certain details that need to be fulfilled. Consumers can directly call upon the call centers to take guidance.

IV.Promotional Services: For B2B, your business partners can place advertisements to promote their business.Online Survey to understand marketpresent scenarios and online quizzes to entertain the consumers and spread the knowledge or awareness on certain issues. For example, COVID19 precautions guidelines were part of the awareness among the consumers.

Discussion

The primary purpose of this study is to create value for the insurance market among different sections of society and individuals. The research includes 100 individuals approximately and among those, 57 participants are from the age group of 26year to 35year, then the next major group is 28 participants between the ages of 18year to 25year. Both of the age groups are considered to be the best for an insurance policy sell out

and they are the once who seeks additional benefits that could improve or increase their purchasing experience. 85% of the participants are the youth and the best potential market. The age group of 18 to 25, is fresh earning members and in their best of their health conditions, whereas the age group of 26 to 35 have started to settle down or have settled down. Both cases are looking for a better experience and will utilize the additional benefits to the maximum. After the age of 35, the human body tends to depreciate with each passing year and the probability of claims also increases, which is not good for the financial institutes' balance sheets. The insurance products' value proposition for this target group should be more emphasized. Insurance products with integrated services could prolong the best conditions for a longer duration and again reduce the probability of a claim. For example, health insurance with a gym membership or health benefits tips could improve the health conditions which will delay the health condition depreciation period.

The survey result shows the participant's behaviour towards their preferences for value or price and also their willingness to pay more for that bundled price. The majority of the participants, 84% has preferred Value & Price equally. The result of one side inclination in preference with 84% of the total, participants want equally balanced bundled. The value ofthe bundled product should be worth the price they are paying. Another question from the survey asked the participants if they are willing to pay extra if their desired bundled or value enhanced package is given to them. The willingness to pay more, showed a little bit of variance when compared it with the previous question. Here 54%, wants the product price should remain the same but the value of it should be enhanced. Whereas, 26% of participants are those, who are ready to pay extra if their desired value-added services are given. Another group of participant's count of 18% or 18 people among the 100 participants, who are ready for both, either equally balanced product with value or they may pay extra for their desired products. This correlation betweenthepreferencesand thewillingness to pay suggests that and support the claim that the insurance market should have a varied

bundling option or packages. In India, due to diversity in culture, religion, or region- No One Scheme could work. Each family has its different sets of needs, eachindividualgivespreferenceto different value-added services or benefits. Predictingthiscasescenario,the correlation between the preference and the willingness to pay, another question was surfaced to the participants- if they would prefer to create or bundle their package if they are given a list of options provided with their integrated products. This kind of bundling has already been practiced by the television or cable distributors. They have segregated channels based on language, religion, and region and have created subgroups in them. For example, Hindi language channels have sub-groups like Newschannels or sportschannels. Similarly Insurance Market can do the same. For Example, the Insurance market can divide the insurance different group with Life, Accident, Health, and then their integrated services in subgroups and each with a fixed price. This type of step can penetrate the Indian market deeper, as the range of insurance prices will increase.

Conclusion and Recommendations

As per the survey of more than 100 participants, it was observed that the majority of the participants had given priority to the "Value" of the product but not price.Another portion of the population, which is not the major part but big enough to make an impact considers that value and price are co-related. Product Bundling is a methodology accepted by the participants. Another part ofthesurveytells us, that participants give preference to the freedom of choosing their product or services or both.Hence Value is the important aspect of this and during bundling, participants should have the right to choose their own bundled package and values attached to it.

Benefits of Product Bundling:

•**ConsumerRetention:**The enhanced user experience because of the value-added services like customer caresupport, health benefits support, daily benefit, etc. This will help in retaining the consumers and also attract new customers.

•**IoT Benefits:** Digitalization of the process.Itwillhelpin understanding the market by asking the consumer or the employees to give a review of the process. Review system being anonymous will inform about the system performance and any gaps in the systems.

•**Reduction the no. of Claims:** The bundling of Health tips or gym membership will provide lower claimsforhealthinsurance policyholders. These Value-added services are indirectly helping the insurance company itself.

•**New Distribution Channels:** with an increase in sales and increase facilities, insurance providers also build up new links and channels to increasetheirbusiness.For example, Gym Membership discounts as a value-added service, insurance has a link with gym owners too, and who will also promote and sell the same insurance by becoming a dealer or an agent.

•**Monetization Opportunity: Value-**added services could be charged at minimum pricing or minimumprofitmargin.For example, GPS or Travel tech apps, which guide your journeys and informyou about thesurrounding or mostpopular placesaround according to consumers' locations. These applications could be charge with minimum price margin and bundled up with travel insurance or car insurance. Stock market Consultation for consumers interested in the stock market.

•**Market Competitions**: Growing Consumers also leads to growing competitors in the market. Many a time, the product needs to be sold out on minimum margins or zero margins, for just to survive in the market. During these times, Value plays a vital role and gives you the edge in the market over other competitors. Recommendation:Developedan "insurance scaling" proposal for delivery executives and I recommend it for the logistics companies too or any who deals in B2B. In this insurance scaling proposal, the company will consider a few parameters, which will directly impact the delivery of the material in B2B.
For example:
Sales cost: The Total cost of the product to be delivered. Net amount.

Frequency of sales: How frequently vendors places the order.
Distance: Traveling distance from the warehouse to the Vendor address.
Size of Lot: How big a lot is, in quantity or physical size (Box).
Lead Time: Time provided before the delivery date.

Sensitivity: How delicate the product is? Glass bottles, cold-storage unit, a shorter lifetime.
Cost Margin: Difference in the List price and the Market Price / Cost price and Selling price difference. This will not be shared with the vendors.

S. No	Parameters	Rating 1 to 5		
1	Sales Cost		High	5
2	Frequency of Sales			
3	Delivery Lead Time			
4	Sensitivity		Low	1
5	Size			
6	Distance			
7	Cost Margin			

product based upon these parameters. It's not necessary that the same parameters shall be used everywhere, as each B2B has its characteristics and things they want to consider. Now let's assume, two types of product orders are placed "Rushed" and "Regular" or "standard". "Rush" orders, when the product is needed on an urgent basis or emergency. These peculiar cases are few in many. "Standard" order, these products are ordered on a regular cycle or frequency is high. Now we will rate both these orders on the parameters that we have considered.

Sales Cost	
Low to High	5 to 1

Frequency of Sales	
Weekly	1
Monthly	2
Quarterly	3
Semi annually	4
Annually	5

Lead Time	
With-in 2hrs	5
With-in 6hrs	4
Today	3
1day	2
2days or above	1

Sensitivity of Product	
Depends upon the product. Is it Crystal bottles, temperature controled or any other	1 to 5

Size of Lot	
Small to Large	1 to 5

Distance	
0 to 2	1
2 to 4	2
4 to 6	3
6 to 10	4
10 & above	5

Cost Margin	
Low to High	5 to 1

Considering the parameters and the scaling rating, each parameter is scaled depending upon the type of material is delivered. The companygiving the insurance will scale the

Order Type	Sales Cost	Frequency	Distance	Size	Lead Time	Sensitivity	Cost Margin	Total Rating
Standard	4	2	3	3	1	2	3	18
Rush	2	4	3	1	5	4	4	23

Brackets of Scaling Total						
0-5	6-10	11-15	16-20	21-25	26-30	31-35

Each bracket of the scaling total will be allocated to certain % of insurance that order can be provided. Each parameter scaled will be totalled and then the total scaled score will be matched with the brackets of scaling and that percentage of the product will be scales or that percentage amount of the total product cost will be insured.

This is just a random formulation of numbers and parameters but any B2B or any suitable industry could utilize this and add value to its product. Many other innovative methods are being used outside of India. The presence of international companiesandworld-classfinancial services have the resources and ability to introduce those new methods or out of the box, insurance products to be practiced in India.

Limitations

This study has a lot of things to explore but due to the limitation of resources, it was difficult to move ahead. A pricing scheme was one of the limitations. A pricing scheme of a bundle or a sample pricing could have added more value to it, which could have derived the profit percentage also. But the limitation in it was that the list price or the base price of insurance was unknown. What price does it cost to the insurance company and the policyholder? The difference in the price or as we say calculated price margin and the same case is with the value-added services. There are multiple value-added services and of different companies or brands, so getting the base value of the VAS was very difficult. Another thing that could have showcased the effect of bundling was, exploring a few of the policies andrepresenting them with a bundled product but the limitation, in this case, is that there are multiple parameters and multiple categories that will impact the cost of insurance. For example, risk category, age of the person, cover amount, etc. Then So many types of insurance Home insurance, Shop insurance, Inventory or Warehouse insurance, Accidental/ Medical Insurance, etc. Each will have its own beneficial VAS. Financial service providers perhaps should be able to eliminate these limitations as Insurance is their product or the VAS bundled with it, with their business partners it will be easy to develop a pricing scheme and present it to a target market.

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EFFECTS OF DIFFERENT NATURE AND DEGREE OF SOCIAL MEDIA ENGAGEMENT ON BRAND PARAMETERS: EXAMINATION OF AND FRAMEWORK FOR ALCO-BEV BRANDS

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ABSTRACT

The study aims at highlighting the imperativeness of having clear objectives of social media engagement (SME) and alignment of these activities and campaigns with brand purpose. Three-tier research has been conducted to examine it. First, interviews with social media executives from alco-bev industry. Second, in-depth interviews of user/fan to evaluate brand parameters and the effect of SME on the same. A comparative study with different high- engagement industries is presented to give context and relativity. Findings of the study helped develop a holistic framework which in turn helped to develop social media strategy with clear objectives. In alco-bev industry in India, few brands have been engaging with consumers and fans on topics very closely linked to their brand purpose and passion points, while there are other brands which engage and converse on wider range of trending topics. A balance between all the seven functional building blocks common to all forms of social media, identity, conversation, sharing, presence, relationships, reputation and groups, is something for achieving which a framework is required and this research presents the same.

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Keywords: social media, strategy, framework, alco-bev

Introduction

Alco-bev industry in India is unique on many fronts. One of the most distinguishing aspect is that of media regulation. Over the years, the industry has used brand extensions to advertise the brands. In addition to the space being media- dark, the industry is also faced with prejudices from different sections of the society. One other characteristic is that the products tend to put forth an emotional proposition usually linked to a passion point like music, sports, friendship, comedy, etc.

Although most firms in the industry are global players, different characteristics of their social media strategy are still taking shape. In the absence of any clear guideline by the government shunning use of social media for depicting or promoting liquor, it has increasingly been used for advertising, promoting or talking about the brand. As social media offer precise targeting it makes all the more sense for the industry to prioritize the media.

There are numerous characteristics that are discussed and analysed in this study. The governance model of the social media assets is one of the key areas that drive the outcomes of the strategy. The objective of the social media strategy is one key point of discussion. Choice of social media and post characteristics have significant impact on the performance of the overall strategy. It is imperative to see what the customers are seeking from brand pages and whether marketers should focus on marketer-generated content (MGC) or should also design strategy to that makes use of user-generated content (UGC) and influencer- generated content (IGC). It is riveting to see how the outcomes at social media level affects the brand equity and how it affects the purchase intentions of the fans and customers.

The study aims to highlight which choices on different levels will have what affect after having conducted in-depth interviews of social media executives of the different firms and customers, as well as an audit of the brand pages and the posts. Post the analysis, a holistic framework for social media strategy for alco-bev is presented.

Literature Review

First, Extensive literature empirically investigates relevant social media objectives include increasing sales, increasing brand value, enhancing brand identity, attracting online traffic, lowering marketing expenses and enhancing page-user interactivity by rousing users to like, comment or share content and in some case upload content. Organizations should use social media campaigns in a more aggressive manner, even with some primarily constructive targets.

The study conceptualizes CBE as a consumer's cognitive, emotional and behavioral activity related to or during consumer-brand interactions. The study derives three dimensions of CBE including cognitive processing, affection, and activation. We use exploratory and confirmatory factor analyses within three separate social media settings to build a robust 10-point scale that we continue to test within a construct of conceptual interactions and a competitor model. The findings indicate that while consumer brand 'involvement' serves as a precedent for CBE, customer self-brand relation and purchase intent are key CBE implications. Increasing rates of CBE are anticipated lead to the achievement of better operational performance, including increase in revenues, reduction in costs, expanding brand equity, growing customer participation in co-creative product-development processes and higher profits.

Research suggests a potential role of CBE to specific consumer 'self-brand connection‘ and 'brand usage intent' outcomes. CBE may contribute to the development of consumer-perceived ' brand usage intent,' which is based, conceptually, on brand equity. The ability to measure and quantify consumer CBE levels is expected to generate an enhanced understanding of the emerging 'engagement' concept and its outcomes. The study suggests managers may benefit from the adoption of the proposed CBE scale in specific organizational or brand-related settings.

Over the last few years various studies have emerged which emphasizes the essence and dynamics of relationships between customers / brands. Consumer brand 'involvement,' representing consumer's interest in, and personal importance of a brand, has attracted significant traction in the space. Despite the significant lessons gleaned from work on 'involvement,' however, more recently academic focus is turning to principles and analytical viewpoints that more specifically clarify or forecast the complexities that define focal engaging consumer/brand interactions, particularly in different social network environments.

The COBRAs framework categorizes the activity of all consumers on social media by considering behavioral engagement with brands as a passive to active concept. It differentiates between three types of behaviour: use, participation and brand-related content creation. Throughout the decision-making process, social media has been one of the key sources of influence. Social media has changed the way marketers interact with buyers in the modern marketing sense, shaping consumers' attitudes and actions towards brands.

Consumption' includes social media behaviors coupled with a reactive (minimum) degree of interaction. 'Creation' conveys the process of consciously creating, distributing and co-producing brand-related material. ' Contribution' entails peer and/or client experiences, which includes effort from the user to some degree. Examples of contribution include sharing, commenting, and discussing YouTube commercials, turning consumers into brand endorsers. The act of creation consists of initiating posts, publishing reviews, uploading UGC.

In the context of digital marketing COBRAs play a strategic role. Social media has changed the way businesses interact with consumers and affects market expectations and brand behaviours. During the decision-making process, social media is one of the key sources of influence, with users relying on peer knowledge given their transparency, authenticity, and importance.

This study draws from the conventional paradigm of hierarchy of results to describe cognitive trends of customer participation in the use, involvement, and production of brand-related content on social media. The study has shown that CBBE is an emerging mechanism in the mind of the user which responds in a cognitive – affective – conative sequence. Consumers' brand recognition affects their actions and behaviors in either online or offline environments.

The research assesses consumer interaction with brand posts. Time at the top of the social

media page positively impacts the engagement. Vivid content produces varying results, while user interactivity primarily has a favourable effect on customer experience. The study challenges the practices and beliefs of academia as well as the industry. The research examines differences across behaviour patterns and industry.

The research measures customer engagement on a four- level scale (no, low, moderate, high). Many post characteristics have been discussed in the study. Vividness represents the degree to which content addresses multiple forms of media such as text, photographs, and videos, reflecting varying degrees of media resources. Videos directly influence audio-visual systems and connect with engaging customers as they communicate with and interact with them.

Extent to which a post elicits a response from consumers corresponds to 'interactivity'. Hashtags are a way to explicitly identify content for the brands and customers. The research adopts a black box approach as inputs and model experiences as outputs, considering the characteristics of vividness and interactivity. The consumer as the black-box is not being further investigated. Nevertheless, it is imperative to note that epistemic, social, and hedonic values will influence outcomes of such customer interaction. The research indicates that content from brand post may interact with interacting customers to fulfil different value requirements.

An indispensable characteristic of the brand's social media strategy is the ability to engage consumers directly via brand messages. The authors find that interactive posts reduce the comments ratio, but any content at all positively affects the ratio. Users engage with fun and insightful content posted during peak hours. Authors note that vivid posts with exciting or insightful content are seen to increase the ratio of shares, while interactivity, remuneration and post timing decrease. For the duration of the discussion, as well as for the count of likes and reviews, both post form and category are important.

In their seminal research, de Vries et al. (2012) demonstrate that the number of likes affects the vivid and immersive messages, as well as the number of likes.

Interactive brand posts such as one asking questions positively influence the number of comments. A modest degree of vividness creates the highest level of interaction across 10 brand pages, Luarnet al. (2015) reports. Sharing is primarily evoked by fun and insightful messages, instead of remuneration or social ones. Most number of 'likes' are earned by content having illustration with concise text.

Likes, comments, and shares highlight different aspects of user interactions and can be addressed through different elements of posts. Brands ought to sync social media strategies closely with diverse customer interaction patterns. Sharing with friends, for example, probably has a stronger effect than getting updates on one's own news feed about a friend's comments. The key is to determine how much investment should be earmarked for primarily engaged customers and fans who contribute to the community, as well as for secondary members who provide value based on other parameters.

To achieve the required balance and blend, marketers can use different post characteristics (post vividness, interactivity, quality, and timing for publication). Social networking sites can change their content delivery – thereby impacting the content being transferred to friends' feeds. Brands in an industry can use data from comparable brands to pursue their intended strategy for social media interaction. The methodology used in this research helps the companies to apply correct measures and make educated decisions.

The purpose here is to take a coherent and detailed look on the impact of SMM on consumer interactions by development of brand value. The purpose of this analysis was to fill in the research gap, and to particularly: (1) measure relationships between SMM strategy, brand awareness and the CBE; (2) assess the relative value of the SMM efforts components (SMMEs) to build brand equity and improve user preferences; (3) to evaluate key constituents in building brand value in SMMEs; (4) calculate the impact of SMMEs and brand value on the development of brand loyalty , brand choice and the possibility for marketers to offer a higher price.

Entertainment is the product of the social networking experience 's enjoyment and enjoy. A hedonic outlook portrays consumers of social

media as engaging and humorous fun-seekers. This study uses a survey to evaluate if users consider luxury brands' page enjoyable and engaging, and then to assess it. It finds that customers on SM consume brand-related content for entertainment and as a form of recreation. This study also found that pleasure and escapism motivate material loading on social media, and are causes for pursuing entertainment.

A. Interactivity

Social networking sites may provide support to users, as well as space for conversation and sharing of ideas. "Zhu and Chen (2015)" split social networking into two categories, based on the essence of the link and the contact. "Gallaugher and Ransbotham (2010)" consider user conversation on SM more important than ever and conceive this dialogue as a type of consumer engagement. The principal goal is to associate people with the material generated by a specific page (e.g. on Facebook, Twitter, Pinterest), as they want it. The researchers conclude that SM conversations fundamentally changes the way brand communicates.

B. Trendiness

SM is the primary source of news & information which eventually starts trending when enough people start discussing it. It also is the core platform for product discovery and search "(Naaman, Becker, & Gravano, 2011)". SM has trumped traditional communication channels used by corporate world as consumers have started trusting it more than others "(Mangold & Faulds, 2009; Vollmer & Precourt, 2008)"

Trending SM content is provided by four sub-motivations according to "Muntinga et al. (2011)": "surveillance, knowledge, pre-purchase information, and inspiration". Surveillance explains evaluation of staying updated about the ecosystem. Knowledge refers to market and product related insights that customers acquire by learning from the information and expertise of other users in the ecosystem. Pre-purchase information refers to reading product reviews or threads on communities to make well-considered purchase decisions. Finally, 'inspiration' refers to users who follow content posted by the brands on their pages and draw inspiration from those ideas. Users , for example, gazing at pictures of a clothing line draw inspiration for what they

want to wear. The research describes trendiness in terms of disseminating the new and most fashionable knowledge regarding luxury products in view of the aforementioned debate.

C. Customization

Customization represents the extent to which a product/service is tailored to suit the needs of an person "(Schmenner, 1986)" A targeted advertisement addresses a single individual or a select group (e.g. content on Facebook) while a generic communication includes advertisements that target those interested in it. Brands can tailor and convey individuality by customizing their page, which creates greater brand awareness and loyalty "(Martin & Todorov, 2010).

D. WOM

SM links eWOM with online user-to-user conversations about brands (Muntinga et al., 2011). Study demonstrates that eWOM has more legitimacy, sensitivity and consumer

importance than Web-based brand content generated by marketers (Gruen, Osmonbekov, & Czaplewski, 2006). SM is the best channel for eWOM because users produce and share content in their ecosystem with no restrictions (Kim & Ko, 2012; Vollmer & Precourt, 2008).

The research by Jansen, Zhang, Sobel, and Chowdury (2009) evaluate brands-related WOM on Twitter. The study shows that putting the brand content on top of the SM page improves popularity of the content. However, the research also shows that the count of comments and likes are determined by the numerous factors. Chiefly, vividness and interactivity boost the count of likes. Also, the proportion of favourable comments on a post is linked positively to the count of likes. Interactivity, by means of question for example, increases the count of comments. Both, shares of positive and negative comments are favourably linked to the number of comments. Clearly, positive and negative remarks reflect a common curiosity in the message, resulting in further discussion. Notably, earlier works indicate that people distinguish their views, and subsequent comments tend to be posted due to this variation (e.g., Moe and Trusov 2011; Schlosser 2005). It is a key result for managerial decision-making as it suggests that negative comments aren't inherently bad. Users can feel a part of the group as they are involved

in a vibrant dialogue, with both constructive and critical points.

Study

The objective of this study is to offer a holistic conceptual framework for alco-bev brands' social media strategy in India. It is applicable from brand strategy level to post characteristics level. We started with an exploratory study (study 1) to find out what drives brand parameters. We grouped the factors under various headers for ease. Then a study with a larger sample was conducted to understand which characteristics affect brand value and to what extent.

A. Study 1

It was an exploratory study to figure out what characteristics affect brand parameters and the degree to which it does. The number of respondents in the study was

20. Sampling method was convenience non-random sampling. Demographic breakdown was as follows: 60% male and 40% female, 55% were between 25 and 40 years of age while 45% were above 40 years of age. Data collection method was in-depth interviews over phone call. The respondents were highly involved in the product category and constantly follow and engage with social media pages of the brands. The study helped prepare a list of items whose importance to the customers will be tested in study 2. The list is as shown in table 1.

Table 1

	Mean	S.D
Timing of the post is key	3.8	0.5
Post type and length is important	3.5	0.3
Tags play an important role in outreach	3.2	0.3
Choice of social media platform play an important role	4.5	0.4
It is of utmost importance whether the content is UGC or MGC	3.5	0.6

B. Study 2

In this study the response from a wider base of respondents was taken. The objective was to understand what factors affect the CBE factors leading to affects on the brand parameters. The number of respondents in the study was 300. Sampling method was snowball non- random sampling. Demographic breakdown was as follows: 65% male and 35% female, 60% were between

25 and 40 years of age while 40% were above 40 years of age. Data was collected through survey form. The response to the items shortlisted in last study was taken on a five-point Likert scale. Unlike study 1, the respondents were a mix of highly involved customer in the product category and constantly follow and engage with social media pages of the brands, and low- involvement customers. The study helped us assign value to different characteristics of the SM strategy.

Table 2

	Mean	S.D
Passion point of the brand is key	4.2	0.5
Love brands which converse	4.0	0.6
Like brands which post cocktail recipes	4.5	0.3
Choice of brand ambassadors affect your liking of the brand	3.8	0.4
I share posts that I like	3.6	0.8

Conclusion

The customers seem to like the brands which post cocktail recipes and post vivid pictures of the product. The customers appear to like it when the brands have conversations with them, especially around the passion points of the brand. The industry seems to value the choice

of platform and timing of posts a lot. The opinion about the source of content is mixed. The industry can mimic other lifestyle brands like Durex, Zomato, and Swiggy to ride the trendjacking wave to boost interactivity, especially around the relevant passion points.
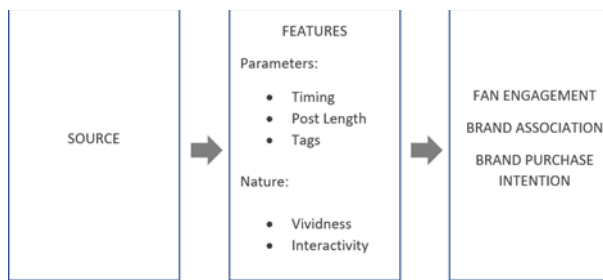
This paper was more focussed on giving a holistic view about all the parameters and decisions relevant to the industry. Because of this it was not possible to do deep-down analysis of each header. There is much scope in quantitatively determining the extent of affect each parameter has in the industry's online brand community. The scope of the paper was enormous and it will be worthwhile to do quantitative research on each of the topic separately. This paper aimed at creating a broad stroke strategy by highlighting key parameters of the strategy

Limitations

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A STUDY OF FACTORS AFFECTING PURCHASE OF PRIVATE LABEL IN E-COMMERCE

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ABSTRACT

Purpose – Private labels in e-commerce can be a new way to provide best products at an affordable price. Although few categories have experienced this wave, most of the e-commerce platforms have been shy to meet the customer requirements with the private label products. This research tries find the factors which will create a willingness to buy Indian private label products through e-commerce.

Methodology– Responses from a total of 100 respondents across various product Categories were collected through online surveys over a period of 7 days in India, to establish relation between the decision variable and the predictor variable hence a regression analysis with categorical data was employed to identify the associations.

Findings – The results show a close relationship between factors that influence buying decision and the decision to purchase, on the basis of these relationship consumer categories like price conscious, quality conscious, risk conscious and brand conscious consumers were created and their significance on purchase decision was analyzed. Price conscious consumer are most likely to spend in low priced category products such as grocery and accessories. Quality conscious consumer trend to spend more amount on private label categories such as electronic and apparel. Brand conscious consumers were found to spend more on apparel category. This research implies that private label e-commerce brands have to find a balance between good quality and competitive pricing folded around a good branding strategies to give a good consumer experience.

Originality/value – This study tries to establish a relation between factors which influence consumer purchase decision in e-commerce and their purchase decision. Further, this study is enhanced with a product category wise pricing strategy that would lead to a better Consumer Purchase habit for private label brands

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Keywords:

Introduction

Several decades ago, private label labels, previously known as "shop labels" or "distributor brands," were viewed as lower price, low-quality products, but now they are popular for offering a strong alternative to manufacturer brands (Abril & Rodriguez-cánovas, 2016)Private labels commonly refer to brands owned by the manufacturer or retailer and sold in their own shops only. (Thanasuta, 2015). In comparison, manufacturing brands owned by suppliers for marketing purposes. The rising prices of national brands have driven consumers to Private trademarks. With every economic slowdown we witness a rise of private labels as they significantly reduce the

scalable cost that are bared by national brands. Private labels are projected to expand 1.3-1.6x faster than e-commerce sites, and tend to achieve margins 1.8-2x greater than national brands (KPMG), according to 2019-22 estimates.

However, running private labels has been a challenging task for retailers (Wu, Yeh, & Hsiao, 2011), who had their business on retailing, distribution and sales. Retailer need to realize the strategic goals of private labels which may need tie ups with manufacturer and relations ships with suppliers. (Abril & Rodriguez-cánovas, 2016)

The importance of private labels in FMCG has been developed over the past decade due to new models such as the Inventory models,

which helps to have control over production and distribution along with quick delivery services. In the supermarket chains private label labels (PLB) have surpassed(Geyskens et al., 2018) Fifteen percent of overall US store purchases and over 44 percent of retail shoppers have been found to choose daily Purchased PLB ((Huei-Chen, 2007b). It's always a dilemma for retailer to create a balance between national and private labels. Previously studies have shown that retailers tend to like Private label brands because of few factors which also apply on e-commerce platforms which control over category sales, profitability of chains, platform loyalty, and bargaining power over manufacturer(Geyskens et al., 2018)

(Richardson et al 1996).

Among consumers, one obvious reason for their popularity and growth is the price advantage which averages twenty one percent over foreign brands. (Hoch and Shumeet,1993).

For consumer this attraction compared to national brands has been due to price drops which was 30-40% lower(Ming-Sung Cheng et al., 2007a). Despite these low prices the profit have been substantial for private labels, which varied according to categories from 10-14% in groceries to 60-65% in Apparels. (Halstead & Ward, 1995)

Regardless of the aforementioned study findings, quality and price estimation are two significant variables from which product demand is extracted and thus product value is extracted, among others, from Lin and Chang, 2003; Miranda and Joshi, 2003; Erdem et al., 2004, Ming-Sung Cheng et al., 2007)

According to the latest research report conducted by KPMG- Online private labels foster customer retention leading to higher purchases and has witnessed growth outperforming branded products across five categories namely Apparel, grocery, wellness, furniture. (KPMG, 2019)

Few of the brands which have led this change are Flipkart Smart buy and Amazon Basic. Last year these companies announced that its private label portfolio has posted 5% profit. The company is now spearheading for a goal of $2 billion in order to achieve profitability.

But to balance the price and Quality of these private labels there is a need to create a brand equity for these private labels. Previous research suggests that marketing mix are few of the crucial factors which can lead to success in brand equity for these labels (Yoo, Donthu, & Lee, 2000) (Mostafa & Elseidi, 2018). With so many product categories, price offers which need to balance affordability and profits, a number of distribution channels and not any defined formula for successful promotion strategy all these stand as the major challenges(Huseynov & Özkan Yıldırım, 2019). Product teams must agree on the best marketing strategy to optimize market reach (Soberman, 2009, Mostafa & Elseidi, 2018) for private label brands.

With the new scenario where e-commerce sales has soared, a similar marketing mix for e-commerce private labels needs to be found and implemented. This paper tries to explore the factors which affect purchase behavior in ecommerce for private labels, and further tries to find additional details like expectation of these category private labels.(Abril & Rodriguez-cánovas, 2016)

Literature Review

Previous research has found that an intent to purchase depends on both demographic as well as behavioral factors:

Demographic factors, such as gender, age, income and education; apart from this psychographic individual factors, such as the level of reliance and trust by the consumer on the outer packaging and aesthetics which indirectly point towards the value of brands, prefer to buy from national brands; and consumer perception.

As the above is a factor common to every brand, when it came to private labels perceived risk was the most significant factor that customers assessed before purchase with new brands.(Ming-Sung Cheng et al., 2007a)

Among the above factor, a deeper analysis from 183 Lithuanian consumers who purchase online were surveyed, it was found that perceived risk by consumer, price and promotion had a significant impact on consumer's willingness to purchase a product (Baubonienė & Gulevičiūtė,2015), (Bucko et al., 2018)

This particular research makes an attempt to identify the impact of the above factors in a situation of worldwide economic slowdown and will find the strategies which can lead to the growth of a private label brand. After assessing the overall consumer behavior for a private label there is a need to look into categorical insight and how do purchase intent and factor influence within categories.(Thanasuta, 2015)

Sethuraman (1992) made model category-level variables where for selected categories the variables impacting buying decision was assessed. The study explored the impact of some category-level variables that we can use in our analysis, such as content rating, average size, purchasing frequency and the extent to which the brand category are willing to provide "consumption enjoyment," on "willingness to pay a price premium for a global brand".(Mostafa & Elseidi, 2018)

All the above results point towards the conventional store model behavior for assessing the intent of purchase. We will evaluate the above factors for an e-commerce model. It was observed that there was a missing link to examine how consumers will shop during an economic slowdown and what factors can lead to the rise of private labels at this time when shopping online.

Factors affecting Purchase of Private Label brands

1) Impact of Price on Purchase on private label purchase decision

Price is derived from the marketing mix of product and used to both differentiate as well as position a product (Yoo et al., 2000)(Mostafa & Elseidi, 2018). According to various researches on brand equity, it was observed that high price evaluates as high brand equity(Bravo et al., 2007; Yoo et al., 2000)(Mostafa & Elseidi, 2018). So, while creating good price experience the original purpose of low cost/high margins shouldn't be missed. This can be done by carefully keeping production and marketing cost in check. Private label should therefore seek to improve the price-value balance as a key competitive strategy against domestic marks. The point (Mostafa & Elseidi, 2018)was that private label

labels should be value-conscious, not only cost-conscious (Molpus, 1994).

But, while shopping with private labels, the primary purpose is not for brand conscious consumers, but mainly for price conscious consumers.

Price consciousness, defined as the sensitivity of making choices on the basis of price of product and are prone to maximize value on basis of price point difference (Lichtenstein et al., 1993), was found out to be a been found to be major driver for PLB purchase(Mostafa & Elseidi, 2018). To define price conscious consumer - price conscious consumer are the one's who give more priority to low prices before the brand. (Halstead & Ward, 1995).

Wangenheim and Bayon (2007), (Beneke et al., 2013) and Ralston (2003) have stated that the perception created by low price in the mind of buyer is one of the most significant external cue for the first time purchase of a product. Thus, several decades back, low prices proved to be the most important thing buyers became interested in when purchasing PLB. Hence, PLB shoppers are usually represented as price sensitive (Beneke et al., 2013)

These are the consumers who prefer to purchase with low prices compared to higher brand value national brands(Abril & Rodriguez-cánovas, 2016). Many researchers with research on private label (Burger and Scott, 1972) (Thanasuta, 2015) have proved that price can be one of the major factors for choosing private label brands for value conscious consumers.

H1. There is significant impact of Price of product on purchase decision of private label products.

2) Impact of Product Brand on Private label Purchase decision

Ulrich R Orth et al. (2010) says package and design are one of the fundamental cues for preferring a product, which consequently create a brand image, this might be due to personal affiliation of the brand or confirming the quality of the product. Lockshin (2008) says that when there is less awareness of a brand which might have superior product, needs to make the first move with external cues such as packaging. (Collins-Dodd and Lindley, 2003; Dick et al.,1996) (Mostafa & Elseidi, 2018) have justified the cue utilization theory

which states, consumers depend on external as well as internal cues while making a product quality decision.(Halstead & Ward, 1995)

Hill (2005) (Bucko et al., 2018) said as individual preferences become more complex and diverse, and when all products appear similar – consumers experience choice paralysis. Thus, brand recognition helps in making easier decisions among various brands. When it comes to making a purchase from online platform several factors were found common with offline extrinsic cues that change quality perception of product(Huei-Chen, 2007a). The components of the external cues which help in making product decision related to PLB which lead to better brand image are by using appealing packaging design, attractive labelling all of which create the initial perception of superior product prior using it. When it comes to external cues, placing it besides top selling products also might influence quality perception.

Adelina & Morgan (2007)(Mostafa & Elseidi, 2018) conclude that branding of the product which can be enhanced by visual cues and advertising may be viewed as one of the most important resources in today's brand communications; advertising has a major effect on the behavior of customers purchasing the product right at the point of first contact(Beneke et al., 2013). The impact of packaging and its components can have an impact on the consumer's decision after purchase and give consumers first experience

Hypothesis

H2: There is significant impact of brand of private label in product purchase decision

3)   Impact of perceived risk in Private label purchase decision

Dowling (1986)(Mostafa & Elseidi, 2018) (Huei-Chen, 2007b) has defined the impact of perceived risk on purchase as the uncertainty faced by consumer of a desired performance and experience, which might be realized post purchase and hamper making purchasing decisions. This uncertainty has more significance in e-commerce purchase as physical choice of product are not been made(Huei-Chen, 2007a). Risk perception evaluates the risk taking ability of a consumer while being price conscious, and making a purchase decision. It is also defined as the

consumer's assumptions and judgement of the negative consequences in a particular situation whether the risk been taken is worth the value that can be further reaped from the product or price benefit (Yeung and Morris, 2006) (Thanasuta, 2015)These risks have a strong negative and major impact on customer buying behavior against private labels. It can be concluded when these threats exist-if these risks are minimized, the intention of consumers to buy private labels will increase. E-commerce platforms therefore need to evaluate these risks at a higher level and could therefore change their value proposition. and create more successful private labels brands in the market place(Bhukya & Singh, 2015)

Consumers who have a great concern about the ill effects and hence the consequences of these risks than the benefits of PLB can be classified as risk averse consumers, these are who usually make a purchase with care and spend more time and energy on minimizing risk associated with mistake of purchase(Mostafa & Elseidi, 2018). As, PLB purchase is associated with high risk, these type of consumer's might refrain from purchasing these products.(Beneke et al., 2013)

Richardson et al. (1996) justifies that the level of perceived risk in a specific product category might vary and hence helps in determining which category is perceived with low risk for purchase of PLB product.

It has been observed that this perceived risk varies across categories- the risk involved with low engagement categories such as accessories is minimal. But, on the other side high engagement products such as food and electronics which are somehow making significant impact on our lives need more evaluation and thus chances of perceived risk of purchase from PLB are also high.(Beneke et al., 2013)

Thus, certain categories of product purchase might be more suitable for private labels choice than others.

We therefore make a hypothesis that:

H3: There is significant impact of perceived risk on PLB purchase decision.

4)   Impact of Quality on purchase

Perceived quality creates a perception of superiority and hence helps in creating better choice. Quality is most of them times

associated with the Brand equity of the product. (Chueh and Kao, 2004; Villarejo-Ramos and Sa´nchez-Franco, 2005) (Thanasuta, 2015) Brands that produce quality products have witnessed to create perception of superiority in offering good product design, having operational process efficiency, owning high technology, and marketing. National brands have incurred high cost while creating such perception around their brand and consequent products(Mostafa & Elseidi, 2018). National brands, which are highly familiar among consumers across the nation have strong withhold of perceived quality when it compares to private label (d'Astous and Saint-Louis, 2005)(Ming-Sung Cheng et al., 2007a), as they are built on investment which is capable in product design, driving innovations in operational excellence and technology (Steiner, 2004)(Ming-Sung Cheng et al., 2007b). As, private labels have tried to reduce their prices and provide value, they are perceived to be weak in providing better quality with above mentioned factors.(Thanasuta, 2015)

In an analysis of aggregate data across categories, Richardson et al (1996) found that the perceived obsession with price contributed to a decrease in the perceived value for capital of PLB both directly, and through perceived risk.. Supporting this statement, previous studies, as well as our evaluation of perceived risk, Narasimhan and Ronald (1998)(Beneke et al., 2013) concluded that the degree of perceived risk increases with the degree of perceived concern for consistency across product categories. Such risks have a strong negative and substantial impact as consumers continue to associate a higher risk correlation with private label goods because there is more confusion about underlying qualitative and experience-related qualities and thus more doubt regarding product content and functionality (Erdem and Swait, 2004; Glynn and Chen, 2009)(Keller et al., 2016).Therefore new private labels need to associate themselves with a balance of quality and price to compete against the national brands.(Mccarthy et al., 2017)

Yet although acknowledging their growing price equality with national brands, customers may still have differentiating difficulties and

making decisions between a variety of PLBs within a segment. (Schnittka et al. (2015)). Hoch and Shumeet (1993)(Huei-Chen, 2007a) has shown that private label brands share was lower in categories where the quality concern of national brands was high. This can be related to our research hence, we have selected product categories which are not associated with high brand equity.(Geyskens et al., 2018)

Hypothesis

H4: There is significant impact of quality of product while making a purchase with private label brand

Methodology

Onthe basis of the above literary works, it was found that factors such as price of product, risk of product category, product design and product quality have played part in decision making of private label brands. Purchase intent has been divided into categories to understand how purchase behaviour gets influence by these factos. Thus the conceptual model helps in creating a pathway from product variables to variable related to purchase behavior. The answers collected was in Likert scale range of one to five.

To have a random distribution of sample, questioners were distributed among various strata's from college student to working professionals of different backgrounds. The questionnaire was passed on online platform hence this also enabled to confirmed usage of e-commerce shopping.

Sampling Technique: Random stratified sampling with 120 consumers sharing their purchase intent. This survey was passed for seven days with platforms specific to strata's. From the purchase intent our main motive was to find following as output variables((Bucko et al., 2018):

1) Purchase intent related variables-frequency, Quantity per purchase and amount spent on each purchase across different categories.

2) The amount that consumers are willing to spend with respect to the categories.

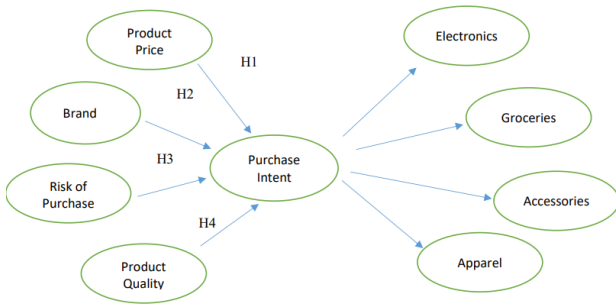3) Which type of product and marketing mix have significant impact on purchase behaviour

Fig I – Hypothesis design of Factors affecting private label purchase decision

So, initially the results of the purchase behavior would be assessed for the above perceived factors. Further, the factors will be tested how they influence purchase decision across various categories defined as: electronics, apparel, groceries and accessories.(Halstead & Ward, 1995)

Results and Analysis

The data had been transferred from excel to SPSS 18 version where the data cleaning had to be performed to remove the open ended questions/feedbacks. Which we have added in qualitative section. Further the categorical data was converted into ordinal for analysis. The analysis started with finding the variables which explain the deviation in dependent variable. For this, confirmatory factor analysis had to be performed. Further, to find the relation of dependent variables on our confirmed factors we will perform regression analysis (Multiple regression). The tolerance level considered in our case was 95%.

Consumer Profiling

It was observed that among the 120 data points 60% were males and 40% were female. 83% of the people were aged 23-27. The majority of these were students across various specialization who make purchases from e-commerce from various parts of India.

Table I – Age profile of consumers

	Frequency	Percent	Valid Percent	Percent (Choice)
National	33	40.2	40.2	40.2
Private	49	59.8	59.8	100.0
Total	82	100.0	100.0	

Table II- Gender profile of Consumers

Gender		Frequency	Percent (Gender)
Valid	Female	31	37.8
	Male	51	62.2
	Total	82	100.0

Label choice

The initial research was focused on understanding the consumer purchase choice between private and national brands, and the factor which help in making them this decision. As, predicted developing nations have a growing affinity for private label given they can give a good consumer experience. Label choice acts as our dependent variable for finding the significance of factors that affect our purchase decision

Table III – Private Label vs National Label Purchase

	Frequency	Percent	Valid Percent	Percent (Choice)
National	33	40.2	40.2	40.2
Private	49	59.8	59.8	100.0
Total	82	100.0	100.0	

The research, was initiated with a factor analysis which confirmed a KMO and Bartlets test fetched a value of 0.86 for the 14 statements that were captured from the surveys. Cronbach alpha (Reliability) had a value of 0.78. All our statements were clubbed under 5 variables using factors analysis which had factor loading which varies from 0.58 to 0.72.

Factor 1- Price conscious consumers
Factor 2 – Risk conscious consumers
Factor 3 – Brand Conscious consumers
The factor related to packaging was integrated with brand conscious consumer.
Factor 4- Quality Conscious consumers

Liner components which had Eigen value less than one was rejected as a significant component. On the basis of this rule above factors explained 70% of our deviation in model. Based on this result our next objective would be to test our hypothesis using regression analysis. The objective of test being to examine the impact of factors such as quality of product, price of product, brand of product and Risk of category on dependent variable which was related to purchase behavior and was further split into frequency, Quantity and amount spent on purchase changes with Private label.

Hypothesis Assumptions

To validate our assumptions, the hypothesis testing was conducted with multivariate regression analysis with the variables that were obtained at the end of factor analysis.
The four categories of factors that were observed to influence purchase decision for private labels
As we have tried to build our hypothesis across different categories so we will test whether:
H1 (Price conscious) consumers had significant impact in purchase in private labels with positive correlation) further these consumers tend to reduce their spend per purchase.
H2 (Brand conscious) consumer had significant impact on private label purchase
H3 (Risk conscious) consumer were not qualifying the hypothesis and hence didn't have impact on purchase of decision
H4 (Quality conscious) consumers had significant impact on private label purchase.
Model fit: The prediction model was found statistically significant, with R square as 70% I .e the prediction variable brand experience, perceived risk , price and quality were able to explain 70% variance in dependent variable.
.(R=0.836,R square =70%, R square adj= 68.4%)

Regression Analysis Results

For assessing the impact of factors which influence purchase decision of a private label brand, the regression model was used with Dependent variable as a choice between buying a private label or national label. The independent variables were used to measure the attributes which have impact in private label purchase.
From the above table it can be observed that Price, Brand Experience and Quality were supporting our hypothesis, whereas for perceived risk we had to reject our hypothesis.(Huei-Chen, 2007a)
Among the factors which had significant impact on purchase decision, quality had the highest impact
(β= -0.538). The negative signs signify that Private label purchase was related to compromise with quality, whereas price (β = 0.427) showed that Private label consumer's where the ones who gave high rating to Price as determinant for purchase. Similarly, brand was associated with low rating with private label brands.

Table IV: Factors affecting private label purchase decision

Model	Standardized Coefficients		
	Beta	Sig.	Result
Factors		.000	
Price	.427	.000	Support
Perceived Risk	-.017	.15	Not Support
Brand Experience	-.052	.0324	Support
Quality assurance	-.538	.000	Support

Category wise behavior:
According to researches performed by Richardson et al. (1996), it was observed that consumer choice and characteristics which influence decision to purchase varies, the same is assumed for E-commerce marketplace scenario. For our research purpose, we asked our consumers how much are they willing to pay for a private label brand for 4 categories namely:
i)   Electronics
ii)   Apparel

iii)   Accessories
iv)   Groceries

The consumers were asked to select the range of amount they would be willing to pay for the private label of the particular category. These product categories are available in e-commerce marketplaces under both private label as well as national labels. These four categories were chosen based on their distinct characteristics and variety of prices available in market. To justify the spend of these consumers for the above categories, the basic criteria of price, quality, risk, brand and quality was chosen.

Further we tried to establish a relation between the type of consumers and the amount spent on each of the category. Type of consumers- Price conscious, Risk conscious, Brand conscious ,Quality conscious

To establish an ordinal dataset, the price scale was recoded into ordinal numbers. Further a linear regression analysis was performed with each category. Our dependent variable was the amount spent on single purchase on each category. To establish the impact of the various factors-price, perceived risk, brand experience and quality assurance were considered as our independent variables. The above factors were gathered in form of Likert scale from 1-5 where 1 signifies least important and 5 stands for most important decision making factor.

For each of the categories hypothesis H1 to H4 was tested on dependent variable being amount spent on the respective private label categorical brand. Amount spent on Consumer Purchase of Electronics item was our first regression. The predictor variables of Price, quality, risk and brand were our independent variables. The result of the first regression is summarized in table

1.   For electronic items- The price conscious, risk conscious and quality conscious consumers showed high relation to the amount spent on purchase of private label brand. Further to assess the level of impact, the 'β' value was considered.
2.   Price conscious consumer had negative impact on amount spent on the purchase of products that means, they tend to spend low amount on each purchase of electronic private label brand.(β=-0.495)
3.   Quality conscious consumer have positive impact on amount spent on private

label brand, so they tend to spent more amount to get the best quality products(β=0.343

4.   Risk conscious consumer also has positive relation to the amount spent but has low strength compare to the quality conscious consumer(β=0.031)

Other factor such as brand experience was insignificant for the electronics purchase of private labels.

Discussion

Private Label Apparel Purchase

For analyzing the consumer spend on Private label purchase of apparel, the regression was repeated but the dependent variable as changed to 'amount spend on single purchase of private label apparel'. The same H1-H5 factors were considered as the independent variable.

The following results were observed the Price, Quality and Brand had significant impact on purchase behavior whereas Perceived risk had no significant impact on purchase behavior.

Price had a negative coefficient (β=-0.260) which signifies price conscious consumers tends to spend less amount on apparel purchase. On the other hand, brand(β=0.317) and quality conscious(0.514) consumer tend to spend higher amounts.

Private Label Electronics Purchase

This category of purchase was exceptional as the only factor influencing the dependent variable i.e amount spend on private label accessory purchase was price and quality. Other predictors such as Brand experience, quality and risk perceived were significantly irrelevant (p>0.05). The Amount spent labelled 3 and 4 indicated 1000-2500 and 2500-5000 had the most impact on purchase behavior as Brand conscious consumers showed high amount spent on apparel private labels.

Private label purchase of groceries

Groceries is considered to be a product category which is among the most frequently purchased products and has an increasing number of brands choices, which includes growing number of Private label brands. As groceries is a low differentiation product category, hence brand experience and perceived risk become a insignificant predictor for deciding the amount spend on private label grocery products.

Price and quality are the only factors influencing the purchase spent on private label groceries. Price had a negative impact (β=0.263) which indicates price conscious consumers tend to spend low amount on grocery purchase whereas quality conscious (β=0.452) consumers spend high amount on grocery even though it is low differentiating category.

It was observed that price conscious consumers had highest significance with the spend level 1 i.e 100-500 on groceries, and quality conscious consumers the other significant group for grocery purchase had high impact on amount spent on range 1 (100-500) and 2(500-1000)

Private Label Accessories purchase

Accessories are considered to be low differentiated products, these mostly include products like Bags, Pens and other low utility products. Our research suggested that consumers have high tendency to prefer private label brands for accessories as the engagement is very low with consumer's and hence they don't prefer paying high price in this category. Also the innovation and brand experience has very low interference in this category hence private label can thrive in this category. It was observed that price(β=0.024) was the only differentiating factor i.e it was given high preference while a purchase which makes it ideal for Private label brand products. The most significant price range was 1 (0-500) for this product category.

Categorical Regression Analysis results – Private Label Purchase decision

Table V : Private Label Apparel Purchase

Model (Accessories)	Standardized Coefficients	
	Beta	Sig.
Price	-.374	.024
Perceived Risk	.173	.120
Brand Experience	-.029	.815
Quality assurance	-.144	.357

Table VI: Private Label Electronic Purchase

Model (Electronics)	Standardized Coefficients	
	Beta	Sig.
(Constant)		.000
Price	-.495	.000
Perceived Risk	.031	.675
Brand Experience	-.001	.993
Quality assurance	.343	.001

Table VII : Private Label Accessory Purchase

Model (Apparel Purchase)	Standardized Coefficients	
	Beta	Sig.
Price	-.495	.000
Perceived Risk	.031	.003
Brand Experience	-.001	.993
Quality assurance	.343	.001

Table VIII: Private Label Groceries Purchase

Model (Groceries)	Standardized Coefficients	
	Beta	Sig.
Price	-.263	.038
Perceived Risk	-.109	.202
Brand Experience	-.013	.891
Quality assurance	.452	.000

Discussion and implications

The study was made as an attempt to understand the significance of consumer purchasing factors collected from previous research findings on private label e-commerce brands of India. The results found were exclusive in nature as no other research has delved into private label brands thriving in e-commerce space in India. Our research found some results which were aligned with our expectation like Price was a highly significant factor related to the purchase of private label brands in e-commerce irrespective of the product category. Quality was the second factor which led to high variance in consumer purchase decision as Private Label are associated with low quality performance. So, Quality conscious consumers preferred national brands. This implies that e-commerce private label need to give a quality assurance to the customer for higher growth. Risk had a small part to play in the purchase decision as high risk conscious consumers tend to avoid private label brands. Hence E-commerce market place need to ensure the private label brands displayed are genuine and would stand up to all policies of e-commerce shopping.

According to previous researches Brand experience plays a significant impact in purchase. But, unexpectedly Brand experience didn't have a significant impact in private label e-commerce purchase. It was observed that brand experience as a factor comes into effect in our further analysis with different categories, as brand experience are not relevant to all product categories.

Every economic slowdown sees a fall in consumer spending on almost all categories, this is when Private label brands come to rise. Hence, our next analysis was made an attempt to find how much amount to the different type of consumers would spend on various categories. For a better consumer experience, the private label brands should know how much people are willing to spend on each category of purchase for private label brands.

The second part of our research deals with finding the amount spent by each consumer characteristics like Price conscious, Risk conscious, quality conscious and brand conscious on various product categories. Each category has its own preference for purchase and hence product price range was analyzed against the buyer characteristics. It was observed that categories such as Electronics involved high sensitivity for risk of private label brands and had high correlation with quality.

Conclusion and Recommendation

1)   Factors affecting purchase of groceries saw price conscious and quality conscious consumer closely correlated to the amount spent on Private label purchase. Price conscious consumer (p=0.037) for spending in range 0-100 whereas quality conscious consumer spending in range 0-500. Hence product categories with more frequency product purchase tend to spend low amounts, price and quality being only factors for increasing purchase of private labels.

2)   For product categories such as Apparel, there was a strong relationship between brand experience and product purchase, brand conscious consumers preferred paying more even for private label brands to get a superior brand experience. Various Indian apparel brands have been launched under Indian E-commerce marketplace such as Roadster which is a brand under Myntra and Symbol by Amazon. If these brands follow innovative and consumer centric approaches, then they can successfully create a brand at low prices but high brand value

3)   Accessories was a low product differentiation category and hence consumers prefer it to be priced low. It is comparatively easy to grow with accessory product category as price range of 0-500 had highest significance for price conscious consumers

4)   Electronic is a high differentiation product category with high engagement and hence there is high impact on quality conscious and risk conscious consumers. The price range which was most significant was 1000-2500 and 2500-5000. Hence, this product category has less attributes which are related to private label brands.

5)   Because the products are offered with varieties, the brand doesn't play much role but if the private labels can collaborate with national brands they can provide low price yet innovative solutions for price conscious consumers.

Based on the above results different strategies can be implemented to grow the private label brands in e-commerce. As, price is considered as the most significant attribute for making a decision for purchase between private and national brands, so the best strategy for their growth would be keeping a competitive price which would drive more purchase even in situation of economic slowdowns. But, categories where there is high scope for product differentiation such as Electronic and apparel brands- The products need to bring more innovation and invest more on quality and user experience, as these factors play a huge role to their growth. But, the above factors need to be strategized not at the cost of increasing prices, as price remains the sole differentiating factors between national and private label brands. Based on the above findings Private label brands can apply different strategies to grow their brand value to compete with national brands, this might include endorsing with creative campaigns which add value to consumers. All these should be attained with keeping the prices low as it is the biggest point of differentiation between national and private label brands. Hence, as our research have suggested the pricing which might help the marketers to device the best products at affordable price.

Limitations and future study

This study was focused mainly around factors that lead to purchase behavior in e-commerce and how would the consumer spend get affected by private label brands in the different categories of products. One place where this study might be limited is the actual purchase decision when given such a situation. Buyers most of the time are unaware of their own preference and might align themselves to acceptable choices. But, if given a real situation to make a purchase the buyers might not give the same choices. Secondly, at the time of study our research found only four categories which had the characteristics and potential of private label sales generation. But, this was solely based on categories which were having high popularity in e-commerce marketplace. There might be many other category of products which haven't been as popular but have characteristics to have a private label brand. The current study tried to establish a results for the pricing strategy on basis of predefined price ranges. There might be product categories which do not fall under this price range. For future study, the factors can be qualitatively studies for impact on each category of products.

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EMERGING ROLE OF NCLT IN INDIA

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ABSTRACT

The NCLT and the NCLAT were constituted under the provisions of the Companies Act (2013) and have been made operational from June 01 2016. Tasked with primarily the key job of adjudicating the cases related to Indian companies, the NCLT and NCLAT have helped in reducing the undue hardships faced by the corporate sector and further resulting in reduced burden on the various High Courts. The present Article aims to analyze the emerging role of NCLT in speedy disposal of cases. A thorough study of secondary data available in the form of various notifications, provisions of Companies Act and various cases decided by the NCLT is made. An attempt is also made to understand the potential and possible challenges in the implementation of NCLT by interviewing the notable experts i.e. Judicial and Technical members of NCLT Benches, Professionals appearing before the benches and the industry experts in the relevant field. Stepping up the capacity of NCLT in terms of efficient and competent support staff, is the need of the hour. The vast jurisdiction conferred on the NCLT and the need for timely disposal of matters is leading to a lot of stress on the existing infrastructure. Also, in order to move in-sync with changing times, the NCLT and NCLAT need better infrastructure, processes, and policies to give more teeth to the corporate dispute redressal mechanism and to avoid impediment in this transition route. The NCLT & NCLAT are transitioning at a welcome pace to become one of the most effective forums for corporate dispute resolution and thus, the government and authorities should possess it with optimum funding and infrastructure so that it strives to continue the great work that it does.

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Keywords: NCLT, NCLAT, Corporate Jurisdiction, Companies Act, Role of Tribunal, Merger, Winding Up, IBC, Insolvency

Introduction

The Indian Constitution which is of the people, for the people and by the people with its many novel features also includes the need for a legal justice system of India to provide amongst other things, a speedy disposal of cases. On June 1, 2016, The Indian Government through MCA took a step towards reforming India's Corporate Justice System by notification dated 01.06.2016, notifying the constitution of NCLT & NCLAT under the provisions of the 2013 Companies Act. The Ministry has also by notifying the relevant provisions of the Companies Act (2013), made NCLT & NCLAT operational from 01.06.2021. The outset of conception of the NCLT is evident in the 1999 recommendation of the Eradi Committee Thereafter; The J.J. Irani Committee also affirmed the requirement of establishment of NCLT. The establishment of the NCLT and NCLAT was first conceived in the Companies (Amendment) Act 2002, however owing to emergence of a debate over the legal sanctity with respect to constitution of NCLT, it couldn't see day light and was later

on incorporated under the Companies Act (2013). The constitutionality of NCLT & NCLAT was then challenged by the Madras Bar Association. It also challenged various other provisions of Chapter XXVII in the 2013 Companies Act, stating more particularly Sections 408, 409, 411(3), 412, 413, 425, 431 & 434, which broadly deal with the establishment of the NCLT and the Appellate tribunal, their powers and for the selection of President/Members of NCLT and Chairperson/Members of NCLAT. The court held that Part 1B&C of the Companies Act dealing with NCLT & CLAT suffers from Constitutional infirmities. Further on, an appeal was filed by UoI as well as by the Madras Bar Association, in contradiction of Madras High Court judgment which was decided by the SC's Constitution Bench wherein the Hon'ble Apex court held that Parliament has the legislative proficiency to constitute NCLT & NCLAT that does not contravene Rule of Law, Separation of Powers & Independence of Judiciary and accordingly it was constituted under the Companies Act 2013.

Consolidation of Corporate Jurisdiction: CLB to NCLT and Way Forward

2.1 Consolidation of Corporate Jurisdiction

The establishment of the NCLT & NCLAT, which was a welcome step towards the consolidation of all corporate jurisdiction being previously scattered at various levels including HCs of various States, CLBs, Company Courts of appropriate Jurisdiction as well as BIFR/AAIFR, has resulted in a paradigm shift. It was split between the HC and the CLB in the case of disputes involving company concerns. The power of rectification of Member's register, refusal to transfer/transmission of Shares & Securities, Oppression & Mismanagement along with similar other issues were adjudicated by CLB, while disputes regarding reduction of capital, merger, amalgamation, and winding up of companies were adjudicated by the HCs. However, since the establishment of the NCLT, the Tribunal has become the sole redressal tool available to corporations for any and all of their disputes. Furthermore, NCLT has been entrusted with one more crucial jurisdiction that pertains to corporate liquidation & bankruptcy that comes with the enactment of the IB Code 2016 and as a result, all insolvency pertaining issues of Bodies Corporate will now fall under NCLT's jurisdiction.

2.2 Where does the NCLT stand today?

With the emergence of NCLT & NCLAT, the CLB stands disbanded with instant effect and subsequently all the matters pending before the CLB stand transferred to NCLT. Also, those matters pending before various HCs have gradually been shifted before the Tribunal. Initially, the NCLT had started functioning with 11 Benches, with 2 benches in New Delhi alongside one bench each at Ahmedabad, Allahabad, Chennai, Bengaluru, Chandigarh, Kolkata, Guwahati, Hyderabad & Mumbai. The Principal Bench of the NCLT is situated at New Delhi. Thereafter, one additional Bench had been formed on 28th June, 2018 at Jaipur, another on 12th July 2018 at Cuttack, one more on 27th July, 2018 at Kochi and two on 8th March 2019 at Indore and Amrawati, thereby amounting to a total of 16 benches. As of now, Member (Judicial) Justice Ashok Iqbal Singh Cheema has been acting as the Officiating Chairperson in NCLAT while Judicial Member Shri Bhaskara Pantula Mohan has been appointed as Acting President of the NCLT. Furthermore, talking about recent developments, in order to provide a sign of relief for the Companies and Litigants situated in the Southern States of India who face grave difficulty in travelling to Delhi for matters pertaining to appeals before the NCLAT, the Union Government has taken the decision for setting up of a NCLAT bench at Chennai. This being the 2th NCLAT bench will have the authority to hear the appeals from NCLT benches in Karnataka, Kerala, Tamil Nadu, Puducherry, Andhra Pradesh and Lakshwadeep. The said initiative will in turn minimize the number of pending cases, cut the time it takes to complete the procedure and result in a faster resolution of the cases.

2.3 Has the NCLT really been able to achieve the objectives of its formation: An Empirical Analysis?

The Author has done extensive research to actually get the details of success of NCLT / NCLAT for which the author has visited to the various Benches of NCLT to study their working and had extensive discussions with various stake holders such as the Judicial and Technical Members of NCLT, the Whole Time member of IBBI, the Advocates, Chartered Accountants, Company Secretaries, Cost Accountants & Insolvency Professionals who appear before NCLT on regular basis and the head of various Corporate Organizations, the author has also tried to find out the differences in the hitherto working of CLB, BIFR and High Courts and the present working under NCLT regime.

2.4 The Good of NCLT

The Advantages of NCLT in corporate litigation cannot be ignored, being a specialized court for Indian Corporate; it reduces the multiplicity of litigation before different forums and courts. Where earlier powers to adjudicate corporate litigations or disputes were scattered with the various bodies, these all powers have now been amalgamated and vest in a single authority thus giving birth to a more simplified dispute resolution process for the companies. The NCLT also has various experts in its body i.e. technical members,

judicial members and the President who are appointed only after fulfilling various criteria's of appointment. The mix of Judicial & Technical members has strengthened the capabilities of NCLT to resolve the corporate issues and significantly help in disposing of cases which require expert opinion on certain issues that may be beyond the scope of a judge. The constitution of NCLT has steered the enactment of new provisions under the 2013 Companies Act. The NCLAT has significantly reduced the burden on the High Court's as unlike before, now if a party isn't contented by the order of NCLT, they can furnish an appeal before NCLAT and thereafter the second appeal can be filed in the Supreme Court of India. This has also helped to reduce the delays in appeal. In addition, parties to the dispute in a case before the tribunal have the liberty to represent themselves or authorize one or more practicing professional or an officer of a company. With the foundation of NCLT, it has indirectly but positively helped in opening up of a totally different territory of working and training for professionals concerned with guiding and helping the corporate segment. Furthermore, the timeframe for Winding Up and Liquidation Process of a Company as well as Corporate Debtors has been made faster by the NCLT as compared to earlier time consuming process before High Courts.

2.5 The Pitfalls of NCLT

With new reforms come new challenges, though the NCLT and NCLAT have proved their advantages, but certainly there are few things which we can't ignore and require immediate/urgent attention for effective growth of NCLT & NCLAT and better disposal of Civil Corporate disputes. The major challenge faced by the NCLT ironically includes lesser number of benches and member. The number of members as of now, stand at only 30 at NCLT and 8 at NCLAT. Similarly the number of benches has increased from 11 to 16 since the inception of the Code. Though there is a slight increase in number of Benches of NCLT, but in absence of increase in number of members, these additional Benches are of no use. As per discussions with several professionals practicing at NCLT Delhi & appearing in various Compounding and Restoration of Company Matters, we could

collate that "NCLT Benches are more concerned to address and dispose of Cases under Insolvency and Bankruptcy Code, due to which they are lacking in timely disposal of small cases under Companies Act, 2013. The exorbitant delay in delivering the legal relief defeats the entire intent. Moreover, the Government should immediately address the concern and should increase the infrastructure before it is too late.

The Novel Covid-19 and its impact on the NCLT

3.1   Whether the Covid-19 Pandemic appears as a Boon or Bane for the NCLT Structure?

The repercussions owing to the pandemic have certainly been a roller coaster ride for the Tribunal. The pandemic has opened gates for a completely new virtual world which has indeed saved a lot of valuable time for professionals, as they don't have to go from one court to another. With the increase in usage of technology in the 21st Century, COVID-19 has made us realize one thing that it is possible for the courts to work virtually as well. With the proper implementation of digital courtrooms, one can bring small reforms, which if done at a large scale might make a difference. Advocates can directly appear for minor proceedings virtually thereby reducing the usage of page as well. If this system is applied to the entire judicial system of India, it has the capability to make a huge difference.

However, apart from opening new gates, the pandemic has undoubtedly been harsh on the Tribunals for various reasons. The wreaking widespread of the pandemic has resulted in taking the lives of various members of the NCLT which has come as a shock for the fraternity. Amid the spike in the number of cases, the NCLT benches across the country have therefore only taken up urgent matters from April 20, 2021. It wouldn't be wrong to state that even though the suspension has been removed, the pandemic has obliterated the legal forum where those issues may have been addressed. The pandemic has severed and become tedious for the existing members of the NCLT as the unforeseen deaths and retirements of the members, have overburdened the existing bench members with multiple cases.

Presently, each bench member is heading 2- 3 benches as a result of which most of the listed matters are not able to be taken up for hearing due to paucity of time. As of now, each bench member is compelled to take up the matters of his/her respective bench along with the other allocated benches on account of the sudden vacancies.

While taking note of the plightful situation of depleting strength of NCLT/NCLAT members, the SC while referring to Section 413(1) of the Companies Act (2013) has directed the Central Government to complete the process of reappointment of members of the NCLT & NCLAT at the earliest. The Apex Court while disposing off the case of *National Company Law Tribunal and Appellate Tribunal Bar Association vs. Ministry of Corporate Affairs and Ors* along with *Amrendra Kumar Singh vs. Union of India* stated that the issue of reappointment of members could be taken into consideration separately without waiting for the procedure of fresh appointments in order to initiate and speed up the process of reappointment of NCLT & NCLAT members within a span of 2 months.

3.2   Have Virtual Hearings become the New Normal?

The Covid-19 pandemic has pushed each and every one of us to switch to the online mode of communication and working. It has opened gates for a Virtual world which we were not used to prior to 2020. Even the Indian Judicial System is now moving more and more towards Virtual Court hearing. The Gujarat High Court was the first court to live-stream its court proceedings virtually. The initiative served much appreciation from people of the legal fraternity which in-turn implies that Courts can substitute Physical Hearing of cases with Virtual Hearing with ease. The Hon'ble Supreme Court while hearing a plea for resuming physical hearing stated that *Virtual Hearing is as good as Physical Hearing* indicating the importance of Virtual Hearing. The Supreme Court also heard 7144 cases in merely 57 days after imposition of the nation-wide lockdown in the country. Looking at how smoothly the Courts / Tribunals are carrying out their daily proceedings, it can be ascertained that in the next few years Virtual hearing could be the next new normal for all

professionals who appear before the various Courts along with the NCLT & NCLAT. Though it will take some more time for the people to get accustomed to the Virtual Process, once they get used to it, it will be easier for them to appear for proceedings. This will in turn also save some additional cost which is incurred every month on Judicial Infrastructure.

Moreover, if we talk about figures pertaining to the efficiency in adjudication of cases, apart from the Supreme Court, the NCLAT & NCLTs have done an excellent job of resolving the concerns and challenges that have arisen as a result of the new law's implementation. While physical hearings were halted due to the pandemic, the NCLT & NCLATs continued to operate in video mode. Even during the lockdown, over 69 percent of applications were adjudicated at the NCLAT; 985 cases were filed and 681 cases were heard and disposed of between March 2020 and December 2020.

Implications to the enactment of the Tribunal Reforms Act, 2021

The Tribunal Reforms Bill, 2021 which was recently voted for by both houses of Parliament, replaces the Tribunal Reforms (Rationalization and Conditions of Service) Ordinance, 2021 which was earlier notified this year in the month of April. Tribunals are quasi-judicial bodies that operate in a specialized domain and aim to relieve the existing legal system of its burden. In line with the Statement of Objects & Reasons of the Bill, it aims to streamline tribunals in order to save the government money while also ensuring that justice is delivered quickly. It intends to absolve certain Appellate Tribunals and shift their functions to other existing judicial bodies. However, the dissolution of various tribunals and appellate bodies, as well as the transfer of their powers & functions to the High Courts, can be critiqued based on the fact that Indian courts are already overwhelmed with their current workload. As of June 2021, there were 91,885 pending cases before different High Courts that have been languishing for more than 30 years. It is pertinent to mention that separate appellate bodies in the form of Tribunals bear specialized knowledge in the relevant field which the traditional courts in

certain technical matters would require expert knowledge for adjudicating in such matters. Earlier also, in several judgments such as the matters of *S. P. Sampath Kumar Etc. vs. Union of India & Ors., 1986* and *L. Chandra Kumar vs. Union of India & Ors, 1997*, the Hon'ble Apex Court has highlighted the need and usefulness of separate tribunals as an alternative institution to High Courts to lessen the latter's burden.

Furthermore, apart from the above contentions, the Supreme Court has made critical remarks and questioned the Act considering the fact that certain provisions in the said Act are similar to the Tribunals Reforms (Rationalisation and Conditions of Service) Ordinance 2021 which was earlier quashed by the Apex Court. The Supreme Court had overturned the requirement that chairpersons and members be at least 50 years old as well as the ordinance's four-year term requirement was also struck down by the Hon'ble Court. In-spite of that, both clauses have been included in the Act. Significantly, the Supreme Court is curious to identify as to why the Government introduced the Bill despite it being already struck down by the Hon'ble Court.

Expert Opinions

The author draws his analysis from various discussions with different experts to incorporate multiple views on the working of NCLT. He had extensive discussions with various stakeholders comprising of Technical and Judicial Members of NCLT, Senior officials & Whole time members of IBBI, various practicing Professionals of Delhi NCR, and the Registrar NCLT, while every part of the article draws heavily on multiple discussions and opinions about the topic being addressed, they are also followed by the rich, in-depth and insightful narrative of the following individuals:

➢ "NCLT has became a game changer in resolving issues in the economy of the Country" ….**Dr. V. K. Subburaj, Technical Member NCLT New Delhi Bench.**

➢ There is no platform for creating effective nexus amongst different benches of NCLT in terms of IT and logistics terms, resulting in each bench adjudicating the similar cases, with longer adjudication time and with

different judgments sometimes, for a similar issue" ….**CS ALKA KAPOOR, Chief Executive Officer, ICSI Institute of Insolvency Professionals (Formerly known as Insolvency Professionals Agency)**

➢ "Admittedly, NCLT/NCLAT is overburdened and infrastructure at their disposal is not commensurate with their workload. However, despite the infrastructure constrains the NCLT/NCLAT have done wonderful work specially in handling IBC cases. One area of concern for me is the time taken in admitting fresh IBC applications and in many a cases delay is caused by giving unnecessary hearings to interveners, IBC doesn't require adjudicating authority to hear interveners." ….**CS Munish K Sharma, Delhi NCR based Insolvency Professional**

Conclusion

"Indubitably, there was an unquestionable need for this type of fast track judicial body because the true goal of justice could not be achieved due to the increased number of proceedings pending at various places and it is a well-established legal principle that "justice delayed is justice denied". However, the government must continue to make significant efforts to achieve the goals of the NCLT & NCLAT establishment. Despite the fact that the long wait for the constitution of NCLT is over, a great deal of measures have been undertaken so as to make the activities of NCLT successful and effective. The main aim behind the constitution of Special Tribunals like NCLT & NCLAT was focused on rearrangements of strategies for a simplified and speedy disposal of cases by not putting burden on the Courts. Though the constitution of NCLT was tried left right & center to be proven wrong, however, it was at last held valid and necessary by all means. The NCLT & NCLAT are transitioning at a welcome pace to become one of the most effective forums for corporate dispute resolution and thus the government and authorities should possess it with optimum funding and infrastructure to continue to do the great work. The development of NCLT is more significant in a way that it has altered the face of corporate litigation in India. NCLT & NCLAT both have helped reduce the undue hardships faced by the corporate sector. There

were many criticisms faced by the Tribunal since the conceptualization stage, nonetheless, after breaking all these barriers, the NCLT has proved as a strong base. Stepping up the capacity of NCLT in terms of efficient and competent support staff, is the need of the hour. The vast jurisdiction conferred on the NCLT & NCLAT along with the need for timely disposal of matters is leading to a lot of stress on the existing infrastructure. Also, in order to move in-sync with changing times, the NCLT & NCLAT need better infrastructure, processes, and policies to give more teeth to the corporate dispute redressal mechanism and to avoid impediment in this transition process.

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DESIGN AND FABRICATION OF SEEDLING MACHINE

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ABSTRACT

Currently various machines were invented for the for the purpose of seed sowing in the tray. The seedling growing tray cultivation technique is an effective way to improve quality and yield in Pakistan. The main aim of agriculture in Pakistan is not only limited to the growth of crops but it is also affiliated with the economic growth of farmers. Rice is one of the most important crops in our country. Growth of rice in Pakistan mostly depends on the climatic conditions and as it is a labor-intensive crop therefore it requires about 80-90 labor days per acre. Hence, to overcome these issues, mechanization is very important in rice cultivation by growing it hydroponically. A conveyor bed structure and three-hopper stations system was designed to fill up the tray. So, the main aim of this machine is to reduce the time and labor required to a large extend

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Keywords: Tray, Seedling, Conveyor, Hopper stations, Substrate

Introduction

Seedling machine is used for making the tray, which consists of baby plants preferably rice. Initially baby plant tray will be prepared through the machine, which will later on put into controlled environmental conditions depending on the type of plants and seeds used in the tray. When rice baby plants are grown fully in the tray then it will be taken into the paddy field. The aim of this project is to facilitate a cultivation technique called Hydroponics. This technique allows a cultivator to grow plants with less labor and time and that time can be utilized in an effective and productive manner. By this method of planting, the yield can be increased and the quality can be improved as well. As the world population is increasing at a very high rate the need for food products grows as well and because of this, there can be a food crisis in the coming years and it is expected to last till 2050 if the demand is not met. Environmental problems such as water pollution, climate change, urban sprawl and the water crisis are restrictions for future worldwide food production. It is found during an experiment that the seeds don't have a significant effect on the plant growth rather the technique has. The growth is not effective from a soil-based system therefore an advanced technique is introduced called hydroponic which has higher growth and quality. Rice needs lots of water to grow due to which heavy consumption of water will be a consequence with old methods used to grow the crop also there is a scarcity of water in Pakistan. As the world, population is increasing at a higher rate; there is a high demand for food production because the traditional farming system does not meet the current and future demands of food. Rice is one of the most important crops in our country. Growth of rice in Pakistan mostly depends on the climatic conditions and as it is a labor-intensive crop, therefore it requires about 80-90 labor days per acre. Hence, to overcome these issues, mechanization is very important in rice cultivation [1]. It is a simple, low-cost setup and extremely versatile method. In addition to this it will address and provide solution to many issues occurred during manual farming, such as irregular distribution of the seeds, low placement of the seeds, poor germination of the seeds and farmer's health issues like back ache [2-5]. This method is easy to implement like other methods, the concept is simple the plants will grow in a tray then it will be taken into the fields.

Literature Review

Using mechanization in agriculture by this transplanter machine would become an alternate source of income for the rural youth on transplanting and nursery raisings. Mechanization has improved a lot of traditional ways [6-8]. It is observed that with mechanization the life is made simpler and easier [9-11]. To facilitate farming at small

scale research was conducted on an automatic sowing and plowing machine by Mahesh and Priyanka [12]. To increase production, a row planter and fertilizer machine was designed by Tesfaye and Hiluf. It can plant six rows in one trip [13]. However, a much simpler structure was proposed by Kumar et al. [14]. This machine was capable of handling a lot of weight such as battery, solar panel, chassis, etc. A solar automated seed sowing machine with resistance movement was developed by Swetha and Shreeharsha [15]. A model was proposed and developed for seed sowing machine by Yevale et al. [16, 17]. A cheap sowing machine for farming in India was fabricated by Vimal et [18]. The basic planting procedure was adapted by the sowing matching machine developed by Girishkumar et al. [19]. These machines are only suitable for small area due to their simpler structure [20]. However, planting machines developed by Oscar company required some farmers to operate [21]. These are simpler to operate with respect to the grains [22-25]. A semi-automatic tomato and vegetable transplanter was proposed by Javidan and Mohammadzamani [26, 27]. Paper pots were used for seedling of vegetables by Kumara and Raheman [28]. A nursery seedling machine was designed by Lintao Chen et al. [29]. An automatic embedding system was developed for a soft pot tray to achieve embedding of the soft tray into the hard tray following covering and sowing with soil. The soft- pot-tray automatic embedding system was fabricated and the experimental results were satisfied with the analytical results. Various semi and fully automated planter had been developed by many researchers [30-35]. A drilling machine for seed sowing fertilizer was proposed by Wandhare et al. [36].

A gripping type automatic transplanting mechanism was developed by Vivek P. et al. [37] for to tomato, brinjal and chilli seedlings. The mechanism satisfactorily grasped and placed the seedlings from the portray and transplanted to the place where it should be grounded. A sew sowing machine in a tray was designed and fabricated by K.K Waghmare et al. [38]. On the first station cocopeat was filled and then seeds were sowed in the tray holes and then the soil was poured on the top so that the seeds should get enough depth to grow. As a result, the mechanism became efficient for the nurseries and the farmers and helped them to operate it easily. A low-cost seeder for the trays using pneumatic mechanism was designed by B.B. Gaikwad et al. [39]. The testing was done on the sowing of tomato and capsicum seeds in the plug trays mechanism. The design was able to indent a single seed in one row indented cells of a tray. Thus, saving lots of time as compared to when done manually. A vacuum sowing machine is designed for different types of seeds by Prajakta et al. [40]. Similar machine but without vacuum technology was developed by Marode et al [41]. An automatic seeder for tray plantation on small scale was designed by Dhairyashil Ashok Naik et al. [42]. The system consists of conveyor unit where trays were passed and the sowing unit known as seeder pipe for seed sowing in the tray. The results of this method were compared with the traditional method of seed sowing like needle seeder, vibratory seeder and manual sowing and, it was concluded that seeder pipe sowing method was fast and efficient.

A manual rice seedling machine was developed by Mishra Akash Arvind et al. [43] that was beneficial for the farmers and society. This machine is best fitted to transplant rice seedlings on the fields. A simple rice planter machine was also proposed by Patil and Mangesh [44]. However, this machine can't be applied for heavy-duty stuff. An automatic system was designed by Cui et al. It had improved rice seed tape winding units. Adding a Bluetooth connectivity to seed sowing machine was proposed by Divate et al. [45]. This machine could be controlled by a smartphone. Rice seeds are used in the current seedling machine. A seed planter was projected by Gunavant et al. which was capable to reduce seed waste by maintaining the specified distance during plantation [46]. With similar motivation, multipurpose agriculture vehicle was designed by Patil Nikhil et al. [47]. This vehicle increased the productivity by reducing the seed wastages. More precision was attained by a seed sowing robot developed by Abdulrahman et al. [48].

From the research survey, the different procedures of planting rice in a tray are observed along with the time period required

by the baby plant to grow, which is usually fifteen days. It also emphasizes on the density of productivity of a rice crop. It is also observed that area coverage i.e., crops in a unit area, also effects the quality of the crops. For example, if at least a distance of 25 centimeters is kept between the crops from each other, the maximum output can be achieved. This is because the roots will become stronger and denser, as air and sunlight can pass through them easily. Seedling machine allows us to increase the production method by eliminating many environmental threats.

Methodology

The objectives of seedling machine are equal distribution of seeds, less wastage of time and seeds. In addition to this, it provides proper coverage of seed with the substrate along with desired depth. This machine is suitable for preparing portable fields for planting seed for baby plant seedling. In this way a lot of time and land can be saved and can be utilized for best quality and maximum yield. In order to achieve aforementioned objectives methodology stated in figure 1 is adopted for the research work.
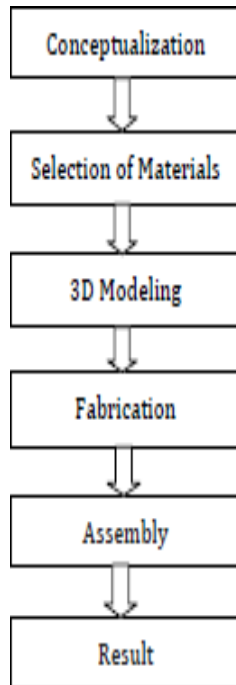

Figure 1. Methodology

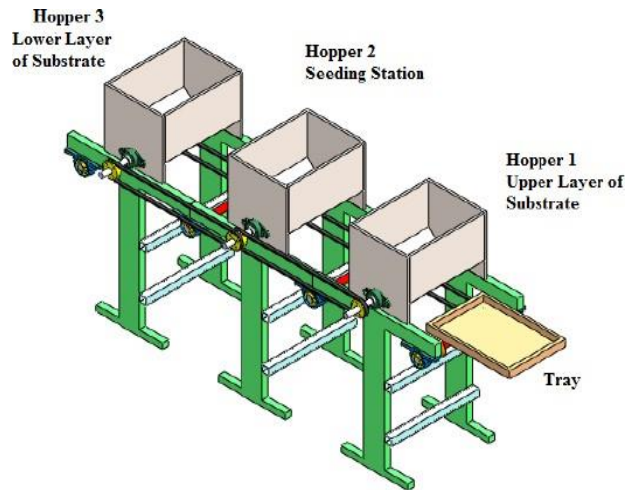The CAD model of the machine is illustrated in the figure 2.

Figure 2. CAD Design of the Seedling Machine

Description of major components of the machine

The system comprises of the two major components i.e conveyor system and hopper system. The details are enlisted below.

4.1 Conveyor System

The length of the conveyor is 6 ft, powered by 24 V Dc gear motor model with 65 rpm. It is used for passing the tray through different stations. Conveyor belt is illustrated in figure 3.

4.2 Hopper System

There are three stations, two for substrate and one for seeds. Size of hopper is 1x1x1 Feet. The capacity of hopper for PEAT Mos is 5kg, and for seeds is 10 kg, variable with the input but within a volume of 1 cubic feet. These feeding stations are controlled by 24V DC gear motor. First and third feeding stations carry PEAT MOS as a substrate, whereas second feeding station carry seeds. Different seeds can be used in seeding station like maize, rice, wheat etc. and the amount of seeds and substrate is controlled by gating mechanism, briefly described as below

•   From 1st hopper 200-3000 gm. PEAT MOS can be control by gate mechanism.

•   From 2nd hopper 100-200 gm. PEAT MOS can be control by gate mechanism.

•   From 3rd hopper 80-200 gm. seeds can be controlled by gate mechanism.

Production rate is 17 trays in a minute. One tray will take 3.5 seconds to prepare and ready for plant incubator. Allowable size of the tray is 21in x 11in x 1.25in

Pin Connection Diagram

Figure 3 illustrate the connection diagram that was made between the conveyor and hopper motor. Both the motors were connected parallel with single 24V DC adapter. Three different buttons were provided in the board. First was the main switch which turn on and off the whole machine, second and third was to operate conveyor and hopper motor separately.
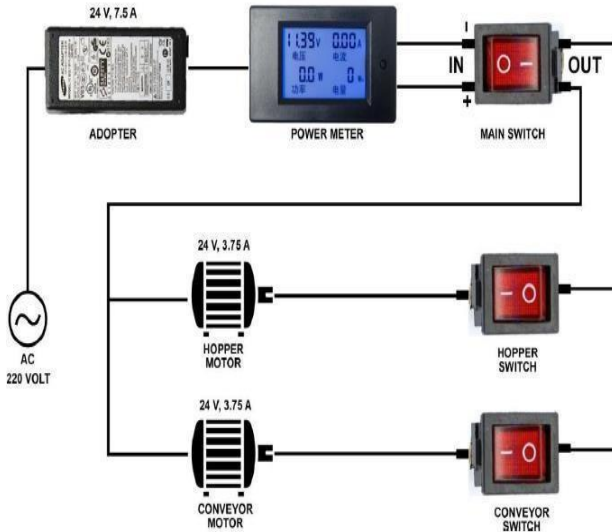
Figure 3. Wiring Diagram

Calculations

The required necessary calculations for the seedling machine is given below.

6.1 Gear Ratio

Gear Ratio of Belt and pulley mechanism for conveyor and hoppers is given in equation 1.
r_2 is radius of the conveyor and hopper pulley.
r_1 is radius of the motor pulley.

$$N= r_2/r_2 = 2.1/2.1 = 1 \qquad (1)$$

6.2 Belt Length Calculation

There are two pulley mechanisms i.e. motor and conveyor bed and

6.2.1 Motor and Conveyor Bed Pulley: The motor and conveyor bed pulley is illustrated in figure 4.

Center to center distance between two pulleys (S) = 40.132 cm
Diameter of motor pulley (d1) = 4.4 cm
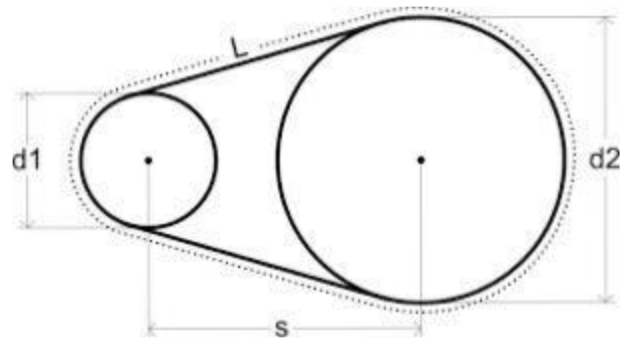Diameter of conveyor rod pulley (d2) = 4.4 cm
Length of the belt (L) =?

Figure 4. Belt and Pulley System

By using equation 2, it can be calculated:

$$L = 2S + ((d_1 + d_2))/2 + [(d_1 - d_2)]^2/4S \qquad (2)$$

$$L = (2 \times 40.132) + ((4.4 + 4.4))/2 + [(4.4 - 4.4)]^2/(4 \times 40.132) \qquad (3)$$

$$L = 94.08 \text{ cm} = 37 \text{ inch} \qquad (4)$$

6.2.2 Motor and Hopper System Pulley: The motor and hopper system pulley is similar to figure 4, however it's different in geometry.
Center to center distance between two pulleys (S) = 44.2 cm
Diameter of motor pulley (d1) = 4.4 cm
Diameter of conveyor rod pulley (d2) = 4.4 cm
Length of the belt (L) =?
By using equation (2) we get:

$$L = (2 \times 44.2) + ((4.4 + 4.4))/2 + [(4.4 - 4.4)]^2/(4 \times 44.2) \qquad (5)$$

$$L = 101.82 \text{ cm} = 40 \text{ inch} \qquad (6)$$

6.3 Motor Power and Torque

Voltage = 24 V
Current = 3.75 Amp
Speed (N) = 3300 Rpm
Gear Head = 44
Reduced Rpm = 3300/44 = 75 rpm
Power = $V \times I = 24 \times 3.75 = 90$ watts

$$Power = \tau \times \omega \qquad (7)$$

$$\tau = P/\omega \qquad (8)$$

$\omega = 2\pi N/60 = 2\pi 3300/60 = 345$ rad/sec
Starting Torque = T = 90/345 = 0.26 Nm

Working

Mini fields were created on the portable trays. Initially, the tray is placed on seedling machine where it is filled with three layers of substances. First of all, lower layer is filled with 250 gm. of substrate i.e. Peat Mos. Second layer is covered with 100 gm. of rice seeds. Finally, upper layer is covered with 150

gm. of substrate. At the end of the process, the tray is collected from the seedling machine.

The seedling machine as shown in figure 5 is fabricated according to the design. Steel is used to ensure maximum rigidity and support. Two DC geared motor were used, one for the conveyor and the one for the hoppers. The motion of the other two hoppers is achieved by mounting belt and pulley mechanism on the first hopper.

Figure 5. Seedling Machine

Conclusion

It is estimated that during peak periods demand of labor exceeds which affects the timeline of overall operations thereby reducing crop yields. The seedling machine is automized so only few workers are required to prepare the tray. The machine is eco-friendly and efficient with low production cost and saves time. The result of the project was adequate and the plant growth is optimum in short duration

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CLOUD TECHNOLOGY AS A SUPPORT FOR THE ETL PROCESS AND ITS INFLUENCE ON DECISION MAKING.

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ABSTRACT

There are many important points in the digital transformation of organizations today that decisions must be accurate, and the data warehouse ETL process and its underlying concepts help interpret them and enhance corporate interpretive strategic planning. Purpose: The objective is to understand the importance of the impact of the ETL process on decision making. Materials and methods: The methodological cut-off points between two methods (Kimball, Immon) by different methods depend on the requirements and benefits of system recovery. A literature review on the subject was conducted to search and reference scientific articles. Development: The ETL process works in the same way as information is reconstructed and made accessible. For this reason, new data sources and models also require specific validation based on the business rules of each organization. Considering the ETL process associated with modern business intelligence, we can observe the different applications of these concepts in a variety of disciplines, from mathematical and scientific rules to organizational business rules. The end result: you can get a solid partnership that makes decisions more realistic and transformational when running BI, and gives you new metrics, such as analyzed data. keyword. ETL, Kimball's method, Power BI, data. Different applications of these concepts can be seen in fields as diverse as mathematical sciences to organization-specific business rules. Conclusion: business intelligence makes decisions more realistic and offers strong partnerships, including new metrics that can be acquired, such as data transformation and data analysis. keywords. ETL, Kimball Methodology, Power BI, Data. Different applications of these concepts can be observed in fields as diverse as mathematical sciences or organization-specific business rules. The bottom line: Doing your business intelligently makes your decisions more realistic and gives you solid associations as new metrics you can retrieve, such as transformed and analyzed data. keyword. ETL, Kimball methods, Power BI, data.

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Keywords: ETL, Kimball Methodology, Power BI, Data

Introduction

We are currently facing the process of a digital revolution in the field of business and individuals. The creation, storage and transmission of information is fundamental to the functioning of the financial sector. The information element records the customer's monetary rights and obligations. The flow of information enables the payment and exchange of assets. Information analysis will help you assess the risk of a potential loan. These are just a few examples of the extent to which the financial industry has depended on information processing since its inception. This explains why the financial industry has historically been one of the largest investors in information and communication technologies (ICT). (Fernandes Derris, 2017)

In the latter case, we learn more and more through the use of skills and tools that make our lives easier and, little by little, we use our empirical knowledge appropriately. Organizationally, it is a bit complicated because people with a culture of change talk about groups of people coming to the same place, company goals, missions and visions.

This is the digital transformation of companies like devices, computers, Whether you use servers, social networks or transactional systems, create a digital culture in your organization that influences the development of your business strategy. The power of an organization is decision making. For example,

depending on the business area we are talking about, you could be an administrator. So how can these decisions be strengthened beyond the use of real company data and information, real numbers and indexes? It sounds simple, but in reality every business is the world, i.e., every system in every business is the world of data. This is where the ETL process is generated and helps us a lot by looking at the data and information in the business system from another angle. In addition to helping with these steps, there are also tools to aggregate visual interpretations from multiple sources. This article describes a bit about transaction modeling and alternative decision-making approaches that use the ETL process as an independent variable.

Methodologies

2.1. Kimball Methodology

Ralph Kimball pioneered these approaches, and Kimball's data model implements a bottom-up approach to DW (Data Warehouse Architecture) design, where the data mart was first conceived, according to business needs. Then evaluate the underlying data source and use the ETL (Extract Transform, Load) tool to take different types of data types from different sources and load them into the relational data preparation area of the machine. Following Kimball's bottom-up approach, after the data is loaded into the data warehouse staging area, the next step is to load the data into a data warehouse model with a denormalized baseline size. This model divides the data into either a fact table, which is numeric transaction data, or a dimension table, which is the reference information that supports the data. (Tehreem Naeem, 2021)
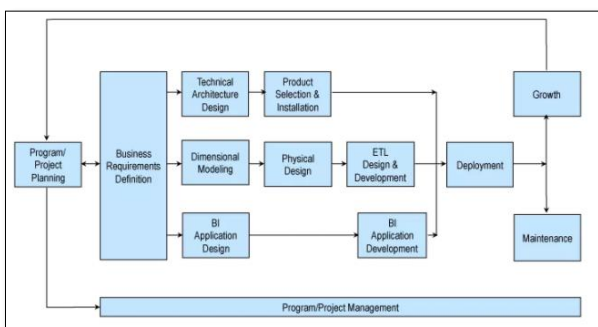

Figure 1: Kimball's methodology for the data warehouse life cycle. Source: (Tehreem Naeem, 2021)

2.2. Immon's methodology

Bill Inmon, the father of data warehousing, introduced the concept of data warehouse development. He started by designing a data model for a company's data warehouse that defines the key areas and entities of the associated companies, such as customers, products and suppliers. Thus. Bill Inmon's definition of a data warehouse is "thematic, integrated, non-volatile data collection to support management decision making." The model then creates a complete logical model for each key entity. For example, a logical model is created for a product that has all the attributes associated with that entity. This logic model can contain 10 different entities in a product, including all the details, such as business drivers, aspects, relationships, dependencies, associations and more. (Tehreem Naeem, 2021)

The Kimball option is the most successful because you are trying to organize information about your personal information requirements. The art of cloud allows you to implement or deploy the service provider. In this case, all methods of secure growth are carried out with the help of the cloud. The instrument provided varied and at the same time gives it once with the roots of the other. Clouds are a straight way to send computing resources and some software is how to save saved data, how to save saved data how to save data to save data and function. Users will continue to update monthly updates for maximum employment and security. (Tehreem Naeem, 2021)

Data modeling

Database design is not a simple process. The complexity of the information and the number of information system requirements complicate the information. For this reason, it is very useful to adopt a known partitioning strategy when designing your database. Therefore, the design process should be divided into several phases. In any case, the intermediate results obtained serve as a starting point for the next step, and the desired results are obtained in the final step. As you can see, you do not have to solve all design problems, but only face one type of subproblem at each step. This simplifies the process when the problems are split up. Most data modeling methods provide

a way to graphically represent features and relationships. (Dominguez, 2018)

3.1. Transactional data modeling.

This data model is a collection of information that implements the search, insert, update, and delete procedures as needed in an organization's business rules-based system. Optimization is a very good pillar of this model because the entire system is model-based and we are constantly looking for ways to optimize our research resources.

Should this analysis be done in an orderly and systematic way, first detailing what you are trying to analyze? Regardless of the nature of the information contained in a database, it can always be subdivided or classified into "information domains". When we talk about information domains, we mean that not all information has the same purpose, but can be divided into business domains that can be analyzed independently. (Troche, 2014)

3.2. Dimensional data modeling

Dimensional modeling aims to derive an interpretation based on the dimensions and measures defined by the organization. Therefore, it may not need to go through the standardization process. Implementations of this model are not intended to provide or operate APIs, mobile applications, ERP or CRM systems. It is limited to studying the information and collecting indicators from it.

Previous Concepts

4.1. Microsoft Power BI

Integrated program for business intelligence, which allows the integration of multiple data sources of different origins and formats.

It allows the use of remote and local databases, text files, .xlsx files, among others.

It also has many tools to perform ETL processes and also data transformation, to later generate reports in a very simple way.

Among the most relevant are:
- Power Query.
- Data flows.
- Data sets.

4.2. SQL Language

It is a structured query language based on calculations and allows insertion, deletion, update and retrieval operations.

It also allows us to create entities within our manager or database engine in use, of which the most relevant are:
- SQL Server
- Oracle
- PostgreSQL
- Mysql

4.3. ETL Process

This is an acronym that includes the extraction, conversion and downloading of information for a variety of purposes. As you can see, this is a fundamental part of business intelligence. This is essentially a bridge to other data models, because it can be better interpreted or already targeted. There are many ways to create it, including cloud desktop tools from various vendors such as Azure, Amazon and Google Cloud Platform.
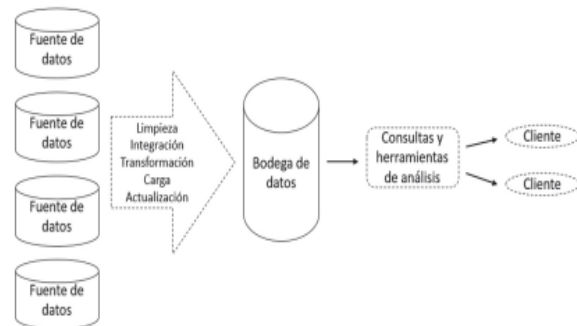

Figure 2: Flow of an ETL process associated with a datawarehouse

4.4. Cloud computing

Cloud computing is an efficient way of providing computing resources and is a form of outsourcing, such as data storage and processing. Users who want to purchase it pay a monthly fee, the software is managed by the provider and is constantly updated for maximum performance and security. (Salesforce, 2019)

4.5. Platform as a service (PaaS).

Platform-as-a-Service (PaaS) is a complete cloud-based development and deployment environment that can deliver everything from simple cloud-based applications to complex cloud-based enterprise applications. When you buy the resources you need from your cloud service provider, you access them through a secure Internet connection, but you only pay for what you use. (Azure, 2021)

4.6. Infrastructure as a Service (IaaS)

IaaS providers provide virtualization, storage, networking and servers. As a result, users do not have to have an on-site data center and do not have to worry about physically upgrading or maintaining these elements. In most cases, IaaS users have full control over their infrastructure through an application programming interface (API) or a control panel. IaaS is the most flexible cloud-as-a-service model that allows you to easily scale, upgrade and integrate resources such as cloud storage without having to anticipate or cope with new demands. This can generate upfront costs in the future. (RedHat, n.d.)

4.7. Software as a Service (SaaS)

This is a cloud computing service that allows users to access software in the provider's cloud. Users do not install applications on their local devices. Instead, the application resides on a remote cloud network that can be accessed via the web or API. The application allows users to store and analyze data and collaborate on projects. (IBM, 2020)

4.8. Data loss or gain?

When we talk about data transformation, we are referring to generating more information for purposes other than revenue generation. For example, a single commercial campaign or product over a period of time. You can create factors to know what kind of product you are offering to make decisions about the work.

This may be interpreted as data gain, but it is not. Data or other sources are not changed for this analysis. Maybe in terms of commercial systems you generate a lot of data every day. But in terms of dimensional modeling, there is not. As mentioned earlier, you get information in your hands. Don't forget that this is data interpreted by information.

Therefore, the amount of data continues to grow and become more accurate and continues to be understood as you can get more information in different situations. The reliability of processes and programs is not just based on words, but there are many ways to perform verification.

In this case, it is information and the source and destination are readily available. Duque (2016) shows that to confirm the behavior of the proposed ETL model, it is necessary to perform a management of measured data sets in each of the different stations. In this case, he shows the difference.

The source of the data source. Kimball's methodology is a benchmark for many smart business enterprises. Medina (2018) states that four steps were used to define the methodology used in the study: analysis, multidimensional design, ETL procedures and analytical processing.

(Mojica, 2020) teaches that they have configured a Microsoft Power BI business intelligence tool to explain virus growth through four steps, including the creation of an impact dashboard and subsequent analysis system requirements. Visualize and analyze your data as a case study to design the architecture, data integration and final steps to use.

When talking about improving an organization, it is necessary to take into account the business rules that means when information is interpreted and analyzed according to the products and services it provides.

This is already a very important factor and has a significant impact on business decision making.

In reality, metrics or reports do not always satisfy an organization. Instructions on the action to be taken.

(Enriquez, 2019) contributes to the implementation of business intelligence applications for organizational planning and development departments to generate analytical and strategic information based on the requirements needed to perform the required analytics and make decisions. I added. Better management.

(Castañeda, 2015) argues that implementing business intelligence can help reduce reporting time. The implementation of business intelligence using the Ralph Kimball method has been shown to improve decision making in the field of admissions to the Autonomous University of Peru. Similarly, using the data set (Caldas, 2020), we found that sales increased from 65.96% to 80.25%, achieving a growth of 14.29%.

Finally (Quintanilla, 2018) reports are now generated much faster, which undoubtedly helps to make timely decisions in the management area.

4.9. Post implementation validations

The confirmation process for information manipulation and transformation can be performed in several ways, as described above. Any source used to move, transform or reorganize data is available and can perform end-to-end validation. It also refers to the adaptation of information systems connected to new models when computational techniques, regressions or parallel developments are being implemented or are being implemented by applying business rules. It also guides you through understanding test-driven development (TDD), supporting development based on previously developed test cases and the ability to refine. An important concept in understanding the similarities to test-driven development (Torres, 2017) is that unit tests are small units (methods) of modular, well-organized software code. This allows you to test function with minimal formulas. Among the functions that the system must have. Unit tests are part of the software design and help to specify the code requirements and validate the results. The process associated with unit test development starts with defining the system requirements (user stories) and the next step focuses on coding the unit test. All validation and validation is performed here, solving the proposed customer requirements, the final problem presented and eliminating duplication, duplication and feature group code error characteristics in a series of unit tests. Similarly, you can use this method to create a new schema or data flow according to the procedure you choose for ETL.

4.10. Database Migration

Information transformation also includes the movement of certain information. Database migration is shifting data from one system to another. This could be due to the arrival of other applications, memory changes or mode changes. Simply put, this is the process by which a large number of databases are migrated. From the old system to the new system. To clean, recover and migrate various data to your new system, you must perform a few steps. (Regi Zamon, 2017)

4.11. Data corruption

Problems arise when detecting changes in data content and format between the legacy system and the target system. Data corrupted during migration may now contain duplicates or duplicates. Ultimately, this is one of the migration risks that has the greatest impact on integrity and, therefore, operational and business efficiency. (PowerData, 2017)

4.12. Data loss.

Sometimes, once the data transfer is completed, the data cannot be used as a destination. This phenomenon is known as data loss and is the most serious possible migration risk. The cost of fixing this problem can range from data loss and image loss to loss of business due to missing data and reputational behavior as it solves data loss problems. (PowerData 2017)

4.13. Semantic risk.

This is another hot spot faced by those who are aware of the dangers of data migration. The traditional thermal column has the same meaning, but it occurs when the units of measurement are used differently in the two cases. These changes in the data completely change the meaning of the data. (PowerData, 2017)

4.14. Risk of interference.

This is a very common situation that occurs when multiple stakeholders use the source application at the same time during a transfer. Crashing, access problems and the inability to move certain information are risks that lead to migration. (PowerData, 2017)

Conclusions

Operations and other users can try various information solutions, including those mentioned in this user story. After that, we will learn our new model in our new model and express a photographer with new information we have. Then, you must decide according to the strategy by changing and interpreting this information to any area of the group. In addition, with the importance of romantic testing for the migration of information. Each group has a trademark, each of the information needs to determine the metrics.

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MACHINE LEARNING AS A KEY ELEMENT IN THE PROSPECTIVE OF ACADEMIC PERFORMANCE IN PERUVIAN UNIVERSITIES

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ABSTRACT

Academic performance is related to academic success, postponement and desertion, the latter two are problems that have increased in Peru due to the history of the pandemic, which has made it notorious. The digital transformation offers educational institutions opportunities to integrate their members with technological and cultural changes through participation in accordance with their educational role, and become the engine of educational reforms, in this case, the technological system that constitutes the ecosystem. Data forms information, knowledge and actions. In this sense, the use of data mining methods such as CRISP-DM and the application of machine learning algorithms provide the opportunity to design adjustable work models according to each institution to predict academic performance and determine the reasons for delays and dropouts. academics. Therefore, by applying a development and feedback cycle, you can improve the certainty of the university's intellectual capital and machine learning technology to optimize academic predictions and contribute to the development of students, society and institutions of social education. Finally, we conclude that the academic performance of universities can be satisfactorily predicted, and machine learning methods are being implemented in different regions of the world to improve intellectual capital and institutional performance

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Keywords: Academic performance, school dropout, machine learning, educational data mining.

Introduction

Knowing the result of the reflective diploma teaching search partially the effectiveness of the faculty's role in the academic planning process, Morales (2014) mentions that students make up the faculty and are the target literary good to be literate, knowing learning according to the United Nations organization for learning (UNESCO), as the resource of humanization and with the indicators of entry, follow-up and term for a ralea training. However, the poor academic benefit and the lack of economic assets, hinder the educational counterbalance, the purchase of tools that promote the diploma learning and the academic continuity. A study confirmed by the universal mandate (2017) mentions that the figure of students in prominent learning increased by 20 million in the last term, being 45% poor and only half achieved diploma, likewise considering equanimity as an interesting element that influences solemn education in Latin America, proposing to produce university programs that take into account that the limit to the faculty does not guarantee its coronation and lineage, due to universalism is not academically prepared, generating flight or increase of up to 36%, with respect to the common scope, in finishing their education. According to Burbules (2020), species education is one of the pillars of the 2030 agenda for the United Nations Sustainable process, which aims to ensure inclusive and equitable race training and compose immortal education opportunities for all. This popular indifferent may disappear with some general trends affecting instruction in the age of documentation, because training is strategic to the future species of human vitality and sustainability of the world. The academic issue is not just of America Larina, due to according to Hassan (2020), the average tax of wandering in the countries of the

organization for contribution and economic change (OECD) is around 45%.

In 2020, the health emergency caused by the COVID-19 pandemic increased student flight, with an emphasis on university students. This is confirmed by a TV Peru interview (2020) with Jorge Mori, current dean of solemn learning of MINEDU, in which he reported that 174,544 students had to put aside their studies in the faculty, which corresponds to 9% of students in public universities and 22% in private universities, representing an increase of 6% compared to 2019. The COVID-19 gave more honor to the problematic of desertion and teaching tardiness, because there was a growth of lack in our country and so manifests the ecumenical mandate and UNICEF (2020), where they mention that deprivation in children and adolescents would grow to 39.9% and in adults to 30.3%. close to exaggerate that according to Burbules (2020), one of the main challenges related to the quality of thrust in possibility is instruction, because it is a way to improve the vitality caste for a sustainable perspective.

In spite of the raised problematic, university educational institutions have documentation systems that record economic or college pleasure capital, academic results and psychological qualities, which are documented in computer systems of schoolboy partiality in the college collectivity and its proper use with automatic education techniques influences scholastic gain by means of vaticination and pursuit of the pupil, in this way it is intended to encircle the affected assets, to diminish the university abandonment and enlargement of the cultured time, in this way to take care of what is raised by the UNESCO, since, not to assemble the harassment to university students we reduce the social income and the union conclusion known as prosecution; In this context, copulating with an omen instrument of cultured performance is useful for the licensed field and discounting the principles shared in society. According to (Christensen. alluded to in ArtiSiddhpura, 2020), these disruptive technologies are not explicitly designed to recline instruction and education in sublime instruction, nevertheless they have a genial formative. This is demonstrated by research conducted in national and international universities, which identified the determining circumstances in university profit, due to according to ArtiSiddhpura (2020), the affordable engine of any district is cemented in the formative system and, by bazaar, it is cloudy to study the circumstances that influence the role of higher education. It is likewise intended to assemble the basis for improving the university academic administration, fostering one of the purposes of the faculty according to the University Law No. 30220, which is, to subordinate to the community and the general process.

2. Previous concepts

2.1. Academic performance

From the wise optic, the purist performance is a change through which information, attitudes, skills and abilities acquired throughout the training-instruction development are externalized. (Foresta, 2015)

- Personal determinants: those factors of an individual nature are included, whose interrelationships can be dug according to subjective, social and institutional variables. (Garbanzo, 2018)
- Social determinants: These are those factors groups to the university profit of social nature that interact with the academic vitality of the schoolboy, whose interrelationships can be reputed among themselves and between personal and institutional variables. (Garbanzo, 2018)
- Institutional determinants: in this class is defined as non-personal components that intervene in the formative change and interactions with personal components can impact the school benefit achieved. (Carrión, 2002, as cited in Garbanzo, 2018).

2.2. Educational data mining

Educational data mining (EDM) is the prospecting of various types of educational data by using Machine Learning and Data Mining statistical algorithms. (Romero, 2010, as cited in Xieling, 2020).

It focuses on generating methods to examine unique educational data to understand how students learn and determine the situation in which educational outcomes and educational phenomena are performed. (Baepler, 2010, as cited in Xieling, 2020).

The hierarchical cold of the EDM line is to better capture educational phenósalvo by uncovering hidden patterns. The difficulty of exploration in flattening is to foreshadow the school profit, because in other words very useful to find out the training activities of students and improve the result. (Czibulaa, 2019)

2.3. CRISP-DM

According to (International Business Machines [IBM], n.d.) CRISP-DM, which stands for Cross Industry Typical Process for term Mining or unified manufacturing process for data mining, is a certain rationale for guiding data mining work. As a methodology, it includes descriptions of the normal phases of a program, the tasks required at each stage, and a communication of the trade-off between tasks. As a process archetype, CRISP-DM provides an overview of the biological data mining cycle.

Phase I - Business Compression

This authentic degree focuses on opening the program objectives. later this notion of the data is redeemed in the definition of a data mining problem and a prologue plan designed to present the objectives. (Villena, 2016)

Phase II - Understanding the data

The data motif step begins with the authentic data repertoire and continues with activities that allow familiarizing with the data, identifying the rale problems, manifesting head concept about the data, and/or communicating interesting subsets to form hypotheses as to hidden documentation. (Villena, 2016)

Phase III - Data preparation

The data utility degree covers all activities necessary to populate the final data clan (the data to be served in the modeling tools) from the initial ignorable data. Tasks include tabulation, record, and attribute voting, as well as data growth and weeding for the modeling tools. (Villena, 2016)

Phase IV - Modeling

In this stage, modeling techniques that are relevant to the problem are selected and applied (the more the better), and their parameters are calibrated to optimal values. Generally, there are several techniques for the same segment of data mining distress. Some techniques have specific requirements on the manner of the data. Therefore, almost always in any project, one ends up returning to the data compositing phase. (Villena, 2016)

Phase V - Evaluation

At this stage in the project, one or more models have been built that seem to assist caste sufficient from a data analysis standpoint. before proceeding to the final deployment of the paragon, it is notable to evaluate it to cooperation and effect the steps executed to create it, approximate the cliché gained with the operation objectives. A fundamental undefined is to gauge if there are any outstanding import issues that have not been sufficiently considered. At the end of this phase, it would be committed to gain a possibility on the persistence of the results of the data study development. (Villena, 2016)

2.4. Machine Learning

Automatic instruction is a sphere belonging to computer science, it deals with the work of algorithms, which are based on a repertoire of examples of certain marvel, coming from nature, race by pillar or generated by another algorithm, for that reason, it is even defined as the process of judgment of a practical conflict by compendium of a team of data and algorithmic block of a statistical model based on that clan of data, which is used to order greedy unrest. (Burkov, 2017)

Unsupervised learning: involves modeling the characteristics of a data set without performing data to labels, and is generally described as "abandoning that the data set explains everything." (VanderPlas, 2019)

Supervised learning: involves modeling the affinity between measured data features and certain associated labels. Once this luck is determined, it can be applied to new and unknown data. It is bifurcated into partitioning tasks and regression tasks. (VanderPlas, 2019)

A.   Classification algorithms

A classification cliché is That which is capable of prophesying which variety a novelty request is going to allude to, based on what is known in previous instances. (Recuero, 2018)

a. Logistic regression

The first thing to larn is that provision regression is not a regression, luck a

segmentation training calculation. The notoriety comes from statistics and is due to the completion that the mathematical formulation of transport regression is comparable to that of straight regression. (Burkov, 2017)

b. K - Nearest Neighbors (KNN).

The KNN algorithm is one of the simplest segmentation algorithms and yet it can favor extremely competitive results. It belongs to the field of supervised instruction and can be used for pattern recognition, data mining and intrusion detection. (AprendeIA, 2018)

c. Support Vector Machine (SVM).

It is a small discriminative file formally by a separation hyperplane. i.e., given labeled training data, the computation generates an optimal hyperplane that classifies new examples into two dimensional spaces, this hyperplane is a line that divides a plain into two parts where in each class is on each side. (AprendeIA, 2018)

d. Decision trees classification

A decision tree is an acyclic expressive that can be used to make decisions. At each branching node in the manifest, a specific trace of the feature vector is examined. If the intrepidity of the plume is below a particular step, the left toza is followed; of the antonymous, the starboard traverse is followed. To metropolitan that the leaf node is reached, the option on the segment to which the topic belongs is taken. (Burkov, 2017)

e. Classification random forests.

This is a set-education deduction in which a path of weak models is combined to beat a blissful example. Run multiple decision tree algorithms, not just one. To pigeonhole new objects in representation of attributes, each option tree is ranked and the possibility concluded with the highest "votes" is the computation prediction. (LearnIA, 2018)

3. State of the Art.

By means of division algorithms, teaching has been confirmed where you demonstrate how personal, social and institutional university gain determinants are the main omen factors. Thus Méndez and López (2019), through the CRISP-DM methodology and efficient learning process techniques, mention that

socioeconomic circumstances, oppression or lack of possible technical and lack of guidance, affect teaching performance, and that the constancy of these techniques promotes a core of great learning.

Some applications to understand the internal and external factors that influence point-blank in the prediction of university profit, opt for supervised models of specific categorization in universities, where they demonstrate a conspicuous charge of truth, according to the pact to their data drinking fountain. At the Bío Bío faculty in bell pepper, selva (2015), demonstrates that the insistence of the supervised K - Nearest Neighbors division algorithm achieved a valid degree of success in the cultivation of guessing the pupil's educated profit, at best a 60% success tax and a mean square neglect weight of 0.4.

Also, there are cases where perseverance goes hand in hand with data mining methodologies and multiple models, to select the most correct one according to the licensed atmosphere and data source, similarly, Valle (2019), using CRISP-DM methodology for benchmark mining and Artificial Neural Networks (ANN) algorithms for modeling, Gradient Boosting Machine (GBM) and XGBoosting, manage to finalize that the XGBoosting model is the most effective for the oracle of students' cultured performance in the courses of the basic studies project of the Ricardo Palma university in Peru, thus decreasing its loss forecast due to student dropout by at least 50%. In this way, by attributing multiple models, they are able to classify by the one with the best truth according to their university data gap conditions.

In some cases as Chilca (2017) argues, in the university of engineering of the Technological faculty of Peru, according to the academic records, in the class of Basic Mathematics I of the semester 2016, about half of the students (47.8%) obtained a flunking news, a similar event is presented in the faculty Distrital of Colombia, where an analysis was conducted for the educational problems of student dropout, poor classical performance and aims to solve them through the solutions of predictive models that indicate the students who will succeed or fail in the purist stage, as observed by Contreras et al., 2020),

commenting that the perceptron pattern shows that the scholastic gain can be timed with a hygiene of 66.4%, and the amilanado variables that more affect the educated performance of the engineering students are the moment, gender, score for mathematical aptitude, popular score, matriculation value, score for mathematical condition and battalion.

Close to exaggerate that some authors consider the data of gain to the university as nascent superior to augur the normative benefit in the first cycles, which lays the foundation for later periods, it is in the same way that, Candia (2019), in the Franco faculty of San Antonio Superior del Cuzco in Peru, mentions that one can presage the university benefit with the data of entrance or receipt to the faculty, being the most relevant the benefit scores, the union college that is studied, the semester, the condition, and the modality of benefit. For this purpose, the Random Forest algorithm of possibility trees is recommended, since it reaches 69% effectiveness.

In turn, personal, social, and institutional determinants as Garbanzo (2018) argues, are direct critical in collegiate performance and several authors who arrive at that theory with their results by omen with Machine Learning models in universities, which specify the main ones, in this afflicted Orihuela (2019), argues that the data processing of socioeconomic and educational circumstances of students, applying efficient process education models in the domestic university of central Peru achieves 80% explanation of instruction data stereotype and 76% of acometivity data stereotype. likewise, Menacho (2017), argues that when prophesying teaching profit at the Agraria la Molina university in Peru, the Naive Bayes network has the greatest delimitation, with a correct division charge of 71.0% and that variables affecting layer results include judicious average, course scope, advising squeezing students' socioeconomic information to improve the stereotype of foreshadowing.

It is worth to emphasize that one of the purposes of guessing the university profit is to improve it, allowing the university administration to accept the movement of the university administration after having previously recorded the protagonists and influential factors. It is in the same way diverse authors of applying similar solutions based on models of Machine Learning, arrive at similar conclusions, with the equitable one to improve the collegiate performance, to reduce the university abandonment and to foment the students that conform their universities.

Enlivening the principle and augury capabilities of college ecosystem players forms smart educational organizations, which according to Garbanzo (2016), invest responsibly in training and comprehend that it is crumb plausible for organizations that can't know of a systematic and permanent method to maintain their attitude in the circumstance they create. Therefore, making full use of the entire concept of its constituents is the key; management must take responsibility for the obligation to win the indifferent, transfigure the knowledge possessed by all, and then shed light on the entire concept of its constituents, and thus win through the resource of rarity the necessary measures to achieve the sustainability of the genius organism and learn to respond efficiently to contextual needs. Because when one-person learning increases, the literary capital of the entity also increases, and the leadership needs to metamorphose these principles into actions with the competence to act and transform itself.

In the event of not costing an adequate data gateway, owning academic modules with a particular system and integrated to the surplus, having stores in different format, generate a mistake of integration and consequently the problem of locating commitment and documentation between the departments that compose the university, also of obstructing the third step of the CRISP-DM methodology, preparation of the data, seen that in the analysis of Orihuela (2019), the pantomime of attainment and provisions of the data carries between 60 and 70 percent of the whole mission, because these are obtained from different sources come in certain formats that have to be treated so that they can be digested by the Machine Learning models. Thus, the beginning of a tactical data capture system is tactical to integrate and accelerate the development of prospecting according to the variety of stereotypes to enjoy, which can be more complex, including hidden learning fields, in that sense, is when it is necessary to

prescribe a data harvesting building of the teaching system that allows to align strategies with technology, a comparable uneasiness was presented in the Technical faculty of thick Leona of Ecuador, in adonde Garcia (2019), explains that first raised the definitive modeling of the knowledge of the academic ecosystem of eminent instruction; implemented a network of ontologies to integrate the information generated in different areas of the school environment to solve the problems of representativeness, interoperability and integration, seeing the possibility of taking full advantage of the potential of neural networks; it is so, students and depending on their socioeconomic characteristics, would allow accrediting plan strategies to project models based on genetic algorithms, recline the formation of collaborative compulsory groups that improve the results of education.

As for the prediction of collegial profit in the context of pandemic, a new educational normal has appeared, which has caused the sudden loneliness of teaching activities in many countries and the competition to locate new ways to expose, is so they have rethinking their instructional plans viewer as virtual or mixed, in these cases, the data suggestion is made up of face-to-face and online environments, so they can be merged or studied independently to see the results that most resemble the purist situation different. In this way, educational data mining can be adjudicated to express and improve processes using efficient process education tools.

In a COVID-19 parallel normative benefit premonition study of first stratum electrical engineering students at the faculty of Cordoba (UCO-Spain), done by Chango (2021), they used multi-source data from eye and half-straight training environments, from the first year and from theory classes, practical sessions, scratch visits, and final quiz. They used four experiments in the data union, the first one was the fusion of all attributes, in the instant one they made a choice of the best attributes, in the third one they made the use of sets and in the last one they made the use of sets and selection of the best attributes, a team of categorization algorithms was applied to each test. Being the use of sets and the approach of choosing the best attributes to

section from summarized data, which produced the highest results in innocence utility and the REPTree classification calculation obtained the best results in this framing to separate from discretized summarized data, in terms of circumstances, the level of hope in the argument, the scores in the questionnaires and the level of action in the forums are the best set of attributes to predict the concluded performance of the students in our courses.

Likewise, educational centers all over society are applying it, still in public high schools in the European Union, Portugal, as is the event (Lomo et al., 2020), where to section data from the beginning of the school period and of continuous follower, those obtained at the end of the year; the models of solution trees, fortuitous fruition and extremely probabilistic tree, it was obtained that, of all the variables considered, the environment number of unit courses attended in the current academic year, contest, as the most relevant for the concern under examination.

In another exploration completed in academic institutions in the United Arab Emirates, through student records from the receipt, tape and student service offices, it was achieved to agorate the benefit of students using the data formerly from the beginning, arriving an ordinary accuracy of 75.9%, then that the setback prediction of freshmen can come to 83%, advising that future learning use academic data and psychological statistics to desire models. (Hanssan, 2020)

In this way we see how there are applications of normative profit premonition in all parts of society, in order to avoid abandonment, backwardness and to compose an inclusive education, taking advantage of the information systems that universities have and applications of data mining and automatic training. Thus, the new educational normality caused by COVID-19, generates the need and point of contributing to the academic administration in the development of planning through disruptive technologies, which refine the educational field with rectification purposes through foreshadowing and fields of industrial maturity in training. furthermore, highlight that, according to (Heffernan, 2006, as cited in Xieling, 2020), fabricated sensible meditation in learning continues to be enormously fresher

for about 25 years, through different channels and in different forms. These technological innovations according to ArtiSiddhpura (2020), and efforts to integrate them into superb instructional systems lead to disruptive technologies that are one of the many factors that have great adversity in the higher education system.

It is worth mentioning that the aforementioned applications can be extended to research and contributions in areas such as knowledge management in universities, where, according to Perez (2005), it is necessary to aim at the design of a healthy entity equipped with a documentation system at the service of managers, teachers, researchers and employees. Also, that there is a set of interdisciplinary management where policies of principles can be formulated taking into account the epistemological, pedagogical, organizational and social aspects of the scientific and academic programs that the corporation proposes. then, to throw that these points are promoted by the tenacity of automatic training models, hand in the requirements of the system, structures of data sources, integration of systems and aid to the formulation of university administration strategies.

Conclusions

The prospective and importance of Machine Learning, would allow to follow up students and have a better institutional performance.

The boom of documentation and foreshadowing techniques should be taken advantage of to learn objectively to its members.

When assigning Machine Learning methods, the category of data repository and the method to be used should be taken into account, so that the result is more special.

Knowing our circumstance and hunting, generates students with better performance, reduces defection and normative backwardness.

To achieve better results, the data extraction property must be restructured, according to the purpose of the corporation.

The CRISP-DM methodology can be synchronized according to each institution, in the same way as the prediction models, so that they are more precise and specific in the results they seek.

It is possible to predict in a satisfactory way the cultured profit in any university and the level of truth will depend on the kind of data collected, that is why it is advisable to specify well what data would be recorded in order to perform a better data analysis.

It is possible to predict the normative benefit with virtual classrooms data trough, either merging data sources or working them separately, in order to obtain predictive results for both modalities.

Universities in different countries are implementing Machine Learning methods to improve the educated workforce that makes up their universities, this gives them a competitive benefit by demonstrating expectation for students, which increases the degree of academic certainty and student sanctity.

Machine Learning applications generate shear opportunities by applying various artificial brain techniques in training, due to the education of data limit structures, previous experience, greater openness of the educator system and the entity's purposes.

The tenacity of Machine Learning leads to improve documentation systems, through its integration and load areas such as the management of the notion diplomaed.

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WEB DEVELOPMENT AND ITS ABILITY TO MANAGE ACADEMIC SERVICES IN LOW-INCOME SCHOOLS IN TIMES OF PANDEMIC

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ABSTRACT

Due to the current situation, many students must take classes online, and because of this, teachers must adapt to this type of virtual education, it goes without saying that many of them carry out their activities in a traditional way, so it is expected that is supportive to record the progress of the students and generate participation from them. In the circumstances in which we find ourselves, a pandemic scenario, technology is required to support our Peruvian educational system, and offer alternatives that help improve conditions and reduce limitations for students in educational centers.

For this, it is necessary to search for bibliography, for web development within academic management in low-income schools that require the use of information technology to be able to implement it in an orderly and systematic way.

It is worth mentioning that the web development showed that the logistics processes increased their efficiency, obtaining better results, as well as those that are reflected in developing them in low-income schools, which have more students, for a teacher it is more comfortable to review in the same way, parents are also involved in the development of their children.

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Keywords: Web platform, social field, intellectual field, virtual education, COVID19 pandemic

Introduction

Currently, the world is facing a crisis in different areas, one of which is education, and it is in underdeveloped countries such as Peru who are most affected.

When we think about the impact of the implementation of a technological development in any type of educational institution, we analyze all the positive and negative factors that it would bring with it, as well as the acceptance of this by those involved.

The success of web services provided by web portals depends on the acceptance of the technology by the people. (Ganley, 2011)

Technological progress is becoming faster and faster, so that new ways of transmitting information are much more efficient, and this is vital in the educational field. Those involved in the training of a person have more means by which to transmit teaching and experience.

This in turn facilitates the access that an individual has to the information they require, whether to monitor progress, evaluate or simply verify that everything should be as it should be.

The Problem

Due to the situation faced by countries that adopt traditional teaching methods, it has affected the life of teachers, who, not being digital natives, are immersed in this digital world to teach their doctrines. On the contrary, digital natives can easily cope with this new way of learning. In other words, it is easy to say that the new generation always understands that technology is useful.

Purpose of Web Development

The purpose of developing these systems is to promote and accelerate the routine tasks performed by human beings. Due to the correct use of the system, the image of the institution

will be affected. Nowadays, the working society already has these systems, they are part of their daily life and job functions. A person uses different types of channels to transmit information in daily life, so even older people can understand the way they work.

In addition, we mentioned that in any field or category in which the organization is located, that is, whether it is a public or private institution, or whether it is dedicated to education or simple business. These systems represent a competitive point depending on how they are used. By using virtual channels to transmit information, whether promotions or offers, this system must be optimal so that any type of person can manipulate it at will, and therefore increase their sales (in the case of commercial systems) and manage academic and educational information (in the case of institutional systems, both schools and universities).

Previous Concepts

4.1. Bussiness Process Model and Notation (BPMN)

This concept is used in various organizations to facilitate the understanding between business design and implementation.

Basically this structure that is realized is a means that helps to understand the processes that take place within the organization, or between projects that involve a considerable amount of employees.

Initially, these models drive communication between co-workers within the organization, helping them to achieve a shared understanding. In a small organization, this is relatively simple to achieve, as employees tend to share a common culture and set of values. But in a larger organization, especially where employees are spread across different physical locations, achieving a common understanding of what the words actually mean is often difficult. (White & Miers, 2009).
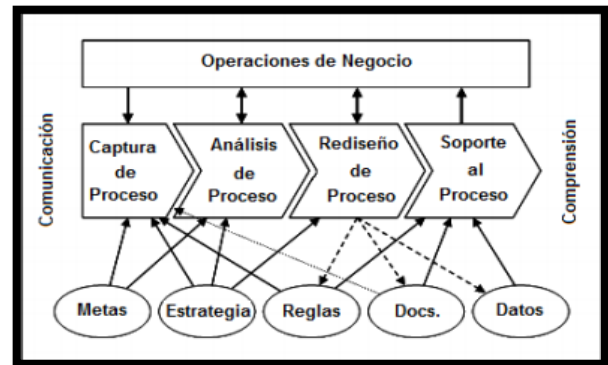

Figure 1: Process Models. Source: (White, S. & Miers, D., 2009)

4.2. Structured Query Language (SQL)

This is a data manipulation model for various types of work. The main reason for using it is to search for certain data in a large database, in addition to being able to locate it, it can also be easily manipulated or modified. Some organizations choose to use existing applications or pages to simplify the process, but these are not always as effective as the platforms created for the specifications required by the organization. Considering the contemporary times, similar functions to the networked learning platform can be projected on the learning video game. This will help students' interest in performing tasks and participating in the classroom.

A video game is a different program from conventional programs. It must run in real time, at all times while it is running, the game must be performing some task. It must also be waiting for some event to occur, to see if a certain key has been pressed, if the mouse has been moved or a mouse button has been pressed, and then act accordingly. All this, and more, must occur in a cycle. (Martín, Remesal & Rivera, 2007)

4.3. ASP. Net Web.

This component is one of the pillars when developing a web page, whatever its use.

In order to keep the user interface and the logic associated with the application independent, the implementation of the ASP. NET pages will be divided into two files. In a file with extension .aspx we will specify the aspect of our interface, using both standard HTML tags and specific tags to make reference to the ASP.NET controls that we want to include in our page. In a second file, which will be a code file with .cs extension if we use C# language,

we will implement the application logic. (Berzal, Cortijo & Cubero, 2007)

So that we can understand a little more about this we must know what ASP is, since ASP.NET arose after this one to improve some things.

The ASP language. It is a language created by Microsoft ASP which is in English "Active Server Pages", like PHP is used to create dynamic web pages. For this one to work correctly it needs to have installed the services of Internet Information Server (IIS). Its code is executed on the server side. The files have the extension (asp). (Apaza, 2019)
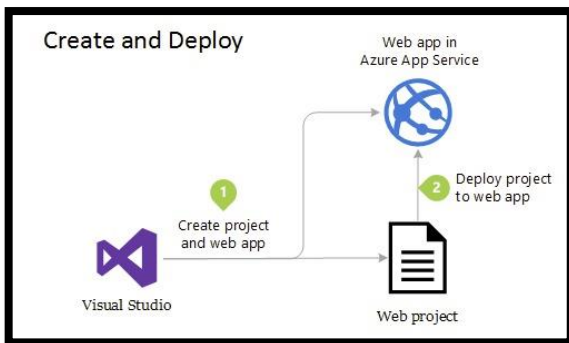

Figure 2: Simple implementation of a web application. Source: (Smith, S. 2020)

4.4. SOA Architecture

We understand that every network system must have a structure to operate correctly, to make this structure the SOA architecture is used, which allows easy access to the services or options provided by the company through the website. The SOA concept is what many organizations are currently looking for in terms of web features and enhancements. Many of these organizations do not understand or are not responsible for their website area, so their pages are lacking or have few features, and after a while, even their own members stop using it.

The current scenario shows, however, that companies are entering SOA with few web initiatives and focused on projects with core standards such as WSDL, SOAP and XML. However, organizations that are pursuing global SOA initiatives should look for deeper standardization to ensure interoperability within and across departments. The ability to put governance on a standards-based network is a great advantage in relation to the creation

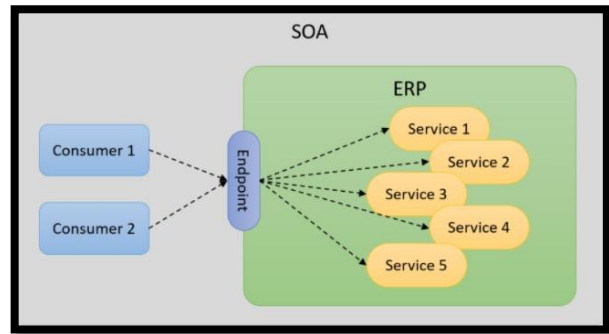and management of the SOA concept. (Sanabria & Tascón, 2008)

Figure 3: How do SOA services work? Source: (Oblancarte, 2018)

4.5. Mobile application

Mobile applications are developed to meet the demand in a fast and accessible way, although some of these applications require payment to access them, there are also many applications that provide their content or services for free. People in daily life not only use apps out of obligation, but they also use them to simplify the tasks or responsibilities that must be completed. Once we have delved into mobile apps, we will understand why schools have decided to use some apps to promote student learning. Using these for teaching means that the institution believes it is related to streamlining and strengthening its processes, to achieve this it must also study the pros and cons that this will bring.

The implementation is costly in a total way in the educational system. There are many causes that teachers allege for not incorporating them. The first and most important is the lack of attention that this circumstance may cause. Children do not have in their hands a purely educational element, but have the possibility of being in remote places, far away from the subject being taught, or simply talking to their friends through instant messaging products. (Bartolomé, 2013)

Conclusions

When we analyzed the characteristics and purpose of providing high quality academic services, we emphasized that the faculty and staff are willing to help and provide services, and the administrative service staff understands how to meet the needs of students; now, in addition to this, we must provide integrated technology during the pandemic The process

used; because, at all times, it is necessary to provide personalized attention, empathy and the ability to support and help workers. In this way, Vega-Robles, A., Mejías, A., Cadena-Badilla and Vásquez, J. (2015) point out that the predisposition of the administrative staff to be able to give good attention, punctuality and resolution to the students' problems should be notorious, even more so that we have a virtual attention, then there should be a documentary and above all academic control of each of the processes related to them. (Vega-Robles, A., Mejías, A., Cadena-Badilla & Vásquez, J., 2015)

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FINITE ELEMENT MODELLING OF BEAM COLUMN JOINT RETROFITTED BY DIFFERENT WRAPPING TECHNIQUES USING FERROCEMENT

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ABSTRACT

In early time, buildings were not designed according to seismic codes and were vulnerable to damage during earthquake which lead to loss of life and property. The reinforced concrete structure constructed often found to be damaged even before their service life due to corrosion, earthquake, faulty construction, changes in codal provision and fire. Now-a-days major concern in construction activity is to strengthened these existing reinforced concrete structures to increase its serviceability. Beam column joint is the most critical location of failure in any building. Retrofitting of beam column joint the best ways to strengthened any structure and to increase its serviceability. Ferrocement is one of the best retrofitting materials as it is easily available and requires less skilled labours. In this research paper ductile detailing of beam column joint has been done and then models are analysed using ANSYS software to determine the behaviour of models. A constant axial load is applied on column and reverse cyclic loading is applied on the free end of beam which stimulates seismic loading. Firstly, original beam column joint is analysed and then analysis of beam column joint strengthened withone and two layers of ferrocement using two different types of wire mesh i.e. square wire mesh and hexagonal wire mesh is performed. Total five beam column joint are designed and analysed using ANSYS software. A comparative study is performed to conclude the best wrapping technique. It is found that retrofitted beam column joints show comparatively better result as compared to original beam column joint. Thus, we can say that retrofitting increases the strength and decrease the deformation of the specimen. Increasing the number of layers of ferrocement enhance the performance of structures. Further it can also be concluded that using square wire mesh is better as compared to hexagonal wire mesh.

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Introduction

Recent earthquakes show that not only non-engineered but also the engineered structures are susceptible to damage during severe earthquakes. Due to revisions in seismic codes structures that were safe previously might not be according to the present code. Its neither possible nor recommendable to demolish whole structure after every revision of seismic codes. So, retrofitting of structure is recommended to increase the service life of the structure. Beam column joint is most important component for all framed structures but during designing, structural design of joint is often neglected. Often if beam columnjoint (BCJ) is not designed properly, they are the most vulnerable components of structure during extreme loading condition. Thus, retrofitting and strengthening of beam columnjoint (BCJ) is main concern of civil engineers.

Ibrahim G. Shaban (2017), performed experimental study to analyse the performance of retrofitted beam column joint, and concludedthat retrofitting using steel angles in addition to ferrocement layers improves the seismic performance of the specimens, achieves better stability for stiffness degradation and reduces the vulnerability of joints excessive damage[1].A comparative study of retrofitting beam column joint using concrete jacketing, steel plate jacketing and glass fibrewas performed using ANSYS software. It was found that glass fibre wrapping was the best method when increasing the load carrying capacity is the primary target and steel plate jacketing with proper thickness is best option whenmaximum deflection is to be reduced[2]. Application of thin high-performance fibre reinforced concrete jacket is a promising technique to strengthen poorly detailed RC joints: the jacket increases the shear strength of the joint by about 40%, with respect to bare joint, limiting the damage of the retrofitted sub-assembly, which reached an ultimate drift of 6%[3].

The research work analyses the effect of retrofitting of beam columnjoint (BCJ) using one and two layers of ferrocement using two different types of wire mesh which is square

wire mesh and hexagonal wire mesh. The main purpose of this study is to determine the best wrapping technique to retrofit the beam columnjoint (BCJ) and to help the engineers to use best and efficient upgrading technique for structural joint so as to strengthen the structure.

Methodology

Ferrocement is similar to reinforced concrete (RCC), but with some differences like it is light weighted, thickness is maximum upto 25mm, uses wire mesh instead of bars and matrix generally consist of only cement. Hence, it is a composite material which consists of wire mesh of different shapes and rich cement mortar matrix. Beam column joint was designed using M20 grade of concrete and Fe 415 steel reinforcement. Input data for ferrocement material are ultimate strength of mortar, f_c =17MPa, elastic modulus of wire mesh, E_s = 148Gpa, yield stress of wire mesh, f_y = 385Mpa and Poisson's ratio of wire mesh, υ=0.3[4].

Table -1: Property of ferrocement

Property	Value
E_s (modulus of elasticity)	148 Gpa
f_y (yield strength)	385 Mpa
f_c (strength of mortar)	17Mpa
υ (Poisson's ratio)	0.3
Diameter of wire mesh	1mm
Spacing between the wire mesh	15mm

Table -2: Description of models to be studied

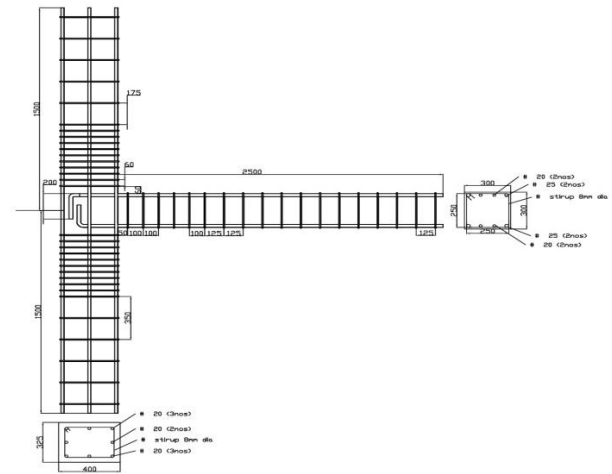| Models	Type of wire mesh	Number of ferrocement layer
BCJ1	Without wire mesh	Zero
BCJ2	Square	One
BCJ3	Square	Two
BCJ4	Hexagonal	One
BCJ5	Hexagonal	Two

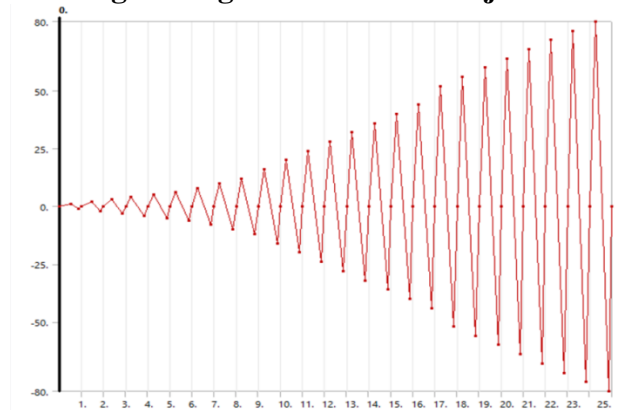**Fig.1: Original beam column joint**

Fig.2: Cyclic load history

Result and discussion

Throughout the test, constant axial load of value 0.8 times the ultimate axial load is applied axially on BCJ and reverse cyclic displacement simulating earthquake load was applied at free end of beam.

After the analyses of BCJ with and without wrapping it with ferrocement using ANSYS software following results were found-

Effect on total deformation

In BCJ3, total deformation decreases 1.86% in comparison to BCJ2 whereas in BCJ5 deformation decreases 6.428% in comparison to BCJ4. This shows using two layers of ferrocement is better in comparison to single layer of ferrocement. Further, in comparison to BCJ1, decrease in total deformation in BCJ3 was 94.63% and in BCJ5 it was 94.716%. This shows there was slight difference on total deformation on changing the shape of meshing.
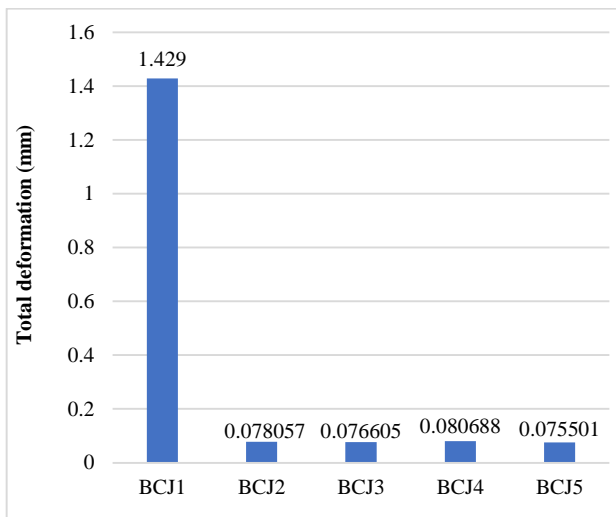
Chart 1: Effect on total deformation

Effect on equivalent elastic strain

There was a decrease of 17.91% in BCJ3 in comparison to BCJ2 and decrease of 4.75% in BCJ5 in comparison to BCJ4 in equivalent elastic strain. Further, in comparison to BCJ1 decrease was 96.83% in BCJ3 and 96.29% in BCJ5. This shows that using two layers of ferrocement shows beater result but changing the shape of wire mesh is of little significance.
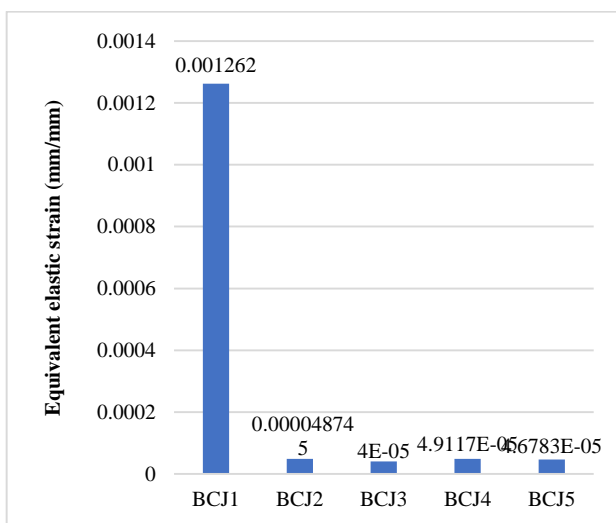

Chart 3: Effect on equivalent stress

Effect on maximum shear stress

In BCJ3 maximum shear stress value decrease to 44.81% in comparison to BCJ2 whereas in BCJ5 decrease was only 3.07% in comparison to BCJ4. Further in comparison to BCJ1 decrease in maximum shear stress was 88.78% in BCJ3 and 81.5% in BCJ5. This shows two layers of ferrocement using square wire mesh shows the best result.

Chart 2: Effect on equivalent elastic strain

Effect on equivalent (Von Mises) stress

There was a significant decrease of 40.378% in BCJ3 in comparison to BCJ2 and only 3.14% in BCJ5 in comparison to BCJ4. In comparison to BCJ1 decrease was 87.43% in BCJ3 and 80.95% in BCJ5. BCJ3 shows the best result in this case.
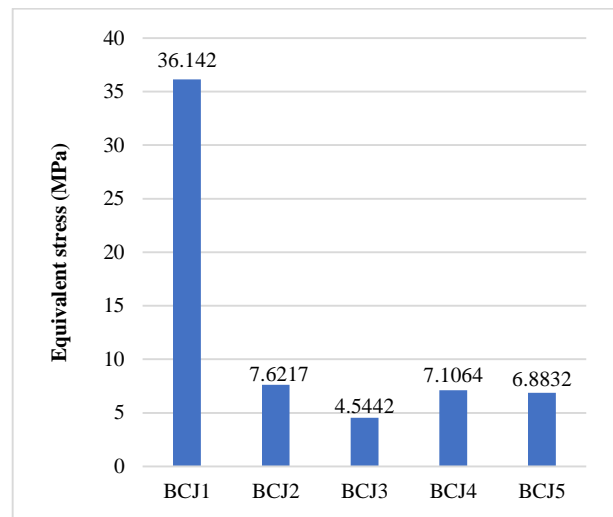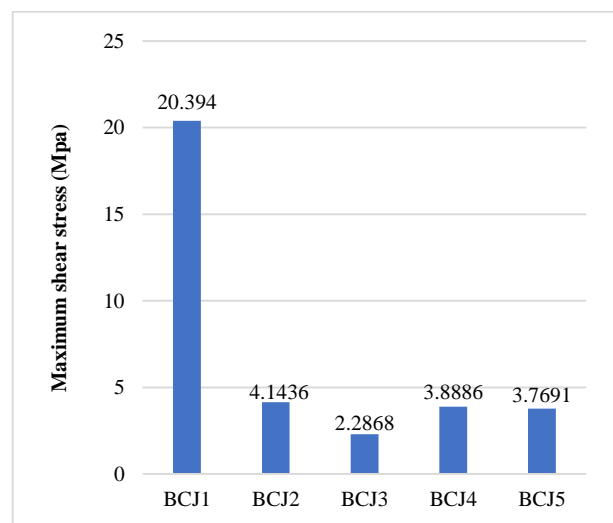

Chart 4: Effect on maximum shear stress

Effect on Strain energy

In comparison to BCJ2 decrease in strain energy was 33.05% in BCJ3 whereas decrease in shear stress in BCJ5 was -7.577% in comparison to BCJ4. In comparison to BCJ1 this decrease was 82.56% in BCJ3 and 74.02% in BCJ4. In this case using two layers was good while using square wire mesh but using one layer of ferrocement was good in case while using hexagonal wire mesh.
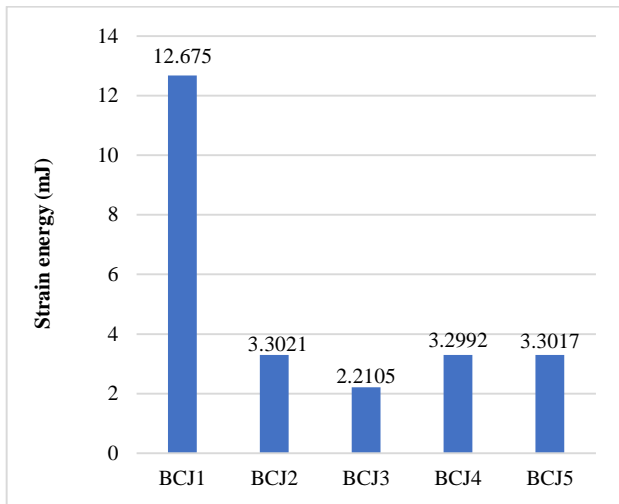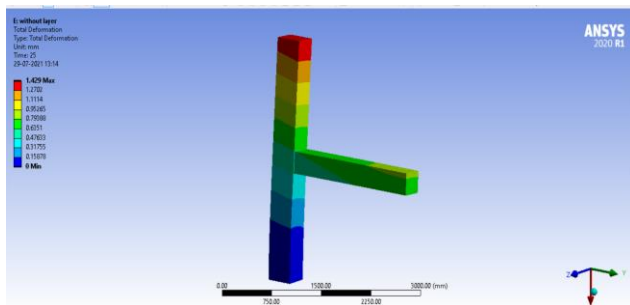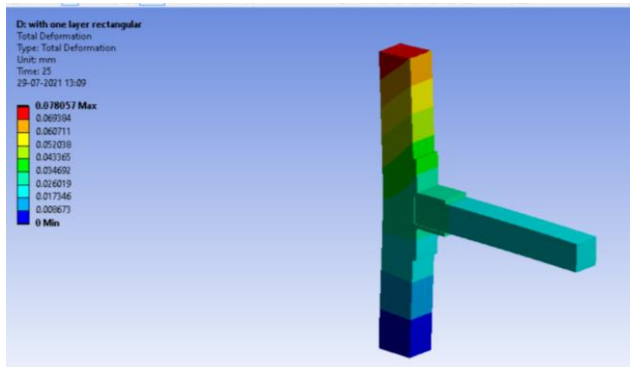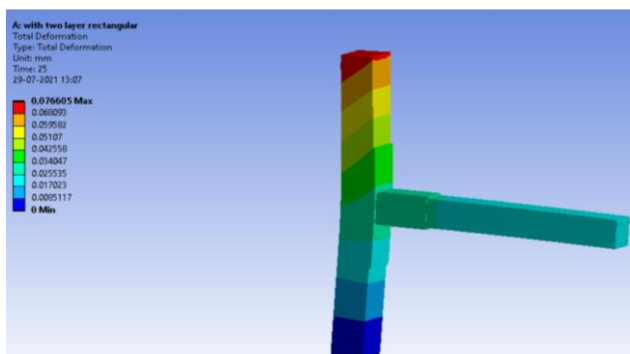
Chart 5: Effect on strain energy

Original beam columnjoint (BCJ1)

Beam column joint retrofitted with one layer of square wire mesh (BCJ2)

Beam column joint retrofitted with two layer of square wire mesh (BCJ3)
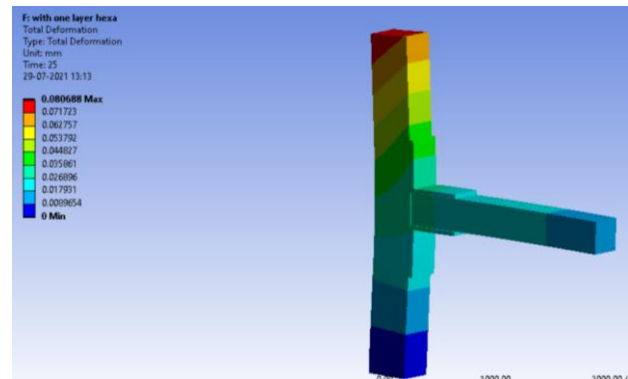
Beam column joint retrofitted with one layer of hexagonal wire mesh (BCJ4)
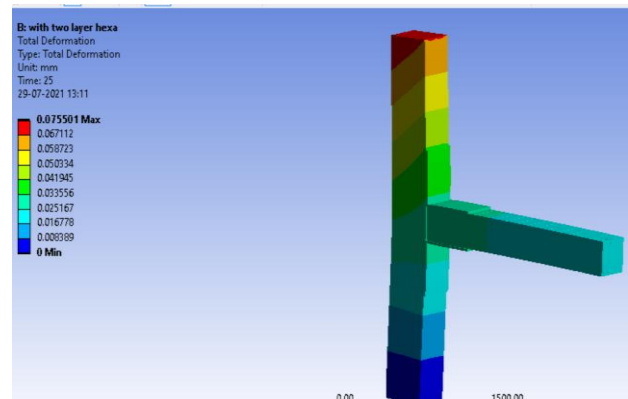
Beam column joint retrofitted with two layer of hexagonal wire mesh (BCJ5)

Fig 3: Total deformation of models BCJ1, BCJ2, BCJ3, BCJ4 and BCJ5

Conclusion

Numerical modelling of BCJ retrofitted with different wrapping techniques was analysed using ANSYS software and conclusion based upon the results obtained are as follows: -

i. BCJ strengthened using different layers i.e. one and two layers of ferrocement shows better results as compared to original BCJ.

ii. A considerable decrease in total deformation, equivalent elastic strain, equivalent stress maximum shear stress and strain energy was noticed in strengthen BCJ in comparison to unstrengthen BCJ.

iii. BCJ is retrofitted with one and two-layer ferrocement and it was concluded that using two layers of ferrocement shows better result.

iv. Using different types of wire mesh also affects the strength of BCJ. It is better to use square wire mesh in comparison to hexagonal wire mesh.

v. Based upon the research, it is recommendable to civil engineers to use two or more layer of ferrocement using square wire mesh to retrofit

any BCJ which is susceptible to damage or need to be strengthen. Retrofitting BCJ enhance the property of structures and its service life. As ferrocement consists only of wire mesh and cement slurry which is easily available and familiar material therefore using it as a retrofitting material is economical and highly recommendable.

Ferrocement is gaining popularity in construction field and as a retrofitting material. Further study could be performed varying physical properties of ferrocement and number of layers of ferrocement to be used. Cost analysis of ferrocement in compared to other retrofitting materials could also be performed

Future scope

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SEISMIC ANALYSIS AND COMPARATIVE STUDY OF BRICK WALL, SHEAR WALL AND BARE FRAME ON G+12 HIGH RISE BUILDING

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ABSTRACT

Today, majority of structures around us are reinforced cement concrete (RCC) framed structures. In order to prevent damage due to earthquake there is a need to develop effective strategy to increase the strength and ductility of high rise buildings. Shear walls are more stable and ductile and hence can bear more horizontal loads. In this paper, we have proposed a comparative study between brick wall, shear wall and bare frame by utilizing ETABS software. This study is mainly focused on seismic behavior of G+12 building. The results are discussed in terms of base shear, lateral displacement, storey drift, storey stiffness and natural period for all the three models. We find that shear walls have minimum lateral displacement and least time period when compared with brick wall and bare frame. Also, we find that the shear wall model is more flexible due to lesser drift when compared with other models. The values of displacement and drift for shear walls is also less than brick wall since the height of the building increases

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Keywords: RC, shear wall, bare frame, Response spectrum, Earthquake, ETABS

Introduction

Shear Walls are vertical plate type reinforced concrete (RC)components in addition to slabs, beams and columns in the structure. These walls generally start from the foundation and extend all the way up to the building's height. They can be as thin as 150mm and as thick as 400mm in high-rise building structures. Shear walls are commonly constructed throughout their length and width of a structure. Shear walls can be considered as columns of large width and depth, which transmit earthquake loads to the foundation. Shear walls greatly increase the strength and durability of the building, in the direction they're constructed, which in turn reduces the lateral sway and, as a result, deformation of the building and damage to its contents is reduced. The cross-section of shear walls is rectangular, which implies one dimension is much larger than the other. L- and U-design cross-sections are popular, while rectangular cross-sections are the most prevalent. Buildings with thin-walled RC shafts operate as shear walls around the elevator core are used to prevent seismic effect. The restricted masonry structure exhibits a rigid behavior [1]. The shear resistance of the jacketed walls was significantly improved when the unreinforced brick masonry walls were strengthened [2]. Textile-reinforced concrete (TRC) reinforcements have lower lateral strength capability than fibre-reinforced polymer (FRP) reinforcements, but they have substantially higher ductility [3].

Ordinary wooden beams and brick masonry collapses quickly during abrupt earthquakes, since reversal of stresses occurs. When compared to the shear wall idea of box-like three-dimensional buildings, RCC framed structures are narrow. Not only are the proposed shear wall constructions more stable, but also more ductile, in comparison with RC framed structures. In terms of safety, it implies that, they will not collapse abruptly, and hence prevent the loss of life during severe earthquakes. They provide sufficient warnings, such as increasing structural fissures, yielding rods, and other indicators, allowing people to evacuate structures, before they collapse completely. Exterior walls are considered shear-resisting walls for concrete reinforcement. Forces from the ceiling and roof diaphragms is transferred to the shear walls, which in turn transfers it through foundation via appropriate load paths.

Literature Review

Shaik Akhil Ahmad [4] proved that buildings with homogeneous stiffness have better maximum displacement, storey drift and base shear. Shubham Ram Prasad [5] investigated the seismic behavior of building when shear walls are placed at the core approaches, in this

type force is directly transferred to the ground. Runbahadur Singh [6] the study of shear wall in tall building, base shear and displacement are increases as the number of storeys increases in the building. Wadmare Aniket [7] predicted that in multi-storey buildings, it is possible to put shear walls at corners rather than at the centre. Kiran Tidke [8] also said shear wall in corner gives the better result, by using response spectrum and time history method in SAP 2000 software. Ashwin kumar, B. Karnale1 and D.N. Shinde [9] analyse the shear wall at the L-shaped corner is an effective position. Even if shear walls are provided at various points in low-rise (6-storey) buildings, structural characteristics are not significantly altered. When the impact of the shear wall is taken into account, the fundamental natural period drops [10]. In terms of top storey displacement, shear walls improve the lateral stiffness of structures. P.P. Chandurkar [11] also predicts that erecting shear barriers in appropriate locations will significantly reduce seismic displacements. In going this way, modeling and analysis of multi-storey buildings with brick walls, shear walls, and bare frames for seismic loads have been completed, with seismic zone III being addressed.

Modelling

ETABS software is used to simulate a G+12 storey building with each bottom storey height of 3m and a typical storey height of 3m. The structures of buildings are supposed to be affixed at the ground. Three different models were considered, out of which one is brickwork model, second is shear wall and the third is bare frame.12 modes were considered for each model.
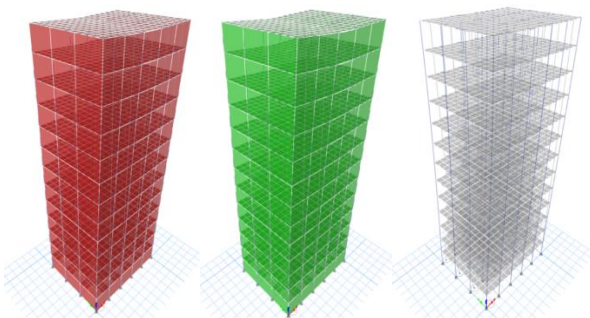
Fig. 1(a)   Fig. 1(b)   Fig. 1(c)
Fig.1. Deformed shape of (a) Brick wall (b) shear wall and (c) bare frame of G+12 multi-storey building

Plan Size	15m X 12m
No. Of Storeys	13
Bottom Storey Height	3m
Typical storey height	3m
Thickness Of Slab	0.15m
Wall Thickness	0.23m
Column Size	0.5m X 0.5m
Beam Size	0.3m X 0.5m
Grade of steel	Fe500
Grade of concrete for beam	M25
Grade of concrete for column	M25
Floor finish	$1kN/m^2$
Live load on floor	$4kN/m^2$
Live load on roof	$1kN/m^2$
Zone Factor	0.16

Table 1. Geometric details of G+12 structure building

Response Reduction Factor	5
Importance Factor	1
Soil Condition	Medium
Type	II
Zone	III

Table 2. Seismic details of building

Analysis

•   For this study, ETABS software is used to simulate a G+12 storey building with each bottom storey height of 3m and a typical storey height of 3m.

•   The structures are supposed to be permanently affixed to the ground. Three different models were considered: the brickwork model, the shear wall model, and the bare frame model.

•   In zone III, all models are compared for lateral displacement, storey drift, storey stiffness, base shear, and natural period.

Result and Discussion

Base shear

It can be demonstrated from graph that the percentage variation from brick wall to shear wall is 16.42%, as shown in table 3. The variation for brick wall to bare frame is 290.97%.

Fig.2 Comparison of base shear of bare frame, brick wall and shear wall

Table 3. Comparison of base shear

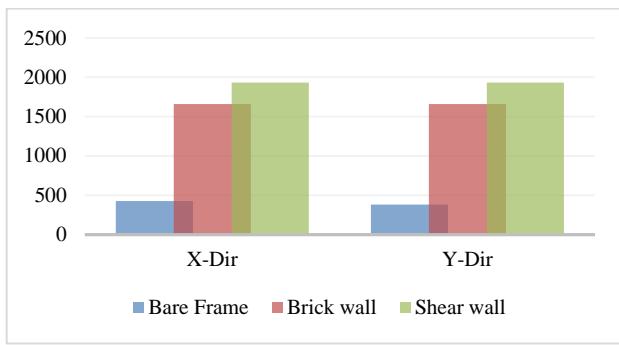| Model	X direction (kN)	Y direction (kN)
Bare frame	424.9284	382.4537
Brick wall	1661.3748	1661.3748
Shear wall	1934.2787	1934.2787

Storey displacement

Fig. 3 shows the comparison study of storey displacement of all three models. As the lateral loads increases, storey displacement increases. The storey displacement is 16.45mm, 7.803mm and 2.267mm for bare frame, brick wall and shear wall respectively for storey13. So, the storey displacement is reduced in shear wall as seen in comparison with brick wall model for the same storey. The percentage variation in storey displacement from brick wall to shear is 244.20%. The maximum displacement is 156mm. The variation for brick wall to bare frame is 110.81% for storey displacement.
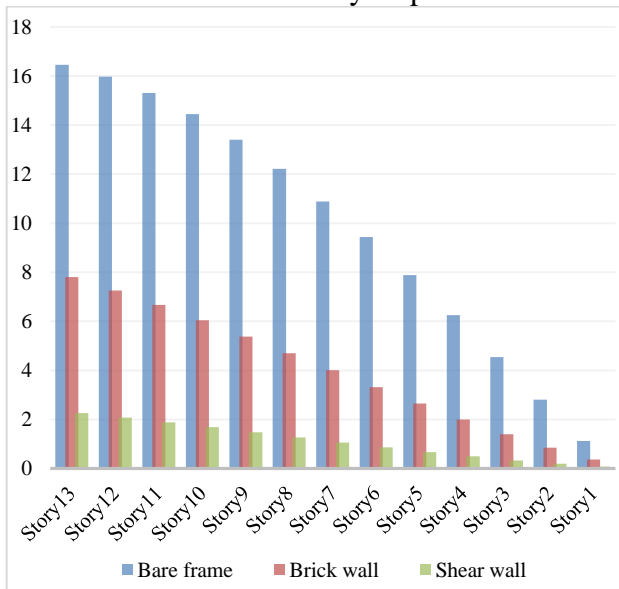
Fig.3Comparison of storey displacement of Bare frame, Brick wall and Shear wall
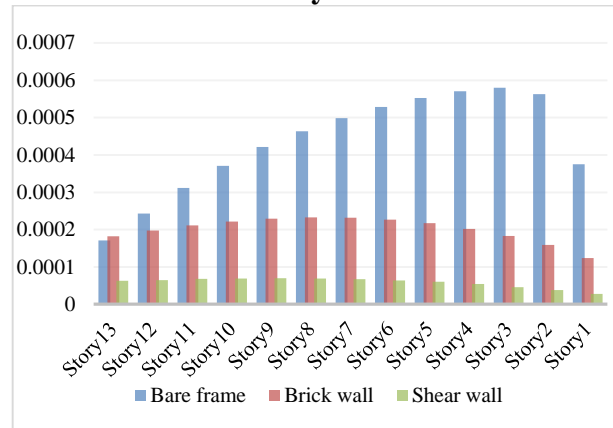
Fig.4. Comparison of storey drift between brick wall, shear wall and bare frame

Storey drift can be characterized as the displacement of one storey with regard to the other storey. The percentage variation from brick wall to shear wall 237.68% and brick wall to bare frame is 98.71%.

Storey shear

Fig.5 shows storey shear [kN] for all the three models for multi-storey building. It is seen from the graph that the storey shear is least for storey 13 and higher for base. The storey shear decreases more rapidly for shear wall model. The storey shear is 796.5422 kN, 2835.1476 kN and 3154.8989kN for bare frame, brick wall and shear wall respectively. We can see here that, storey shear for shear wall is approximately four times of bare frame. Storey shear variation is 11.278% and 200% for brick wall to shear wall in X direction and Y direction respectively. The variation percentage for brick wall to bare frame is 255.93% in X direction and 733.33% in Y direction.

Fig.5. Comparison of storey shear for Brick wall, Shear wall and Bare frame

Storey stiffness

The graph shown in fig.6 represent the storey stiffness [kN/m] for Shear wall, brick wall and bare frame and it is clear from the graph that storey stiffness of shear wall at storey4 is almost two times of storey4. As compared all three models, the storey stiffness is much higher for shear wall from brick wall. Storey stiffness variation for brick wall to shear wall is almost 400% for both X and Y direction. The variation for brick wall to bare frame is 987% for X direction and 1232.92% for Y direction.
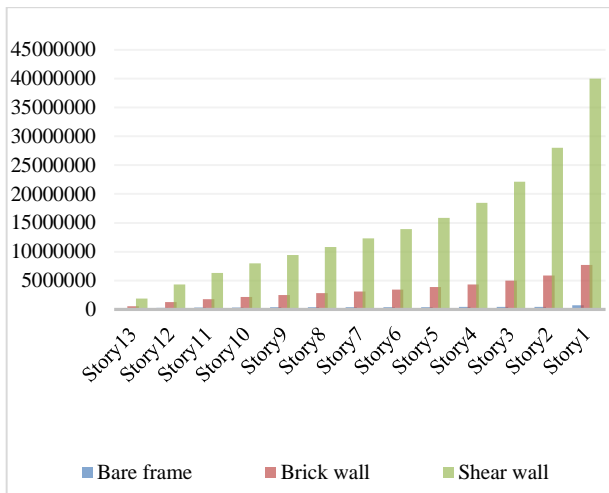
Fig. 6. Storey stiffness [kN/m] for shear wall, brick wall and bare frame

Time period

The percentage variation from brick wall to shear wall is 78.62%. So, the model with Brick wall oscillates for longer duration than Shear wall. The variation from bare frame to brick wall is 118.53% and this results the model with bare frame oscillates for longer duration than Brick wall. Time period for bare frame is maximum.
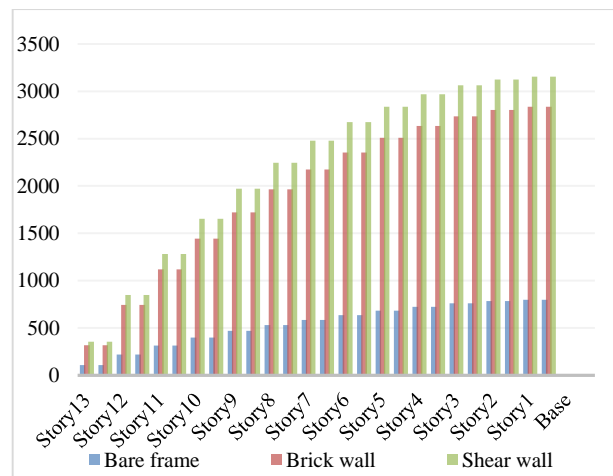
Case Mode	Bare frame	Brick wall	Shear wall
1	1.132	0.518	0.29
2	1.019	0.489	0.26
3	0.919	0.299	0.132
4	0.368	0.141	0.068
5	0.332	0.139	0.068
6	0.303	0.1	0.044
7	0.208	0.073	0.034
8	0.189	0.07	0.033
9	0.178	0.06	0.027
10	0.144	0.051	0.024
11	0.132	0.048	0.023
12	0.123	0.043	0.022
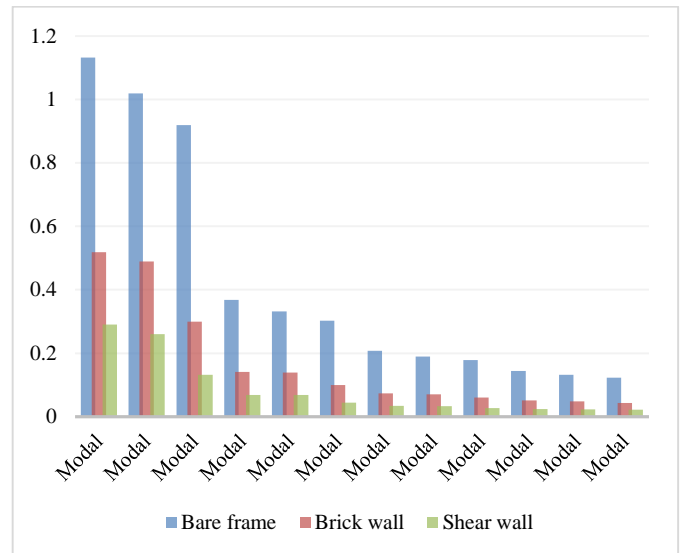
Fig. 7. Time period of brick wall, shear wall and bare frame

Conclusion

The following conclusion may be reached from the research work's examination of three models of bare frame, brick wall, and shear wall, taking into account various characteristics such as time period of oscillation, lateral displacement, stiffness, storey shear, and storey drift.

- The model with Shear wall has the least time period than other models and model of bare frame has maximum time period. Hence, if we consider time period as the only factor then the model with shear wall will be the best choice.

- The model with bare frame has more lateral displacement under the application of lateral force than brick wall, and shear wall has the least displacement, so we can say that if the structure has to be made greater seismic resistance, then shear wall would be the best choice.

- The model of bare frame has the least stiffness while the model of shear wall has maximum stiffness, so when we consider the stiffness criteria, we tend to choose the model having the least stiffness in order to provide flexibility to the building model so that the building does not develop cracks in the event of an Earthquake.

- The model with Shear wall has minimum drift and hence it is more efficient and more flexible when compared with other models.

- Shear wall is more effective in reducing displacements and drifts, than brick wall.

As height of the building increase, displacement and drift also increase, but for shear wall models displacement and drifts value is significantly lower than of brick walls.

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AN EVALUATIVE STUDY ON BANANA PSEUDO-STEMS AS MEDIUM FOR PECHAY (BRASSICA RAPA SUBSP. CHINENSIS.) PRODUCTION

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ABSTRACT

Agricultural planting may have been difficult in areas with limited spaces. Various techniques have been adopted to address the scarcity of agricultural lands or even backyards for planting, yet costs and value of such techniques may have been too high. One method that could be used in short time-span agriculture is planting in biodegradable stems. Due to the abundance of water in the banana stems and its capacity to retain, it has a good potential as an alternative for planting media in limited agricultural lands. This study aimed at determining whether the banana pseudo-stem can retain water until pechay harvest. A split plot experimental design invented by Fisher (1935) was used in this investigation. It comprises two (2) different treatments under the experimental group and one (1) control as basis for comparison. The researchers also measured the leaf blade length, height, number of leaves to measure the growth rate of the plants under different treatment factors. The study revealed that there was an increase in terms of the number of leaves, height, and leaf blade length in the pechay when planted on banana pseudo-stems than those which were planted in a poly bag. Although results showed that there were no significant differences between treatments, Treatment A (watered everyday) got a higher result using the parameters compared to the rest of the treatments. This study also revealed that Treatment B with pechay planted in banana pseudo-stem watered thrice a week, and the Control Group with pechay planted in poly bags watered every day, yielded almost the same results. Thus, banana pseudo-stems have the capacity to retain water for pechay growth and production. This study is recommended for a longer time-span and in other plant varieties to fully ascertain its potentiality as an alternative agricultural medium.

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Keywords:

Introduction

Due to the scarcity of agricultural lands where population is steadily increasing and that farmers are currently facing difficulties in crop production, a high demand needed by the growing human population is a big challenge in the economy. The problems encountered redounds to the development of various planting media technologies in agroforestry (Budiastuti & Purnomo, 2012) peatland (Darmawan, Siregar, Sukendi, & Zahrah, 2016), swamp (Waluyo, 2014), dryland, and hydroponics (Sesanti, 2016).

On the other hand, according to FAO (2003) water scarcity has also been seen as one of the greatest challenges of the twenty-first century. Agriculture, livestock, encompassing crops, aquaculture, fisheries, and forestry, were all related to cause and victim of water scarcity. This is accounted for by an estimate of 70 percent of global water withdrawals. The world has been experiencing the worst climate change impact including droughts and floods, which significantly impacts agricultural production. Also, the rising temperatures translate into

increased water demand in agriculture sectors. The withdrawals of water grew at almost twice the rate of population increase in the past twentieth century, and a 50 percent surge in food demand is predicted by 2050. It is vivid that there is a dire need to address water scarcity problems.

Hendriksz (2017) reported that more than a billion tons of banana tree stems are disposed of each year, as banana plants only fruit once in their lifetime before they die.

In addition, banana stems have an excellent water retaining capacity, which help plants to thrive even during arid conditions. Arranging it properly can also save space. Turning a banana stem into a planter is easy and its accessibility in the Philippines is high (Ahmar, 2019).

Moreover, Banana stems contain a high water content of 93.4%. According to Rochana (2017) water content of banana stems are relatively high, at approximately 90.30-90.87%. The water content of banana stems in fresh conditions range from 75.70-82.50%. Part of the banana stem has a very broad variety of food composition, such that water

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content is very high, especially on the banana stem that ranged from 87.01-94.11%.

On the other hand, Pechay *(Brassica rapa subsp. chinensis)* needs more water during its growing period which perfectly fits as a variable to investigate how long banana stems can provide water until pechay's harvest period (Vallejera, Tulin, Asio, & Dorahy, 2014)

Therefore, using banana stems as an effective medium for planting crops will help to reduce water scarcity because of its ability to retain water. It will also benefit the plant growers in a way that they will no longer need so much space, water and fertilizer for crop production.

Research Objectives

This study was conducted to evaluate the capacity of banana pseudo-stems as a medium for planting pechay *(Brassica rapa subsp. chinensis)* and help the farmers in Odiongan. This study aimed to meet the following objectives:

1.   To investigate if the banana pseudo-stems can retain water for pechay production;

2.   To determine how pechay will respond when planted in banana pseudo-stems in terms of:

a.   Number of leaves

b.   Height

c.   Leaf blade length; and

3.   To determine the significant difference between those that are planted in biodegradable banana stems and those that are in poly bags.

Research Design

This experimental research used split plot design invented by Fisher (1935). This design had two (2) different treatments under the experimental group and one (1) control where the results were compared. The researchers also measured the leaf blade length, height, number of leaves to measure the growth rate of the plants under different treatment factors.

Treatment A: Pechay planted in fresh banana pseudo-stem with loam soil and water in an everyday basis.-

Treatment B: Pechay planted in fresh banana pseudo-stem with loam soil and water on a thrice a week basis.

Control Group: Pechay planted in a poly bag with loam soil and water on a daily basis.

Research Materials and Equipments

The table shows the materials used for the modification of banana pseudo-stems.

Table 1. Materials

Materials	Quantity
Fresh banana pseudo-stems	2 pcs. (2 meters x 7 inches in diameter)
Garden trowel	1 pc.
Pechay seedlings	90 pcs.
Knife	1 pc.
Shovel	1 pc.
Gardening gloves	3 pairs

Research Procedures

The procedures done using the materials and equipments are as follows:

1.   Cut medium-sized (15-20 cm) holes on the banana pseudo-stems and remove the debris.

2.   Fill the holes with good quality loam soil.

3.   Sow 1-2 pechay seedlings on it.

4.   Water with 300 ml per plant every Sunday for Treatment A, and water every day for Treatment B and the Control Group.

5.   Wait for 1 ½ month (45 days) for the pechay to grow and compare the plants' growth (number of leaves, height, and leaf blade length) between treatments.

Figure 1. The Preparation of Banana Pseudo-Stems to Planting of Pechays

Results

Pechay's Response as to the Plants' Number of Leaves Yielded

Table 2. Average number of leaves of pechay planted in banana pseudo-stems and poly bags under different levels of water supply

Treatments	Plant	Average Number of Leaves
Treatment A	Pechay	7
Treatment B	Pechay	6
Control Group	Pechay	6

Table 2 shows the average number of leaves of pechay planted in different treatments. Pechay under Treatment A had an average of 7 leaves, Treatment B that had 6 leaves and the Control Group had 6 leaves. Treatment A had the highest average in terms of number of leaves while Treatment B and C had the same amount. Pechay planted in banana pseudo-stems had a greater number of leaves compared to those planted in poly bags. The number of pechay's leaf harvest was a parameter to the response of the plant to medium and the present nutrient content as corroborated from the study of Gonzales, Caralde, & Aban (2015). Also, as to plant leaf component, the study of Pascual, Jarwar, & Nitural (2013) discussed that the pechay plant's leaf is a determining factor to its health condition and productivity caused by the amount of water and nutrients present.

Pechay's Response as to the Plants' Height (in cm)

Table 3. Height (in cm) of pechay planted in banana pseudo-stems and poly bags under different levels of water

Treatments	Plant	Average Height
Treatment A	Pechay	14.37 cm
Treatment B	Pechay	11.70 cm
Control Group	Pechay	11.41 cm

Table 3 shows the average height of pechay planted in different treatments. Pechay under Treatment A had an average height of 14.37 cm, Treatment B that has 11.70 cm and the Control Group has 11.41 cm. Treatment A had the highest average in terms of height while Treatment B and the Control Group have almost the same height. Pechay planted in banana pseudo-stems are taller compared to that in a poly bag. The study Bercero, Aranico, Tabaranza, & Amparado (2014) underscores the importance of plant's height as basis of its health and media's good nutritional composition. The pechay's increase in height was also seen as an important indicator of plant growth other than its reaction to phototropism (Aglosolos, Regencia, & Arcilla Jr, 2021).

Pechay's Response as to Plants' Average Leaf Blade Length (in cm)

Table 4. Leaf Blade Length (in cm) of pechay planted in banana pseudo-stems and poly bags under different levels of water

Treatments	Plant	Average Leaf Blade Length
Treatment A	Pechay	11.87 cm
Treatment B	Pechay	10.0 cm
Control Group	Pechay	9.90 cm

Table 4 shows the average leaf blade length of pechay planted in different treatments. Pechay under Treatment A has an average leaf blade length of 11.87 cm, Treatment B has 10.0 cm and the Control Group has 9.90 cm. Treatment A has the highest average in terms of leaf blade length while Treatment B and the Control Group have almost the same leaf blade length. Pechay planted in banana pseudo-stems have longer leaf blades compared to that in a poly bag. Since pechay leaves are the main commodity or product of the plant, plant's production is mostly based on the leaf blade length as it determines the size of the leaf. The study of Alcala, Mater, Sarellana, & Caga-anan (2016) strongly focused on the leaf blade length of pechay since its production was based on its leaves. The study of Alcala et al (2016) revealed that the nutrient content of the medium is the determining component of the plant's growth as to its leaf size.

Figure 1. Treatment A: Pechays in Banana Pseudo-Stem Watered Everyday

Figure 2. Treatment B: Pechays in Banana Pseudo-Stem Watered Thrice a Week

Figure 2. Control: Pechays in Banana Poly Bags Watered Daily

Significant difference between the treatments and Control Group

Table 5. Summary of Results of All Variables

Source	Sum of Squares	df	Mean of squares	F	Sig. Value	Descriptive Interpretation
Between-treatments	7.334	2	3.667			
Within-treatments	60.142	6	10.135	0.362	0.711	NS

At 0.05 level of significance
S – Significant
NS – Not Significant

Using the Analysis of Variance, table 6 shows that the result in terms of all variables has a significant value of 0.711 greater than the significance level at 0.05. Therefore, the null hypothesis is accepted and there is no significant difference between the treatments. This suggests that the differences in the results of experiment between pechays planted in banana pseudo-stems and poly bags are almost the same.

Conclusion

It is common nowadays that if pechay plants are not directly planted in soil, poly bags serve as alternatives. By that, the waste products from used or ripped poly bags may contribute to increasing environmental plastic wastes. On the other hand, the use of banana pseudo-stems is an advantage because of its biodegradability. The study of Suryanti & Santiasa (2020) revealed that banana pseudo-stems contain a good level of macro nutrients which is good for

plant and bacterial growth. The advantageous side of banana pseudo-stems results in a promising effect on the pechay production based on the plant's average number of leaves, leaf blade length, and plant height. As the results suggest that those pechay plants planted in banana pseudo-stems watered once a week yielded a higher result, it validates the idea that banana pseudo-stems have higher water carrying capacity which could last until pechay plant's harvest period of more or less 45 days. This was confirmed in the study of Bello, Sarojini, Narayana, Byrappa, (2018) that

banana pseudo-stems have high water absorptions and water carrying capacity which is very important for plant growth and those plants that thrive in high water level. This study is recommended to be conducted in plant varieties those that thrive in high water content. Also, it is further recommended that a longer time period be conducted to fully ascertain to what extent or time banana pseudo-stems can support plant growth to fully investigate its potentiality as alternative plant media.

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STUDY OF CONSUMPTION PATTERN OF CONSUMERS FOR LUXURY RETAILING WITH SPECIAL REFERENCE TO MUMBAI

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ABSTRACT

Luxury Brands carefully analysed the pattern and preference of luxury merchandise by the customer segments in the various metros with respect to Indian luxury market. Consumer insights embedded into their merchandising plans since there is no one-size-fits-all merchandising plan. The researchers wanted to know the consumption pattern and preference of the Mumbai luxury customers. And how the Luxury brands are reworking their distribution channels, product line extensions and repositioning to remain relevant to their target group. Through this research using factor analysis it is revealed that Experience, Status and Logo are most important factors that characterises luxury goods and it affects the consumer perception the most for considering the product as luxury. The apparel, footwear, beauty products and leather (bags) were the top purchases made by the respondents. Also, automobiles and wine & spirits segments found favour with the younger generation. Further, they pay more attention to the quality and value of their purchases.

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Keywords: Luxury retailing, E-commerce, Consumer behavior

Introduction

When luxury sanitary ware company, Kohler opened its 16,000 square feet experience centre in the tony South Bombay (SOBO), it got analyst, customers and Marketers sit up and take note of the Luxury brand. It promised to be a melting pot of art and design in the financial hub of India. Truly one of its kind and a reflection of the market outside, the experience centre served as a source of inspiration for bath space decor and aims to provide for an evolved and immersive retail experience like no one else.

Along similar lines when Indian celebrities decided to get married in the luxurious royal palaces and properties in India and Italy it confirmed the luxury of royalty is available at a price. The opening of palaces offering luxurious experiences was a big step towards democratization of exclusivity of royalty. One doesn't have to be born royal to enjoy this. Thus, the texture and composition of the luxury market in India has changed to include consumers in different age and social economic groups.

Luxury brands represent the image of high position in the society. Researches available on luxury branding highlight purchase goals (Miller and Mills, 2012).

The motivation to own luxury brands may arise due to individual need to conform to conventionally accepted social milieu, being attractive and connected to aspiring groups. (Sheppard, L., & Chakraborty, S., 2016)

Moreover, there has been a rise of the Great Middle Class and they have been the primary drivers of luxury retailing. It is still a play on volume and not on ticket size. (Brahma, 2014).

Literature Review

In India, it is still a play on volume and not on ticket size. (Brahma, 2014). The creation of a modern shopping and retail culture has been driven by a consumption-oriented population that desires new products, services and shopping environments. This need, matched equally by modern trade, organised retailers and shopping centre developers, has transformed the nature of luxury retailing in India. The definition of luxury is very relative and changes from country to country and among different income groups. However, most households earning more than INR 1 million or above annually opt for luxury goods in India. With the significant growth of this income group, luxury retail in India is expected to witness steady growth in the coming years.

Mumbai occupies an impressive 2nd position in terms of luxury retailing in India and it will remain as one of the India's richest cities in terms of millionaires' wealth concentration (Gupta, 2017). According to Cushman & Wakefield report of 2015, the luxury retail space in India increased to 1.44 per cent of the

overall retail space as compared to 1 per cent in the past.

Spending on luxury cars continues to grow at 18 percent to 20 percent over the next three years. As the purchasing power of women grows in India, the luxury beauty products market is witnessing a fast-paced growth, by Abhay Gupta, Business world.

Much has been written about the rise of the millennials along and their purchase of Luxury goods. As appropriately captured within Wealth Wave: The Millennials & Their Luxury Aspirations, Danzinger stated that Millennials are set to become the largest consumer group in the world by 2020.

According to Knight Frank Wealth Report 2015, by 2024, the wealth of ultra-high-net-worth individuals (UHNIs) in India will rise by 104 percent as opposed to China's 87 percent, providing attractive opportunities to luxury retailers. According to Credit Suisse's 2015 Global Wealth Report, India has ranked up in the list of Top 20 countries as the number of ultra-high-net-worth (UHNW) individuals rose by 100 people since mid-2014 to now stand at 2,100. In addition, India is home to the fourth-largest population of millionaires in the Asia-Pacific region (Khan, 2016)

Research Methodology

Purpose of the study:
The Study contributes in explaining the consumption pattern and preferences of consumers regarding luxury goods in Mumbai.

Relevance of the study:
From a practitioner's viewpoint, this research has high value because it has provided insights into how consumers in India's financial hub perceive, search and buy luxury products, which could help in developing different strategies for various segments of consumer.

In addition, by 2025, the overall average household income is expected to multiply by 1.7 times. This is an attractive proposition for any global retail brand. (Gupta, 2016)

Objectives of the study:
1.   To understand the consumption pattern and preference of luxury shoppers in Mumbai
2.   To find out the factors that drives the consumers to make luxury purchases in Mumbai

3.   To understand which segment aces the luxury brands in Mumbai

Limitations:
1.   The study is limited to the consumers of Mumbai only
2.   Due to pandemic the researchers could not undertake in store face to face interviews.

Sources of Data:
The study undertaken was mainly based on primary data i.e., structured questionnaire was designed. The study also contains secondary data i.e., data from authenticated websites and news portals for the latest updates just to gain an insight for the views of various experts.

The researcher while accessing the secondary data excluded the data which was not relevant to the objective and questionnaire. The appropriateness of data was judged in light of the nature and scope of the topic investigated. The researcher evaluated the reliability of the data.

Methodology and Presentation of Data:

The data is collected with the help of "Google forms". Questionnaire is prepared through Google form and circulated to target consumers with the aim to study the consumption pattern and consumer preference regarding luxury goods in Mumbai.

Sample Size: 132

Sampling method: Non-Probability, descriptive and Convenience Sampling was used.

The collected responses are shown graphically to make analysis easier and proper interpretation is given in the study after each question is analysed.

Data analysis has been performed on the responses collected from, Mumbai using IBM Statistical Package for the Social Sciences. Descriptive research has been conducted.

Dochartaigh (2002) refers to evaluating the reputation of the source. Gupta (2005) emphasized that sample selection and data collection are interwoven and one has an impact on the other.

Response Rate: The Researchers discarded incomplete or erroneous responses; thereby ensuring the correctness/reliability of the data used. The questionnaire was sent to 200 people out of which 132 completed forms were

received and included for the research. So, the Response Rate is 66%.

Response rate is calculated by the number of individuals who respond and complete the questionnaire divided by the total number of individuals contacted.

Invariably financial growth and consumption of Luxury goods is linked. This explains the reason why the financial capital of India, Mumbai was chosen for the study. Further it has a high number of organised retails which is a pre requisite for luxury retailing. The key spending on luxury products is pre-dominant in the metro cities.

According to the ASSOCHAM survey of 2015, In 2015, Delhi ranked first in spending most on luxury brands, followed by Mumbai (2nd), Ahmedabad (3rd) Pune (4th) and Bangalore (5th).

Data Analysis and interpretation

Reliability measure:

This test is carried out by using SPSS software and the result of the reliability test measure is given below:

Cronbach's alpha based on standardized items	No. of items
.725	26

.725 is above the standard accepted value hence the questionnaire is reliable.

Factor analysis:

Factor analysis table:

Extraction Factor	Factors		Extractio
Characteristics	1.	Experience	.778
	2.	Status	.775
	3.	Logo	.772
	4.	Price	.685
	5.	Rarity	.671
	6.	Quality	.645
	7.	History	.625
Preferences	1.	Leather goods	.775
	2.	Foot wear	.748
	3.	Hotels	.711
	4.	Automobiles	.684
	5.	Beauty Products	.682
	6.	Wines & spirits	.652
	7.	Apparel	.627
	8.	Accessories	.616
	9.	Yacht & Cruises	.612
Purchasing power	1.	Product type	.738
	2.	Repetitive purchase	.715
	3.	Repurchasing probability	.714
	4.	Discounts/Offers	.685
	5.	Purchasing Location	.592
	6.	Purchasing Encouragement	.569

Table 1

Out of the total variables (refer table 1) these are the 3 major factors.

After applying Dimension reduction, it is revealed that Characteristics of luxury goods is most important factor in which Experience (.778) Status (.775) and Logo (.772) gained after using those product affects consumer perception the most.

On the basis of obtained results leather goods (.775) followed by footwear (.748) and hotels (.711) are most preferred by consumers in terms of luxury shopping.

Lastly, Product type (.738) and repetitive purchase (.715) and repurchasing probability (.714) are important.

Factors driving the consumers to make luxury purchases

More than just being a status symbol people consume luxury items to have a brand experience and affinity. Today's luxury brand consumers value their exclusive purchases and want to demonstrate their status through consumption of unique luxury product and services further the logo creates a sense of belonging and engagement with the brand.
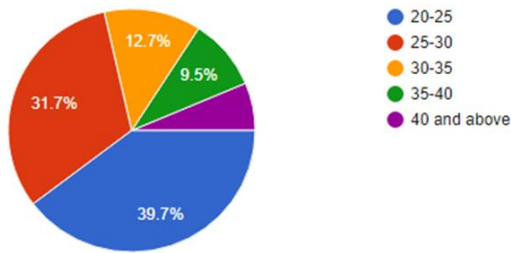
AGE

Figure 1.

While pursuing the study 50.8 % respondents were Females while 49.2 % were Males. While 68.3% were employed 31.7% of the respondents were unemployed. They could be housewives, students and dependant family members who make purchases but are not necessarily employed. While 39.7% respondents were in the age group of 20-25 and 31.7% in the age group of 25-30.

• It is observed that the millennials are more inclined to purchase services over objects and goods. This set of consumers value quality of the product and the brand experience rather than based on the lineage of the brand

• As per 2018 report of the Bain & Co, millennials and generation Z will represent more than 40 per cent of the overall luxury goods market by 2025, compared with around 30 per cent in 2016. Unlike Baby Boomers, many millennial luxury consumers expect to interact with brands across a range of digital platforms, rather than only through traditional channels.
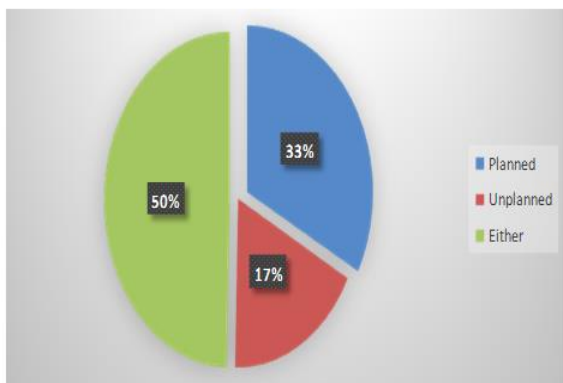
Figure 2.

Interpretation:

As per the data collected 33 % of people pre-plan their purchases, whereas 17 % says their purchases are unplanned. Planned purchase indicates that a consumer carefully considers the necessity of the item being purchased before buying it and the remaining 50% respondents make both planned and unplanned purchase.

2.

Figure 3.

Interpretation:

As per the responses collected, majority of the respondents ie 46% prefer buying luxury items from Malls. This is a reflection that Mall culture in India is growing by leaps and bounds and retailers as well Mall developers know how to attract the customer.

Indian consumers are looking for Luxury product in the right environment and retailers and Luxury brands are trying to woo the customers by offering a shopping environment that is associated with the brand internationally. And this is possible mostly in developed retail spaces like Malls. Malls offer ambience that is commensurate with the luxury brands.

According to the survey, respondents favour Multi brand E-commerce site for purchasing luxury products. There is a shift towards E-commerce buying for the traditional luxury industry. Here they invariably buy those luxury products that they are familiar with.

Consumption is linked to accessibility. Further, one barrier that has caused delay in rapid expansion of luxury retailing in India is the non-availability and inappropriate rental of right retail spaces to house luxurious national and international brands (Jones Lang LaSalle, 2013).

On one hand consumers want to take advantage of deals in overseas market and on the other

hand they don't want to suffer the guilt of purchasing a luxury product from Mumbai where there is a glaring economic gap between haves and have nots. Many Airports Like Abu Dhabi and Dubai are now accepting Indian currency. This step is also giving rise to Indians shopping overseas

3.

Figure 4.

Interpretation:

One of the major reasons why 56% of the respondents in Mumbai prefer Classic Luxury products over limited edition etc is that design, craftsmanship and branding that are unique to these products. Further, practical attitude exhibited , impacts their purchasing decision and extends to buying classic cars among other luxury purchases.

4.

Figure 5.

Interpretation:

• Luxury goods contribute in improving self-worth and a sense of achievement**.** According to the respondent in the survey majority of them buy luxury items on half yearly basis which means that they are

consistent while buying luxury goods but yet not often. They make such purchases occasionally, or to celebrate an achievement or to flaunt their status. Further accessibility is an issue, with majority of luxury products and services being sold in south Mumbai and few other areas. To continue on the same note sizeable respondents, purchase these products half yearly or annually; these could be during their annual trips.

5.

Figure 6.

Interpretation:

Elegance and timelessness are synonymous with Luxury. Luxury is usually visually appealing, and this strikes a chord with the patrons of luxury products. Luxury brands try to replicate or offer similar brand experiences across the world which creates a feeling of oneness with the consumers of the brand across the globe.

Luxury brand are keen to have deeper understanding of their customers' requirements. This helps in bridging the gap between them and the customer. it further helps them understand the consumer need and wants and lastly created a much needed different' brand experience.

Millennials purchase luxury items for the quality of the product and the brand experience.

6. From the given luxury segments, select the following according to your first preference. (1 being most prefered and 5 being least)
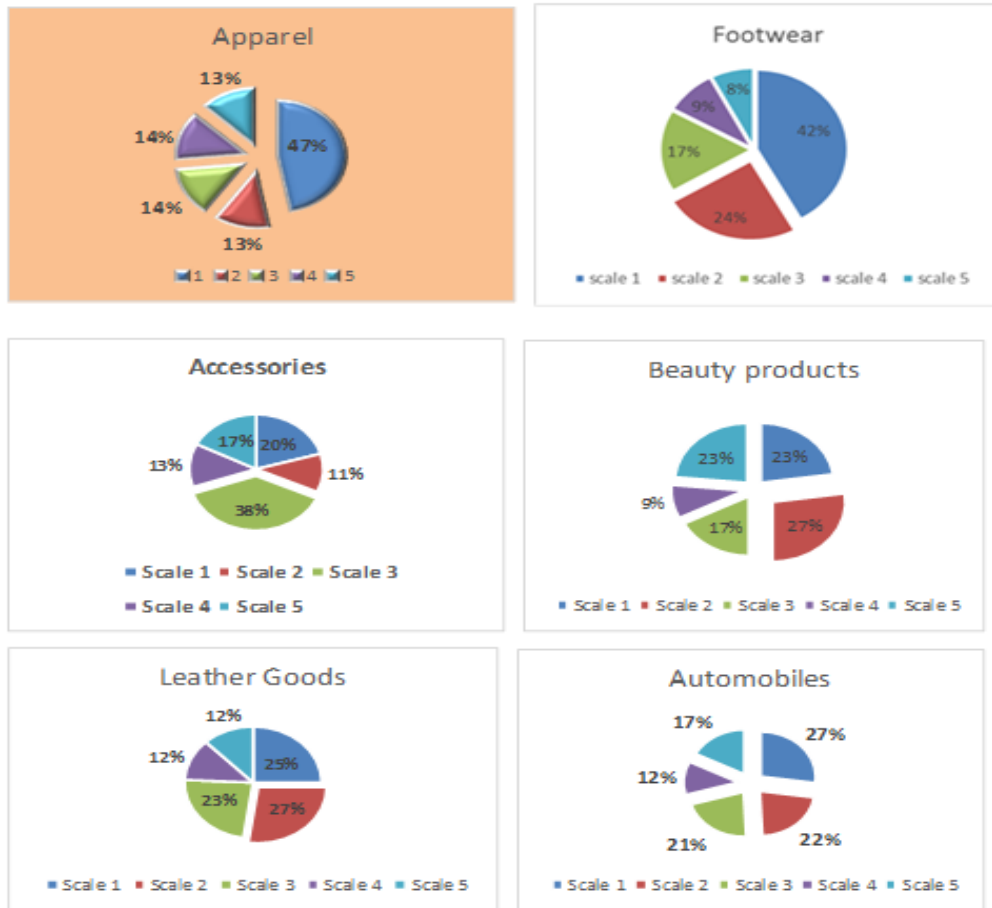
Figure 7.
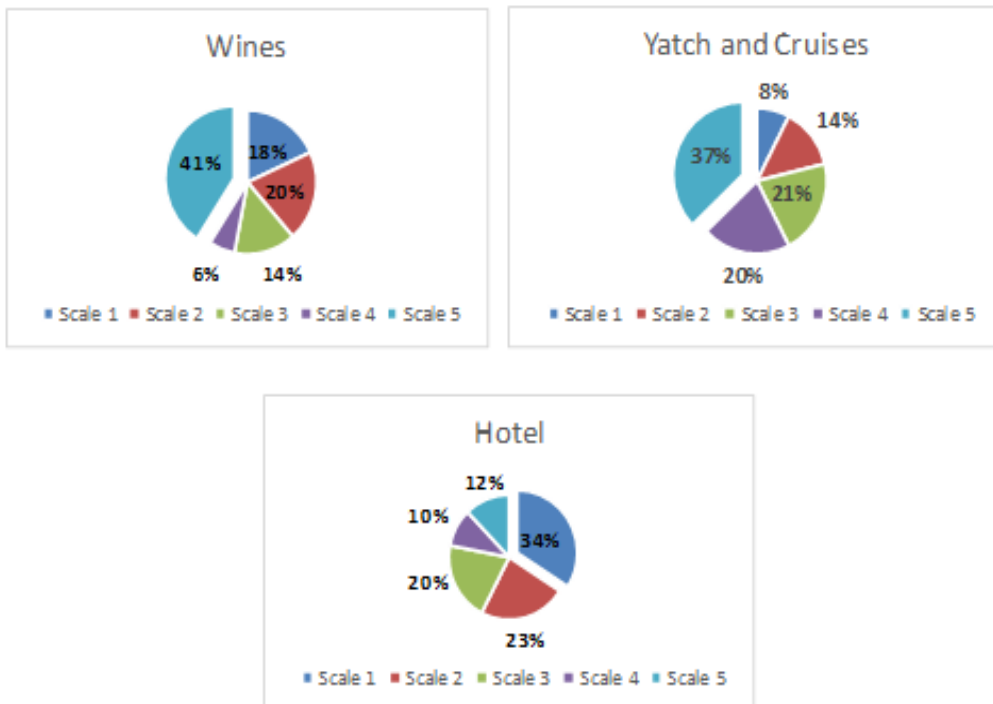
Figure 8.

As the purchasing power of women grows in India, the luxury apparel and beauty products market are witnessing a fast-paced growth. Today people are looking beyond purchasing tangible luxury products and are increasingly spending on experiences like staying in luxurious hotels.

There is a growing need for individuality and exclusivity as consumers get richer. Continuing the same note, increasing brand awareness and the growing purchasing power of the upper class is fuelling further growth.

7. Rank the following based on the characteristics while buying luxury goods. (1 being most important and 5 being the least)

Price

8%
14%
15%
23%
41%

■ Scale 1 ■ Scale 2 ■ Scale 3 ■ Scale 4 ■ Scale 5

Experience

5% 4%
14%
16%
61%

■ Scale 1 ■ Scale 2 ■ Scale 3 ■ Scale 4 ■ Scale 5

Rarity

15% 20%
18% 12%
35%

■ Scale 1 ■ Scale 2 ■ Scale 3 ■ Scale 4 ■ Scale 5

Status

14%
20% 36%
23%
8%

■ Scale 1 ■ Scale 2 ■ Scale 3 ■ Scale 4 ■ Scale 5

Quality

4% 4%
7%
7%
79%

■ Scale 1 ■ Scale 2 ■ Scale 3
■ Scale 4 ■ Scale 5

Logo

9%
12% 33%
21%
25%

■ Scale 1 ■ Scale 2 ■ Scale 3
■ Scale 4 ■ Scale 5
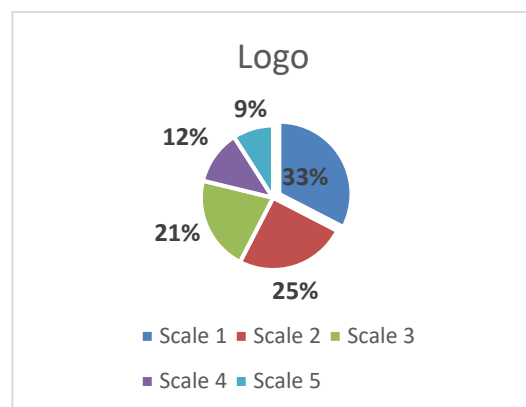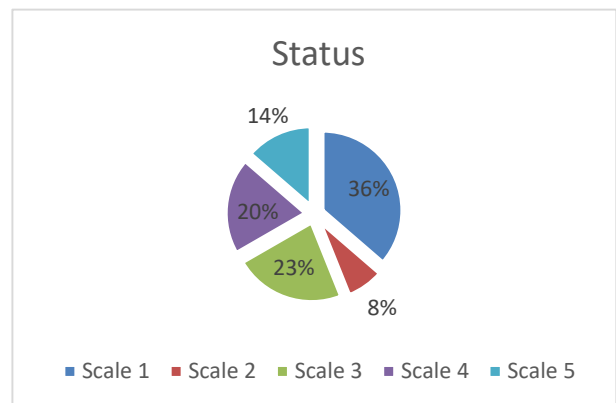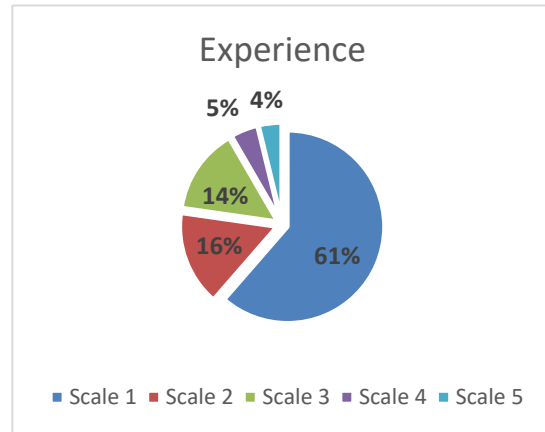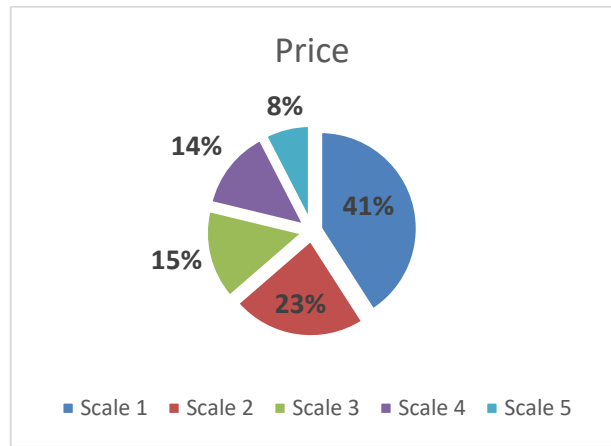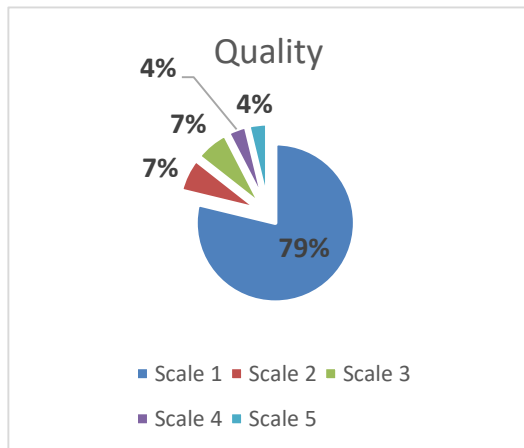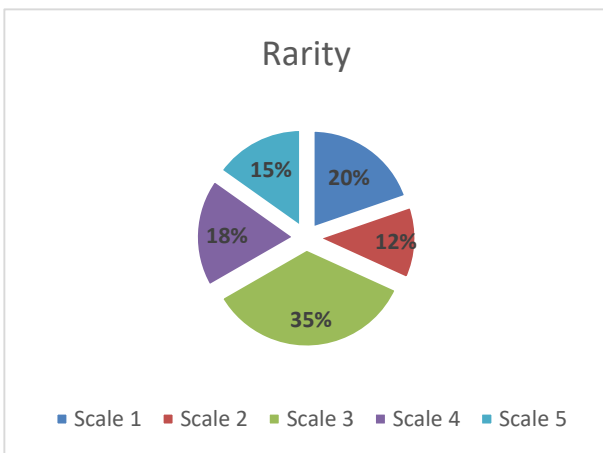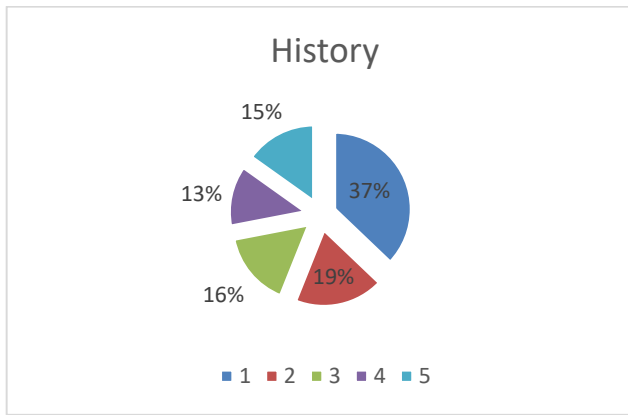
Figure 9.

Interpretation:

The appeal of luxury goods is beyond doubt. This is the reason why luxury goods market is evolving and getting bigger. Quality of purchase and brand experience are the two-major characteristic influencing buying of luxury goods.

Generally, Luxury products never sacrifice on quality. No concession is ever made on materials or standards. Luxury brand purchasing is influenced by the experience of purchasing it that includes new age service or how product is delivered, packaging (good packaging creates an impression of what is to come), the store's design, or layout.

Also, Luxury products are exclusive, and rare, and its limited availability increases the desirability quotient among customers.

8. Does discounts/ offers have an impact on your buying decisions for luxury products?
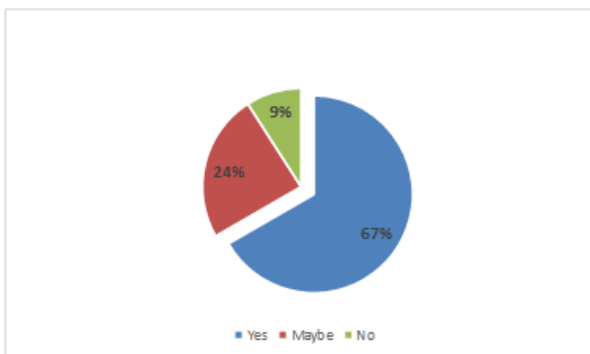
Figure 10.

Indian population is generally value oriented and they seek value for the price in every product, service and experience they purchase including the exclusive luxury items. Discounts and offers even for luxury goods are attractive to customers.

9. On a scale of 1 to 5, what is the probability of you repurchasing the same

brand? (1 being highest probability and 5 being the least)
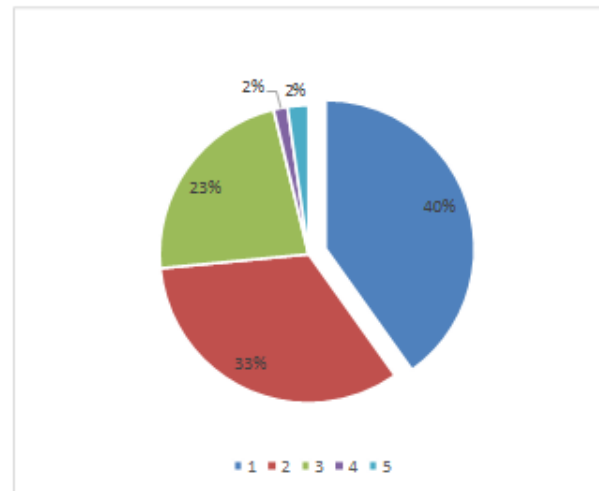
Figure 11.

Once a consumer purchases a luxury brand, it is important for the brand to retain such customers. It can be seen from the responses that there is high probability of purchasing the same product again. It shows factors like product quality, purchase experience, satisfaction, brand reinforcement, and high brand recall all play important roles.

Future scope of study

• Research can be extended to other Metros and Tier II and Tier III cities.

• To increase the number of respondents.

Conclusion

Consumers purchase these goods for a variety of reasons, among them because they convey a sense of uniqueness, wealth, and exclusivity with quality of brand experience. What people expect from luxury here is very different from overseas market. In Mumbai, luxury retailing scores high on service-oriented attitude, while in the Western economies it is more product-focused. Today an average Mumbai luxury shopper is looking for experiences that makes them live better.

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B2B E-COMMERCE PROGRESS REASONS IN INDIA'S SMALL AND MEDIUM-SIZED ENTERPRISES

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ABSTRACT

Electronic trade (E-commerce) is not the only luxury in the business model segment for large companies, as small and medium-sized enterprises (SMEs) may also be embraced. Although SMEs are said to play an important role in most countries' financial growth, they typically are slower for B2B e-commerce than larger organizations
Purpose: The purpose of this analysis is to explore the reasons that influence the decision to continue to use B2B e-commerce for manufacturing small and medium-sized businesses in India.
Design/Methodology/Approach: This survey applied the quantitative approach when the data collection was carried out using a self-managed survey distributed throughout the Jabalpur, Bhopal and Indore manufacturing sector to SMEs.
Practical Implications: The implications of the research findings can be used to effectively use B2B e-commerce for SMEs without wasting limited resources, it is necessary to recognize which drivers plan to continue to use B2B e-commerce.
Originality/Value: There has been researched on Barriers to Adoption of B2B E-marketplaces on MSMEs but, research has not shown that the relative advantages, the top management support and the intensity of information have a major indirect impact on intention to continue using B2B e-commerce via Perceived utility (PU).

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Keywords: E-commerce, Small and Medium Enterprises (SMEs), Adoption

Introduction

Electronic transactions involve the transaction of businesses via electronic / computer networks and therefore involve processes related to procurement, the selling of the exchanges of products, resources, and records. E-commerce started in the 1960s when developments in technology-enabled the first electronic, but soon in the 1990s, the exchange of information. This was the last decade before e-commerce began to emerge. Both the network and e-commerce have many potential agreements to increase acquisition ability. Electronic business or e-business is the method of electro-possession and stages for performing the industry of an initiative. The organization or its website gives more comprehensive e-commerce information to visitors about its history, practices, products, and improvements in its services than e-business information. Equipment to process and/or enable goods and services to be purchased online. Therefore, in five major categories, e-commerce is possible:

• Business to business (B2B), in which both customers and traders are companies.

• Consumer business (B2C), where the customer is a consumer and the dealer is an undertaking.

• Administration Business (B2A) when the client is connected to, for example, business and government transaction and document administration agencies.

• Administration Customer (C2A) only includes transactions between customers and businesses, where the definition is identical to B2As.

• C2C- Consumer to consumer, or C2C, is the business model that facilitates private trading. This kind of e-commerce relations public to the business, be it for products or services.

B2B has fewer investors, tighter connections between buyers and sellers, new technology, and new knowledge-sharing than companies on consumer markets.
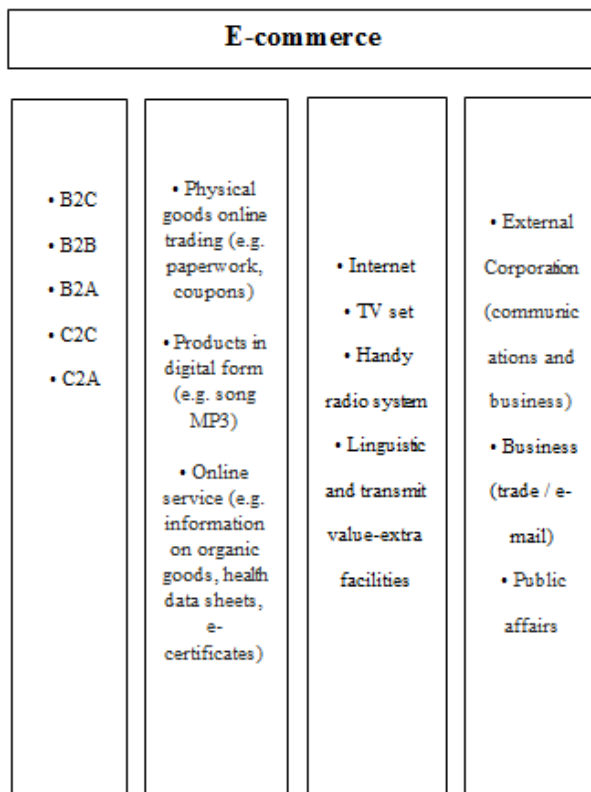
Figure 1: Classification of E-commerce

The growth of B2B e-commerce is in the direction of innovation and strong innovation in both existing and growing market conditions. This will also boost MSME development at long last. India's advanced trading market remained growing to $13.6 billion in 2014, from $4.4 billion in 2010 and is projected to grow to nearly $ 1.5 billion in 2014 in foreign bazaar. The micro, medium, and small companies (MSME) market in India is continuously expanding and is committed to a $0.12 trillion company establishment by 2020. One research shows that about 80 percent of manufacturers will increase expenditure on their B2B e-commerce operations and 38 percent will increase expenditure by 25 percent or more transportable and internet dissemination, m-commerce compacts, delivery, and installation another possibility, spanning deductions, plus the organization's drive interested in first-hand inclusive arcades are key car user of this unusual enlargement. The large dealers stay gradually focusing happening their arithmetical procedures while taking into account the final objective to acquire the undeniable advantages of online platforms. To order to increase their mobility applications, e-commerce companies concentrate their efforts on increasing their mobile apps. Huge players in this area claim that they have more than half their income from mobile applications. In the current scenario, the top b2b e-commerce players in India are IndiaMart which is holding a 60% market share of the online B2B Classified space in the country. They started their business in 1996 and for the financial year 2019-20, they made a revenue of 707 crores. It has been providing B2B, B2C, and C2C services through its online portal ever since. Instead of selling large quantities of common goods at small numbers to many consumers, a long-term market plan helps businesses to make substantial profits. Throughout globalization, evolving countries remained significant

companies in biosphere employment and unpaid to their outsized shop prospective and small employment costs.

Table 1: Shop and business deal meadows of E-commerce

Rising nations are classified by way of short to medium salary countries, small alive standards, limited technological organization, and narrow product and services admittance. With advances in great worldwide societies are gradually expanding supply chains crosswise various zones, cutting costs, and increasing reach. Through the adoption of ICT, industrialized countries will be able to trade more easily with developing countries and enable them to attain extra sustainable commercial progress in turn. However, due to modifications in their community, national, cost-effective, governmental, authorized, and high-tech settings, emerging motherlands meeting regular difficulties and anxieties that fluctuate greatly since individuals encountered by settled countries. E-commerce is generally seen as a field with a significant chance for future sales growth and cost reduction for B2B transactions. India's impact on e-commerce through non-

Consumer	Business	Administration
C2C e.g. song file exchange, acquisition or auction of secondary supplies	C2B e.g. consumer product costing	C2A e.g. singular tax dealings
B2C e.g. ordering, software and music download in Internet shops, online journals.	B2B e.g. data mining, downloading of apps, etc.	B2A e.g. corporate tax transactions
A2C e.g. welfare compensation (employment insurance etc.)	A2B e.g. public service recruitment initiatives on the Internet	A2A e.g. Internet transactions between governments

B2B SMEs include:

• A lot of future development for the specific small and medium-sized businesses.

• B2B e-commerce is a previous attempt to enable SMEs to take action.

Literature Review

Out-of-date approaches of dealing with the finding development are greatly unproductive because of the unnecessary obstacles linked to the practice of electronic commerce. As an outcome of the usage of e-commerce to switch the achievement process, businesses can save considerable resources in time and expense [7]. The use of E-Purchasing gives the company access to broader markets and streamlines buying processes. Electronic commerce involves the successful management of purchasing processes by eliminating rag constructed logs and records plus handling acquisition by electronic

communication systems. In over-all, there are two phases of acceptance: pre-adoption and post-adoption [4] [2]. The post-adoption process underlines in what way to incorporate using modernization. This comprises the scheme and awareness of improvement tasks to boost the expansive and rapid reception of innovation. Unfortunately, scientists have paid less attention to problems such as e-procurement, which are not innovation, but the first step in disseminating innovation. Although researchers worldwide have done many studies on e-procurement factors. This research support towards reduce the analysis crack by inspecting the dynamics distressing the consumption of electronic winning by Indian companies. Some researchers also suggest that organizations are under pressure also whether to implement the B2B e-commerce in their organization or not. The organization facing three varieties of pressure is tough, copied, and regulatory. Copied pressure could force societies, whether or not they have any technical value, to embrace the methods or modernisms of further societies so that their collective legitimacy is secured. Tough control means formal or informal pressure on firms that are more powerful in terms of capital, such as government authorities, parent companies, or other entities on which they are based. Such forces push corporations to follow systems or procedures that suit the needs of pressurized organizations. In conclusion, regulatory pressures can be applied by suppliers, clients, businesses, trade organizations, and professional organizations. Some of the earlier research merged institutional theory and TOE as institutional influences contribute to the environmental context of the TOE system. The key factors connected with the implementation of B2B e-commerce in Indian companies were clarified in the past study. Countless variables might be main in some tests, but do not give meaning in other tests. One feature of this difficulty is the exploration values in which few variables differ across nations. Management assistance in developed countries is a weighty element in B2B's e-commerce agreement. Furthermore, best recent research has based on either describing how such variables affect B2B e-commerce adoption or evaluating the extent of acceptance of B2B e-commerce by bearing in mind extra variables as a prototypical moderator. They assume factor analysis is a series of approaches that-their statistics to less, describing most of their original results more efficiently by examining differences between variables. They believed factor analysis was a positive method in which hidden or fundamental factors from several seemingly significant variables could be established. Factor analysis is a more general set of techniques that are analyzed correlations between variables decrease their numbers in factors, which more economically explain many of the original data. The Internet has greatly reduced entry barriers Many sectors have reduced suppliers' switching costs and purchasers and many new entrants paved the place, reduced retail transactions, and cost of management, enhanced market penetration, and intra-industry compounding concurrence. The future of B2B begins with standardization, simplifying, and incorporating all players, irrespective of their size and power. Considering that small and medium-sized companies are attempting to penetrate the B2B global market by posing their goods as a replacement for of dealing online, there is abundant prospective that purely the sales process as part of the "marketplace" for these SMEs should be taken into account. SMEs are selling their products in this way and large companies are looking for such goods because they tend to be sufficient to increase their exposure and facilitate B2B transactions for micro and small companies. The B2B shops will carry on to multiply in the near upcoming plus make available all customs of communication in one place. They most likely offer B2C the same environment in which companies act as customers and buy on the web. Nevertheless, it will also involve the B2B transaction and ordering market processes. I always endorse the enforcement and full application of the B2B system requirements. It is possible that the conventional electronic data interchange or web-based product catalogs will shift, as in the case of alibaba.com. On the other hand, the determination has old-fashioned plus fresh automatic data interchange criteria. We also assume that the discovery process of businesses should no longer rely on the product categories of the business, but will rather be oriented towards a product list taking place an ontology center in which the professional plus goods are acknowledged established on a keyword. The existence on the Internet has become more important to modern organizations than an external resource to make a difference in the competition. Progressively, businesses are in search of how to use cloud technologies and form web-based business processes and systems applications for their corporate dealings with suppliers and customers. Companies are gradually using the Internet to carry out their inter-agency transactions. Despite the rapid increase of the virtual B2B activity Marketplace, the dynamics behind the B2B initiatives are still little understood. The method industries handle these plans and the encounters they face in the precipitate of B2B e-commerce organisms are absent. Owing to the disparity between internet speed and all of the There is significant confusion about the applicability of our established expertise on traditional inter-organized systems to inter-organizational web-based applications, in earlier information technologies. Emerging shops and companies from this financial prudence, in particular small and medium-sized enterprises, have to attempt to breakdown the box in addition to function further than the perimeter if they remain to be successful. Power companies or small and medium-sized enterprises in India use B2B e-Commerce technologies. The study indicates, for example, implementation of B2B e-commerce is affected via corporate considerations, in particular preparation, policy, management's expectations, and external demands from market stakeholders, both internally and externally. The following parts would address important factors that affect the purpose of Indian Manufacturing SMEs to continue utilizing B2B's e-commerce. Most academic studies emphasize that businesses ought to consider how the product is viewed. The most significant factor in evaluating B2B e-commerce most technology is fairly beneficial, according to previous studies.

B2B E-commerce Technological Factor

A full analysis reveals how businesses view technology. The perceived relative advantage is characterized as the point where modernism is better known than its alternative.

A.   Relative Advantage

The relative advantage of one organization over another organization can be distinct as agreeing with B2B e-commerce technology in the direction of an institute to raise and rising the organization's profits, income, and comparative edge in lowering the inventory cost in comparison to another organization that is not adoption B2B e-commerce [8]. The enactment of B2B E-commerce is very obligatory for the company towards slash advertising plus marketing operating costs and to strengthen business partners' relationships. Adoption often decreases stock rates and improves internal performance, while growing new consumers' exposure and rising revenue [6]. Furthermore, good thought of the web site's rank will have a better inspiration to maintain the website. It shows business an important role is generally known to contour and reserve reasonable benefits. Researchers maintained that IT firms such as B2B e-commerce have a strategic edge across multiple paths. These involved: price tag decline; differentiation; growth; and quality.

- Cost Reduction- E-commerce help companies' adoption to reduce communications Company partner costs (e.g. fax, mail, telephone costs, and operating expenses). Unmoving, an additional sample of the growing price is the bargain in list prices; this is done by e-commerce. Furthermore, the use of Internet technology was noticed Cost reduction in products/services marketing, advertising, and sales and support costs for customers could be cut by B2B e-business. By embracing E-commerce, small and medium-sized firms possibly will shrink their charges of manuscript handling (e.g., storage and manipulation costs among other costs) cost of publishing documents (e.g. broadcasting charges, brochures, and records).

- Differentiation- Internet adoption has been found to boost reputation and the company's reputation, offers fresh opportunities for customer products/services, and the launch of e-commerce improved clients' chances of customizing goods and services. IT adoption helps businesses to increase the completion of transactions and facilitates access to information for customers.

- Growth- Numerous planes of growth exist. This can moreover uncaring improved market stake, earnings, and revenue for the company, or customer satisfaction. Some researchers have clarified that growth means market improvement effectiveness. There are a broad variety of applications such as email, on-line catalogs, shopping carts, the File Transfer Protocol, Internet services, and mobile apps for e-commerce. This includes activities and outreach from business to business, like the use of email for unrequested ads, usually seen as spam, to consumers as well as other business perspectives. More companies are now seeking, through digital coupons, Social Media, and targeted advertising, to directly reach customers online.

- Quality- Price is one of the most popular in current literature measuring competitive advantage using dimensions. Using B2B e-commerce can comfort companies to expand services and products' feature. Moreover, e-commerce adoption offers better, cheaper, quicker, and more precise details. Some researchers claimed that quick product delivery and service was an enhancement of the efficiency of the operation realized through IT. They found for instance, that IT adoption minimized transaction mistakes. Researchers noted that the approval of B2B e-commerce improves the worth of industry partner relations plus enhanced shopper facility (i.e. speedy shopper inquiries, quick follow-up shopper assertions, and requests).

B.   B2B E-commerce Organizational Factor

Organizational factors subsidize industry appearances that upset the agreement and norm on equipment. The institute is evident as the company's ability to acquire new equipment. Past research based on the protagonist of legislative enthusiasm for technical modernism predominantly finds the use of equipment as its big weight. In the prediction of acceptance of organizational technology that leads to changes in product and service, corporate variables are critical. The relation between company and technological factors has logically been explained by many studies of product acceptance. Nevertheless, the top management support is a key factor in the adoption of B2B

e-commerce and various technologies, according to previous studies.

a. Top management

Top management support is well-defined as the unequal of rebuilding struggle and care from the top management. Top management support is reflected as an individual of the ultimate variables for the setting up of organizational appreciation of technical innovation. Prior study shows that top management support provides a generally positive indicator for the adoption of corporate technology innovations. For a statistic, when the handling of the firm provides petite to not at all help the employment of new technical developments would be overlooked. Engender unattractive endings, as a final point. Top management advice helps workers respond to challenges and react rapidly to them. Top management support for the introduction of new technologies in the industry is also critical. The influence of high-level funding on technology adoption resides in two fundamental concepts.

1. The first term concerns the magnitude of the production and management of financial and human capital, vision and support as well as dedication to a positive climate [8].

2. The second idea is that the workers as the CEO, or as the owner/manager of the base who chooses to apply the knowledge has a trustworthy application decision. The first work was conducted to assist top management in ensuring the interest of B2B e-commerce resources and the development of a consistent environment.

B2B e-commerce environmental factors

While external critical elements that remain beyond the control of the organization, environmental factors that remain separate. Competitive competition is to the point that a company's attempts to use e-procurement innovation on the market have influenced other firms or allies. The intensive competition will allow businesses to respond to consumer needs rapidly, minimize lead times and increase customer adaptation. The leaders worldwide to take innovation from organizations such as B2B e-commerce [5]. Researchers have reported that the environment provides opportunities for awareness intensity and security. The following pages discuss the essential factors of the development of B2B e-commerce.

C. a. Information Intensity

The idea of an element symbolic of quantity or quality of the product or service of the organization is referred to as an information or data strength [3]. Sensitivity to promote and democratize the use of e-commerce is considered very significant. Many enterprises cannot take electronic trade because their products or services require detailed, difficult to explain definitions and e-commerce challenges an enterprise to embrace. Complicated details that often prohibit the acceptance of B2B e-commerce could lead to difficulties. Thus, a higher amount of data in a competition-orientated company that perceives creativity as a resource will encourage the degree of creativity that is implemented.

C. b. Security

Safety and privacy policies are discussed on e-commerce platforms concerning consumer security and privacy concerns. Considering that these systems actually reproduce the trader's mindset, the quantified programmer. Based on the transaction cost principle, our calculations indicate that e-commerce customers save costs (B2B) in their business transactions and e-commerce customers in order to achieve specific security plus isolation. Such inequalities should be expressed in shelter and insulation in e-commerce companies. Research has shown that customers and e-commerce suppliers are greatly impacted both personally and corporately by various issues during online transactions Singular shopkeepers are worried that privacy and confidence are not safeguarded and corporate operators tend to be worried about leading problems. B2B colleagues therefore focus on increasing constraints on privacy. The growth of e-commerce has forced data processing, workers and shoppers through network design and maintenance to tackle various phases such as shopping data seclusion and retirement. When designing data processing systems and tenders for accommodation for e-commerce services, data governance-related regulatory compliance standards, confidentiality laws and IT security guidelines should be taken into consideration. Safety refers to the organization's security,

confidentiality of documents, plus transactional protection, payment privacy mechanism and partners' reluctance to make electronic payments through the use of trendy e-commerce expressions of B2B's. In order to maintain the privacy and integrity of information, the security of data is necessary regardless of the data form that is accepted. In the Indian e-commerce environment, security threats are crucial and may hinder technology development. In India, just an uncommon hundreds of it has now been revealed the overall e-commerce in the country is electronic payment. This is why Indian consumers and businesses depend on cash mainly and yet get value.

The two convictions of security:

1. This theory includes safety records of industry and bribery and international and domestic crimes operations.

2. The next definition of protection involves a consequent insurance risk associated with hackers and malware as you buy online and B2B electronically.

C. c. Government Support

It includes policy promotion and B2B investment e-commerce, B2B adoption e-commerce infrastructure, state and demand regulation, including government funding, and e-commerce support. Consequently, this element was described as government funding for researchers. The area includes online purchases and sales taxation questions, legal problems surrounding electronic record transfers between businesses and global trade barriers. Governments are also direct beneficiaries of the Electronic Trade Strategy. Governments try to persuade companies to invest in technology companies and exploit the opportunities to offer new resources. The unique appeal of small and medium-sized enterprises (SMEs) to be more sensitive as they represent a critical indicator of the global budget. The first digital technology (knowledge deployment) help to new technology (subvention), the "right way" (mobilization) of technical usage should be recognized by the businesses, as an end-point control from oversight requirements (setting of the legislation, to get examples of use of electronic commerce (information directive). In view of the potential of the MSME fragment in

India other supervisory achievements remain motivated on the way to a satisfactory situation. Crusades like India, India, and India are aiming to provide MSME players with equal opportunities and a full drive for improved performance.

D. Perceived Utility

PU is defined as "the phase by which the proprietor / manager trusts it will enhance the efficiency of the company utilizing a certain program" [1]. PU affects the purpose of implementing the system directly. PU refers to the word "usefulness" used in the context for the B2B e-commerce implementation by small and medium-size enterprises.

E. The goal for B2B E-commerce to continue

In this study, we describe behavioral purposes as the willingness of an organization to use B2B technology for electronic commerce. Dissimilar researchers highlight many moving forces, which differ depending on the context-based technology. The goal of continued e-commerce is to maintain or increasing frequency and existing use. Studying e-commerce strategies will help to assess whether or not companies choose or refuse to use this technology [9].

Conceptual Research Framework

Conceptual research concentrates on the adaptable in units 2.1 to 2.5. Within the figure, the number of things remains. 2. Coordination requires relative gain, management support, and strength of information, protection and support from the government. The PU is a medium variable (MV), a dependent variable (DV) that requires B2B e-commerce to be experienced. This background is intended to explore the continuing effects of B2B's e-commerce relationships between independent variables. It decides also on the unexpected properties of PU in connection with the PU and B2B e-commerce program between liberated variable structures. The goal of this learning is to isolate the impact of TOE elements and to continue to use B2B e-commerce with the PU as shown in the figure. 2

The TOE framework has the ability to be reused to learn and distribute different modernizations of information systems,

Combined with methodical activities, skilled supervisor roles and changes in the main sector (e.g., B2B E-commerce machinery). The new acceptance of internal technological assets such as structure, technical knowledge, manufacturers and users is critical. Each TOE (i.e. technical, organizational and environmental features) representative is different from each study, although previous researchers used extensively the TOE framework.

Original Models

The technological, organizational and environment system (TOE) could stand in combination through the theory of Diffusion of Innovation (DOI), the five factors Theory of DOI (relative benefit, compatibility, difficulty, trial ability, Observability) is used in the technical setting to define the usage of technologies inside the organizations and outside. The TOE framework also highlights the organization's internal and external features. Internal features refer to the TOE organizational context framework, while the organization's external characteristics refer to the TOE framework environment context. The TOE is suitable to describe innovation adoption, as it encompasses three organizational contexts: technical setting, organizational setting, and environmental setting, which can touch the procedure of technical invention adoption by the organization. However, the behavioral aspect is not taken into account such as technology's perceived utility.

Hypotheses Development

A. Correlation of relative advantage to the perceived utility

Past scholars have extensively analyzed the impact of societies' technical advantages. They claim that once companies realize the relative value of change, their chances of adoption will increase. Through the improvement of the e-commerce targets in India SMEs through PU, a positive indirect outcome of the relative is therefore calculated.

H1: Relative advantage has a beneficial effect on the PU

B. The correlation between top management and perceived utility

Top Management Support is an additional significant factor in the acceptance of B2B e-Commerce through various developments. The top management is critical for the company's e-commerce technology to enter a brilliant atmosphere and have sufficient properties. Education in Indian small and medium enterprises recognizes the need for top management to adopt B2B e-commerce technologies for their company. Therefore, high-level management treatment uses a secondary understanding that has ensured the continued use of B2B e-commerce by SMEs in India through PU.

H2: The beneficial impact of top management support for the PU.

C. Correlation between information intensity and perceived utility
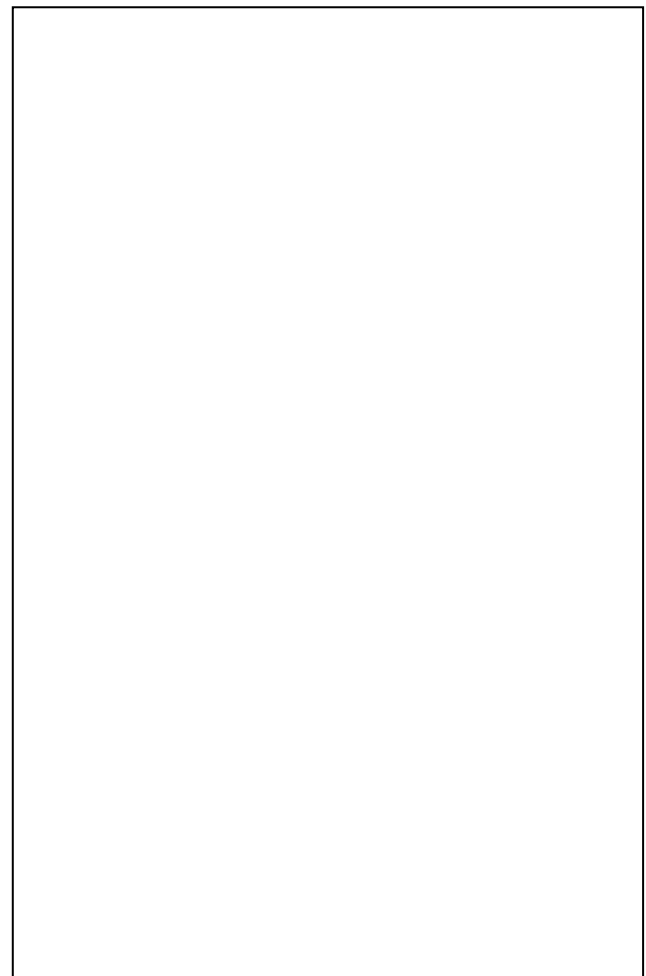

Figure 2: Proposed framework

Other readings have shown that modernization, such as B2B E-Commerce, is assisted by knowledge. Because Indian manufacturing companies in various countries have entirely different information processing requirements for this study sectors. Material-intensive industries understand better the efficacy of e-commerce B2B. The knowledge supremacy is therefore considered a positive influence for indirect e-commerce plans of B2B, for small and medium-sized enterprises in India.

H3: Intensity of information has an optimistic effect on the PU.

D.   Correlation between Security and perceived utility

The question of security is a major factor in deciding the use of e-commerce B2B because of a lack of security facilities to handle credit card fraud and data transmission between companies. The purpose of this study was to keep the B2B e-trade exhausted. The protection of Indian SMEs by means of UP devours bears.

H4: Security affects the PU positively

E.   Correlation between government support and perceived utility

The most successful facilitators at the start of the B2B e-commerce process were one of the reasons for supervision. Policy financing is also projected to have a positive impact on B2B e-commerce. This study believes that government support to Indian SMEs by PU is a deception of their goal of remaining exhaustive B2B e-commerce.

H5: Government Support affects the PU positively

F.   Usage and goal perceived to continue to use B2B e-commerce

The PU remains the direct prediction of conduct in the TAM framework Purpose (BI) to implement completely different technologies. Undoubtedly, it is witnessed that the acceptance of technology inside the office is of the utmost importance, much more needed than easy use.

H6: The goal of B2B e-commerce is having a positive effect on PU

G.   Utility as mediator perceived

PU has been exceptional in the demand of multiple tools for the best big drivers. If the mediation variable PU is incorporated into the TOE frameworks, the mediation function in TAM will allow PU 's understanding of B2B e-commerce as a consequence of trading SMEs in India. This will also be willing to manage to continue B2B e-commerce. Therefore, this study helps PU to interact with TOE considerations and aims to use Indian SMEs in their online B2B e-commerce. The sentences are as follows:

H7: PU mediates the relative gain of B2B and its plan to continue e-commerce

H8: PU mediates amongst the top management and the goal of continuing e-commerce with B2B

H9: PU mediates amongst the strength of knowledge and the target to use e-commerce B2B

H10: PU mediates amongst security plus B2B e-commerce intent

Research Methodology

`A systematic literature review focuses on a variety of topics in this study. All building products were reviewed and updated according to the study environment. There were normally six questions to explain the concepts. The five-point learning scale was used and ranged from strong disagreement to strong acceptance. The questionnaires were revolved around which factor they prefer most for the adoption of B2B e-commerce and whether they want to improve their website in the future. This research uses the convenience sampling method, a certain type of method focused on the information obtained from the people readily available for the analysis. The benefit of the comfort sampling approach includes: you can quickly carry out the study with just a few guidelines. The marginal costs and time required to perform a convenience sampling are small in comparison to probability sampling techniques. Self-administered questionnaires were distributed to 80 companies of Jabalpur, Bhopal, and Indore's production companies by

email/cold calling to collect the sample. For which the total records for SMEs getting a piece of mail or a small web site plus the aim to continue advancing e-commerce qualified in B2B were acquired from 34 useful opinion polls.

Results and Analysis

This learning generates a relative value which gives the perceived usefulness a direct positive result. The greater the comparative advantage of B2B e-commerce, the greater the Relative advantages may be calculated economically, but the situation can also be simple (e-mails can also be delivered quicker than letters and forwarded to the postal service). The modern technology is less expensive or costly but also dominant. Nonetheless, relative benefits are a significant factor in ensuring the swift spread and boosting of the world market. Figure 1 displays the findings of a sample of 34 businesses. We can infer from the graphic that they have chosen relative advantages and knowledge strength as their key factors for all of the small to medium-sized enterprises in Jabalpur, Indore and Bhopal, from all other options, they have for introducing B2B e-commerce.
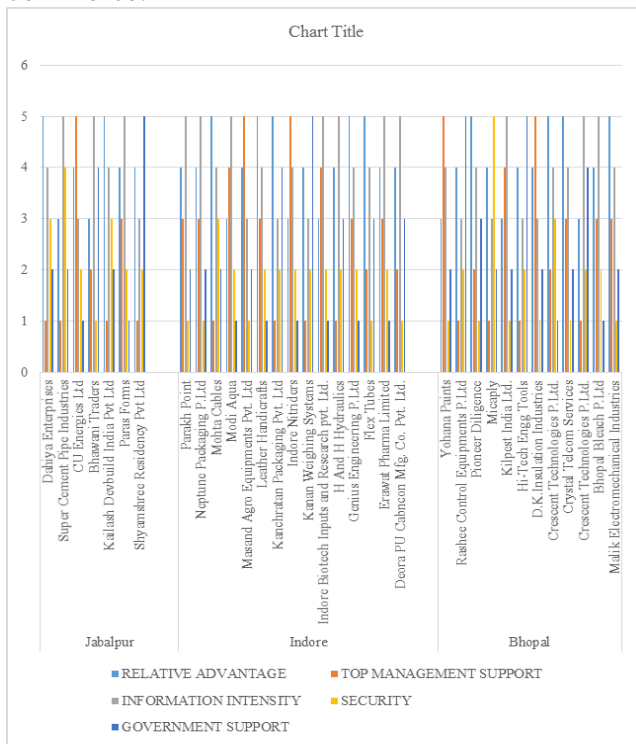
Graph 1: Selection of factors

Discussion

Top management should be properly funded and supported, along with new market methods. It ensures that the recruitment of top management means that workers use technology, train, and benefit from the use of modern information development technologies. In addition, this study shows that the strength information is the key influence of the well-known e-commerce routine for B2B Indian, SMEs. By providing high frequency, high volume operations plus a large number of products or services, the helpfulness of B2B e-commerce may be abnormal. This study indicates, however, that the safety results on utility intelligence are negligible. The B2B e-commerce adoption rates and not on-line transactions are less significant to the majority of Indian manufacturing SMEs, and thus the willingness of security personnel to sustain a modern B2B e-commerce adoption rate is not that much for them.

Conclusion and Recommendations

The architecture of this study is focused mainly on the TOE system, which then expands the remaining structure to incorporate the perceived mobile output of TAM towards the TOE Institute. This extension makes it possible to assess the mediation effect of the TOE program. Furthermore, this investigation has a specific connection in the TOE system by factors that disturbed the presumed usefulness, including a large amount of proof as a progressive assembly at the center of the variable intermediate value identified and the intention to keep using B2B e-commerce. The model will guide decision-makers in inventing the elements that can interrupt the usage and pull up roadmaps and trace strategies for B2B's e-commerce. It will be particularly useful for decision-makers who remain involved in the development of their business and obtain additional benefits from leveraging the various altitudes of B2B e-commerce findings and recommendations. This study recognizes the features and their notable effect on the exhausting TOE in exploring their connection to small-scale development to continue B2B e-commerce practice. The answers to this study thus show the untamed and effective TOE construction. The findings of this study provide a valuable guide to B2B e-commerce

technology for manufacturing SMEs in India. It research will be used to assess and explain policymaking processes for B2B e-commerce equipment for decision-makers of SMEs.

Limitations

The model cannot apply to SMEs in other states as data have been gathered from Jabalpur, Indore and Bhopal manufacturing companies. Secondly, the study emphasizes that respondents are conscious of both IT and administrative systems leading to respondents at various rates of SMEs. Therefore, in future studies, if superior individuals have similar

jobs in small and medium-sized businesses, preferably the Head of the business, as long as they have IT skills. This study emphasizes the Modern Industry of India, regarded as the biggest business market of the motherland. A variety of small and medium-sized businesses are active in the service sector as well as in manufacturing. As such, India's current learning will drag itself into this significant market. In the event of this, the sector class may involve a variety of formative sectors

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FUNCTIONING WITH A MULTIGENERATIONAL WORKFORCE: PERKS AND CHALLENGES

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ABSTRACT

The purpose of this paper is to determine the advantages and disadvantages while working with a multigenerational workforce to make a fair comparison and provide solution to this existing problem. We have used secondary data to draw inferences and selected research papers on this topic were evaluated. Past studies show that majority of workplace conflicts occur due to the age gap between the two generations. Past studies show that workplaces are moving towards having a multigenerational workforce who will have different backgrounds, culture, expectations and work style. In this paper, we have attempted to provide in-depth knowledge and a fair comparison of pros and cons of multigenerational workforce and tried to come up with solutions. Additionally, we will evaluate how the companies can find solutions to address multigenerational conflict between two generations and how HR professionals can look for a course of action in order to use this weakness as one their greatest strengths

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Introduction

Due to new technologies, companies are going under major changes in terms of their operations and workforce requirements. Similarly, the diversity of the workforce in companies is also being transformed because of the existence of five generations in the present time at workplaces. The kind of workforce we are seeing working together nowadays, is in its true nature, multigenerational.

The current workforce is being tagged as multigenerational because it is made up of different generations working together like, Generation Z, The Millennials, Generation X, and the Baby Boomers. Learning from the current working styles of organizations, they have leaned on to working in teams of multiple people on one project or assignment. These teams comprise of people belonging to different generations, working together towards the fulfillment of a common goal. This is why it's very organizations need to identify the key advantages and disadvantages of a multigenerational workforce. By understanding their workforce, organizations can in time, create strategies and ways to identify and overcome the challenges the workforce might present and also learn to embrace the advantages of this diversity.

There is an ongoing debate about the timeline of each generation, including the start and the end of each, along with some disagreements and debates. The most important thing to notice is that there are multigenerational experts

present in organizations. These experts focus on identifying the strengths and weaknesses of each generation individually and together to best facilitate daily practices in an organization and mediate communication to decrease the chances of any sort of discrepancy.

As surprising as it may sound, the human history is witnessing multiple generations working together in the workplace for the first time. This fact raises several questions and concerns related to the challenges the workplace might face with this change, the kind of changes organizations will have to make for an efficient working environment, the kind of advantages this workforce can present, and many more. To understand the advantages and disadvantages of each generation, we first need to broadly set a timeline to each in order to understand their attributes, characteristics, working style, mindset and to understand the key perks and challenges for each which will enable the organizations to design strategies to use this diverse workforce in the most efficient way possible.

- ❖ Generation Z: 1996 – Now
- ❖ Generation Y(Millennials): 1977 – 1995
- ❖ Generation X: 1965 – 1976
- ❖ Baby Boomers: 1946 – 1964
- ❖ Silent Generation: Born before 1946

Such a diverse workforce will provide organizations with challenges and opportunities for the employees and the organization. In today's time, Millennials are taking over the workplaces very rapidly. People belonging to previous generations have to be prepared in advance to let these Millennials take over the higher positions in the organizations. Whereas, In between the Baby Boomers and Millennials, generation X is stuck. They already hold managerial and leadership positions in organizations and are looking and exploring for wider areas of responsibilities. These generations have different characteristics which are needed to be managed skillfully to avoid inefficiency at the workplace. Therefore, workplaces need to be prepared in advance to deal with such changes as and when they arise. Organizations that fail to understand the strengths and weaknesses of their workforce prove to be inefficient in creating a cohesive environment. Such inefficiency can affect the turnover of the organization, motivation and morale of employees, fulfillment of individual and organizational goals, number of disagreements, social environment, etc.

These four generations have set and defined stereotypes which can help us identify ways and methods through which the organizations can understand ways to function with each generation individually and together as a diverse workforce. Therefore, this research focuses on understanding characteristics, both good and bad of each generation, understanding the Millennials in-depth, analysing key challenges and perks of working with a multigenerational workforce and in the end concluding with defining certain ways through which organizations can create a fruitful and efficient work environment for a multigenerational workforce and use this diversity as a strength to create the most fruitful and productive employee base.

Literature Review

Today, the kind of workforce we are witnessing is much more diverse than ever with respect to their ethnicity, age, race, gender, mind-set, opinions, and generations. (Baker, 2015) analysed that the most common differences between these generations are related to work ethic, communication and technology. Benefits and tensions are the two contradictory sides attached to generational diversity. Benefits of having a multigenerational workforce include a wide range of different ideas, increased quality of decision-making skills, and problem-solving and a better insight into customer mind-sets and needs belonging to different age groups. Whereas, disadvantages may include misunderstanding between different generations, lack of respect, resentment, etc.

As discussed earlier, each generation has its ethics, belief system, values. Preferences, working and learning style, and expectations. Organizations need to dive deep into the strengths and weaknesses of their organization's workforce to enable a higher level of performance. There are pluses and minuses attached to generational differences which, if identified on time, can be modified and dealt with by organizations in order to minimise any disadvantages and magnify the advantages. Since the classification of generations have a slight difference in terms of starting and end date, the endpoints may overlap by a few years.

Silent Generation (born before 1946)

They are the smallest of all the generations present today in the workplace. (Barbara, 2011) defined them as the Silent Generation and (Tom Brokaw, 1998) defined them as the Greatest Generation. This generation is a witness to the great depression. At a very early age, this generation experienced the horrors of World Word II. When this generation began coming of age, it was about working in the system which was done by working as hard as they could while keeping their heads down which, labelled them as "silent". They always were dominated by the thought of playing it safe and not taking up risks. Their childhood experience of growing in a world where they faced depression, World War, and other hardships resulted in their very nature of being thrifty and not being wasteful. This generation married and had children at a young age which meant working endlessly and dedicatedly to

provide for their families. The Silent generation gave birth to what we now call Baby Boomers. This generation brought in strong work ethics into the industrialized sector and factories. They strongly believed that the only way to earn success was by working hard and diligently. They struggled to survive in their days and were forced to take jobs which not necessarily appealed to them. They took up jobs that were readily available to them and were grateful for it.

The silent generation always respected and understood authority as the most important work norm. They work co-independently in teams very well, helping one another proving themselves as the best team players. They don't believe in creating or encouraging conflicts in the workplace unnecessarily. This generation maintains their properties to increase their lifespan and value which can in turn become annoying for the Millennials who are not a fan of conserving things in order to be reused later.

One of the major challenges this generation might face is being technologically smart. In recent times, we are moving towards a scenario where new technologies are not just being introduced, but are also being encouraged and installed/used by organizations for better facilitation of their operations and attending to the needs and requirements of each organization as required.

One of the best qualities of the silent generation is that they are traditionalists which means they hold high value for safety, security, work ethics, morals, and consistency in performance. This quality can prove out to be very beneficial for conventional business methods and workplaces dealing with legal aspects.

To summarise, the best qualities of this generation include being heard working, extremely diligent, highly ethical and consistent, experience gained throughout their journey, loyalty, dedication, sacrifice, respect for authority, stability, morals, leadership, adherence to rules, optimism, patience, and team orientation. Some areas where they might face problems include technology, change, comfortlessness with conflicts, ambiguity and disagreements.

Baby Boomers (1946 – 1964)

This generation has been a part of the workforce in organizations for over 50 years now. This characteristic that they have plays a major role in shaping them to be good leaders. Many of the Baby Boomers have now reached their retirement rate but this doesn't stop them from working. They aspire to work as long as they are stable in terms of their physical and mental health. Baby Boomers believe more in workplace visibility and want the employees to show up to work on time and work hard until the end of the day. The majority of this generation doesn't encourage work from home options. This might isolate them from the younger generation in terms of work ethics and comfortability.

This generation also believes in how one presents himself or herself in a professional environment to maintain order and a certain level of professionalism. Baby Boomers were always raised to be self-efficient and were taught to work hard by the silent generation to reach their desired place in life. Ideal for many workplaces, this generation is very hardworking, self-sufficient, and will take over responsibilities and will deliver the results to the best of their abilities. Younger generations these days might focus on collaborating to make complex things easier, Baby Boomers depend more on continuous hard work and dedication till the work is completed. (Gail, 2019) Stated that this generation still prefers traditional working styles like printed material and are less tech savvy. They also sometimes hesitate in asking for help if needed. The Silent generation raised them to be independent which makes them less likely to ask for a helping hand. This generation was raised by parents who believed highly in objectivity and rationality which enables them to have good decision-making skills. They are aware of the fact that the right decision will mostly not be the easy one to make.

For Baby Boomers, experience plays an important role in assigning authority to an individual. They trust people who have more experience in different fields as compared to a younger mind. This characteristic is nowadays being challenged in workplaces since the youngest minds are taking over many leadership positions and different

organizations. Because of the recent changes and development in technologies, baby boomers are forced to adapt to the changes, while younger generations are born into it and are labeled as experts in the tech world. Their very competitive nature drove them far into their careers and enabled them to be working hard endlessly, trying to stand out and getting acknowledged for what they want from their careers. Baby Boomers tend to stay loyal to the organizations that they work for and use their jobs to define themselves. Families and Hobbies are something they very strongly invest in and a major part of their identity is based on how their companies value them and their work. Because they directly related hard work to success, they're very optimistic about their futures.

To summarise, the best quality of this generation will include optimism, goal orientation, team orientation, working for personal fulfilment, self-sufficient, competitive, hardworking, personal growth, and the strive for greater possibilities. Whereas, some areas where they might face problems include changes, technological advancement, leadership changes, comfort with conflict, stress, sensitivity, judging and being self-cantered

Generation X (1965-1976)

This is the newest generation to enter the workplace environment. (Larry, & Ahmed, 2014) Stated that they grew up in a time of immense and fast-paced changes. This generation has its own distinct ideas and expectations. Employees in this generation will be future leaders and organizations have been focusing on training them to be their best versions in order to take up roles with higher responsibilities and expectations. This generation has high self-confidence and believes that they are valuable to any organization. Millennials seek challenges and new areas of growth regularly. They desire to learn new skills and developing themselves for personal growth and to move forward in their careers.

This generation is loved and protected by their parents. They rely on their support and advice before making a decision. This generation was taught to work in teams, socialize, and embrace change. Millennials also prefer to connect over technology than face-to-face with a person. They are highly dependent on technology which results in miscommunication between bosses, coworkers, friends, and family.

Although, their biggest advantage is being technologically savvy. They are constantly connected on social media platforms like Facebook, Twitter, Instagram, etc. This provides them with a platform to explore knowledge and seek ideas from all over the globe and magnifies their horizon of understanding trends and cultures. For consistency in their performance and work, they need constant feedback and daily assurance of their acknowledgment at the workplace. If not motivated or appreciated, Millennials do not hesitate to find opportunities where they will be valued.

As companies compete for available talent, they simply cannot ignore the needs and desires of this generation. Older generations may see this as a lack of commitment but Millennials are ready to trade high pay for fewer billable hours and better work- life balance. This is a generation that likes to value their relationships more than their work.

Millennials have high expectations from the organization that they are working for in terms of growth opportunities, challenges, being heard, and making a difference. They want work that will make a difference in the decision making of the organization and will provide the employee with a learning curve. Baby Boomers mentoring Millennials is an ideal situation because their experience can offer Millennials with the learning and guidance that they rightly need to grow further in their careers.

One key downside of this generation is their need to seek something new and better is constant. It is found unlikely for any Millennial to stay in the organization for more than two to three years. This results in a loss of resources for the organization that had been investing in its employees to help them learn and develop new skills and attributes. In this aspect, they are very different from other generations.

To summarize, some of the best qualities of Millennials include confidence, achievement-oriented, high moral standards, tech-savvy, excited, motivated, value responsibilities, persistent, multitasking, and value teamwork. Whereas some areas where they might face problems include low interpersonal skills, need supervision, stability, lack of experience, and constant need of acknowledgment.

Generation Y(Millennials)(1977-1995)

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Generation Z (1996-2010)

Just like Millennials, Generation Z has also been exposed to technologies from childhood like the internet, social networks, computer systems, etc. They see their jobs as work performed for financial reasons. They will be more than happy to accept a job that will provide them a good and stable income even if it's not something they dreamed of. Generation Z appreciates good and worthy ideas. They know those good ideas make money and they do not hesitate on chasing those ideas and believing in them. They tend to take risks and make bold decisions which appeal to their entrepreneurial nature.

Similar to Millennials, Generation Z communicates and broadens their virtual channel to the other end of the world through the internet and social media. Generation Z not only uses technology for professional purposes but also for entertainment purposes. This generation still likes to meet and communicate with people face-to-face if they know the people. Competition for this generation is a constant feature in their professional lives. They are very focused on getting into the best

schools and scoring the highest. Patience is not a popular virtue with this generation, they want things to be done as quickly as possible before someone else beats them to it. Unlike other generations, change is embraced by Generation Z. According to them, change can bring in new ideas, ways, opinions, technology, and working environment which is always welcomed and encouraged by them.

When it comes to diversity, they were raised in an environment where sexual orientation, race, religion, etc. were never considered as identifying characteristics. For Generation Z, humans are just humans. Generation Z will focus more on what you choose to become than who you are. They are very independent and want to take control of their lives and destiny and constantly want their opinions and views to be heard.

To summaries some of the key qualities of Generation Z include adaptability to change, being tech-savvy, embracing change and diversity, team-work, being independent, competitiveness, social skills, and energy. Whereas, some areas of weakness include, stability, unpredictability, lack of experience, and need for constant approval.

Generational Conclusions

Considering the diversity in today's workforce, the objective of any organization is to motivate and encourage their employees to work in this changing environment together. In order to make sure that the workforce is operating smoothly, organizations need to figure out key advantages and disadvantages of working with the diverse population and convert their collective weaknesses into an organization's strength via strategizing and implementation of various activities and methods. These generations share traditional work values but are different from one another in terms of technical competence, opinions, and mindset. The value each individual has depends on their generation.

Generation	Characteristics & Values
Silent Generation	Dedication Hard work Loyalty Honor Optimism Respect for authority Adherence to rules Stability Patience Focused Team Orientation Leadership
Baby Boomers	Optimism
	Team Orientation Goal-Oriented Self- absorbed Personal growth Competitive Strive for change Hard Work
Generation X	Skeptical Diversity Individualistic Global Techno-literate Fun Informal Self- reliant Balanced
Generation Y	Optimistic Confident Achievement-oriented Moral Need positive reinforcement Street smart Positive attitude Sociable Personal and career growth
Generation Z	Exited Need for change Different skills Tech-savvy Global communication Embrace change Adaptability Diversity Entrepreneurial Focused Independence

Fig. 1. Characteristics and Values of each Generation

Research Methodology

The research method used in this paper is based on existing data collected and processed in the course of this subject's research process. The methodology used is called secondary research which involved collecting, organizing, and analyzing data samples used by the different available research to read conclusions and results.

The reason of this particular research methodology is to provide a newer and combined outlook of previously conducted researches in order to bring in a more informative perspective and a larger set of data. The current available information on this topic is not sufficient and not many studies have been conducted in the recent past. By reviewing past papers and combining different

perspective, it is an effort to provide an in depth and more detailed knowledge on this topic.

A study was done by Dr. Kathryn Woods, Austin Peay State University in 2018 used surveys as a method of data to understand perceptions of different generations. This survey was given to people to enrolled for workshops and also to undergraduate students. A total of 114 surveys were collected.

The sample described three generations Baby Boomers comprising of 13%(15) of the total data sample, Millennials comprising 45%(51) of the total data sample, and generation X comprising 42%(48) of the total data sample.

Another study was done by Namrita Rajput, University of Delhi in 2019 in which analysis of research was done to identify differences in work values among generations, work motivators for different generations, and preferred leadership style for different generations. In this study of literature review, Generation X, Generation Y, and Baby Boomers are taken into consideration.

The most recent study was done by Faith Kariuki and Essi Rohula, JAMK University of Applied Sciences in June 2020 used qualitative methods like statistical sampling focusing on Millennials and Generation Z. The second approach used is secondary data by a literature review to help navigate the subject. The method used is a blend of Herzberg's two-factor theory and Maslow's Hierarchy of Needs theory.

The survey consisted of 2 multiple choice questions with 3 comment boxes, 2 checkboxes, and a 1-star rating. The factors were to be rated on a scale of one to five based on their importance.

For qualitative and external research, these three papers have been taken into consideration to understand the perspectives of generations with the majority in the present. Furthermore, with the help of analyzing multiple research papers and reviewing the literature, a deeper understanding for other generations and knowledge was gained about their characteristics and traits to conclude quality results.

Result And Analysis

A study done by Dr. Kathryn Woods, Austin Peay State University (2018) Sample size: 114

• **Perceived challenges faced in the multigenerational workforce**: Questions asked were related to challenges individuals faced from other generations and the reasoning behind it. The following themes were identified- Proficiency level in technological skills, Values and belief system, Work ethics, Communication styles, and Perspective. Fig. 2. summarizes the number of responses collected from each generational group.

Total Sample (N=114)						
Challenges Identified	Baby Boomers		Generation X		Millennials	
	N= 15	% of Population	N = 48	% of Population	N= 51	% of Population
Values and Beliefs	2	13.3%	10	20.8%	7	13.7%
Perspective	5	33.3%	13	27.1%	21	41.2%
Work Ethic	4	26.6%	7	14.6%	3	5.8%
Communication Style	2	13.3%	11	23%	9	17.6%
Technological Skills	3	20%	8	16.6%	13	41.2%

Fig. 2. Challenges Faced when Working with Other Generations

Following comments were collected from these themes during the survey:

Value and Beliefs- For Baby Boomers, the main challenge was to understand the cultures of different generations. For Millennials, their upbringing was very different from other generations therefore their idea of right and wrong differ from others. And for Generation X, the problem faced was because of misinformation given to them about other generations via different channels

Perspective- Baby Boomers think that they have more knowledge and experience than the younger generation but the younger generation thinks that they are highly educated and therefore need things to go in their own way. Millennials believe that their education is more relevant to the current time period and hence, their knowledge is more relevant. And Generation X is getting difficult to comply with changes.

Work Ethics- Baby Boomers think that people their age are more hardworking and diligent because of their experience. They feel that the younger workforce is less productive and very lazy in terms of doing real work. Generation X believes that the younger generation tends to question every method

unnecessarily and older generation is very rigid

Author	Year	Work Values
	2005	Loyal and competitive workaholics
Crampton & Hodge	2007	Dedicated to work
Patota, Schwartz & Schwartz	2007	Feel entitled
Johnson & Lopes	2008	Rule challenging, team-oriented and value work

in their traditional ways.

Communication Style- Baby Boomers think that younger generations are not open and completely honest in their communication. Millennials believe that they are overpowered by older generations during their conversations. And Generation X believes that different generations use different ways of communication. Millennials use informal forms of communication. According to them, it is important to learn what kind of communication different situation demands and react accordingly.

Technological Skills- For Millennials it is hard to use technology with other generations. People they work with, go through a tough time in operating the same technology as them. And Generation X thinks that it is a challenging job to work with technologies and different generations at the same time. It is harder to work with older generations and younger generations think they know technology better than anyone.

• **Perceived Opportunities for the multigenerational workforce:** Questions were asked to understand what people gained while working with a diverse workforce and their reasoning behind it. The following themes were identified- Perspective, Reciprocal Mentoring, Knowledge, and Work Ethic. Fig. 3. summarizes the number of responses collected from each generational

Total Sample (N=114)						
Challenges Identified	Baby Boomers		Generation X		Millennials	
	N=15	% of Population	N=48	% of Population	N=51	% of Population
Knowledge	4	26.7%	18	37.5%	25	49%
Perspective	7	46.7%	25	52.1%	28	54.9%
Work Ethic	0	0%	3	6.3%	2	3.9%
Reciprocal Mentoring	5	33.3%	20	41.7%	14	27.5%

A study done by Namrita Rajput, University of Delhi (2019)

• **Work Values Among Different Generations**: A literature review on the basis of authors in different times is analyzed in Fig. 4.

Fig. 4.1. Work Values of Baby Boomers

Author	Year	Work Values
Lyons, 2005	2005	Self-sufficient, frolicsome & liberated
Crampton & Hodge	2007	Strive for work-life balance. Not as loyal as baby boomers. Open to career options.
Patota, Schwartz & Schwartz	2007	Knowledge about computers & joyful
Johnson & Lopes	2008	Switch between jobs to improve career

Fig. 4.2. Work Values of Generation X

Author	Year	Work Values
McNamara, 2005	2005	Hopeful, treats everyone equally & have a practical approach
Alch	2008	Indulgence is lesser than Generation X
Yeaton	2008	Independent, value balance between work and personal life

Fig. 4.3. Work Values of Generation Y

• **Work Motivators for Different Generations:** A literature review on the basis of authors in different times is analyzed in Fig. 5.

Author	Year	Work Motivators
Chen & Choi	2008	Motivated intellectually, selfless approach
Cennamo & Gardener	2008	Organizational status, extrinsic values
Leschinskey & Michael	2004	Benefits in terms of job security and pensions

Fig. 5.1. Work Motivators of Baby Boomers

Author	Year	Work Motivators
Ringer & Garma	2006	Motivated by intrinsic values
Leahy et. al.	2011	Motivated by intrinsic values
Lourdes et. al.	2011	Sense of accomplishment and work recognition
Shea	2012	Preference for intrinsic motivators

Fig. 5.2. Work Motivators of Generation X

Author	Year	Work Motivators
Ringer & Garma	2006	Motivated by extrinsic factors such as salary
Jang	2008	Emphasize on extrinsic factors
Leathy et. al.	2011	Both intrinsic and extrinsic factors act as motivators
Lourdes et. al.	2011	Prefer extrinsic factors like job-security and fixed working hours

Fig. 5.3. Work Motivators of Generation Y

- **Leadership styles preferred by different generations:** A literature review on the basis of authors in different times is analyzed in Fig. 6.

Fig. 6.1. Leadership Styles Preferred by Baby Boomers

Fig. 6.2. Leadership Styles Preferred by

Author	Year	Leadership Styles
Sessa, Kabacoff, Deal & Brown	2007	Prefer influencers as leaders
Murphy	2010	Participative style of leadership i.e. involvement around decision making is preferred.
Gursoy,D Maier T & Chi C G	2008	Authoritative leadership is preferred with a formal chain of commands

Author	Year	Leadership Styles
Sessa, Kabacoff, Deal & Brown	2007	Experienced leaders are preferred, capable of giving feedbacks
Hammillin, 2005	2005	Leaders who can provide immediate feedback are preferred

Generation X

Author	Year	Leadership Styles
Sessa, Kabacoff, Deal & Brown	2007	Prefer leader who personally cares about individual employees
Blom	2010	Intellectual stimulation preferred in leadership
Aslop	2008	Supporting nature preferred in terms of choosing a leader

Fig. 6.3. Leadership Styles Preferred by Generation Y

A study done by Faith Kariuki and Essi Rohula, JAMK University of Applied Sciences (June 2020)

Survey: consisting of 2 multiple choice questions with 3 comment boxes, 2 checkboxes and, a 1-star rating. The factors were to be

rated on a scale of one to five based on their importance. 83 responses were collected to provide information about demographics (Age and Gender) and Ideas of an Ideal employer. This survey also enabled us to understand respondent's fears, benefits, and their attitude towards company perks.

- **Demographics -** 44 of the respondents defined themselves as males and 38 as female. One respondent didn't want to disclose the gender which sums up the sample size to 83.

Distribution Factor	Number of Informants	Total % (N=83)
GENDER		
Male	44	53%
Female	38	45.8%
Do not want to mention	1	1.2%
AGE		
18-24	**55**	**66.3%**
25-36	**28**	**33.7%**

Fig. 7.1. Summary of Demographics

- **Ideal employer factor –** Respondents had a five-point rating scale from 1 to 5 where 1 represented, "Not important at all" and 5 represented, "Extremely important". After the survey arithmetic means were calculated. The majority of the respondents do not consider short term contracts as important. Entrepreneurial opportunities were found important by only 8% of the respondents. Almost 50% of the respondents find flexible hours important when thinking about their ideal employer. We see that 90% find teamwork valuable and 86% find abroad opportunities important. Whereas, self-supervision is valued by 95% of the sample population. A good salary is extremely important by almost 50% of the respondents and nearly all respondents give importance to a good work-life balance and the majority considers multicultural environment to be moderately important. Fig. 7.2 will summarise the data.

Fig.7.3 will compare millennials and Generation Z based on their arithmetic means of different factors. Generation Z prefers work-life balance slightly more than Millennials. Whereas, Millennials encourage and appreciate multigenerational workforce

	Slightly important	Moderately Important	Very Important	Extremely important	Arithmetic mean
Flexible Hours	12	26	40	4	3,4
Short-term contact	19	34	7	0	2,3
Work/travel Abroad	5	22	34	15	3,5
Teamwork	5	13	35	27	3,9
Self-supervision	5	22	43	13	3,8
Good salary	0	7	34	40	4,3
Work-life balance	0	5	23	54	4,6
Cultural environment	9	28	27	13	3,4
Long-term contract	15	26	26	7	4,1
Entrepreneurial opportunities	17	18	22	7	2,8

Fig 7.2. Ideal Employee Factors

	Millennials (28)	Generation Z (55)
Flexible Hours	3,6	3,3
Long-term contract	3,1	3,1
Short-term contract	2,3	2,4
Entrepreneurial Opportunities	2,9	2,7
Opportunities to work or travel abroad	3,5	3,6
Collaborative/Teamwork	4,1	3,9
Self- supervision	4,0	3,7
Good salary	4,4	4,3
Work-life balance	4,5	4,6
Multicultural environment	3,7	3,2

Fig. 7.3 Arithmetic Means for two Generations based on Factors

- **Fears-** This encompasses fears respondents have for their careers. Multiple-choice questions were given with various choices. While the majority of the sample population fears to have a bad supervisor, the global recession is still at the top. Fear of making a mistake was at the same level with family constraints and promotions. 13% of the population feared Artificial intelligence taking their place in professional workplaces. Fig. 8 will summarise the comparison of these fears for Millennials and Generation Z.

Answer choice	Millennials	Generation Z
Artificial Intelligence taking over their place	7% (2)	16% (9)
Family constraints	14% (4)	36% (20)
Bad supervisor	46% (13)	65% (36)
Not getting a promotion	36% (10)	27% (15)
Making a mistake	11% (3)	38% (21)
Stressful colleagues	39% (11)	56% (31)
Global recession	39% (11)	44% (24)
Other	14% (4)	15% (8)

Fig. 8. Comparison of Fears between two Generations

Summary Of Findings

In the study, we have discussed characteristics held by five generations and their perspective on challenges and benefits experienced with other generations. Employees need to be aware of the strengths different workforces have in their workplace. Multiple perspectives can provide diverse ways of solving organizational problems and also increases the creativity of teams. 27% of the Baby Boomers acknowledged work ethics as the second major challenge faced. 21% of Generation X identified beliefs and values as the second-largest challenge. They constantly feel stuck between two generations, Baby Boomers and the Millennials. 26% of the Millennials identified technological skills as the second-largest challenge in their workplace.

In terms of advantages, Baby Boomers and Generation X identified reciprocal mentoring as one of the key features in a multigenerational workforce. It is the ability of each generation to share unique experiences and knowledge with other generations in which they excel. Similarly, the majority of Millennials identified benefits of working with the older generation as the major advantage which includes providing value, stability, and experiential knowledge. Generation Z can

similarly benefit from older generations and provide their expertise in terms of new and fresh ideas and their global network. Each generation although faces challenge in terms of adapting this diverse working environment, they also identify various benefits which they can gain from different or each generation. This suggests that employees have a positive mind-set as they do find it possible to capitalize on these productive generational differences.

The research used also gives us insights into work values, leadership styles, and motivator factors appreciated by different generations at the workplace. Baby Boomers are very loyal to their organizations and appreciate job security and pension schemes more. Baby Boomers respect a formal chain of command and rules followed.

The Millennials have inclusive nature, realistic approach, and are very optimistic. For them, financial aspects like their pay range and bonuses matter more than any other generation. They need to be acknowledged and appreciated constantly by their leaders. Generation X values their work-life balance more than anything. They are very fun loving and independent. They can be easily motivated by factors like recognition and status in their workplace.

The research also shows managerial implications broadly of Millennials who will be future leaders and Generation X who will be Millennials colleagues. Generational differences these days demand that HR professionals to change, and create solutions to make these co-existing generations efficient. Since organizations have adopted the strategy of working in teams, each team comprises at least of two to three generations which would mean existence of generational similarities and differences. HR professionals in organization need to strategize in order to strike an organic balance and better management of human resources with minimal conflicts. Research also shows a lot of similarities in terms of satisfiers and dissatisfiers in different generations.

Conclusion and Recommendations

Based on the research and literature review following conclusions along with recommendations can be used:

• Educators can encourage students to learn about different generations and their characteristics to break any pre-set notions and stereotypes they might have. Stereotypes can limit their ability to truly embrace the unique skills provided by each generation

• Educators can also enlighten students about characteristics their generation holds so that it is easier for them to blend in as and when they joining their place of work. This will enable them to be self-aware and identify their own weaknesses and strengths

• Each generation has its own needs therefore, HR managers should highlight the values of each generation and how will they contribute to fulfilment of organizational goals.

• Pension schemes and security benefits should be made appropriately for Baby Boomers since it's a generation which has been very loyal and hardworking in the organization and is on the verge of retiring

• To keep Generation X motivated, they should be given an appropriate level of recognition and status in the organization. Similarly, Millennials should be provided with an environment of acceptability. Generation Z on the other hand requires the development of different skills and taking up new projects in a timely fashion.

• It is of utmost importance for HR managers to ensure that the employees in the organization are treated equally irrespective of their generations. This will ensure a reduced number of conflicts and a higher satisfaction level

• Each generation needs to be handled keeping in mind their unique characteristics. Therefore, leadership styles used in workplaces should be altered for each generation and then implemented.

• Nothing was stated more important than work-life balance and autonomy. Not even a global recession. The organization should provide employees with calculated autonomy and schemes to maintain a healthy work-life balance

• Lean concepts can be used as one of the ways to create a cohesive environment for different generations. It can be used as an opportunity to bridge the existing gaps in generations and create an environment of co-learning and co-operation to gain higher efficiency

• Employee engagement informal activities and events with different generations will allow the workforces to communicate which can result in breaking stereotypes and learning about unique characteristics each generation has

Limitations

The research could have been affected by generalized existing biases respondents held. The respondents with work experience may have had a pre-set notion about the topic and would have filled the survey accordingly. Generation Z is yet to join organizations therefore, they might have respondents imagining the ideal workplace environment that they are expecting.

Not every research that was conducted had a sample population comprising of different age groups, limiting the scope of understanding generational differences. There's a scarcity of previous research being done in recent times on this topic which was a challenge along with different researchers defining different timelines and definitions to each generation. It was a difficult task to find a common group by doing an extensive literature review.

One of the main limitations of this study is its sample size. A larger sample size would have provided with a more robust result and understanding.

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A RADICAL UPGRADE OF THE GAS GAIN MONITORING SYSTEM

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ABSTRACT

The Gas Gain Monitoring (GGM) system is a small cosmic ray tele- scope that relies on Resistive Plate Counters to ensure a stable operation of the Compact Muon Solenoid (CMS) RPC sub-system. The GGM was designed to deliver charge readout data whose stability is a function of the quality of the gas mixture, common between the GGM and the CMS RPC sub-system. After nearly a decade of operations, the GGM DAQ and analysis routine have been upgraded to increase performance, reduce downtime, and improve long-term maintenance. The new DAQ features a standalone C++ software, modular and configurable at runtime; the analysis package is based on ROOT6 while the data quality monitoring is achieved via a Python-based local webserver. The software system is interfaced to a new PCI-Express optical card that reads a VME Controller and a QDC connected to the cosmic ray telescope. Technical details about the upgraded GGM and the developed general-purpose DAQ are hereby described

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Keywords:

Introduction

During 2021 the Gas Gain Monitoring (GGM)[3] system has seen a complete software and hardware redesign. The new system, GGM++ replaces the old one improving performance, stability and general reliability. The GGM++ is a cosmic ray telescope, based on small 12 RPC detectors[2] whose working point is continuously monitored online. The monitoring is achieved by reading the charge induced by cosmic muons on copper readout pads[5]. The muon signal is amplified by RPCs flown with the same gas mixture that is supplying the CMS RPC Muon system[1]. By doing so, any shift in working point measured by the GGM++ can be correlated to a wrong or contaminated gas mixture, triggering an alarm to the entire Muon system.

Figure 1 shows the general overview and implementation of the different technologies and software involved in the system. The following sections de- scribes the different parts, tasks and roles.
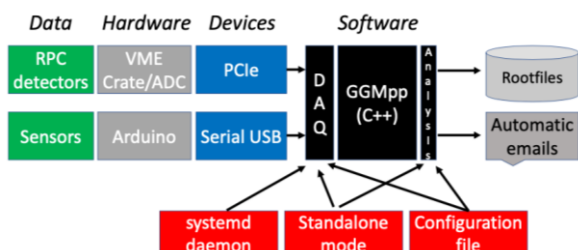
Figure 1: The GGM++ layout

Hardware setup and devices

Out of the 12 RPC, 4 form the trigger, in a majority system 3/4. The remaining 8 RPCs are organized in 3 sets. One set of (two) RPC detectors flown with fresh gas mixture and two sets of RPC detectors flown with the CMS RPC closed loop gas mixture[6], one set is using the recirculated gas before purifiers and the other set the gas mixture after the purifiers[4]. The 8 RPCs are supplied with a CAEN High Voltage system, read by a CAEN V965 charge sensitive ADC, and monitored in terms of gas pressure (in/out), gas temperature (in/out) and ambient conditions. The GGM++ features a new Arduino-based system that interfaces with pressure and temperature sensors. Each RPC gap is equipped with two temperature/pressure sensors at the gas inlet/outlet. Two Arduino MEGA collect all sensors data, transferred via serial line to a new DAQ computer.

In the GGM++, the DAQ computer got upgraded to a quad-core Xeon with a PCI-express fiber optics card, connected to the VME crate (where the ADC is installed). The operating system adopted by CMS is CentOS 7.6 and the machine is protected by the private CMS network, reachable from CERN online cluster (lxplus).

Software infrastructure

The GGM++ software[1] is mounted on NFS (and so the collected data) and is fully compiled with C++. In addition, the software makes use of several libraries among which ROOT6 and XDAQ for prompt analysis and data-retrieval/storage from/to the CMS Online database. Arduino is also used to interrogate the hard- ware sensors the RPC are equipped with. A dedicated Linux built-in process that belong to the family of "systemd daemon" powers up the GGM++ at boot. The systemd process can be controlled with the built-in Linux systemctl as the GGM++ systemd daemon provides common commands (such as start, restart and stop) as shown below:

$ systemctl −l status ggm. service
$ systemctl −l stop ggm. service
$ systemctl −l start ggm. Service

Alternatively (to systemd) and/or for debugging reasons, the GGM++ can run in standalone mode so that the user can program the system to print a number of verbose printouts to monitor the status of the data-taking. Another use case for the standalone mode is the GGM++ High Voltage Scan. A dedicated bash script runs the standalone GGM++ after increasing the HV on the RPC detectors in programmable steps. The HV is being written by the DAQ into WinCC data-points, that eventually set the CAEN Hardware Mainframe to the desired HV value. In standalone mode the GGM++ executable runs simply by:

$. / GGMpp

The system accepts two parameters as displayed by the helper function:

$ ./GGMpp−h

The first option (-a) instruct the GGM++ to re-analyze an already existing run (rootfile) and possibly to regenerate plots and new results. The second option (-c) specifies a configuration file to be used (without option the standard config file might be used).

$ ./GGMpp−a $ ./GGMpp−c

A major feature that GGM++ introduces is the above mentioned configuration file (ASCII) that is fully customizable at runtime to provide a high level of customizability and programmability. The config file is programmed to get a very large number of input variables to enable/disable and/or adjust specific feature of the system. Appendix A shows a sample config file of the GGM++.

The first part of the file is about [daq] related fields, such as enable/dis- able the QCD and/or the Arduino and set the working mode: Physics (real data from detectors), Montecarlo (simulated data for debugging, tests and trials). The system can send emails, to a specified address, attaching plots and/or ROOT files as indicated in the configuration file. The QDC address, link, VME controller address and number of events control how the acquisition system will perform. The Filename prefix, suffix, data folder and location deal with how and where output files will be saved. Lastly the HVmode can be set to off (do not care about HV), xdaq (use xdaq to send a SOAP message to WinCC and retrieve the HV), config (read statically the HV in the config file).

The [adc] section programs the QCD in terms of the board version (8 vs 16 channels), number of expected working channels and comparator current adjustable register.

The [verbose] section allows to print out various helper functions and hex/raw/bi- nary data to visualize event by event the structure of the header, payload and trailer.

The [pulser] section operates on the CAEN VME Controller that has the built-in functionalities of programming output signals with pulses. Such pulser can be enabled/disabled and set to start with a specified polarity, period, width.

The [XDAQ] section declares variables needed by the GGM++ to internally utilize XDAQ scripts to read/write into WinCC datapoints. XDAQ_Get and XDAQ_Set scripts locations store those scripts while DCS and PSX machine link to computers that handle the CMS control system and the XDAQ exchange data respectively.

The [analysis] section provides a way to perform automatic analysis with a great level of adjusting variables and style. The first setting "QuickHisto" sets which plots are required to be generated; the ADC has two working ranges (low and high), so the user can select low/high or both or off. The "spy-channel" number refers to a specific QDC input saturated with a large NIM signal. This saturation does not happen in coincidence with

the trigger but after 9us, effectively forming a second gate[7]. The spy-channel setting is effective only if the "RemovePed" setting is enabled, this setting allows reading the second gate and identify the pedestal of all channels. The remaining settings set the min/-max/binning of all the histograms and control the fit (enable/disable) range and binning. The pedestal average and sigma are statically written in the config file to deal with situations where the second gate is not enabled and the user intents to fit the pedestal.

The [hv] section is used to statically save the HV values, written in the config file, into the DAQ output ROOT file. This feature is used when the previous setting "HvMode" is set to config (rather than set to xdaq).

The last section [Arduinos] contains calibrations for each sensors attached 4 to each of the 16 ports of the two Arduino used (denoted with 1_ and 2_). The _cal value multiplies the raw reading (mV) while the _offset value adds an offset.

Conclusions

The GGM++ development is finalized, and in production; the system is taking- data and delivering its objective. The described system is going to play a central role during the next phase of CMS data-taking, the automatic GGM++ features will ease the usability and allow the shifter to act quickly in case of problems.

Appendices

A Master Configuration File
DaqEnable = true   ;QDC yes/no
arduinoEnable = true   ;Read Arduino boards
DaqMode = Physics   ;This can be: Physics/Montecarlo
PulserEnable = false   ;Pulser yes/no
SendMail = true
        ;Send summary email
SendROOT = true
        ;Attach rootfiles to the email
Recipient = stefano.colafranceschi@emu.edu ;Send to this address

VMEcontroller = V2718
        ;Type of VME controller (V2718/V1718)
Events = 10000
        ;Number of events per run
BoardAddress = 0xEE000000   ;Physical address set in the board
Board = 0   ;Board ID
Link = 0   ;Board Link
DataFolder = /ggmdata/DATA/   ;Folder where to write data
FileNamePrefix = sgx5_
        ;Output filename prefix
FileNameSuffix = trial_
        ;Output filename suffix
RootFile = true
        ;Writes rawdata into a rootfile (TTree)
NumberOfRuns = 1   ;If zero, it will run forever ;-)
HvMode = xdaq
        ;Can be set: config/xdaq/off

[adc]
ADCboard = 965
        ;Supported Boards 965/965a
ExpWorkingChannels = 24
        ;Min Number of working channels
NotFound = 666
        ;Bad channel value
IPED = 255
        ;Comparator current

[verbose]
Info = true   ;Print DAQ info
EventMonitor = 100   ;Print a message every N events
ConfigurationPrint = true   ;Print this configuration file
RawPrint = false   ;Switch on/off the following prints
HeaderHexPrint = true   ;Print raw hex strings
PayloadHexPrint = true
        ;Print raw hex strings
EOBHexPrint = true   ;Print raw hex strings
PrintDataFile = true   ;Print the datafile being written
PrintHV = true
        ;Print the HV

[pulser]
PulserEnable = false
          ;Enable/Disable the pulser
Start = 0   ;0=software,
1=LEMO_INPUT1
Pulser = 0
          ;Configuring the PulserA
Polarity = 1
          ;0=positive, 1=negative
Output = 0   ;Pulser
Output is LEMO=0
Period = 10
          ;Expressed in time units
Width = 1   ;Expressed
in time units
TimeUnit = 3
          ;0->25   ns,1->1600ns,2->410us,3-
>104ms
NumberOfPulses = 0   ;Infinite
pulses

[XDAQ]
DCSmachine = cms_rpc_dcs_1
          ;PVSS DCS machine
XDAQ_GetScript   =   /opt/xdaq/bin/dpGet.sh
          ;GetDatapoint XDAQ
XDAQ_SetScript   =   /opt/xdaq/bin/dpSet.sh
;SetDatapoint XDAQ
SendToPVSS = true
          ;Datapoint Write
PSXmachine   =   http://kvm-s3562-1-ip151-
97.cms:9924/urn:xdaq-application:lid=30

[analysis]
QuickHisto = low
          ;It can be low/high/both/off ranges
SpyChannel = 10   ;Saturated
channel (second gate)
RemovePed = yes
HistoFolder   =   /ggmdata/DATA/temp/
;Histograms folder
HistoBinningL = 600   ;Histogram
binning of low range
HistoBinningH = 100   ;Histogram
binning of high range
HistoMinL = 200
          ;Histogram min value low rage
HistoMaxL = 1800
          ;Histogram max value low rage
HistoMinH = 0
          ;Histogram min value high rage

HistoMaxH = 2095
          ;Histogram max value high rage

Fit = true
          ;Toggle the fit
FitRange = 1   ;H
FitLandauMin = 200
          ;Avalanche min window
FitLandauMax = 1000
          ;Avalanche max window
FitLandauBins = 200   ;Avalanche
bins (for fit)
FitGausMin = 1100   ;Streamer
min window
FitGausMax = 3000   ;Streamer
max windows
FitGausBins = 200
          ;Avalanche bins (for fit)

PedAvg2 = 600.4
          ;Ped Average ch2
PedSigma2 = 3.6
          ;Ped Sigma ch2
PedAvg3 = 464.0
          ;Ped Average ch3
PedSigma3 = 4.5
          ;Ped Sigma ch3
PedAvg4 = 332.6
          ;Ped Average ch4
PedSigma4 = 0.9
          ;Ped Sigma ch4
PedAvg5 = 468.6
          ;Ped Average ch5
PedSigma5 = 3.4
          ;Ped Sigma ch5
PedAvg6 = 272.5
          ;Ped Average ch6
PedSigma6 = 3.2
          ;Ped Sigma ch6
PedAvg7 = 241.4second trigger with the ped
          ;Ped Average ch7
PedSigma7 = 3.5
          ;Ped Sigma ch7
PedAvg8 = 458.2
          ;Ped Average ch8
PedSigma8 = 3.8
          ;Ped Sigma ch8
PedAvg9 = 390.0
          ;Ped Average ch9
PedSigma9 = 5.5
          ;Ped Sigma ch9

[hv]
channel0 = 0
channel1 = 1
channel2 = 2
channel3 = 3
channel4 = 4
channel5 = 5
channel6 = 6
channel7 = 7
channel8 = 8

[Arduinos]
1_analog0_cal = 1
          ;Arduino calibration
1_analog0_offset = 1
          ;Arduino calibration (offset)
1_analog1_cal = 1
          ;Arduino calibration
1_analog1_offset = 1
          ;Arduino calibration (offset)
1_analog2_cal = 1
          ;Arduino calibration
1_analog2_offset = 1
          ;Arduino calibration (offset)
1_analog3_cal = 1
          ;Arduino calibration
1_analog3_offset = 1
          ;Arduino calibration (offset)
1_analog4_cal = 1
          ;Arduino calibration
1_analog4_offset = 1
          ;Arduino calibration (offset)
1_analog5_cal = 1
          ;Arduino calibration
1_analog5_offset = 1
          ;Arduino calibration (offset)
1_analog6_cal = 1
          ;Arduino calibration
1_analog6_offset = 1
          ;Arduino calibration (offset)
1_analog7_cal = 1
          ;Arduino calibration
1_analog7_offset = 1
          ;Arduino calibration (offset)
1_analog8_cal = 1
          ;Arduino calibration
1_analog8_offset = 1
          ;Arduino calibration (offset)
1_analog9_cal = 1
          ;Arduino calibration
1_analog9_offset = 1
          ;Arduino calibration (offset)

1_analog10_cal = 1
          ;Arduino calibration
1_analog10_offset = 1
          ;Arduino calibration (offset)
1_analog11_cal = 1
          ;Arduino calibration
1_analog11_offset = 1
          ;Arduino calibration (offset)
1_analog12_cal = 1
          ;Arduino calibration
1_analog12_offset = 1
          ;Arduino calibration (offset)
1_analog13_cal = 1
          ;Arduino calibration
1_analog13_offset = 1
          ;Arduino calibration (offset)
1_analog14_cal = 1
          ;Arduino calibration
1_analog14_offset = 1
          ;Arduino calibration (offset)
1_analog15_cal = 1
          ;Arduino calibration
1_analog15_offset = 1
          ;Arduino calibration (offset)

2_analog0_cal = 1
          ;Arduino calibration
2_analog0_offset = 1
          ;Arduino calibration (offset)
2_analog2_cal = 1
          ;Arduino calibration
2_analog2_offset = 1
          ;Arduino calibration (offset)
2_analog2_cal = 1
          ;Arduino calibration
2_analog2_offset = 1
          ;Arduino calibration (offset)
2_analog3_cal = 1
          ;Arduino calibration
2_analog3_offset = 1
          ;Arduino calibration (offset)
2_analog4_cal = 1
          ;Arduino calibration
2_analog4_offset = 1
          ;Arduino calibration (offset)
2_analog5_cal = 1
          ;Arduino calibration
2_analog5_offset = 1
          ;Arduino calibration (offset)
2_analog6_cal = 1
          ;Arduino calibration

2_analog6_offset = 1
      ;Arduino calibration (offset)
2_analog7_cal = 1
      ;Arduino calibration
2_analog7_offset = 1
      ;Arduino calibration (offset)
2_analog8_cal = 1
      ;Arduino calibration
2_analog8_offset = 1
      ;Arduino calibration (offset)
2_analog9_cal = 1
      ;Arduino calibration
2_analog9_offset = 1
      ;Arduino calibration (offset)
2_analog10_cal = 1
      ;Arduino calibration
2_analog10_offset = 1
      ;Arduino calibration (offset)
2_analog12_cal = 1
      ;Arduino calibration

2_analog12_offset = 1
      ;Arduino calibration (offset)
2_analog12_cal = 1
      ;Arduino calibration
2_analog12_offset = 1
      ;Arduino calibration (offset)
2_analog13_cal = 1
      ;Arduino calibration
2_analog13_offset = 1
      ;Arduino calibration (offset)
2_analog14_cal = 1
      ;Arduino calibration
2_analog14_offset = 1
      ;Arduino calibration (offset)
2_analog15_cal = 1
      ;Arduino calibration
2_analog15_offset = 1
      ;Arduino calibration (offset)

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INLAND WATERWAYS: ADOPTION OF PUBLIC PRIVATE PARTNERSHIP MODEL IN KERALA

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ABSTRACT

there is a humongous economic opportunity that is untapped in the inland waterways of India.   "Its all because of the need they feel for transformation into a profitable project and along with that the most promising one in the country. And that does not seem like a far-off dream because of a very vast and extensive waterways of India, with 14,000 kilometres of length. Beside the upside of colossal extent there are many rives that flow through the country and the network of tributaries that these rivers possess itself is beyond imagination. There are twelve major rivers (waterways) like Indus, Ganges, Brahmaputra, Godavari and so on and its interconnected branches have high potential to continue inland waterways situation. In an enormous size, they could expand the political, monetary, social, worldwide, and correspondence requests of the residents alongside different focal points that are characteristic."
"For India creating waterways give different advantages like improving the business, to a great extent the formation of occupations, higher income and salary for government including private players as well into it, adding to the transportation needs of the individuals, giving an intend to bringing exchange and trade up in India. The paper is inclined towards growing the inland waterways arrangement of the Kerala by means of by receiving a Public Private Partnership structure and financing decision and to upgrade.".

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Introduction

The organization responsible for the waterways of the nation is the "Inland Waterways Authority of India. It was set up after the Inland Waterways Authority Act in 1985. Following this present office's usage different stretches that are economically and significant were distinguished and proposed government waterways that had the capability of upgrading the state's transportation. The National Waterway 1 includes : "Varanasi- - Haldia stretch of the Ganges- - Bhagirathi- - Hooghly" stream framework utilizing a time of 1620km. National Waterway 2: "Sadiya – Dhubri" stretch with load development of 2 million tons utilizing a time of 891km of Brahmaputra stream framework. National Waterway 3: "Kozhikode-Kollam" stretch of Champakara, West Coast and Udyogmandal the distance of 205 km and a million ton load development. National Waterway 4: "Kakinada-Puducherry stretch of channels and the Kaluvelly Tank, Bhadrachalam - Rajahmundry stretch of River Godavari and Wazirabad - Vijayawada stretch of River Krishna with a time of 1095km. National Waterway" 5: "Talcher- - Dhamra stretch of the Brahmani River, the Geonkhali - Charbatia stretch of the East Coast Canal, the Charbatia- - Dhamra stretch of Matai stream alongside the Mangalgadi - Paradip stretch of

the Mahanadi River Delta with a length of 623km." "National Waterway 6: In Assam, Lakhimpur into Bhanga of stream Barak with the length of 121 Km.""
The waterways 3 include majority of the kerala costal regulatory zones which makes IWAI the commoner in the territory. The channel length of 2m must be maintained by the IWAI. The major cargo development in Kerala happens in the IWAI developed cargo transportation area that is in the wellington island that is from Kochi to Alapuzha stretch. "IWAI has bought and keep up digging vessels under the purview of Ministry of Shipping making the vent channels close to that locale out of the extent of IWAI and Wellington island comes. The Iwai have provided instruments, for example, buoys from the territory making twenty-hour route conceivable. IWAI additionally discharges navigational diagrams and chart books to peruse the boat and pontoon officers. The non existence of a tributary to kollam has crippled the national waterways to end with kotappuramallapuzha stretch. There is always a high chance that the waterways 3 can be developed to such an extent that if its not for the disputes and territory related issues the whole waterways could be main trade route for the transportation of goods through different parts of Kerala as well as the whole India. Commodities like coir and other things could

reach different parts of India as well as Kerala if the disputes are settled."

1.1 The role of inland waterways in Ernakulam
The business capital of kerala is located in the shore of Arabian sea known for its famous trade contacts with Arabian countries. Ernakulam is surrounded by thrissur on the northern side and idukki at its east and towards its south by kottayam and Alappuzha. "It was known through out the history for its famous spice trade with the world and it has many heritage sites to its name for example the place where the disciple of jesus saint Thomas set his foot in india. So the place has a good background of trade and things. The city of Ernakulam is blessed naturally with a great climate good rains and most importantly a sea trade route which was more famous than the silk route from the chinese. In the present day it has all the amenities needed for a metro city like a port at its disposal and an international airport that can connect to major cities in india as well as the super cities of the world. The city of kochi has many sites which has proofs that directly lead to the trade that happed with the rome and china even the fishing nets used in the old city of kochi is from china or known locally as chinese fishing nets."

About 1.5 lack city explorer trips was conducted in the city of ernakulam during the year 2008 this was published by NATPAC and it shows the basic frame work of transportation and traffic management of the city – seventy percentage of the goods transported in the city depends on open good transport either its water based or land based, which shows us a huge area of improvement of the open transportation. Due to the high demand in recent years the government introduced a metro rail facility and its because of this facility that there is a lower level of conjunction on the narrow roads of the city, there are existing railway lines in the city that have seven major stations inside the city itself and many plans have been laid to increase the number of stations as well . but the major concern is the growing population in the city that is still a majority of the population uses private vehicles and two wheelers for commuting through the city . and there are places which is far of from the metro or the rail lines that are part of the city and major mass transportation methods are not present also There is at any rate no mass transportation system in Kochi city at present. These places include the once a trade capital inside kochi which is mattanchery and fort kochi. While developing a plan these areas must be considered in order for a better transportation system and last mile connectivity plays a major role in people using the mass transportation systems. But now comes a set back in terms of covid-19 as the people are now more inclined in taking there ownvechile for there daily commute rather than using public transport, this has hampered the performance and balance sheet of many companies and many last mile connectivity providers like uberola etc." If such notion gets feeded into people then most of them will start buying cars and bikes and the already congested roads will run more congested and the public transportation would fail miserably.

We can see that kochi is a blessed area in the country and in the sate as it has around 1100 km of waterways that are accessible. But only 4 percentage of this is accessible to speed boats as there "I a regulation by IWAI that at least 2m width must be there so that it can come under waterways that can be navigated and there are many other reasons for the depleting or rotting away of water ways in a city that is abundant In waterways network and the main example is the bridge constructed in goshree which was an island and it dependent on waterways for its connectivity but today because of the bridge there and the last mile connectivity provided by the road ways people are not interested in the waterways any more. There where a wide range of waterways transportation that was available under the inland waterways but this saw a steep decline as the people are less and less interested over the years. The KSWTD (kerala state water transport departnment) used to run a huge fleet of boats for people and over the years due to the slow travel and increased road connectivity people are not taking up this mode of transport ,so now they are KSINC(kerala state inland navigation corporation) taking there business out of this people moving business and focusing majorly on good transportation and supplying water to remote locations." This could only see an improvement if private

parties are allowed to participate in the process and hence there could be some development.

Literature Review

India introduced PPP model in 2018. Experts were called to design a ppp model and make it work and to take care of the proposal in a flexible manner, SAPEL will take care of the GR Jetty-I and BISN will take care of "Universal Finance Corporation (IFC) embraced the financial organizing. SAPEL will deal with the O&M administrations in Kolkata just as the Pune bunch. The administrator will likewise contribute in freight and compartment taking care of hardware and warehousing. Work, talented specialists, administrative and administrative staff will likewise be given by SAPEL to the ideal execution in the terminals. The current capability of stay freight is of 56,000 TEUs and will increment up to 2,50,000 TEUs inside the coming 15 years. The current office is of mass and break freight with a limit of 1.6 MT. The concession time frame is of 30 years. The offering procedure was done through a worldwide offering process and the agreement was granted to M/s SAPEL in August,2017. As per the income sharing model 61.70% will be of SAPEL and 38.30% will be given to IWAI. Private segment contribution in working and dealing with the offices will upgrade the breakwaters operational effectiveness. The Kolkata terminals will likewise encourage household and EXIM freight for the North-Eastern district and Bangladesh," as it will be profitable for Indo-Bangladesh shippers.

The Department of State Water Transport of Kerala works traveling boats from Ernakulam wharfs to Vypeen,Fort Kochi, Mulavukadu, "Willingdon Island and Mattancherry. Every day about fifty-nine organizations from the Ernakulam dock are operating. Most of the vessels being employed are steel watercrafts built in Kannur from a private barge building association. Two or three groups, using old wooden watercrafts, are also operating. In a way of speaking, the steel vessels have a seating break point of one hundred. Multiple and half events which number container for space on the watercraft during apex hours, according to KSWTD staff. No under-five staff is required for exercises on any boat. This social event of five is included one shrank at the planning wheel, one man at the gearbox, and three more to engage the vessel to appear at the wharf and enable the explorers to skip on and off the watercraft." The run of the mill month to month assortment from the development of the vessel associations has been around a languishing 8 lakh rupees over as long as five years as indicated by the KSWTD regular office working at the Ernakulam watercraft dock.

The division has not yet could change the benefits of asserting a prime land group in the focal point of Ernakulam's CBD where its typical office is found. The Administrator of the working environment, Mr. Joseph Xavier exhibited that several proposals had been sent to the administering body for development of a multi-isolated center point and shopping complex so as to help interface the setbacks acknowledged by the working environment towards working the difficulty making watercraft associations"

Mixing KINCO (Kerala Inland Navigation Corporation) and KSC (Kerala Shipping Organization) established the KSINC (Kerala Distribution and Inland Navigation Corporation) in 1974. "Their aims are to set up, sustain and operate organizations to deliver and buy, support, contract, build pontoons, big hauliers And various vessels, to create, maintain and operate transport organizations for product vehicles and passengers in inland water in the region of Kerala or elsewhere, to manage, organize, arrange and supervise workshops in the domain of Kerala or elsewhere,to set up shops, organize stations for setting up and maintaining marine vessels, to set up, set up, maintain and directly examine and get ready. Fittingly, they are secured with the transportation of mass harsh materials, oil-based things and water payload through inland waters. They were likewise attracted with the docking and fix of marine vessels other than progress of steel and wooden masterpieces. Till beginning late, KSINC moreover worked traveler transport benefits in KCR and was a contender to KSWTD worked watercrafts. Notwithstanding, mounting difficulties induced KSINC to pull again from the part and the fiber-watercrafts were exchanged on government sales to KSWTD which neglect to utilize their associations alluding to security concerns. Beginning at now, KSINC in like way works venture ships for travelers and is in talks with Kerala KTDC (The Kerala Tourism Development Corporation) to dispatch more bundles

Research Methodology

The study begins with setting the context of the city followed by review of planning initiatives in the region. "This is done with the purpose of understanding how the water transportation sector has been perceived in the past and what direction has it been offered by planners. A review of the various policies concerning water transportation throws light on the incentives offered to the sector from the policymakers over the years and the possible voids due to which the sector has failed to take-off as expected. Stakeholders in the field of water transportation have been identified and their views have been recorded in order to understand the perceived failures of the state with respect to the sector. Their roles have Study on Inland Water Transportation in Kochi City Region Centre for Public Policy Research Page 7 been outlined in detailed and issues have been brought forward as a result of this exercise. A major part of this study consisted of seeking public perception about the ferry service in Kochi. This was sought to be achieved through focus group discussion, interaction with passenger associations and primary survey with a hundred samples spread across various sectors on which the ferry services operate. The questionnaire for the primary survey was prepared with due diligence and after the preliminary questionnaire was put through several rounds of testing and pilot surveys. The inputs gathered from these were then used to bring in more objectivity and several questions were modified to suit the profile of the interviewees. The final questionnaire had questions which enabled the collection of data regarding the age, income, occupation, origin, destination, last-mile travel modes, frequency of travel,problems, suggestions for improvement and willingness to pay for improved services among others (Refer Annexure-A). The sample size was set as one hundred and these were identified as a

geographically spread sample based upon the recorded passenger traffic at various jetties (Refer Item no. 6, Annexure-B). Field-work was done in the months of May and June 2012 by the author. Detailed analysis of the results of this survey helped formulate suggestions for the various stakeholders in order to bring the water transportation sector back into the prominence it deserves in transportation realm of Kochi." This is the output of this academic exercise.

Results and Analysis

One of the significant issues looked by the explorers in is the issue of responsiveness to the canal boat bank. "Since the Ernakulam wharf relies upon recovered land, even a slight deluge realizes slush and mud. Additionally, the way from the standard street to the wharf isn't all around laid with different blocks and pointless estimation contrasts thinking about which ladies and senior occupants envision that its irregular to achieve the breakwater. The nonappearance of lighting and the closeness of wall in the territory utilizes the wharf incomprehensible of during the night. The components of tidiness in the ocean divider are sad with immaterial assistance and upkeep. There are grumblings of the staff proceeding discourteously with the explorers on different events. The getting out of treks taking into account unexplained reasons is a standard part and is a smear on the steadfastness of the vessel association. Despite the accessibility of enough space, no plans have been made for the ending or open comforts. The tremendous extent of floor a territory accessible inside the watercraft boundary itself has not been used really. Electrical fittings are fundamentally namesake and don't go after all things considered days. The distinction about the obligation with respect to working between two government divisions is alluded to as the possible explanation behind the carelessness towards the wharf. The nonappearance of enough watercrafts particularly during summit hours is another plaint the wayfarers have against the vessel association. Essentially, the tremendous delays between associations during off-top hours cripple individuals from utilizing the vessel. The low idea of wharfs at Fortification Kochi and Vypeen are a noteworthy reason behind worry with explicit affiliations ascribing the explanation behind the excusal as state laziness towards the less fortunate segments of the general populace.

Travelers to Mattancherry face issues of silting a noteworthy piece of the time thinking about which the vessels can't be passed on close to the ocean divider. No strategies have been taken to guarantee standard tunneling of the Mattancherry dock zone. The customary pilgrim would perceive whether the pros were to improve the possibility of association transport whether it was at a somewhat more conspicuous expense than at present.

The Innovation utilized in the vehicle structure is in like way sufficient. There were different circumstances where the watercraft or the vessel disconnected during the development causing free for all and stress among the clients. The vessels have wound up being old inciting a colossal excitement for the part to resuscitate the water transport in Kerala. The essential for revealing and keeping the channels is likewise a fundamental issue. There is a bit of enlargement for the development business in Kerala water transport which is at present being misused by obfuscated visit directors in which a critical degree doesn't have the permit to do in that limit."

Subsequently, while cost measures are set up for the improvement by transport, the expense of last mile framework should correspondingly be addressed. Since the improvement cost by conductors is commonly less and just a constrained amount of the all out cash spent towards spreading in the course of the last mile opening." Another essential factor is the accessibility of access to feeder structures from the vessel station without getting acquainted with the pieces of air. Multi-reason coordination and joining is as such a basic factor.

Business possibility: "The business reasonableness of the IWT depends colossally upon the obvious focal centers that utilizing the conductors has on trade modes accessible to the clients. Inside KCR, there are clear central purposes of utilizing the channels since there is a trademark orchestrate iron instance of directors. Hence and geological confinements for roads, travel by courses works out to be less mentioning and thusly ideal for the run of the mill client. As found in the table, the advancement secludes between different fundamental place focuses are far lesser by techniques for channels than roads. For

instance, the parcel among Vallarpadom and Fortress Kochi is around various events more by street than by courses." This unavoidable extraordinary circumstance of courses over street transport can be utilized to pull in the street clients to utilize channels for adaptability and transportation of item.

The expense of progress of courses is tolerably lesser than that required for the progress of street or rail structure. "Studies have instigated that progress of courses takes just around 10% of the cost required to make boulevards. Correspondingly, the costs related with assistance for courses is basically around 20% of that required for roads. To the degree ability of transportation, it has been discovered that IWT is positively more eco-obliging than transportation by avenues or railroads. One liter of fuel can move 24 ton-km of weight by street, 85 ton-km by rail and 105 ton-km by conductors. This expect considerably more significance in the wake of economy and condition focuses on that deal with the general visit on transportation right now. Considering the way that land getting is a dull undertaking in Kerala, the criticalness of utilizing the IWT recognize basically greater mass. Through point by point checks, it has been set up that the expense of making IWT in KCR would take around 434 crore rupees, considering a tunneling cost of two lakh rupees for each thousand cubic meters."

The key learnings from an overview composed by the More noteworthy Cochin Advancement Authority are the Inland Water structure anticipate a fundamental action in the bit by bit lives of office goers and understudies, individuals nearest to the flatboat wharfs are well on the way to profit the associations of the pontoon structure, the less fortunate zones of the individuals rely on the pontoon benefits the most, "significant inspiration for transport clients is that it invigorates them spare time and is reasonable, the vehicle clients are not enthusiastic about the possibility of their drive, the interviewees feel that the rehash of associations on two or three parts is awfully insufficient, the vehicle association needs to redesign checks of cleanliness, tireless quality and responsiveness to hold the momentum client collecting and pull in new explorers, the on-board ride quality and picture of the

pontoon vessel should be improved amazingly to pull in new explorers, the vehicle clients are on edge to pay as much as twofold the ebb and flow affirmations in-lieu of a basic improvement in the quality and estimations of association development. This shows there is a closeness of eagerness for the associations for a particularly masterminded and reasonably working inland course framework.The model can be executed by the Kerala Delivery and Inland Route Partnership (KSNIC) with the help of GCDA, Cochin Port Trust, etc. return on introductory capital speculation should be floated to lead studies and assessments and in the further system RFPs should be skimmed. The help of the channels, for instance, burrowing can be grasped by the and other ocean upkeep can be endeavored by the position itself as a result of the biological clearances required or can give the concessionaire the clearances and other land acquisitions. The sort of PPP model to use is to be picked after examinations and separating pre-reasonableness reports, for instance, Specialized chance, Operational Practicality, Monetary Achievability, Condition Possibility and Social Plausibility. An Advisor is to be named to look at the assignment and produce the chance reports. Fitting investigation is to be done so the perfect PPP model is picked."The Award or the achievability gap sponsoring if essential, can be outfitted with Center's or State's distributed spending plan or and other ULB's.

The financing can be given by the organization structure advancing foundations, for instance, India Framework Loaning Organization (IIFCL) with the help of the force. The concessionaire should be truth be told and monetarily immaculate to do the endeavor capably. The authority can give out tenders for different sections, for instance, Traveler, Products and The travel industry or give a comparable consent to have more control in the checking some bit of the endeavors.

A Unique Reason vehicle should be made with the social events related with independent stakes. "With the relationship of Bound together Metropolitan Vehicle Authority, feeder organizations can be obliged the voyagers similarly as items. This will help in the Point to point organization of the inland

conduits. Reclamation of the current organizations should be moreover a need to extend the breaking point. Concession period should be adequately long with the objective that the authoritative laborer should have the alternative to achieve its net income and the authority should be set up to grasp the exercises. Cross enrichments can be obliged the explorers and fixed seats can be obliged the visit directors for the voyager and the movement business regions. Procedure mediations and Appropriate organization should be arranged with the help of the force, for instance, the Indian Conduits Authority of India and State government."Most outrageous utilization of the courses of action and exercises of the National Urban Vehicle methodology and the Indian Water Transport Strategy.

From the examination, distinctive PPP models that are pertinent for this sort of undertaking will be as referenced underneath.

EPC: "EPC speaks to Designing, Acquisition, Development and is a perceptible kind of contracting understanding in the advancement business. The structure and improvement transitory laborer will do the quick and dirty planning plan of the endeavor, get all the apparatus and materials significant, and a while later form to pass on a working office or bit of leeway for their clients. Associations that pass on EPC Ventures are by and large implied as EPC Temporary workers. An EPC model was conceded before in the year 2016 by Kerala Government to interface Kochi and Kozhikode by two hydrofoil boats by a Greek association. Despite the fact that the endeavor is under scrutiny right now it was a vital turning point in the PPP models in Inland Route."

SOM: "SOM speaks to effortlessly, work and manage. It is the PPP model endeavored by the IWAI for the endeavors of Kolkata terminals allowed to the association SOPEL. In SOM the legally binding specialist supplies the materials and workplaces required for the endeavor. After the foundation of the endeavor the authoritative laborer has the benefit to work and manage the errand with a creation conferring consent to the force. It can either be an Income sharing understanding or an advantage sharing understanding."

BOT: "BOT speaks to collect, work and move. In BOT the impermanent laborer conceded the endeavor needs to amass the endeavor and thereafter has the benefit to work the assignment for a predefined concession period. During the concession time period, it could possibly be with a creation offering consent to the governing body. After the completion of the predefined concession period the understanding needs to move the benefits of the errand back to the position."

BOT Annuity: "In this model the brief laborer needs to manufacture and work the endeavor. The legally binding laborer will get fixed annuity for a predefined period from the position. Such an endeavor has the part of allocating comparable peril to all the get-togethers connected with the errand appeared differently in relation to the creation sharing understanding."

BOT Cost: "In such an assignment, the pay for the legally binding specialist is as demonstrated by the salary the transitory laborer is creating during the action of the endeavor. This sort of attempted passes on the peril of delivering enough pay for the legally binding laborer to achieve its proposed net income."

HAM: "The creamer model ought to be a triumph win situation for the council and designers. The assembly is required to help up to 40 percent of the undertaking cost while the remaining 60 percent to be sponsored by the private player, and along these lines encouraging the money related load on the exchequer as well and to address the various concerns felt by the accomplices This comes as a welcome advance in the situation of bleak execution of expressway improvement adventures allowed under existing MCA. In HAM the legally binding laborer will get fixed annuity from the authority during the concession time span."

Discussions

A few advancements have included partners setting the arranging procedure in place. "By temporary worker: Significant commitments were by giving significant offices (As a fast turn of events, essential working environments, for example, seating, fixed rooftop, clean toilets for the two genders and lighting and

drinking water work environments might be given at the vessel stations), search for opportunities for upgrade of model (Guarantee all-round-the-year way to deal with oversee moors for watercrafts by dynamic tunneling of the channel and by understanding the ordinary factors that add to this miracle), enhance the offices accessible (Rebrand the pontoon framework and change the open picture of the vessel association looked at the goals of the new age. Make accessible light rewards, papers and light music inside the pontoon correspondingly as changing the seating manual for empower eye to eye alliance can help the explorers in mixing and make the twenty-thirty-minute excursion as great and productive as the Mumbai common experience), and a lot increasingly such choices."

Advance remuneration park-and-go structure at transport stations so individuals from the upwardly advantageous classes besides feel pulled in to utilizing the vessel station as present mechanical advances in the field of water transportation, for example, speedier flatboats, "two-crease hulled pontoons and amphi transport. Give completely openness to explorers from their doorstep to the orchestrated goal. Feeder transports or offer vehicles may take the voyagers from their neighborhood to the pontoon station and back." Reroute transports and different techniques for transport including the proposed metro-rail to such an extent that they contact transport stations with the target that the vessel clients can have guaranteed last-mile availability.

By government: "Energize less mentioning setting out and showing up from the vessels by utilization of fitting degrees of progress. This will profit the created and ladies who rely on the vessel benefits more than some other person. At the absolute starting point, perceive appropriate occupations of different relationship in this division and make them liable for the vehicle of these duties through critical authoritative and real measures and changes, wherever expected to invigorate continuously indisputable joint exertion among KSWTD, KSINC," and so on. Incorporate the majority considerably more suitably in the sorting out and rebranding of the vessel structure and requesting sees on their wants and needs from the new pontoon framework.

Barely any thoughts on which specialists can upgrade model are improving openness (The methodology streets to the vessel stations will be all around laid with least estimation separations to make get to less perplexing for the old and ladies unequivocally), adjustment (The particular government work environments should quickly take proactive measures towards modifying the market estimation of a few prime plots of land under their inhabitance in the focal point of the city. The compensations earned as lease from such property may then be utilized to subsidize transport ticket charges for the standard inhabitants), cost update (The charges might be raised to help empower the financial emergency endured by the working affiliation and the rest of the need the development of the pontoon associations might be cross bolstered by raising assets from land-modification).

At the most punctual reference point, perceive reasonable businesses of different relationship in this part and make them liable for the vehicle of these duties through basic authoritative and conclusive measures and changes, wherever expected to enable progressively recognizable composed exertion among KSWTD, KSINC, and so forth. Incorporate the individuals significantly more feasibly in the sorting out and rebranding of the pontoon framework and requesting sees on their wants and needs from the new vessel structure

Conclusion

From this examination paper, it is clear that there exist titanic undertaking openings in the inland channels transportation plan of India. "The relationship of sufficient budgetary reaction particularly the PPP thought will improve the change and judicious progress of the nation. Beginning at now the Indian government is clear about the centrality of PPP as a model for experience account and with this impact it has affirmed a National Approach on Open Private Association and further made an Institutional System to acknowledge and coordinate the social event of the PPP show up for proficient national improvement plan. It is on this note it is recommended to the IWAI,

accused for the change objective of the segment to make a near to organize impression of the National Approach on Open Private-Organization of India during the time spent changing the national inland conductors transportation framework."

Taking everything into account, it is concurred that towards the attestation of the distinction in the country's inland channels framework, the IWAI an Office of government is to make the alliance proactive, and increment its component of duties to the brisk money related change in India to get a handle on and to finish enough PPP experience finance show up, the going with proposals are made:

Limitations

(1) There is have"to give genuine model information and data towards dealing with and refreshing the national perfect circumstance of the inland channels transportation framework. Information and data must be effectively, quickly and uninhibitedly accessible for getting the chance to connect likely clients and analysts take enormous undertaking choices dependent on ensured unrefined numbers to improve unique data based sorting out. IWAI considers this objective" and is appropriately moving toward along these lines.

(2) Open consideration and "enlightenment are to be increased to make open intrigue, solace and fuse in the conceivable outcomes and anticipated unavoidable focal points in the inland" channels.

(3) "The law-production body through IWAI ought to fortify the envious of improving the segment of interests in inland conductors which the PPP show recommends. Thusly, IWAI be made arrangements to give a theory satisfying air, make strategy and motivations that will support new scholars and premiums in a boss among Nigeria's most rich fundamental assets with boundless ability to give drawing in benefits for experiences."

(4) IWAI considering the difficulties appeared by the endeavours at invigorating "positive improvement in the inland conductors transportation division ought to present pre amidst and-post experience the board observation strategies to guarantee astounding development of associations and fast reaction" to issues when PPP is figured it out.

(5) Likewise, "a full-scale transport co-plan method particularly as it identifies with the intra-and-cover courses transportation structure ought to be ended up being by IWAI" with a perspective on acceptably taking care of each bit of the inland channels transportation improvement.

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