



Anekant Education Society's Anekant Institute of Management Studies (AIMS), Baramati



**In association with
All India Council for Technical Education (AICTE)**

10th National Conference (Virtual Mode)

On

Fostering Human Resilience- Catalyst for Management, Science and Technology

8th (Friday) & 9th (Saturday) October 2021

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Dear Researchers,

Vidyabharati International Interdisciplinary Research Journal (ISSN 2319-4979) in the month of December 2012 has brought its 1st issue by publishing quality research articles written by researchers all over the globe. Since then it has regularly published research articles spanning all disciplines till the date. The journal is open access, online and has been indexed with ASI, Germany and ISI. Due to its high quality publications recently it was included in the Master Journal List of prestigious Web of Science group. The Master Journal List is an invaluable tool to help you to find the right journal for your needs across multiple indices hosted on the Web of Science platform. Spanning all disciplines and regions, Web of Science Core Collection is at the heart of the Web of Science platform. Curated with care by an expert team of in-house editors, Web of Science Core Collection includes only journals that demonstrate high levels of editorial rigor and best practice.

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The Vidyabharati International Interdisciplinary Research Journal has been indexed with globally recognized databases and hence included in UGC CARE LIST II.

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VIIRJ**

RESILIENCE BEHAVIOR AMONG INDIAN WOMEN**M. A. Vhora¹, A. Babley², M.A. Lahori³**^{1,3}AIMS, Baramati-Dist-Pune, Maharashtra.²Co-optex, Chennai, Tamil Nadu.manishavhora@aimsaramati.org¹ drmalahori@yahoo.com³**ABSTRACT**

In our today's environment learnt folk very often talk about 'Resilience' in the workplace and does research on it with structured survey method and designated sample size. But 'Resilience' is very much inextricable with our lives more particularly with our women. The very simple meaning of the 'Resilience' is ability to feel better and rejuvenate to the original shape. We know human life is Pandora's Box of logger heads and lot more issues, in the family environment and situation, the scale of 'Resilience' real matter for the development of family as a whole, more particularly for the new generations.

This paper is indeed conceived on the ground reality of Indian Women, who are at default is backbone of the family's growth and has intrinsic stimulation towards family's responsibility and accountability as compared to the men. No matter what class they belong to, it means Top class family, medium class family and Low-class family, the role of women in family is very much empathically attached. Further in this firsthand research work all the data and information whatsoever in nature were from the ground level and on pragmatic mode (situation based). Hence the analytics are construed on original information than any kind of fabrication and adorn.

Women basically a wholesome and comprehensive term, which includes mother, sister, daughter, wife, and all feminine gender. In Indian practice and scenario 'Feminine Gender' is very much synonymous with divine respect in the form of Goddess.

In this firsthand study it was observed that, the behavioral scale of resilience, tolerance and adjustment is much more in Indian Women for the growth of family and even the obedience and sacrifice are pre-existed, which supplicate to the resilience.

Keywords: *Inextricable, Pandora's Box, original shape, comprehensive term, tolerance, adjustment.*

INTRODUCTION:

The term resilience coined and originated by psychologists and psychiatrists. In the course of study and research it was noticed that the term resilience has made paradigm shift from mental health to general health and behavior of persons. In the process of research on the 'Resilience' there is variations and argument on the term. However few psychologists namely Werner, Luthar, Masten etc., whole heartily vouch for the simplified definition of the term.

Resilience need the presence of the clear substantial risk and adversity. Because s/he may gain in one aspect but certainly lose in other one. For instance, Indian women very much knows she loses her comfort and cushy things at beginning but later commands the situation and perhaps situation may be matriarch. Thus, the construct of Resilience has two dimensions namely.

1. Significant Adversity
2. Positive Adaption

Based on these two dimension the Resilience can be measured. Thus,

resilience never acts in individual term it has to have indirect inferences. The Survival of person is the significant adversity for his Resilience (do or die position) and for the development of the situation is called positive adaption in the Resilience.

LITERATURE REVIEW:

Augmentation in research certainly leads to the arguments and lot more diverse meaning and definitions, research on resilience is since 1980. The term resilience is best understood as 'Bounce-Back' and ability to recover quickly from adversities and adapt to the life's adventures. In the literature it was noted the four types of classification of resilience. They are, Diagram No 1:

Classification of Resilience

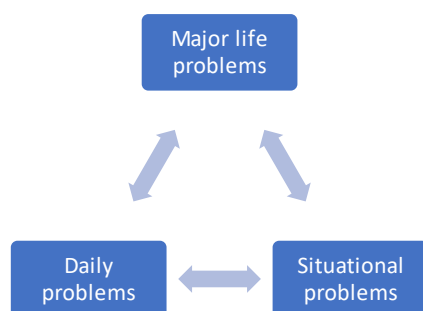


Source: Secondary data

Discussion:

Above said types of Resilience in general we encounter with our life issues which are depicted in the following diagram, Diagram No 2:

Application of Resilience in Problems



Source: Secondary data

Major Life Problems:

These problems of our lives are basically by nature, for instance death of loved one, chronic health issues, homeless, and often traumatic and which scar for longer years. The spirituality and listening to the inspiring stories and exchanging dialogs with positive mind set people, certainly subdue the problems over period of a time.

Situational Problems:

The magnitude of this problem comparing to major life problem is less and not much serious. But cause serious consequences upon work, relationship, life humor and self-satisfaction. The situational problems generally referred as living with unpleasant family members, rift with spouse, bullying and temporary loss of job or business dealing. The life span of situational problem is for shorter time. The best remedial steps would be nurturing

resilience to get over the situational problem.

Daily Problems:

The problems and hurdles what we face in our daily life like, traffic jams, rude colleagues, work pressure to meet deadlines, work efficient and autonomy. The best remedy for such problem to keep at bay is the working on time and work prioritizing on need base and importance of the work.

Now let us see the application of four kind of resilience in the above problems.

1) PHYSICAL RESILIENCE:

Physical resilience pertains to our body's agility to face the physical challenges and overcome with efficiently and effectively when it happens. Let us understand, *Major Life Problem + Physical Resilience* a person who have undergone dental surgery takes longer time (6 to 9 months) to come back on its original shape till then he needs to suffer with eating issues, incorrect pronunciations, excruciating pain, may avoid public meetings etc., is the opt example of physical resilience with major life problem. The role of *Physical Resilience in Situational Problems* it denotes the presence of stamina in expected and unexpected situation. For instance, attacked by goons it needs physical resilience to deal with them and run away from the situation to save yourself. *Physical Resilience + Daily Problems* for our daily chores of life like, eating healthy food, physical exercise, rest, household work, self-study, nurturing and nourishing to children and parent etc., land into conflict and call for physical resilience because of the paucity of time and tied over with deadlines. The agility and flexibility in physical resilience certainly overcome such issues.

2) MENTAL RESILIENCE:

This is all about thinking and analytically taking decision based on the alternatives and options, which suits to solve the problems. The applications of this in three different problems are dealt herein. *Major Life Problems and Mental Resilience*- when

we grew up in the catastrophe, it really need mental resilience to save own life and help others at our cost of life, like flight landed on sea etc., such critical decision requires mental resilience. *Situational Problems and Mental Resilience* mother has some health issues but despite of that, she prepares food for family in situation her mental resilience pushed her to deal with the situation. *Daily Problems and Mental Resilience*, our life is full of challenges either short term or medium term viz daily problems may be at office or at home. The best way to tied over is keeping engaged with the prioritize of the work and interest.

3) EMOTIONAL RESILIENCE:

The emotional resilience basically relates to the emotional intelligence, emotional awareness, and perseverance, People with emotional resilience accept the adversities with flexibility, positive thought and had an attitude that, times are tough, but they will get healed. Let us understand the application of emotional resilience in three different situations as mentioned in the above. *Major Life Problem and Emotional Resilience*, it is experienced that life is not bed of roses and most of the times not synergy with our plan. In this study Indian Girls marriage really a relevant topic of Emotional Resilience, pertains to the fear of unknown. In this context, bride's positive behavior and time factor shall make the situation very grateful and millions of silver linings over the major problems. *Situational Problems and Emotional Resilience*, in this it generally involves other people, it how the situational issues may get aggravated, instigated and the ego factor work as fuel to fire. The best example of this is the workplace and working with complex team. Best tool to get rid of such or otherwise kind of situation is to be with polices and find better option to avoid the loggerhead. *Daily Problems and Emotional Resilience* is all about our ability to imagine, dream and plan with positive highlights. Daily Problems and hurdles may be buckled with just walking, listening to music, mediation etc.,

4) SOCIAL RESILIENCE:

It is all about networking with others socially. It includes connecting with friends, working in teams, working for social cause. Social Resilience basically builds on trust, tolerance, diversity, and respect. Let us see the impact of Social Resilience on three problems. *Major Problems and Social Resilience* it is experience that, aftermath of natural calamities most of the countries, nations, neighbors, family members come together to help and assist in times of need is the best example of social resilience in major problem. *Situational Problems and Social Resilience* the change management and revamping workplace and organization which involves leanings, new teams and new organizational policies is the best reference of social resilience in the situational problems. Although such situational change may give confusing look at first, but later things cherish. *Daily Problems + Social Resilience* it is process of taking initiative to stay engaged productively. For instance, meeting people, saying hello at the workplace, even we don't like need to do that work. Yes keeping engaged productively keeps away the daily problems.

Thus, these four types of resilience with examples of three kinds of problems (major, situational and daily) it understood that resilience is not so easy but resilient people must have undergone that worst situation.

WHY THIS STUDY:

The problem statement of the study is that most of the time Positive Behavior is the sole answer to the most of situation and it work as panacea. But seldom the society and women folks, have this soft tool. Further the Resilience certainly has the system of input and output process. As to understand and create better visibility and applicability of Resilience factor among Indian women this study is carried out.

Author of this paper has done empirical study and experience on the Behavioral Science and most important he wanted to give the justification by virtue of this study

that, Indian Women indeed has better behavior than men. Because of this positive behavioral power only most of the Indian families are cherishing and progressing in most of the odd situations.

OBJECTIVES:

The core study objectives are,

- a. To study the women's resilience status both at workplace and family.
- b. To examine the behavioral impact on the resilience.
- c. To identify and earmark master resilience tips.

RESEARCH METHODOLOGY:

This is a very comprehensive study, a blend of actual occurrence at the ground level and firsthand data. The structured questionnaire, designated study area, and customized sample size were in the pea size references as comparing to the open ended and pragmatic analysis. Indeed, the authors of this paper have undergone an extensive and relevant study of literature and have used enlightened hand-on-approach. It is very interesting that, author have personally handled the rankle and unpleasant situation and that's the most urging factor and driving force to write this paper.

The secondary and basic primary data have been squeezed from proper sources and judiciously applied to arrive at meaningful findings and result oriented conclusion. This paper being a conceptual one, simple statistical tools have been in placed wherever necessary to right size the information.

RESILIENCE BEHAVIOR OF INDIAN WOMEN:

It is universally acclaim and understood that Indian Women has greater magnitude of resilience behavior in their daily lives. This study indeed vouches the statement with the experientials. As we know there are four kinds of resilience namely, physical, mental, emotional, and social. These were hovering in three categories of problems namely, life major problems, situational problems, and daily problems. Let us understand role of resilience in

Indian Women's Behavior in above circumstances.

The insightful study has enlightened that among four kind of resilience three are with us physical, mental, and emotional but the social is the extravert and has introvert. The Indian Ethos and Etiquettes really gives great values to apply in our lives for better living and leading happy life. In homely environment Indian Women have been groomed in all three area of resilience at default. The practicing of home etiquette like doing the home chores by themselves, taking care of elder and younger at home, it makes them physical fit to handle the situation whatsoever in nature at later stage. Alike they manage the hotchpotch situation of the family with mental resilience and similar to this the emotional resilience. Most of the time it is observed that Indian Women are emotional attached to their loved one but with their positive resilience power they overcome the emotional barrier. The ingrained strengths of resilience have made Indian Women's Behavior very positive and productive in all three categories of problems. Life Major problems, Situational Problems and Daily Problems. They do it better because of ethos and etiquettes what have practice at their homes, keeping positively engaged, doing some physical movements (yoga etc.) and spiritual activities at their leisure time or otherwise a schedule of the same. This sound practices are helping Indian Women to perform better in ...

- 1) Work-life-balance
- 2) Gain respect
- 3) High morale
- 4) Better public opinion
- 5) Enjoy work satisfaction
- 6) Execute the planned ideas
- 7) Gain support

This is the realistic behavior of Indian Women which are being embedded from the childhood by virtue of etiquettes and ethos at home by elders, that certainly made them tested their resilience in all time.

Findings:

- a. It is found that the practicing of ethos and etiquettes at childhood in families gave

greater status to the women. And daughters are treated as 'Heavenly Angels' in the family. In the life journey the 'Motherhood' is a pious status of women. This indeed make them more of resilience and gaining the high towering status.

b. The study reveals that the grooming itself at hardwiring time is an important input-engine of behavioral resilience. At the initial stage undergoing with tough like situation and incidents is like the antecedent for greater resilience. The humane of childhood learnings is being supported to gain the resilience to face all kinds of situation and problems.

c. During the study and research the major and master panacea tips of resilience are the knowing the things, be positive and patience to react to the situation, because time is the great healer. The general major tips are,

1. Be positive reactive

2. Be patience

3. Be aware of the happenings

4. Be on the threshold of resilience always

5. Be in the practice of antecedent to get better thereof.

6. Be on the go-getter platform

7. Be instrumental in the work

8. Be dependable in team

9. Be positive and sportive

These are major tips one can use to gain the resilience to tie over the traumas.

CONCLUSION:

To sum up the study and research the Indian Women's Behavior intrinsically ingrained with Resilience and abilities to handle hotchpotch kind of situation have been groomed at hardwiring time at home. The great source of the resilience has been the ethos and etiquettes learnt at the childhood.

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KNOWLEDGE MANAGEMENT CYCLE (KMC) IN NETWORK CONTEXTS

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ABSTRACT

In the post-modern information economy, information is a vital asset for the economy, yet we are not completely ready to see how we can oversee data and information cycles to acquire upper hand. Another idea of data the board, i.e., data the executives in network conditions (KMC) has been presented. Furthermore, we are presenting an essential data the board system (SKM). SKM is a cycle that includes the accompanying advances: 1) key vision, 2) information vision and key data recognizable proof, 3) development, 4) data insurance, 5) execution, and 6) data use. Extension of sources and thoughts dependent on organization data fill in as the reason for the reasoning and advancement of the system. To acquire and keep up with upper hand, associations can profit with the structure's direction on the administration of information systems and data measures. The idea and structure open up new subject matters the executive's examination and issues that will be tended to and further researched.

Keywords: Knowledge Management, Network, Data Insurance, Data Measures

INTRODUCTION

In numerous examinations, it has been underscored that the organization's upper hand comes from its remarkable information and the manner by which it deals with that information (Nonaka and Takeuchi 1995; Boisot 1998; von Krogh and associates 2000a, b; Wikström and Normann 1994; Nonaka and Teece 2001; Nonaka and Takeuchi 1995). From certain perspectives, data replaces regular assets, cash and work as the main monetary asset in the post-mechanical information economy (otherwise called the data economy) (Drucker 1995). Somehow, associations are continually "in charge" of data, regardless of whether deliberately or purposefully. While the idea of coding, putting away, and sending data to associations isn't new, late changes in association and conduct have prompted more prominent accentuation on data move and maintenance. Reports of data the executives' frameworks (KMs) and execution of data the board frameworks (KMS) can be acquired. Aside from the way that we have numerous responses to the inquiry, "For what reason do firms put resources into data the executives and use KMS?" we have a couple of answers to the inquiry, "How might firms viably oversee information to work on vigorous execution?" We have a few thoughts, systems, and models identified with information the board (KM), yet there are significant holes in

the information body rather than how you can acquire and keep up with upper hand through essential data the executives.

This paper has two principal destinations. First give subtleties. As a matter of first importance, data the board should be rethought. To figure the firm, it is important to grow both assets based and organization-based data. We likewise place data the board in network conditions and would contend that the different kinds of organizations ought to be the primary focal point of key data the executives. Second, we are fostering an essential information the executives system dependent on the reasonable structure we have grown up until now (SKM). SKM is an interaction that includes the accompanying advances: 1) vital vision, 2) information vision and key data recognizable proof, 3) development, 4) data assurance, 5) execution, and 6) data use. To acquire and keep up with upper hand, an association can profit with utilizing a system to help it with methodologies to oversee data and information measures. Likewise, thinking and structure recognize new spaces of examination and issues in data the board. In particular, our methodology is applied logical in nature (Järvinen 2000), which implies that we use past craftsmanship studies and hypotheses, models, and developments to work on our reasoning and SKM system.

In the accompanying segments, you will discover the layout of this paper: The following area makes way for a short conversation of data, data the board, and data the executives' frameworks. Following, there will be a show and conversation of another idea of data the executives. We present an essential data the executives system, in view of basic reasoning, and examine the jobs that ICT (data and correspondence innovation) can play in this cycle.

2. DATA, INFORMATION MANAGEMENT, KMS

It isn't new to consider associations places where data is coded, put away, and communicated; notwithstanding, ongoing advances in hierarchical and the board rehearses have made them more centered around information (California Management Review 1998; Truch et al. 2000). This segment presents a concise outline of a portion of the numerous educational thoughts examined in the writing and data frameworks, techniques, and hierarchical vision. This permits us to communicate certain (vague) thoughts regarding data and data the executives, which we can challenge. We likewise present data thoughts, data the board, and data the executives frameworks that will fill in as our beginning stage; in the accompanying segments, we will expand on these spaces. (No, we won't go into the contention that information the board is another idea or the restoration of old thoughts. KM is another idea, and accordingly, ground-breaking thoughts, ideas and strategies should be created. See the model Nonaka and Takeuchi (1995), Alavi and Leidner (2001), Alavi (2000), Spiegler (2000), Nonaka and Teece (2001), and Von Krogh and associates (2000a, b) discover contentions on the side of this view; for this situation we concur with these creators.)

The accompanying hypotheses of data (Alavi and Leidner 2001) are basically partitioned.

- The connection among data and information and data. A few creators, particularly those in the data innovation (IT) people group, have

addressed the topic of clear information by making a differentiation between information, data and information (Fahey and Prusak 1998; Tuomi 2000; Spiegler 2000).

- Cognizance as a demeanor is characterized as "the state or truth of information," information is characterized as "the arrangement acquired through experience or study; the total or extent of everything procured, got, or contemplated" (Schubert et al. 1998).
- Data about data can be put away in files (authoritative recollections) and utilized as articles (object) (Stein and Zwass 1995; Wijnhoven 2000).
- Information as an interaction that includes knowing and doing at the same time (Brown and Duguid 2000).
- Information as an ability or asset, where data is viewed as a force or asset fit for working on the exhibition of an association (Carlsson et al. 1996; Meso and Smith 2000).

Because of alternate points of view on data, there are alternate points of view on data the executives and KMS jobs (Carlsson et al. 1996; Alavi and Leidner 2001). Contingent upon the RBV, we will begin with data as an expertise as our beginning stage. The principle justification this decision is that, in the different points of view accessible, this is the one in particular that addresses the connection between information, information the executives, and strong fortitude.

The resurgence of interest in hierarchical data has prompted the issue of data the board to support the association. Distinguishing and benefitting from individual and corporate data to assist the organization with becoming serious is data the executives (Davenport and Prusak 1998; O'Dell and Grayson 1998; Cross and Baird 2000; Liebowitz 1999). Data the board is tied in with recognizing and causing a benefit on individual and incorporated data to assist the organization with turning out to be more aggressive.

Data the board, as indicated by designs and sorts of associations like data frameworks, comprises of four arrangements of data

frameworks for the general population, to be specific: 1) data creation, 2) data association and capacity/recovery, 3) data move, and 4) data use (Pentland 1995; Davenport and Prusak 1998; Boisot 1998). It is the reasonable and social idea of authoritative information, and its application to the arrangement and activities of people, that is, to incorporated practices (for example hierarchical) and societies addressed by designs and models. The four cycles don't address a bunch of solid capacities, yet rather an organization of associated and associated capacities.

As per Davenport and Prusak (1998), most data the board projects are intended to accomplish one of three objectives: To accomplish these objectives, associations should initially make data apparent and show the job of information in their tasks. They should then foster a culture of more information by advancing and coordinating practices, for example, data sharing and dynamic inquiry and data, and at last they should fabricate a data framework - an innovation framework, yet an interpersonal organization. Teece (2001) affirms that the "KM development" has three wide targets sought after by its individuals: the foundation of data files (information vaults), the improvement of "data" access, and the improvement of the information base, all things considered.

Hierarchical data the board frameworks (KMS) are a bunch of data frameworks used to oversee authoritative data and data. At the end of the day, it is data and correspondence innovation (ICT) programs intended to help and further develop the association's data building, stockpiling/recovery, transmission, and arrangement measures. Albeit not all data the board frameworks depend on data and correspondence innovation (ICT), just as admonitions focused on more noteworthy accentuation on data and correspondence innovation (ICT) by sabotaging the social and social designs of data the executives are remarkable (Davenport and Prusak 1998; O'Dell and Grayson 1998; McDermott 1999;), numerous KM programs depend on ICT as a key facilitator. Records on the utilization of data and correspondence innovation (ICT) in the association's data the executives

frameworks distinguish four normal applications: Best practices are incorporated and shared, and organization data frameworks are made, for example, data organizations, and information based dynamic and activity dependent on information. . The KMS is certainly not a particular ICT in the conventional sense, yet rather a dream (point of view) in data the board, the job of data and correspondence innovation (ICT) as the reason for data the executives, and how to apply this thought. There is a spot for variety of thoughts in data the executives, and there is likewise a spot for variety of thoughts in data the board frameworks. Following the dispatch of the SKM system, we will momentarily examine the different jobs that can be played by data and correspondence innovation (ICT).

In synopsis, these reports diagram the numerous explanations behind data the board, articulate alternate points of view on data, clarify KM and KMS practically speaking, and clarify the different capacities related with data the executives. There is little exploration on how firms can adequately oversee data to acquire and keep up with upper hand. We will do this in the remainder of the paper, which will begin with the organization's asset based (RBV) viewpoint as a beginning stage.

3. CHANGE OF INFORMATION MANAGEMENT SYSTEM.

The epistemological reason for the data the executives we bring is found in the field of business procedure hypothesis. It depends on the development of asset-based perspectives (RBV) and corporate-based visuals (KBV), separately. RBV's moderate idea that cutthroat benefit depends on significant and novel interior assets that contenders are hard to copy at a sensible expense. On account of KBV, assets are those identified with information and learning. In tending to the job of assets on which item/administration highlights are based, RBV and KBV expect to characterize and incompletely anticipate the organization's market execution by taking a gander at the job of assets on which item/administration highlights are based. RBV got a negative reaction. When alluding to RBV, for instance, Teece et al. (1997) express that it perceives

however doesn't endeavour to clarify the components - dynamic powers - that permit firms to keep up with their upper hand. Furthermore, late exploration recommends that an organization's unfamiliar relations organization could be a significant wellspring of corporate rivalry (Gulati et al. 2000; Nohria and Ghoshal 1997).

Data the board (KM) can be drawn closer by key, with data oversight as a wellspring of procedures. The methodology is about the drawn-out course and extent of the organization's activities, and the hypothetical technique is tied in with getting sorted out the main authoritative assets for senior administration, and for anybody with an interest in the reasons for progress or disappointment inside associations (Rumelt et al. 1994; Johnson and Scholes 1997). Subsequently, adopting an essential strategy to data the executives require resolving two issues: 1) vision and course, and 2) how to design and oversee data related assets to acquire upper hand. In a setting where we accept that data and information measures are basic, reasonable, and viable contemplations in essential data the board should address how significant parts of information the executives and data frameworks can prompt upper hand.

This segment will give itself to the issues referenced above, specifically: 1) powerful energy, which is an augmentation of RBV; 2) the extension of RBV to incorporate outside associations as a wellspring of upper hand; 3) networks as the setting of data the board; and 4) general key data the executives structure.

3.1. EXTENDING RESOURCE BASED INFORMATION AND INFORMATION SYSTEMS

Business and modern data resources that are hard to repeat are a wellspring of long-haul upper hand for business associations in the "new economy." The development, proprietorship, assurance, and utilization of such resources give an upper hand to business elements in the "new economy" (Teece 2001). As of late, essential archives have seen the development of the organization's information-based vision (KBV) (Grant

1996a, b, 1997; Spender 1996a; Cole 1998). As per the organization's asset-based point of view (RBV), which was first upheld by Penrose (1959) and later created by Wernerfelt (1984), Barney (1991, 1995), and Conner (1999), this thought constructs and extends the organization's RBV (1991).

They attest that the administrations given by unmistakable assets rely upon how they are incorporated and used, which is an element of the organization's information base (i.e., information). Notwithstanding the individual workers, this data is installed and communicated through different designs like the way of life and personality of the association and its practices and arrangements. It is likewise communicated through PC based data frameworks and archives (Grant 1996b; Nelson and Winter 1982; Spender 1996b; Boisot 1998). To some degree since data related assets are by and large hard to duplicate and are unpredictable in the public arena, KBV accepts that these data resources can possibly create long haul upper hand. Notwithstanding, the restricted information accessible at some random time is the organization's capacity to effectively deal with new data and utilize existing information to tackle issues, decide, and make strides that fill in as the reason for beneficial rivalry - as per the World Economic Forum.

Two confirmations were performed by RBV. In the first place, there are asset imbalances, which implies that assets and abilities can be conveyed independently between contending firms. Another thought to consider is the failure of assets to move, which implies that distinctions in assets and energy can stay stable over the long haul. With regards to the organization's assets and abilities, this incorporates any monetary resources, HR, unmistakable resources, and authoritative resources utilized by the association to create, produce, and convey administrations and items to its clients.

There is no lack of meanings of administration includes that give upper hand. A couple of the most as often as possible referenced assets highlights, as per Kalling (2000), incorporate the accompanying: they ought to be 1)

significant, 2) unmistakable, 3) subject to flaw and vulnerability, 4) expensive to copy, and 5) disseminated all the more proficiently in the association.

1. Cost. The instrument should empower the organization to react to ecological dangers or openings in an assortment of ways, like diminishing expenses or expanding the cost of an item or administration, or by isolating an item or administration from its rivals.

2. Merciful or effectively open The gadget should be one of a kind and have an inconsistent dissemination to all rivals to give upper hand.

3. There are contrasts in value and assumptions. Various assumptions for future ware esteem are firmly identified with the issue of evaluating in any case. Seen according to SKM's point of view, this is identified with the normal sum that specific data related sources will bring to the association.

4. Modest thumping. The application should be difficult to repeat to acquire and keep an upper hand. It is important to give assurance against future duplication of material. Subsequently, organizations lacking assets or limit face higher securing costs contrasted with existing firms.

5. Arranging and using assets. This component is identified with how well the application is arranged and how well the application is appropriately overseen. Thus, it is related with authoritative construction, measures, etc to guarantee that the asset is completely used.

Most RBV archives are worried about stable assessments that are troublesome, if certainly feasible, to copy. Flexibility of assets has as of late been considered by numerous creators (Grant 1996a, b, 1997; Teece et al. 1997 ;: Kogut and Zander 1992; Eisenhardt and Martin 2000). This can be viewed as an expansion of RBV and KKV as far as execution. This expansion is significant according to SKM's perspective since it will drive us to zero in on the incredible parts of information and data measures, which are at present ignored. We likewise see an expansion in the quantity of cases wherein market rivalry is eliminated from market contest (Teece 2001). As indicated by Teece (2001), "instalments from market understanding

Insights are high with regards to think about where the market is going and contributing intensely to be quick to arrive. Having the option to distinguish and take advantage of such lucky breaks is an ability that associations have. "This expertise is alluded to as powerful energy and alludes to the adjustment of center - the change of insightful units and plan units - that happens during work (Teece and Pisano 1994; Teece et al. 1997; Teece 2001; Eisenhardt and Martin 2000). While assets are the principle focal point of RBV, cycles, positions, and techniques are the fundamental focal point of the powerful energy vision. Teece and partners (1997) characterize dynamic potential as "... the organization's capacity to incorporate, form, and redesign inside and outer abilities to react to quickly changing conditions ..." intensity with regards to advertise patterns and market positions. " thus, benefit is acquired not just from the organization's resource building and the degree of impersonation, yet in addition from the organization's capacity to upgrade and change its plan of action.

Our reasoning is essentially founded on RBV and KVB, however has been significantly improved by the consideration of the idea in powerful energy. Coming up next are instances of how to get and keep an upper hand in data the board:

- Building data measures (data creation, data association and capacity/recovery, data move, and data use) are significant.
- "Planning" instruments and strategies for overhauling, upgrading, and changing information-based cycles.
- Data Management in Networks (otherwise called Knowledge Management in Networks)

These are the second and third augmentations, identified with: 1) moving from a solid highlight a solid and mid-solid viewpoint, and 2) putting incredible accentuation on networks as the setting of data the board.

An article distributed fifteen years prior by Thorelli (1986) underlined the significance of organizations and the need to proceed with research on network power. To depict the

relationship that exists between at least two associations, Thorelli utilized the expression "organization." Some writers have utilized this term to allude to both inward and outer organizations in their composition. To summarize the definition given by Laumann and partners (1978): An informal community is characterized collectively of spots (e.g., people or associations) associated by a gathering of social connections (e.g., kinships, moves or separation) of a predetermined sort. "In data the executives, the correspondence organization will serve principally as a method for enabling and supporting different data the board measures. The utilization of data and correspondence innovation (ICT) can permit and work on the organization.

Notwithstanding the way that a "network" of development can be utilized to characterize a visual example, we propose that it be utilized with regards to vital information the executives. If proficient organizations acquire and keep an upper hand over data the board, we accept that data the executives should zero in on network. There is proof to help this idea in numerous incredible investigations. Von Hippel (1988) found that providers and clients were the main wellsprings of novel thoughts for new authoritative items and administrations. An organization with phenomenal data moves between clients, makers, and suppliers will set up networks with wasteful data sharing administrations, as per von Hippel. In an examination directed in the biotechnology business, it was tracked down that an organization of firms, instead of individual organizations, is a wellspring of development (Powell et al. 1996). Utilizing Toyota for instance, Dyer and Nobeoka (2000) showed that the organization's capacity to viably oversee and oversee data sharing organizations is basically important for the item benefits Toyota and its providers appreciate. As indicated by Liu and Brookfield (2000), Taiwan's proficient hardware gear industry has a wide scope of organization segments. They likewise tracked down that the achievement of the instrument business could be expected to some extent to the presence of organizations. These and different examinations (e.g., Miles et al. 2000; Boisot

1998) show the significance of organizations and that organizations can work viably in all data handling exercises (from data creation to data preparing and use).

New hierarchical structures have been proposed, and a considerable lot of these stress the significance of utilizing networks in data and creative cycles - see, for instance, Nononaka and Takeuchi (1995), Quinn (1992), Quinn et al. (1997), just as various commitments to Nohria and Eccles (1998). New sorts of association have likewise been proposed, and a significant number of them underline the significance of utilizing networks in new data cycles and cycles - see, for instance, Nononaka and Takeuchi (1995), Quinn (1992).

We order three sorts of data the executives organizations: 1) Intranetworks, 2) extranetworks, and 3) online exercises. Intranetworks are those inside an association. Intra-network networks are clear organizations, which implies they don't cross the association's limits. It tends to be a Lotus-based intranet determined to spread great practices all through the association. Extra organizations are outside the constraints of a solitary association. Organization cooperation is denied, which implies that people and gatherings partnered with specific associations are permitted to take an interest in exercises. For instance, a few broadcast communications organizations engaged with the improvement of Bluetooth applications might have an extranet for their innovative work staff. Between networks are likewise networks that surpass the constraints of individual organizations; however support isn't restricted to those in the organization. They are exceptionally open to any individual who wishes to join and take an interest in the exercises they offer. For instance, Fiat has utilized the Internet to test ground-breaking thoughts for the plan of its Punto, which has prompted an effective result. Fiat has welcomed expected clients to partake in online exercises, for example, choosing vehicle things on the organization's site. More than 3000 individuals partook in the change and furnished Fiat with key development data - this

is a phenomenal illustration of coordination through the between network. (Despite the fact that we have utilized models dependent on data and correspondence innovation, not all organizations will be founded on ICT, and in many organizations, ICT will be one of the segments and highlights.)

Our reasoning brings up new examination issues in the field of data the executives, for example,

- In what circumstances are different interchanges compelling in the field of data the board? There are three sorts of fundamental organizations, as per Liu and Brookfield (2000a), in particular: implanted organizations, dispersed organizations, and exceptionally focused organizations. They discover various sorts of organizations inside the fundamental kinds they find. This division can be utilized related to the recently referenced contrasts (intra-networks, and so forth)
- Networks with solid members contrasted with frail wired organizations It has been recommended in certain investigations that profoundly associated, solid associations are more powerful in scattering data than building new data, which is the strength of tie ties (Rowley et al. 2000; Dyer and Nobeoka 2000). It is important to lead research in circumstances where solid unbending nature organizations and powerless tie networks work in data frameworks.

The issue with extra-organizations, and particularly between networks, is that much of the time there could be no more significant position power to plan a "hierarchical" plan, which makes a test. It is likewise important to investigate how these kinds of organizations can be fabricated and utilized successfully.

- From an administration and plan point of view, we can recognize: 1) fake (planned) networks, 2) normal and arising organizations, and 3) different organizations. Instances of planned organizations incorporate the arrangement of an electronic correspondence organization, which might incorporate the utilization of Lotus Notes, or the development of a data set, which might remember the

enrolment of best practices for lab testing. Be that as it may, the development could likewise incorporate the advancement of motivating forces and instructive projects, just as the development of substantial gathering places. A few organizations create and arise normally inside and inside associations, while others are worked because of a causal cycle. As per the discoveries of von Krogh et al. (2001), firms can and should find ways to make data building and partaking in the association. Gupta and Govindarajan (2000) call attention to that the turn of events and backing of dynamic social biology is a fundamental prerequisite for viable data the executives. The social climate is characterized as the social climate wherein individuals work and is created and upheld by the association. As indicated by Liu and Brookfield (2000), relationship improvement and the foundation of trust are fundamental for useful organizations. Examining how an organization can take part in the mix of coordinated ecological organizations is another significant examination question.

In rundown, we accept that the most suitable conditions for data the board ought to be those of organizations. This will have benefits in data the executives examination and data the board conduct overall. Aside from the way that hypothesis and observational investigations support this proposition, we actually need a ton of exploration in the spaces and issues referenced previously.

4. VITAL MANAGEMENT: MANAGEMENT FRAMEWORK

The five asset credits, every one of which, when met, give the organization an upper hand, talked about over, all taken from RBV. Thus, an essential asset the executives asset based vital administration structure should help the association in carrying out these highlights. This implies that the structure should direct the association through the accompanying advances: 1) recognizing proper data and information measures, 2) creating and refining data and information cycles to expand esteem, 3) carrying out and spreading data and data frameworks

adequately; and 5) to ensure data and information measures.

As per Kalling, our structure is part of the way dependent on the system of IT asset the board frameworks that he has created (2000). You fabricate a structure based on the organization's leftover worth. As well as zeroing in on data and information measures, we have changed and extended Kalling's system by: 1) fusing dynamic establishments, 2) underlining networks (inward, reciprocal, and moderate organizations), 4) renaming different capacities, 5) orchestrating the substance of assignments straightforwardly to the assets and cycles identified with the data, and 6) to add a solitary capacity (vital thought).

As per SKM's proposed system, the securing and maintenance of upper hand through information and data measures is a cycle that incorporates (Figure 1): 1) vital vision, 2) vital information and basic data distinguishing proof, 3) structure, 4) data assurance, 5) execution, and 6) The utilization of data and information measures. In request to acquire an upper hand through information and data measures, an organization should oversee six distinct activities simultaneously. Different targets and issues are related with each assignment, and numerous appraisal issues are related with each errand.

As indicated by RBV, Barney (1997) made four inquiries that could be posed about any asset or ability to decide if it very well may be a wellspring of upper hand. The accompanying inquiries emerge because of adjusting the inquiry to our reasoning:

- The topic of why something is significant. With regards to regular freedoms and dangers, does authoritative data and organization-based data frameworks empower the association to recognize and abuse those chances and dangers?
- The issue of simple access is being created. Is it conceivable to appraise what number of contending firms as of now have some significant data and organization-based data measures?

- whether or not something can be replicated or not. Contrasted with firms that have some important data and cycles dependent on network, do firms that don't have that information and cycles face more prominent trouble in acquiring such data and cycles?

- The issue of hierarchical design. Is the organization association with the goal that it can completely use the serious force of its information and organization-based data measures?

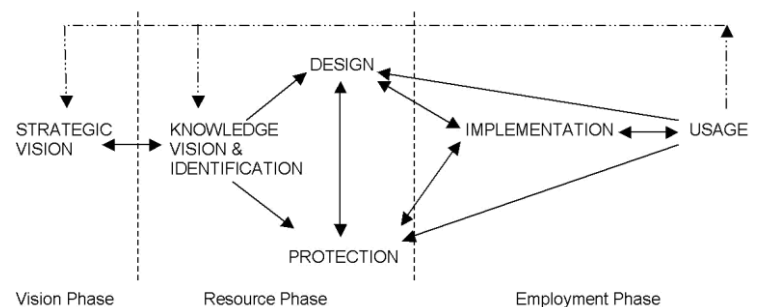


Figure 1: A model of the strategic knowledge management process

A dream for what's to come. This is like what is known as "conventional" arranging. The essential vision might incorporate the accompanying: a) corporate mission, which is the main goal as far as costs and assumptions for different partners, b) vision or objective, which is the ideal future situation, which might incorporate firm aspirations, c) objective, which is a typical mission statement or reason; d) targets, specifically measurement and execution or explicit strategy explanations. Notwithstanding the system in question, it ought to, from an essential information the board point of view, distinguish key data the executives as basic components for the association to acquire and keep up with upper hand. The fundamental reason for key data the board will be recognized in the essential vision text. On the off chance that essential data the executives isn't viewed as a basic apparatus, associations can all the more likely advantage by zeroing in their endeavors on different assets. The arrival of this capacity is utilized as a contribution for the survey work, portrayed beneath.

Understanding the situation with data and recognizing key data related assets. An information point of view is required for an organization to oversee data related assets in an adaptable and economical way. The authoritative vision ought to be in accordance with the hierarchical key vision. It should show how the organization, through the administration of data systems and cycles (network-based), can accomplish its vision of accomplishing its objectives and goals. Because of its relationship with key viewpoint, the information point of view can possibly rise above the limits of existing information, items and administrations, hierarchical constructions, and markets.

We can pose the accompanying inquiries dependent on the responses to the above questions:

- Is it conceivable that some type of organization-based data and cycles will be helpful to the organization? The worth of a resource ought to be evaluated as far as essential viewpoint.

Would you be able to advise me if contending firms have some sort of data and cycle data dependent on the organization you need?

- Can firms that don't have this specific kind of data and organization-based data measure be more cutthroat when they attempt to procure them contrasted with the organizations they have?

- Is it conceivable to plan and utilize an assortment of workmanship objects, fake frameworks, physical and virtual spaces, and different materials to exploit the cutthroat force of specific kinds of data and organization-based data frameworks, for instance?

Requests will help the association in deciding the likely aggressive effects of particular sorts of data and organization-based data frameworks (absence of rivalry -> progressing upper hand) by posing proper inquiries. It will likewise give a sign of conceivable monetary execution (beneath ordinary to better than average, for instance).

Therefore, the data viewpoint determines what data related assets the firm ought to create to acquire upper hand in data the executives, yet

it doesn't indicate how these data related assets ought to be planned, procured, and utilized.

Plan. Configuration work is tied in with deciding how needs (from past work) can be met. Configuration is about the entire substance and interaction. As well as planning files, business cycles and thorough data the executives, reward frameworks and other such projects, development can likewise incorporate planning spaces like structures and different designs (Earl and Scott 1999; Brown and Duguid 2000; Hansen et al. 1999; Nononaka et al. 2001; von Krogh et al. 2000a; Gupta and Govindarajan 2000). This may likewise remember the development of visual regions for use for reproduction programs (Schrage 2000). The undertaking considers the development of the capital, yet in addition the advancement of human resources. It includes constructing how data can be utilized to develop or upgrade other existing (key) assets that can be wellsprings of upper hand, for example, fabricating how data can be utilized to foster new item advancement measures (NPD measures).

At the core of the plan is the development of an essential information structure, comprising of a bunch of information related assets that cooperate to make the possibility of information work. The accompanying inquiries can be utilized to test make-up:

In particular, how much and how much are the absolute generally significant (network-based) measures - significant as far as information viewpoint and vital point of view, to explain?

- Do contending firms have explicit plan techniques (network-based) that they can use for their potential benefit?

- Can firms that don't have a particular data measure (network-based) plan hazard an upper hand when attempting to obtain them contrasted with existing firms?

When and how much will it be feasible to utilize an assortment of artistic expressions, creation frameworks, visual guides, and visual spaces, in addition to other things, to exploit the serious force in a specific industry?

Information assurance is significant. The fourth undertaking is momentarily talked about in the data the executives writing. With regards to information assurance, there are two primary targets: 1) insurance from impersonation, and 2) security from value disintegration. Except if the firm can utilize authoritative and legitimate security measures at times, for some, data related assets, it can just depend on disconnection systems to ensure its most significant data related resources. Strategies for separation might incorporate, for instance, the accompanying:

- **Uncertainty** The topic of "obscuring" the connection between a data related gadget, for example, an ICT-based organization-based data framework, and the aftereffects of that source.

- **Complexity.** The "inserting" inquiry is a data related application as in it catches parts of an unpredictable social circumstance, for example, an organization-based data measure, for instance.

- **The magnificence of time.** Attempting to be above all else in creating data related assets (which are exceptionally managed by contenders) is imperative to consider in this specific situation, which is identified with the unique capability of the organization.

These strategies can make it hard to reproduce and can assist with lessening esteem disintegration. Second, it is feasible to utilize inquiries to survey: 1) regardless of whether certain actions taken to ensure protected innovation and data cycles might bring about upper hand; and 2) diverse plan strategies from the review point.

Execution. The business stage trails the assets stage. It isn't sufficient to distinguish and plan data related assets in an inventive manner. As a rule, different mediations are required all together for the data and cycles of organization-based data to be completely used. You could utilize another award framework, just as learning and learning programs, in addition to other things. Questions might be utilized to investigate diverse execution systems relying upon their cutthroat results and monetary execution.

Use. This is the real utilization of data and organization-based data measures in true

circumstances. Questions can be utilized to test the consequences of real utilization of data related assets. They are not intended to be awesome. The test outcome can affect both an essential viewpoint and an information point of view.

4.1 Outcomes of Information and Communication Technology (ICT) Information Management

As referenced before, KMS is anything but a particular data and correspondence innovation (ICT) innovation in the conventional sense, but instead a thought (perspective on) data and information measures, the job of data and correspondence innovation (ICT) as a help for data the executives, and how to apply this idea. The Internet, intranet, groupware, and PC related associations, information warehousing, information securing of data sets (counting information mining), yellow PC based pages, recreation apparatuses, keen specialists and video conferencing are only a couple instances of ICT that can be utilized for data the executives in network conditions. This is not a thorough rundown, notwithstanding. (1999), Alavi and Leidner (2001), Carlsson et al. (2000) gave instances of different parts of the utilization of data and correspondence innovation (ICT) in data the executives.) We have talked about a similar idea of data the board the executives and the SKM system in the past segment. This can be utilized to recognize and investigate the possible job of data and correspondence innovation (ICT), and how ICT can be utilized on intra-, extra-, and different organizations to acquire and keep up with upper hand. The utilization of data and correspondence innovation (ICT) in network-based data frameworks requires critical exploration consideration.

5. CONCLUSION AND OBJECTIVES OF FUTURE RESEARCH

We have grown new information thoroughly considering reasonable examination. Contingent upon the RBV and KBV of the firm, we have extended our intuition to incorporate the accompanying thoughts: 1) the idea of dynamic energy; and 2) a solid and in the middle of view. An essential data the executive's structure was likewise presented,

just as the presentation of organizations as a setting for data the board. A structure might be utilized to direct the association through the way toward building and creating efficient data frameworks. To make thinking and system more precise, more hypothetical work is required. Exploratory examination will be significant in assisting us with seeing how

firms can become capable in data the board in network settings, how they here and there stay that way, how they further develop their data the executives, and why data the executives can at times disintegrate in network conditions.

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SOCIAL IDENTITY AND WOMEN EDUCATION: AN EMPIRICAL STUDY ON IMPACT OF MANAGEMENT EDUCATION ON SOCIAL IDENTITY OF WOMEN

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ABSTRACT

Retrospection into the history of human civilization highlights its evolutionary process, varied challenges faced by this species against all odds and its struggle to establish a unique supremacy status over other species on the earth. Contributing factors for the said supremacy are their unparalleled intelligence, broad knowledge base and profound experience. Education considered to be an effective tool in bringing the required awareness in an individual. On the flip side, from ages, male-dominated societal structures across the globe have led gender discrimination in many walks of women's life. Thus, it demands an insightful approach towards understanding the impact of Management Education on Social Identity of Women. The results reveal that management education resulted in the upliftment of women in terms of their economic and social status compared to non-management graduates. A clear positive linkage was observed between women empowerment through management education and their employability, gender inequality, social status, and work-life balance.

Keywords: Women empowerment, Social Identity, Gender Equality, Quality Education, Management Education

INTRODUCTION

Mr. Nelson Mandela quotes how education is one of the most useful tools and rightly highlights the spirit of education in the context of today's world where we are facing various problems ranging from poverty to terrorism. Mankind has evolved over the period of time by learning from the surroundings and adapting to the changing environment if one has to understand the significance of learning or gaining knowledge the current advancement of mankind would be the right example. One of the most important advantages of education is that it builds awareness in an individual about self and surroundings. If one is educated he/she will be aware of their rights, laws and their responsibilities towards society thus leading to social harmony and peace.

In all religions, women have been given a special and sacred status, but if we look around, we may doubt the status quo. "Religion and customs always had been the strong influencer in the making of Indian society, irrespective of educational literacy even today a lot of customs are followed without any practical consideration. Girls are likely to get married at the early tender age of 18 years even today in countries like India.

"Poverty is one of the major reasons for the intermediate withdrawal of children in

schools. Parents find it difficult to understand the cost-benefit of educating their child especially girl children, against the extensive child labor market. Thus schooling becomes an opportunity cost for parents, in extreme situation the girl child has to sacrifice the schooling to take care of domestic responsibilities like cooking, taking care of a sibling, etc.

Various scholars have highlighted different areas in which women should get equality like, education, marriage, inheritance, politics and employment. Women empowerment is a real concern and that's why it has been a priority in the agenda of various stakeholders in the government as well as the non-government organization. Over the period education has shown a positive effect on various social aspects in general. "Men & Women should get the education they rightly deserve, and it should be provided regardless of their gender. This paper explores the impact of management education on the social identity of women with special emphasis on Rashtrasant Tukdoji Maharaj University. The purpose of this was to ascertain the reasons behind the social development of women and its correlation with management education.

REVIEW OF LITERATURE

Moser(1989) defined empowerment as the capacity of women to increase their own self-reliance and internal strength. It helps women make choice with better confidence and ability to gain control over the material and non-material resources. Women empowerment have always been associated with basic ingredients of Education, Economic Freedom, Social Representation, but it may also be important to understand if they have any interdependency on each other and thus influencing the empowerment of women.

Acharya & Ghimire (2005) have highlighted the different dimensions of women empowerment and proposed that these dimensions have interdependency on each other. There are THREE dimensions to women empowerment process i.e: Economic, Social & Political, all dimensions have interdependency and strengthen each other.

Jones-Deweever A (2012) has addressed the issue of women education in one of the international conferences, where she related education of female gender with various social, economic and personal benefits. "True empowerment of women would be to provide full access to education, health care facility, employment and participation in political activities without fear of violence or cultural backlash of any sort from any section of the society.

Dr.Kumar J and Sangeeta (2013) in their research have studied the importance of education and how it helps a girl child growing further in matured women thus helping them to build a respectful image within the family as well as in the society. Girl education is the most powerful tool to bring positive change in the society. Education helps to bring reduction in inequalities and functions as a means of improving their status within the family.

Mukherjee D (2007) has rightly highlighted the positive effects of education considering various social parameters like birth rate, death rate, infant mortality rate and population growth rate. Social phenomenon like Birth Rates (CBR), Death Rates (CDR), Infant Mortality (IMR), and Population Growth Rates (PGR) decelerate with improvements in literacy and thus it can be said that literacy has wide socio-economic impact.

Blustein D & Noumair D (1996) in the research work have tried to review work carried on the self and identity, to develop a means of integrating these bodies of work with contemporary issues in the theory and practice of career development and to provide a theoretically informed discussion about the implications of recent innovations in conceptions of the self and identity to counselling practice. The study concluded that embedded view of the self and identity provides a means of understanding the increasingly complex network of factors that influence the development and expression of those concepts.

Cameron J and Lalonde R (2001) in the research the nature of women's and men's gender-derived social identification was examined with focus on the relationships between aspects of identity and gender-related ideology. Researcher concluded that factor analysis provided support for a multidimensional conception of gender-derived social identification, with viable subscales reflecting in-group ties, cognitive centrality, and in-group affect.

Dovidio J, Gaertner S, Pearson A and Riek B (2005) in the research work have reviewed how social identity and social categorization impact people's responses to others and personal well-being. Researcher concluded that people belong to many different groups, and these social identities can become activated simultaneously. Meanings of social identities have difference implications for members of different groups.

Shore B (2005) an article focusing on women participation in MBA program has highlighted few areas how women can be motivated to participate in big number for better gender inclusion in future.

Churchard C (2010) has highlighted different initiatives which may help promote women in business. Different measures are required to promote more and more of women as Directors on boards, one of the key measures would be to attract more and more women in pursuing MBA courses.

Simpson R, Sturges J, Woods A and Altman Y(2003) in their research have analyzed career benefits from MBA. Important benefit of MBA was greater marketability, enhanced job

prospects, enhanced salary or status and enhanced credibility and confidence. Important skills gained from MBA are ability to handle and analyze complex data and negotiation skills.

RESEARCH METHODOLOGY

I have used Descriptive Research to understand different aspects in relation with education as a tool in bringing Women Empowerment. To achieve the required results, it was important to reach out to TWO different categories of respondent's i.e: Management Graduates and Non-Management Graduates.

For the research purpose only the Degree Course of Management offered by Rashtrasant Tukadoji Maharaj Nagpur University (RTMNU) i.e., Masters in business administration (MBA) has been considered as the criteria to shortlist the respondents. Thus, MBA was the natural choice, since it is governed by the University having standard syllabus and inputs as part of the curriculum avoiding any deviation from standard.

As I have used survey method in my research work, it was clear that a questionnaire would be required to capture primary data and achieve the desired outcome to facilitate the data analysis and further interpretation. Data captured through pilot study was entered into SPSS and was further tested.

Based on the research objective it was important to figure out the different constructs

associated with the dependent variables of Social Identity.

Table 1

Variable	Construct
Social Identity	Pride
	Self-Esteem
	Well-Being
	Self-Efficacy

H1 Management Education has positive impact on Social Identity of women

H1A Management education has positive impact on Self-Esteem of women

H1B Management education has positive impact on Well-Being of women

H1C Management education has positive impact on Pride of women

H1D Management education has positive impact on Self-Efficacy of women

Based on inputs received from literature review it was decided to use independent t-Test to achieve the results of research.

RESULT ANALYSIS

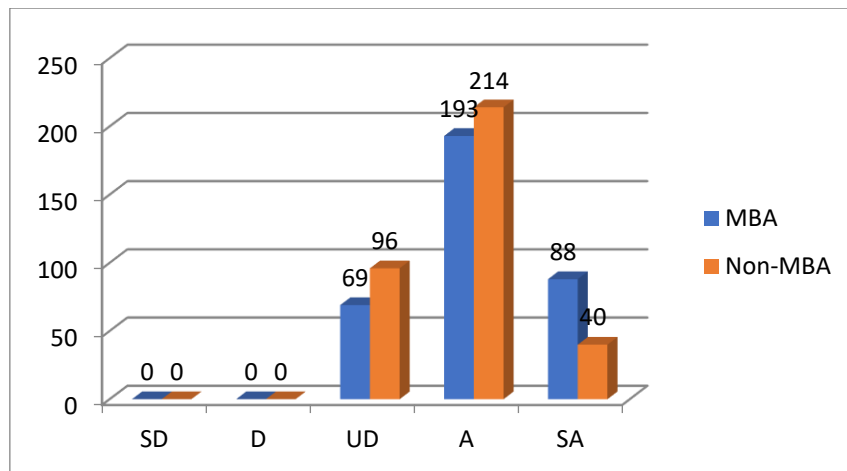
Table 2

Demographic Variable	Number of Respondents		Percentage	
	MBA	Non-MBA	MBA	Non-MBA
Age Group				
20 – 25	117	125	33.42	35.71
25 – 30	208	211	59.42	60.28
30 - 35	25	14	7.14	4
Marital Status				
Married	207	267	59.14	76.28

Unmarried	143	83	40.85	23.71
Graduation Details				
B.A	47	79	13.42	22.57
B.B.A	77	0	22	0
B.C.A	0	52	0	14.85
B.Com	85	83	24.28	23.71
B.E	53	44	15.14	12.57
B.Sc	88	92	25.14	26.28
Type of Family				
Joint	151	208	43.14	59.42
Nuclear	199	142	56.85	40.57

I feel good about myself**Table 3**

	SD	D	UD	A	SA	Total
MBA	0	0	69	193	88	350
Non-MBA	0	0	96	214	40	350

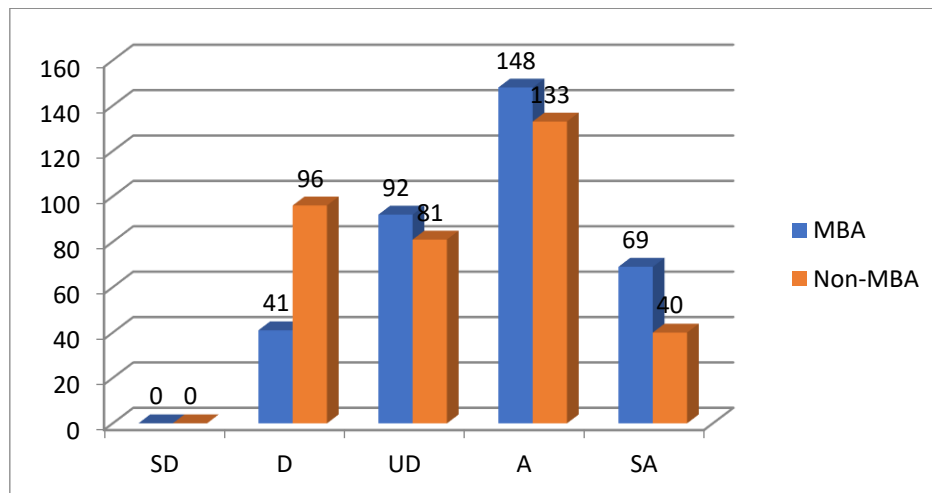
**Figure 1**

Majority of the management respondents believed due to their management qualification; it has provided them strong foundation for better career prospects and social identity. Education is one of many aspects for an individual to feel good about

oneself. Management education, which is considered to a business degree, provides tremendous emphasize on business skills development. It helps build confidence in an individual, which otherwise is not generally done by other streams of education.

Many people respect me**Table 4**

	SD	D	UD	A	SA	Total
MBA	0	41	92	148	69	350
Non-MBA	0	96	81	133	40	350

**Figure 2**

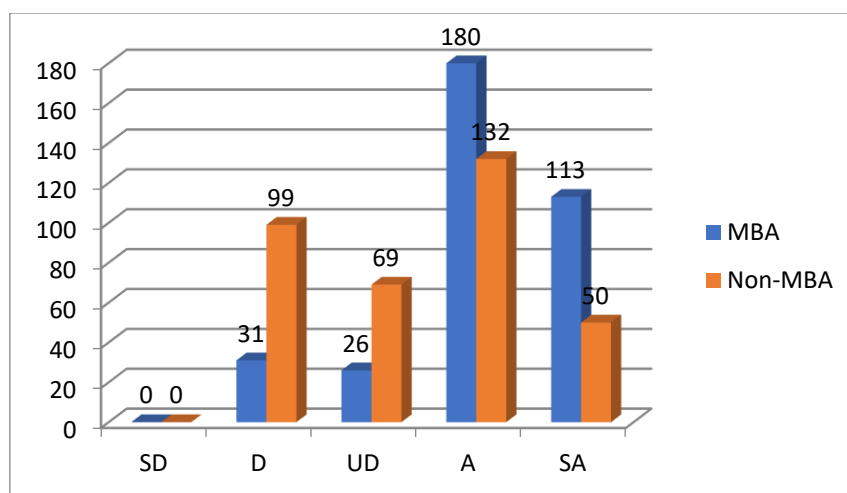
Based on the interaction it was also understood that management respondents were more involved in team and people management giving them the extra edge as compared to

non-management respondents who were more involved in operational work. Management education emphasizes on business skills as compared to other streams of education.

On the whole I'm satisfied with myself

Table 5

	SD	D	UD	A	SA	Total
MBA	0	31	26	180	113	350
Non-MBA	0	99	69	132	50	350

**Figure 3**

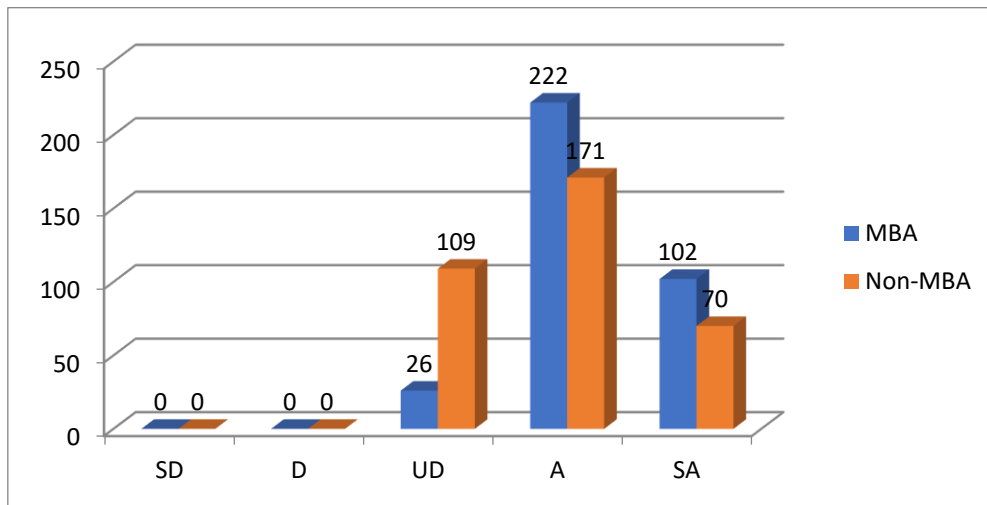
Based on the interaction with respondents it was observed that in general both type of respondents had positive feedback to the statement, but non-management respondents felt that they might have achieved more in terms of education, compensation, career

growth as compared to management respondents. Respondents believed they are definitely satisfied with themselves, but they had aspirations to achieve more, and it would have been possible with better skills, training and career opportunities. Thus, it was clear that management education provided an edge over non-management education.

I feel that I have number of good qualities

Table 6

	SD	D	UD	A	SA	Total
MBA	0	0	26	222	102	350
Non-MBA	0	0	109	171	70	350

**Figure 4**

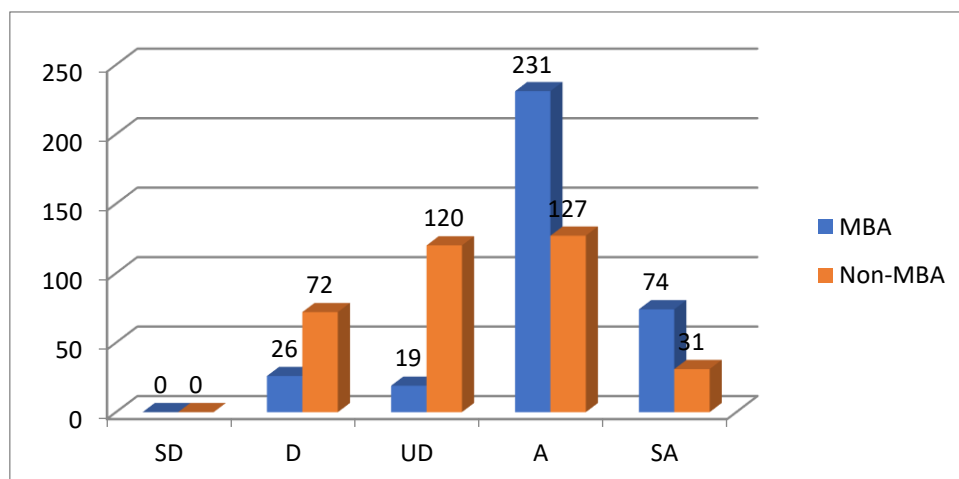
Based on the interaction with respondents it was understood that both respondents had agreement with the statement, but they had their own aspirations to achieve. Non-management respondents believed they do have good qualities but as compared to management respondents they were not provided any special training on different life-skills like team management, conflict

management, behavioral training, time management, etc. which made them felt that they had much more to be achieved. Difference in the skills possessed by the respondents made them give a mixed reaction to the above statement. But in comparison it is obvious that management respondents were in majority agreement to the statement.

I am able to do things as well as most other people do

Table 7

	SD	D	UD	A	SA	Total
MBA	0	26	19	231	74	350
Non-MBA	0	72	120	127	31	350

**Figure 5**

Management respondents in majority have agreed with the statement and the basic reason was that they were trained for various skills during their MBA program which can help them achieve higher efficiency at workplace. Non-management respondents too believed they have basic employability skills, but major

I take a positive attitude towards myself

of the learning happened on Job which may have consumed more time to prove their efficiency. Whereas management respondents possessed majority of the business skills which gave them the edge to perform and deliver immediately in their respective job roles.

Table 8

	SD	D	UD	A	SA	Total
MBA	0	0	26	250	74	350
Non-MBA	0	48	77	201	24	350

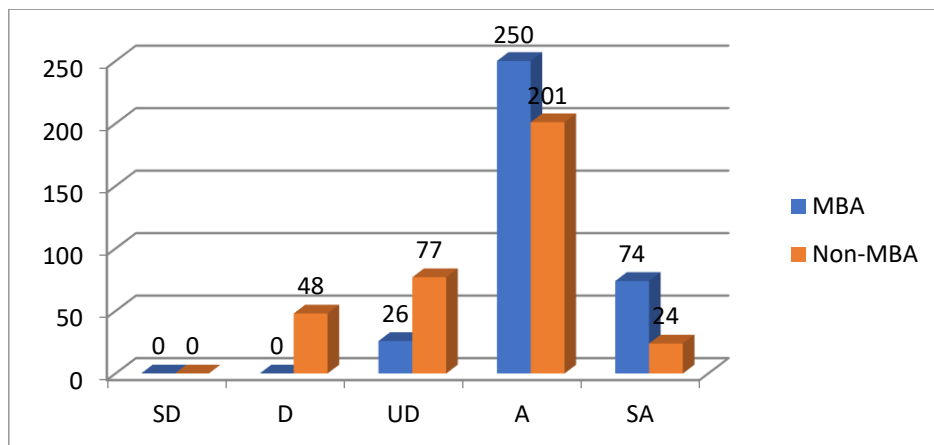


Figure 6

Based on interaction with respondents it was observed that management respondents had strong agreement with the statement as compared to non-management respondents. It was found that the major difference in the thought process was because of difference in

business skills possessed, career prospect, designation, compensation and respect commanded in the personal and professional life. Non-management respondents were of the opinion that they too felt positive about self but had many things to be yet achieved in life.

The conditions of my life are excellent

Table 9

	SD	D	UD	A	SA	Total
MBA	0	26	35	220	69	350
Non-MBA	0	48	171	119	12	350

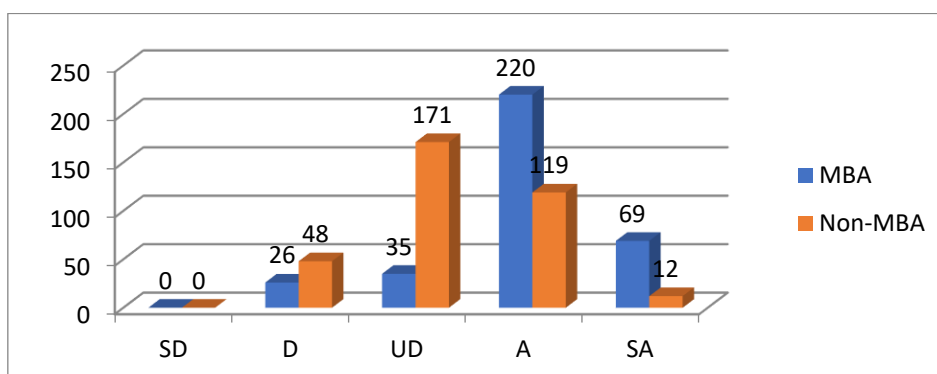


Figure 7

Based on the interaction with respondents it was observed that management respondents were in strong agreement as compared to non-management respondents. Respondents responded to the statement based on their personal and professional experience. In personal they felt that they were getting good respect, were part of family decision making

and in professional life it was good job role and responsibility, clarity on career path, stability in career, etc. Whereas non-management respondents were of the opinion that their existing status is not bad, but they had aspirations to improve it and take it to the next level.

I am satisfied with my life

Table 10

	SD	D	UD	A	SA	Total
MBA	0	24	120	66	140	350
Non-MBA	0	75	120	129	26	350

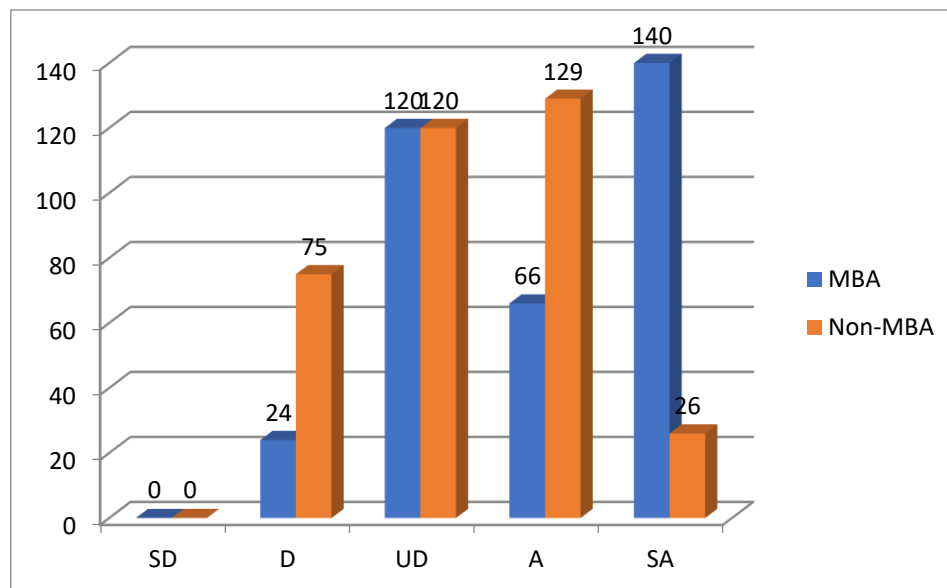


Figure 8

Based on the interaction with respondents it was observed that management respondents were in strong agreement as compared to non-management respondents. Respondents responded to the statement based on their personal and professional experience. In personal they felt that they were getting good respect, were part of family decision making and in professional life it was good job role

and responsibility, clarity on career path, stability in career, etc. It was not that non-management respondents were not satisfied with their lives, but they had many things to achieve. Apart from personal achievement, they had an opinion that they deserve more respect and freedom in society. So, there were few external factors that might have influenced their response.

So far I have gotten the important things I want in life

Table 11

	SD	D	UD	A	SA	Total
MBA	0	10	74	195	71	350
Non-MBA	0	119	39	165	27	350

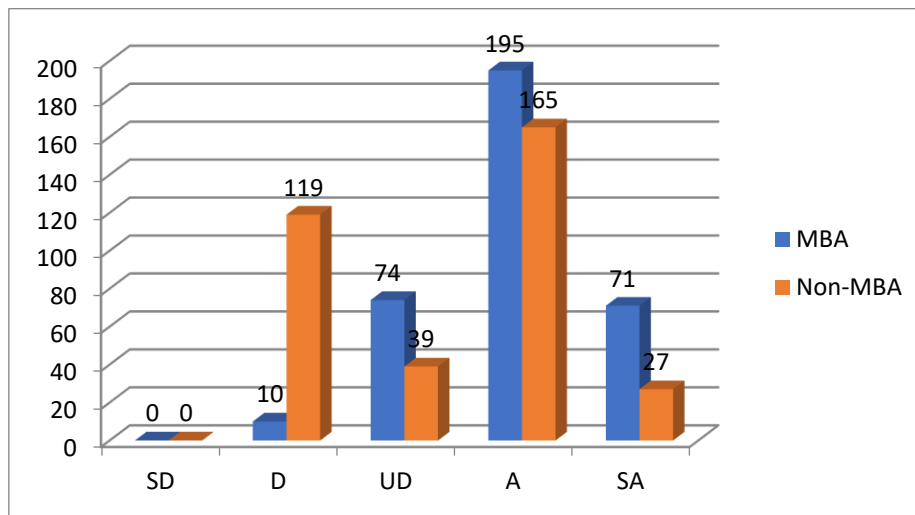


Figure 9

Based on the interaction it was observed that both respondents had agreement with the statement, but the majority was of the management respondents. The major differentiating factor was the personal and professional benefits derived from education and overall family background. Management respondents were of the opinion that due to their education they are able to reap good

benefits on personal and professional front. If we consider basic needs of human being, they are food, clothing and shelter. In our context we can put it as lifestyle, earning ability and social status. It was understood from management respondents that due to management education they have been able to achieve good success in their personal and professional life.

If I could live my life over, I would change almost nothing

Table 12

	SD	D	UD	A	SA	Total
MBA	0	25	30	149	146	350
Non-MBA	0	75	87	165	23	350

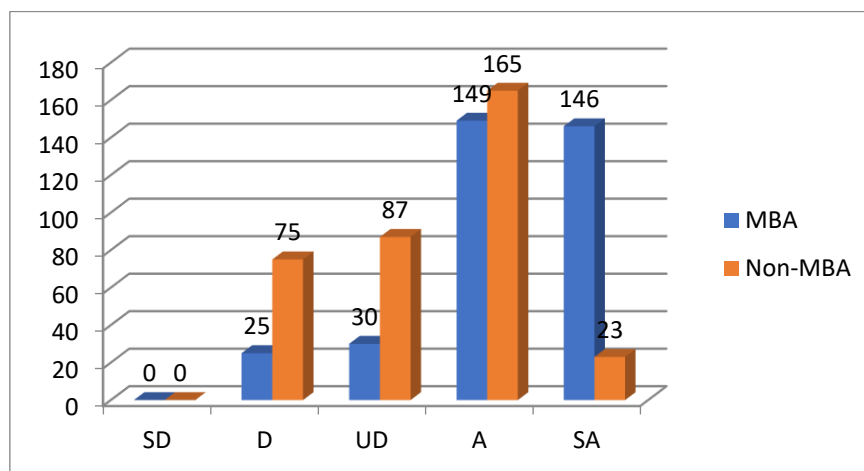


Figure 10

Based on the interaction with respondents, it was observed that management respondents had strong agreement with the statement. They

had strong satisfaction with whatever they have achieved in their lives. Management education has helped them achieve social

status, employability, decision making skills, confidence, etc. Non-management respondents believed they too are satisfied with their life but aspire to achieve more. They

expressed that if they would have been provided with business and life skills, they too would have been in a better position today.

No matter what comes my way, I'm usually able to handle it

Table 13

	SD	D	UD	A	SA	Total
MBA	0	0	94	191	65	350
Non-MBA	0	54	115	148	33	350

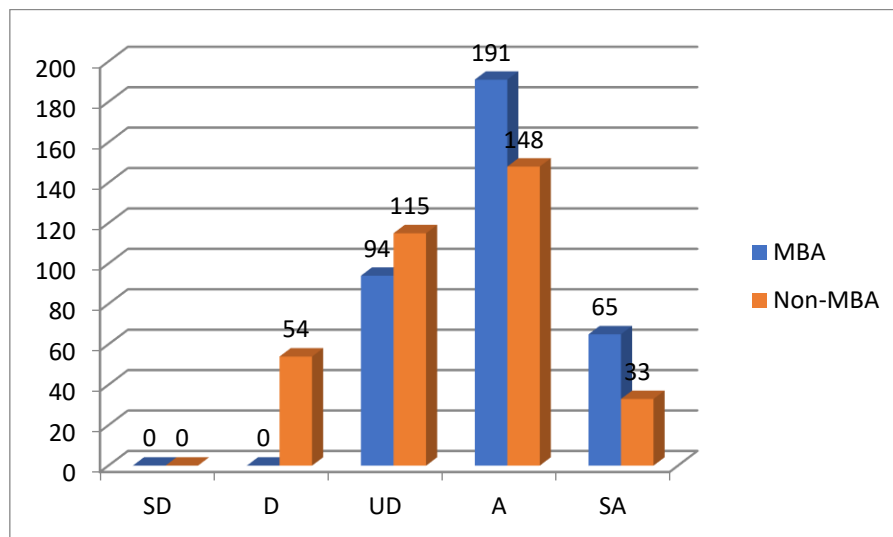


Figure 11

It is obvious that majority of the situations management respondents were more confident to face it as compared to non-management respondents. Training and grooming provided in MBA program helps to face challenging situations and provide strong foundation to build on it for future requirements.

In order to test the relationship, independent t-test was used as a statistical tool and the relationship was found to be significant at 0.05 alpha and strongly supporting the preposition. Thus, based on above test results and discussion it is obvious that Management Education has Positive Impact on Self-Esteem, Well-Being, Pride and Self-Efficacy. Consequently, it is proved that Management Education has positive impact on Social Status of Women.

Hence, it is interpreted that "Management Education has Positive Impact on Social Status of Women".

LIMITATIONS

Above research work was carried out in Nagpur District, it may not be the same in other areas. Respondents response may not represent the overall scenario. Responses may be influenced by the research subject and/or the complexity involved in the questionnaire.

CONCLUSION

The research undertaken found out that the individuals had positive impact on their social aspects. Factors taken into account were Self-Esteem, Well-Being, Pride and Self-Efficacy of women. From the research it can also be concluded that management education can definitely help in wholistic empowerment of women. The government must generate more awareness related to management education and different support schemes available for MBA aspirants. Research results also lead to future scope for research work to be carried in the field of women empowerment.

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DIGITAL ADDICTION AND HAPPINESS QUOTIENT OF STUDENTS- A DEVELOPING COUNTRY PERSPECTIVE

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ABSTRACT

COVID-19 has fast-tracked the internet evolution in a developing country like India. Unprecedented digital growth may result in India having more than 900 million internet users by 2025 (Warc, 2020). Digital is not only fulfilling the educational, entertainment needs of students but are also resulting in behavioural changes caused by over consumption of digital content i.e. digital addiction. This research analysis the impact of digital addiction on young students in India in the age group of 18-24. The study uses mixed research design covering three steps viz collection of real time smart phone data of the screen time of 400 students, self-report questionnaire and a focus group discussion with 24 students. The findings of the study suggest that digital addiction negatively impacts the happiness quotient of the students with an urgent need for marketers to be more morally responsible with use of various digital marketing tools.

Keywords: Digital Addiction, Digital Marketing, Happiness Quotient, Social Media, India.

Introduction

COVID-19 has fast-tracked the internet evolution in India. Unprecedented digital growth may result in India, one the fastest developing economies of the world, having more than 900 million internet users by 2025, an addition of about 350 million users over the next five years (Warc, 2020). In India, the smartphone usage is estimated to touch the 829 million by the year 2022 as India is also the second largest populated country in the world. 6 out of 10 individuals smartphone users in India are over dependent on their phone which can be appreciated by the fact that it hardly takes them 30 minutes of waking up time to go online and get updated (Ram, 2017).

Digital is fulfilling the marketing, educational, entertainment needs of students in India. With development in the digital space, consumption is also increasing exponentially that directly puts the consumer at the risk. More than 400 million citizens of the Indian population contribute to the young workforce of the country, driving key economic activities. Hence, understanding the consumption patterns of this generation becomes essential to any broad-based social analysis.

The digital growth at an unprecedented rate is also resulting in behavioural changes caused by over consumption of digital content a.k.a digital addiction. This, in turn affects various aspects of our lives including mental, physical and emotional wellbeing of young students. Life satisfaction and happiness quotient are largely the factors that can effectively quantify these impacts. To fully understand this phenomenon this research studies the impact of digital addiction on happiness quotient. A study of Digital Addiction defines it as “*developing a compulsive need to use your digital devices, to the extent where it interferes with your life and stops you from doing things you need to do, is the hallmark of an addiction.*” (Time to log Off, 2018). India being a young country with majority of its population in their mid or late twenties is more susceptible to fall into the traps of digital addiction.

Hence, this paper aims at covering all the implication that intensive use of digital devices can have on the life of its students; and its implications.

Literature Review

Over usage of Smartphone and social media in India: Expansion of Social Media usage

in India has seen a boom period with the increased & ease of accessibility. By the year 2023 it is forecasted that India will have almost 448 million users of social media (Diwaji, 2020). Such proliferation is bound to have drawbacks in various domains. Research done by the (Dhirubhai Ambani Institute of Information and Communication) DAIICT suggests that an average Indian student spends more than 7 hours a day looking at their phones (2019). The smartphone users in India access their phone within 30 minutes of waking up, 42% of users actively use their devices during the working hours, while 38% use during the night. One research indicates that 67% of smartphone users find themselves incomplete without their smartphone. The report also discusses the high frequency usage of various apps, games and activities that the users are dependent on to their devices. (CMR, 2017).

Addictive designs of Social Media websites: It has already been established that social media platforms are addictive in nature. This pattern of addiction was recognised first when the media giant Facebook created the 'Like' button. This capitalised on the human need for validation and kept its users to come back and post more in order to get more validation (Alter). Online validation functions in the same way as the human brain's reward system works on the neurotransmitter dopamine. Social media activities such as liking, tweeting, sharing, reviewing, commenting, etc. trigger the same neural responses as positive human emotion does, with the release of Dopamine. This mechanism keeps the users hooked to the platform and even develops a resistance in the dopamine receptors as the users engage more to further increase the release of dopamine. (Robertson, 2019)

There are various other functions and psychological mechanisms that social media platforms operate on to increase engagement. Mechanisms like 'intermittent reward system', 'delayed gratification', 'social reciprocity' are built

upon set psychological phenomenon of addiction. (Morgans, 2017). The feature of push notification functions on social reciprocity where the notification usually leads to a new message, a story posted, comment or like on the user's profile. In March 2018 Instagram came up with a new update where once you switch off the app the icon flashes a white light which seems to be taking an image. This gamification of the app icon was successful as any change makes the consumer stop and focus on it.

Another interactive way that Facebook and Google have used to keep its users engaged is by simplifying the tedious procedure of signing up and also ensures dependency and relevance of the app in the students' lives. Dating Apps, Entertainment Apps et al, have used the tricks of creating personalised playlists to maintain the membership.

With the incorporation of novel features on a daily basis to increase the engagement time, it becomes essential to understand the patterns of digital addiction and what it entails.

Digital Addiction: According to research conducted by Qualtrics and Accel (2017) it is reported that young students tend to consult their phones around 150 times a day which qualifies as borderline obsessive-compulsive disorder. Audio-visual brand semiotics (distinct sounds, vibrations, colours) is capitalised to get students to respond immediately. With increasing access and acceptance smartphones communication as a cultural norm in India, 'moderation' or control of smartphones is increasingly challenging. The impact of social behaviour of peers, family and friends using the phones has further strengthened the idea that excessive digital usage is now our new normal. (Conick, 2017)

Impact of Digital Addiction: The impact of digital addiction is seen on many aspects of human psychology. According to the American Psychiatric Association taking 'selfies' is considered to be a mental disorder and posting them on social media

accounts for making up for low self-worth. Resources also report a decline in sleep quality due to the harmful light emitted by the electronic devices. Moreover, lack of sleep, excessive screen time and exposure to all-night blue light is increasingly damaging various brain functions. (Alter, 2017).

Happiness Quotient: Happiness is an all-pervasive emotion that forms the backbone of policymaking of the state, understanding drivers and motivating factors of students, patterns of consumption, emotional states, etc.

Recent research on happiness emphasises the need to differentiate real time experiences of people and the memory caused by the experiences. The retrospective experience, 'is not just the mean value of the past episodes, but it is rather a weighted average of moment perceptions' (Muaremi, 2012).

There are multiple factors that affect happiness but the ones related to digital addiction include:

- Activity, Leisure
- Sleep
- Friendship, Sociability

These factors help determine if the person's digital and social media usage affect the happiness/satisfaction levels of the consumer.

Objectives of the Research

This research aims to understanding the impact of digital addiction on happiness quotient, the self-awareness of the young students about their addiction.

Methodology

This research follows a mixed research method viz real time data of screen usage (without invading the privacy of the students), a self-report questionnaire and a focus group discussion. The questionnaire based on the Oxford Happiness Questionnaire (OHQ) (Peter Hills, 2001) was used as the standard way of analysing happiness scores for an individual.

Sample

The sample size of this study for the real time data and questionnaire was 400 participants selected based on convenience sampling. The participants were in the age group of 18-25 years, from similar economic backgrounds (upper-middle class households) in India. They had ready and easy access to smartphones and internet. Although gender is not a differentiating factor in this study, the researchers have taken equal responses from both. Students selected are from Western India (Mumbai and Pune), India only. These students were exposed to the primary research in three stages each measuring a certain factor. For the focused group discussion, 3 groups of 8 participants (24 participants) each were formed from the existing students, the selection for on random basis.

Primary data collection

Primary data was collected in three stages:

Stage 1- The students were asked to download the apps RealizD & ZeroDesktop Inc (application specifications mentioned in the appendix) to collect real time data from the students that provided:

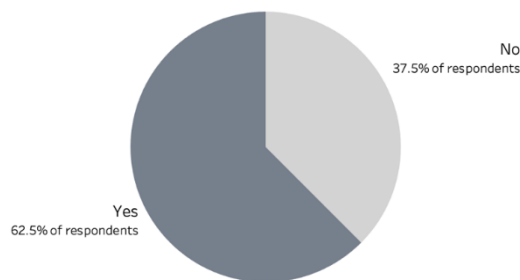
- Average Daily Pickups – average number of times respondent picks up and unlocks his/her phone throughout the day
- Average Daily Usage – average number of hours the students have used their phones for (average screen time)
- Weekly App Usage – total number of hours spent on various apps of the phone throughout the week
- Weekly App Frequency – total number of times the respondent has opened an app throughout the week

Based on research the students were categorized in the following categories:

- 0-3 hours of average daily usage – Not addicted
- 3-5 hours of average daily usage – Moderately addicted
- 5+ hours of average daily usage – Addicted to Smartphone

Data for Fragmentation of attention span was also collected through the app and was

segregated based on certain research-based



parameters:

- Below 130 pickups – Attention Span Not Fragmented
- 130-160 pickups – Researcher looks at Weekly App Frequency and Daily Usage figures and estimates if the attention span is fragmented or not.
- 160+ pickups – Attention is fragmented.

The parameter is set based on the fact that 140-150 pickups a day is the average times people touch their phones. This itself is considered to be a lot according to experts. This being said for the purpose of the study this parameter along with the questionnaire analysis will help understand fragmented attention spans.

Step2- The self-report questionnaire of Oxford Happiness Quotient adapted for the Indian demographic and digital addiction was used. The questionnaire consists of questions assessing happiness, life satisfaction and traits of digital addiction. A six-point Likert scale was used to measure the responses of the agreeableness towards the statement.

Step3- A Focused Group Discussion was conducted with three groups of 8 participants each randomly selected from the students of the questionnaire. The discussion was actively transcribed, coded and analysed.

Data Analysis

Primary Data Analysis

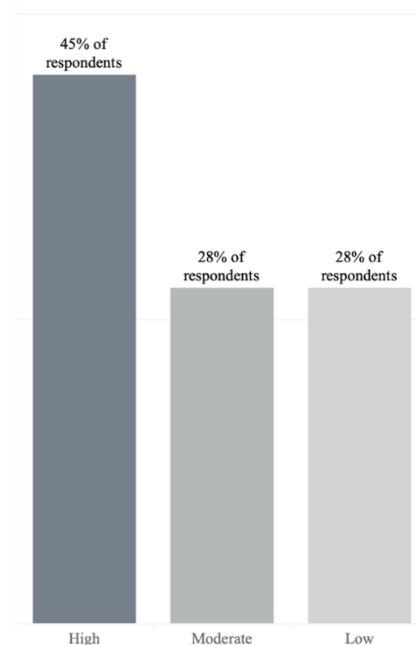
Stage 1

Addiction Levels

The data collected from the four hundred students was segregated in three classes

based on the predetermined parameters of addiction.

Out of the 400 students of the study, almost a majority that is a 180 (45%) are inferred



to be or are likely to be digitally addiction, while nearly the same percentage of the students are either moderately addicted or not addicted at all. This study investigates the addicted or moderately addicted subset of the sample size that are 288 out of the 400 students.

Attention span fragmentation

Unified data of the students that have a fragmented attention and the percentage that did not is described in the figure below.

Based on the above figure it is clear that 260 students (62.5%) portray the traits of fragmented attention span, which is more than half of the sample. When parallels between the two domains of digital addiction (including moderate addiction) and fragmented attention span are drawn, it can be inferred that there is a moderately high level of correlation between the two. 82% of the students express the traits of both, digital addiction and fragmented attention span.

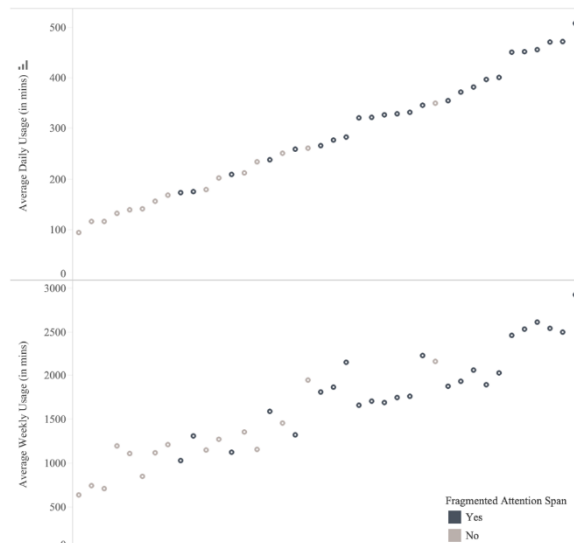
Stage 2

Questionnaire Analysis

Based on the final questionnaire formulated post adjusting the Oxford Happiness Quotient for the Indian demographic and inclusion of the digital aspect the results can be analysed based on the following aspects.

- *Accessibility and usage of the device:* Accessibility is an integral aspect of addiction and how other aspects manifest themselves. The students who reported to not have their phones on them at all times is as acute as 7.5%. Upon personal evaluation of their usage of phones in a day 35% of the participants would qualify as moderately addicted and 35% to be fully addicted to smartphones based on the aforementioned classification of addiction. When compared with the actual number of hours spent on smart phones the data does not differ much as there is a one percent difference between the cumulative data.

The data also indicates that there is an increasing dependency on phones as well more than the majority of the students'



report using their phones thirty minutes before going to bed and fifteen minutes right after waking up. Such behavioural characteristics can also be said to affect the overall happiness levels as looking at phone post waking up and before going to sleep indicates sleeplessness and have been said to affect quality of life.

Another important aspect of addiction is control and on a gradient the participants

reported that most of them strongly feel that they are unable to cut down on their usage of phones after being aware of the fact that they might be getting addicted. Power and control effect addiction in tandem to each other, if the individual is unable to exert control over their situation, the behaviour would reach addictive levels.

- *Types of content consumed on the device:* In line with the real time data collected by the students', the self-report questionnaire also indicate the highest used applications are social media apps, followed by video and music streaming. The specific type of social media platforms used by the students indicates that apps like WhatsApp, Instagram and Twitter were used extensively.

- *Impact on professional life and/or work:* It has been noted that in spite of conscious awareness of the students' work being affected because of their phones, they almost always indulge in digital activities like using their phones and/or social media to procrastinate from work. 82.5% of the students report to be beyond the threshold of slightly agree where the maximum account to 'always' being on their phones on a Likert scale. Procrastination can account for measuring the overall productivity & work life balance to measure life satisfaction ultimately contributing to the happiness quotient. However, most of the participants also confirm to be happier than their peers when asked to compare. Distraction and procrastination go hand in hand, 290 of 400 students agree that they get distracted easily. This hints towards fragmentation of attention spans. In the previous step 260 of 400 students were analysed to have fragmented attention spans. The fact that students are aware about their low attention spans indicates that they are more likely to be open to control measures. The fact that students get distracted easily can be attributed to digital addiction/overuse. A 42% and 7.5% marked to be happier and slightly happy respectively than their peers. This can be interpreted as digital addiction

and/or social media usage has little to do with self-perception when compared to the respondent's peer group. Additionally, the data also points that most of the students are unable to complete the work that they aimed at completing in a day meaning that they were not productive enough based on self-assessment standards.

- *Impact on personal life and happiness:* There is a very deep impact of smart phones on the respondent's personal life which would account for happiness quotient. Most students agree to be satisfied with their lives given the background of digital addiction. The lack of fulfilment despite excessive usage hints to addictive traits and flaws in design of such platforms as these platforms hook students on and not fruitfully engage them. Dependency is an integral marker of addiction and it can be analysed that a moderate number of the students feel a sense of emptiness when their phones are not around them. An important aspect assessed in the questionnaire is the self-awareness of digital addiction of the students as it sets the benchmark for awareness amongst the students. 60% of the students think that they are addicted to their phones. This tallies with the previous step where 45% of students were addicted and around 28% were moderately addicted.

Stage 3

Focus Group Discussion (FGD)

The FGD sheds light on many key points of the interplay between the role of a marketer in the space of digital addiction the happiness quotient. These findings were related to the following four broad categories:

1. *The seriousness of the issue of digital addiction calls for intensive awareness:* It is evident that in the Indian scenario the educated marketers do have an idea of how advertising and other contents engage the audience and/or the students but fail to understand the brevity of it. Such content is "sticky" and captures the audiences in an endless vicious cycle before the user can realise it. Another takeaway

from the discussion is that the mental well-being of the users is being affected.

2. *Marketers are the key stakeholders in dictating the cycle of digital addiction:* All the participants strongly agreed that marketers have a stronghold over creating novel and more engaging content. They are trained and retrained to 'ensure the customers are hooked' through employing different strategies. Which makes it necessary for the marketer to have an ethical compass.

3. *There is an urgent need for the marketers to be held responsible:* Capitalising on the competitive advantage created by digital and social media marketing completely ignores the ethical grounds and as it would put such companies at a disadvantage. It is this attitude that leads to the exploitative cycle of digital addiction that has already begun. This would provide more perspective to the public at large.

Conclusion

Out of the entire sample size 72% were found to have digital addiction and portrayed various traits of it that include excessive usage, dependency on the device, loss of control, constant usage to avoid other activities. Upon comparing these with the happiness quotient of the students, it indicates dissatisfaction at many instances negatively influencing the happiness quotient. The reduced levels of fulfilment in spite of excessive engagement further increases the engagement, continuing the cycle. However, satisfaction levels decrease, having a progressively negative impact on the happiness quotient. Along with this, digital addiction has also severed the attention span and distractibility of its students. The real time and self-report data clearly point out that 62.5% of the students have a fragmented attention span and majority reports to be distracted easily. Digital addiction can be a superlative variable governing happiness quotient and attention span. The findings suggest that 60% of the students' report that they are

aware of their digital addiction, leaving a discrepancy of 10% who are addicted but not aware of it. This calls for immediate actions to raise awareness and implement coercive measures.

- Marketeers are major governors the cycle of digital addiction and need to realise the importance.
- It is the responsibility and accountability of the marketeers to acknowledge this vicious cycle of digital addiction.
- The platforms where such contents are published, and their developers should also be held accountable.
- The current situation calls for raising awareness and employing a bottom-up approach can potentially be successful. The secondary data analysis supports the findings of the primary data analysis. Tapping into addictive behaviour of the students does give results to the company or brand but can seriously hamper the students without their knowledge. Whereas, utilising digital tools in the right manner without

compromising ethical practices also yields results. This calls for an industry wise discussion on what ethical guidelines should be followed while formulating campaigns.

Future Direction

As there are no clear ethical standards for marketing practices, researches in this domain are still in their nascent stages. This study was limited to young students in Pune and Mumbai and thus further studies need to be done especially in the post-pandemic era when digital is a way of life. Online and offline life balance and many other aspects of consumer behaviour that can potentially be affected such as their emotional quotient, desensitisation levels, perspective towards such pathologies, etc. which needs more study. The juncture where disciplines like education, psychology, sociology, neurobiology, engineering, medicine and marketing meet also opens new avenues for further research.

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A STUDY OF CHANGING PROMOTIONAL ACTIVITIES AND MARKETING STRATEGIES OF SHOPPING MALLS AMIDST PANDEMIC

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ABSTRACT

'Shopping malls' are the organized form of retail sector. Malls, 'one-stop hub' of shopping and recreation are centrally owned and managed cluster of architecturally unified selling areas designed to accommodate all under one single roof. Shopping malls are witnessing a huge revamping exercise amidst COVID-19 pandemic. Lockdown leading to shutdowns of the shopping malls left the mall developers, tenants and owners with a big question mark. It forces all to rethink what next? A strong and rightly channelized marketing and promotion strategies are what mall stake holders need to carry out to recall and recollect the footfall to the shopping malls. This research paper is an attempt to understand the phases through which the shopping malls went through amidst pandemic. It highlights the problems and challenges being faced by shopping malls. Further it explores the changes that are being exploited by the mall stakeholders in marketing strategies so as to attract customers again in the new normal.

Keywords: Marketing, Strategy, Shopping, Pandemic, Channelize.

Introduction

Shopping malls, super bazaars, departmental stores are some of the modern concepts of retailing. Shopping malls are not just shopping destinations, but they play the role of community centres for the society. Malls serve as one stop hub for shopping, hanging out, movies, window shopping, entertainment and recreational activities, dining and much more under one single roof with an excellent ambience and a wonderful experience.

Majority of the shopping mall has seen a great boom period until March 2020, the unpleasant attack of COVID-19 pandemic. Designing and executing promotional activities and marketing strategies pre-pandemic was completely different and easy, whereas now, amidst and post-pandemic it is a big challenge for the mall stakeholders to channelize their promotional activities and marketing strategies in such a manner that they successfully attract and call back their old and new customers.

Literature review

1. Research study entitled *'Emergence of organized retail in India'*

by Paramita, focused on growth of retailing industry in India and elaborated the growing awareness and brand consciousness among people of different socio-economic classes in India and how the semi-urban and urban retail markets are witnessing significant growth .

2. Research paper by Rillyan Nur Ramadhania and Atik Aprianingsih entitled *'Marketing Strategies to Enhance attractiveness of Shopping Malls case Study: Mall Ratu Indah Makassar'* revealed sixteen attributes as major strengths that should be improved by Mall Ratu Indah.

3. Thesis by Maheshwari Harshita entitled *'A study of shopping malls pull strategy for attracting customers'* was done with the objective to study the promotional activity of malls with special reference to pull strategy and to evaluate the significant difference among different income and age groups on the perception of pull strategy .

4. *'Impact of Celebrity Advertisement on Shopping Mall Consumers, A Study with reference to Chennai city'*, thesis by VALARMATHI R, is extended to analyze the effect of celebrity endorsed

advertisements on shopping mall consumer behaviour.

5. 'Branding of Shopping Malls and Preference of Customers: A Study with Reference to the City of Kochi', research paper by Sudeep B. Chandramana and Mr Arun Prem, focused on examining the latest trends in Indian malls, the reason for customers' preference towards a particular mall, top challenges for mall managers.

Research Methodology

The present research paper is conceptual in nature. The researcher have used the secondary sources of information from publications of various organizations, institutes, new journal and newspaper published, news articles, online and offline reports, magazines and commercial journals, websites and discussion regarding the research subject on various blogs.

Research objectives

1. To understand the pre-pandemic promotional activities and marketing strategies of shopping malls.
2. To elaborate the changes in promotional activities and marketing strategies of shopping malls post-pandemic.
3. To analyse the challenges faced by shopping malls amidst pandemic COVID-19.

Scope of Study

This research paper explores three phases of shopping malls, i.e. before, during and after COVID-19 pandemic. It is a study in depth about the marketing strategies and promotional activities which were being used under normal circumstances, problems and challenges faced by shopping malls amidst pandemic and what will be the new normal strategies exploited by the shopping malls to attract footfall back to shopping malls.

Limitation of the study

The information gathered is primarily only from secondary source due to difficulty of

offline visiting shopping malls and meeting mall stake holders during pandemic period. The promotional activities and marketing strategies designed are gradually being executed and implemented as and when the government is coming up with rules to be followed to re-open the malls. Time will prove the effectiveness and success of these activities and strategies, which is yet to be recorded.

Marketing Strategies of shopping Malls

The basic marketing model which usually is the guide line to develop any strategic marketing plan involves the business product, the price of the products, the promotional techniques, and the marketing place. Shopping malls have to go much beyond this basic 4Ps marketing model. The marketing plan blueprint of a shopping mall must promise overall property performance along with satisfactory profit to the tenants. Proper tenant mix to a great extent decides the customer attraction and assures the profitability of the mall. Mall stakeholders including property owners, managers, and tenants, all have a vested interest in marketing the property successfully. A well-designed marketing plan executed by a shopping mall assures higher rentals, fewer property vacancies and more sales.

The 4Ps marketing model usually serves in designing and developing a strong marketing strategy. No strategy can be static; in fact, they have to be dynamically designed in a manner to serve according to the changing levels of competition, changing societal expectations, changing technology, changing customer behaviour etc. The 4Ps marketing model involves an understanding of the four elements of marketing-mix necessary for effective marketing which involves; the product, the price of the products, the promotional methods and the marketing place. A proper SWOT analysis is required to understand and finalizing the marketing strategy the will be suitable to a particular mall. Hence,

let's understand the basic 4P model of marketing. Product selection

Shopping malls act as one-stop shopping destination for several goods and services. They must serve to accommodate state-of-the-art products of well-known brands from local merchandisers and importers, variety of stores selling electronics and digital gadgets, accessories, clothing, FMCG products, footwear, etc. and diversified services like food courts, movie theatres, recreational activities, gaming zones, ATM facility, organized parking, proper rest rooms, drinking water facility, children play area etc. Variety of the products that a mall offers and the services that create 'happy customers' paves way to a successfully performing shopping mall.

Price of the Products

Price decision of the goods and services is one of the most important elements of the 4Ps marketing strategy. A good pricing strategy assures the correct price point that generates maximum profit on the selling the goods or services. A proper survey and analysis is required also in deciding the rentals of the shops of the shopping mall. Factors that directly or indirectly affect the price decision like products and services offered by competitors in the market, demand and supply of goods or services in the market, selling and distribution cost, target customers, etc. The price strategy has to be selected depending on what the mall intends, it may be creating awareness, create brand / build positive reputation, take competitive advantage etc.

There are many types of pricing strategies but the most common ones are;

Cost-plus Pricing – very simple to calculate; just add profit to the cost.

Competitive pricing – price is decided based on the price charged by the competitors.

Value-based pricing – price is based on the value or worth of the product or service the customer perceives.

Price skimming – Initially starting with a high price and then as market evolves lowering it.

Penetration pricing – Initially starting with a low price to enter a competitive market and gradually raising it.

Promotion Technique

Product promotion is a combination of advertising and publicity done to promote any brand, product or service in the market. This again one of the most important elements of the marketing mix model. Trends are changing on daily basis. The expectations of customer are changing with time. Gone are the days when plans made once used to continue for years. Today if one has to sustainably grow and stand the stiff competition, a dynamic promotional plan is something that is required to hold back their old customers and attract new ones. New and innovative ideas for branding any product or service are the need of the hour to ensure continued growth. Every business uses a continuum of promotional techniques to make public relations, exhibitions and publicities. Advertising and promotion can be done on several platforms like promotional advertisement on television, broadcast on radios, local hoardings, brochure distribution etc. Digital platforms like shopping malls own website and App can also be included in promotional plan. Social media; Facebook, Instagram have also become a popular platform of marketing.

When talking of promotional activities; discount seasons, festive discounts, exhibitions, tradeshow, field marketing, BOGO (buy one get one) offers, free sample distribution and such many more ideas can be employed to pull customers to a particular mall.

Marketing Place

Place concept of 4Ps marketing model involves marketing strategies such as the mode of transport, the channels of distribution, the warehousing facilities and

the techniques of inventory control. All these variables are usually employed hand-in-hand. A shopping mall must have a designated channel of distribution and a mega warehouse to execute the storage facility to stock the essential products of the mall on a continuous basis. This will make branding and rebranding easy. Further it will also assure proper quality control and availability of goods as per the demand. Shopping mall must accommodate an efficient display area where the products can be efficiently displayed.

A dynamic marketing model helps mall management to understand the progress and success of the mall on a continuous basis. This ensures that marketing strategies can be renovated or revamped to amplify or improve the products and services as and when need arises.

Points to be taken care while designing a shopping mall marketing plan

Shopping malls are not an overnight revolution, it has evolved through years, but the the essence of tying communities together still remains. Malls have their roots in ancient times when communities were in need of a uniting center, where they could not only find the products and services but could also interact with other members of the society. Modern shopping mall serves a 'one stop hub' or 'all under one roof' for the people in the society. Society has great expectations from a mall, much beyond shopping. It is a local destination for people to shop, hangout, dine, movie, entertainment, recreation or spend quality time in a luxurious ambience.

1. All marketing efforts of a shopping mall must aim at attracting customers.
2. It must focus on how best it can serve the customers locally.
3. Analyze the footfall on different days of the week.
4. The plan should be intended to extend throughout the year.

5. Special business days; weekends, public holidays and festivals to be recorded so as to enhance the promotional activities on these days to attract more footfall.
6. Study customer shopping behaviour to accommodate them better.
7. To create a set of happy, satisfied and loyal customers, a mall management must plan for convenience and comfortability of customers which will increase the frequency of their visit and bring them back repeatedly.
8. A mall which creates loyal customers can successfully stand competition, perform well and build a brand image.
9. As shoppers want variety of offerings, the tenant mix should be tailored to serve the local customers to their expectations.
10. A convenient shopping mall is usually a successful one.

COVID-19 a challenge to shopping malls

Somewhere in the month of March in 2020, the spread of COVID-19 brought Indian economy to a near halt. Only general stores, grocery stores, dairies and pharmacists stayed open as essential goods businesses. Shopping malls with electronic stores, apparel stores, footwear, accessories and more were temporarily shuttered as these are considered non-essential goods. Economy has witnessed a sudden shift to e-commerce by many retailers, this being either the only option or the safer mode of shopping. Shopping malls across India have remained shutting or operated partially last 18 months. Slowly the malls reopened with strict guidelines of wearing masks, sanitizing and social distancing. Almost 80% of the footfalls in malls had returned but soon due to the second wave of Covid-19 wave and local lockdowns shopping malls had to shut down across the country. Now, after the second wave gradually malls are opening but the footfall count is unsure as use of mask, social distancing, and

sanitizing norms continue. Also, though malls have reopened, Indian shopper's mentality has changed to a great extent. They have either started to prefer open-air areas for shopping or online shopping for safety purpose. This predefines that the new normal is not going to be easy but is going to be full of challenges to all shopping mall stakeholders.

Shopping malls in Indian retail sector play a central yet complicated role. They serve the society by creating a locus where merchants connect with customers and offer products, services and experiences that no single retailer can offer.

Fear to reopen under restricted guidelines in the new normal, stress of footfall recovery, question mark about the success of the planned new marketing strategies and promotional activities, challenges of e-commerce, shoppers psychology of fear of safety, extra burden of overheads expenses of sanitizing and creating a safe mall atmosphere, limiting the crowd in the mall to maintain social distance yet increasing footfall and so on. These and many more such challenges the shopping malls are facing amidst pandemic COVID-19 which might be unfavourable for the growth of shopping malls.

Post-COVID Marketing Strategies

Almost all shopping malls have adapted to sanitizing, social-distancing and mask-wearing to create a COVID safe atmosphere. To recover sales, to recall foot traffic and to promote in-store time spent by the footfall, shopping malls must reboot their marketing and promotion strategies and resort to new mediums and methods to revolutionize the complete shopping experience. It is a visible fact that on one side fears of social gatherings, crowds and social interaction will retain for a still long time, yet other side shows, crave for engagement and connection after months of isolation. Hence, shopping malls need to prepare a frame that fits to adapt and survive ensuring a balance between commercial viability and the emotion and

psyche of the shopper. Greater degree of touch-less amenities with hygiene atmosphere has become the primary need of shopping malls.

1. Subdivision into smaller zones

To avoid overcrowding and maintain social distancing large mall areas can be subdivided into smaller zones separately meant for different purposes; queuing, waiting areas, takeaway services, pick-up zones, drive through pick-up points etc.

2. Remodel car parking

Remodelling car parking areas to adapt for contactless pick-up zones, including separate access and refrigerated lockers with unique access codes etc. this could also be integrated for centralized contactless drive-through routes for food and beverage outlets and restaurants.

3. Art and cultural offers

Shopping malls are now not only focusing on big brands, electronics, fashion stores, food courts and recreation and entertainment offers, but are adapting to include arts and cultural offers and attractive public places to establish improved mobility, activity and safety. Under such circumstances malls will reposition themselves amidst COVID-19 pandemic.

4. Convert mall space into personal shopping precincts

Malls have to rethink in deciding tenants and focus on personal shopping precincts; beauty parlours, fitness centres, wellness and healthcare centres, Gym/sports destinations, pharmacy/medical facilities, play and education zones, e-sports venues, cultural spaces, community halls, adaptive co-workspaces. To mention a few such possibilities can be planned and implemented.

5. Digitization and Technology

Shopping malls can target and engage with customers online, for this they can convert foot traffic into intelligent data. As shopping is not the only attraction, mall management need to promote themselves on digital and social media platforms about their latest recreational and entertainment

activities. For this they can make use of promotions on mall websites, app, Facebook, Instagram etc. A well planned an super new idea that was not earlier available in the mall can pull the attention of mall visitors.

Conclusion

COVID-19 has made unparalleled destruction all over the world. No one is left unaffected. The economy has been facing a temporary standby, but is prepared for a stronger comeback.. Everyone has accommodated and have adjusted in the new normal. COVID-19 has collapsed the retail sector to the extent that survival has become impossible and has forced all physical retailers with small stores or huge building structures like shopping malls and departmental stores to rethink for a dynamic comeback to face the challenges in the post-COVID era where in-store shopping will never be the

same. Shopping malls are essence of organized retail business. Selling of goods is not the only purpose of mall. Basically malls are more of other things than shopping. Among which entertainment, recreational activities, movie theatre, community meeting place, place to hangout etc. COVID-19 pandemic was a severe blow to the mall business. Looking forward positively, there has to be a comeback strategy for every business. So are the shopping malls coming up with such marketing strategies and promotions that no one can resist from entering the malls. Also after more than 18 months of isolation everyone is looking forward to move out with friends and family to have fun and enjoy special moments at convenient and luxurious ambience, that's where malls can serve their best and attract foot traffic back.

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IMPACT OF CHANGING BUSINESS ENVIRONMENT ON INDUSTRY PERFORMANCE: A LITERATURE REVIEW

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ABSTRACT

The present study is an attempt to identify various components of business environment capable of affecting various Functional areas of Pharmaceutical Organizations and its impact on performance. This paper presents a comprehensive review of various studies conducted by experts, researchers, and academicians all over the world. The paper essentially is the summary of work done by different researchers in the field of various business environment components affecting various functional areas of organizations and its impact on performance.

Keywords: Business Environment, Impact, Performance, Functional areas.

Introduction:

Business Entities form an integral and vital part of any society. These are the institutions that cater to the goods or services for the consumers, gainful employment for the skilled / needy and continuous betterment of living standards in general. Thus, the role of these entities (however tiny or large) to the economic growth of a country is crucial. Therefore, how these businesses manoeuvre through the uncertain business environment is intriguing as well as interesting matter of academic study.

It is extremely important to have insights into one's business environment to formulate relevant strategies. The environmental factors are all pervasive in the business, the nature, location, and the prices of factors / products, the supply chain, or the HRM policies. Therefore, it is important to learn about the various components of the business environment, involving economic, the socio-cultural, the political framework, the legal, and the technological aspects.

Quang Linh Huynh(2018) has studied the relationship between the external market climate, corporate governance, and organisational efficiency. The research offered much-needed insight into the essential relationships between the

parameters. Usually, the analysis is an empirical study of the effects due to corporate governance and external market conditions on organisational success. This sheds light on how corporate governance interacts with unpredictable externalities to improve organisational efficiency. According to the findings, companies that are exposed to the risks of external market environments should follow appropriate corporate governance practises. Thus, the companies can achieve the best organisational performance. This research paper would help the present study in linking pertinent variables in order to manoeuvre through the uncertain business environment.

Giriati (2017) provides clarity over the effect of Business Environment entrepreneurial competence and orientation. It's a popular myth that the business organizations carry enormous freedom to formulate strategies. On the contrary, External Business Environment can have a crippling influence on the companies' ability to operate.

This demonstrates that the variables of entrepreneurial orientation and individual entrepreneurial competency have a positive impact on business success. Furthermore, in hostile situations, the same may be beneficial

to business success. Individual entrepreneurial competency, on the other hand, has a positive impact on business outcomes, but it is susceptible to changing business conditions. According to the study, "Entrepreneurial Orientation has a positive and stronger impact on Business Performance" in a competitive environment. The researcher will gain a better understanding of business competencies (individual and organisational) as a result of this analysis.

Siti Normi, SE, M. Si (2017) The researcher chose this research article to review for its effort in linking Strategic Human Resource Management to organizational competitive advantages. As the theory would imply, Competitive Advantage essentially is how a given organization does better than the rest of the industry. As a result, the article addresses the importance of competitive advantages, Key Result Areas, and 'human resource concentration' as a strategy for integrating human resource functions into the strategic domain.

Dr. Joshua D. Jensen ⁴ (2017) . The current market climate is highly competitive, demanding, and unpredictable, according to the report. Due to this Many organizations that have enjoyed many dominant players in the industry for decades had to yield to the business dynamism.. 'Traditional structures and leadership approaches' as the author mentions are no more effective in managing modern organizations effectively.

According to the study, businesses must turn into learning businesses. In today's demanding market world, this paper emphasises the value of organisational learning. Systematic attempts to acquire and apply organisational learning will result in the development of a learning company, which will pay off in the long run. The present study is about the impact of changing Business environment on performance of select pharmaceutical organizations in

Maharashtra derives that only learning organisations are distinguished by certain core disciplines outstanding leadership, robust leadership growth programmes, and innovative strategic planning processes.

Luz Esperanza Bohórquez Arévalo (2016) The study focuses on how organisations react to a changing market climate. As the paper argues, the inflexibility, vulnerability, and slowness with which business organisations react to evolving environmental conditions stems from the prevailing management paradigm's mismanagement of complexity.

The failure of business organisations, according to the research report, is primarily due to conventional management, which is ineffective in achieving goals, achieving the vision, and so on. Furthermore, the study emphasises the need for new ideas, models, and organisational and administrative practises that increase the degrees of freedom available to businesses. Thus the above literature paves way for the present study on Impact Of Changing Business Environment with specific reference to the Pharmaceutical Organizations in the study area.

Ridwan Ibrahim, Ina Primiana (2015) effectively establishes the connection between the business environment and the performance of the organisation. The research is primarily a theoretical examination of the impact of the market environment on organisational success. The research shows that the market climate has a substantial influence on an organization's efficiency. According to the authors, the market climate has an effect on the success of organisations. This research paper made the present study focused on various components of Business Environment and their impact on different functional areas.

Corina M. Rădulescu et al (2015) The study draws a contrast between reactive and proactive approach of an organization to the changes in the externalities. Companies achieve a competitive advantage, according

to the study, when they can easily learn skills. This necessitates a company's dedication, as well as the rapid dissemination of product, technology, and management information. The existence of a national and regional ecosystem that promotes competitive advantages is particularly important. The developed model can be used to determine the degree of entrepreneurial proactivity based on business risk and entrepreneur management results. The present study benefitted in terms of organization's preparedness for turbulent business environment.

TömöriGergő (2014) The research paper has tried to investigate the role of innovation eco system in augmenting profitability of the organizations. Pharma R&D operation had the greatest impact on long-term firming, both individually and in contrast, among the factors studied, but different financial strategies and accounting policies as a type of risk management asset also had a significant impact. The researcher's methodology is primarily theoretical and quantitative in nature. The findings of this study should be used by all cross-border pharmaceutical companies, as they demonstrate why more commitment to R&D is needed in this sector in order to maintain market position and ensure multilateral disease prevention. The above study gives an insight into the effect of R&D efforts as a strategic approach to manage business uncertainties.

Dr. Muhammad Khaliq (2014) The study focuses on small and medium-sized businesses, which are considered the backbone of every economy in the modern world.

The author refers to organisations with a clear vision, who understand their organization's mission and direction, and who can succeed in a variety of circumstances and who can plan themselves well to outperform their competitors. The above study endorses the need of empirical research to be done in the

area of strategic planning with special reference to various components of strategic planning in emerging economies. So far, there has been a severe lack of analytical research in the pharmaceutical industry from a strategic planning perspective. However, the researcher's aim in this report is to perform an analytical study in the pharmaceutical industry from the viewpoint of market environment constituents.

Francesca Capo *etall* (2014) This paper is an example of a pharmaceutical company's creative business model. The research focuses on the competitive climate in the background of the pharmaceutical industry's newer problems in mature markets. The authors propose accounting for a paradigm shift in the environment while allowing established business models to integrate with competing firms' business models, giving rise to something important, namely a network. A network that allows logistics, analysis, and development activities to be shared. In reality, size alone is no longer an effective tool for accurately representing a firm's competitive capacity; instead, cooperation, specifically cooperation to manage all strategic stages of the value chain, has become necessary. The paper provides a means for exploring similar strategic approaches for the pharmaceutical companies in the study area of the present study.

Gayane Gyurjyan *etall* (2014) To achieve and maintain high success over time, according to this study, leaders must strike a finer balance between their company's health and its performance. According to the report, organisational health factors like culture and motivation can be difficult to measure and tackle, leading some executives to dismiss them as "soft stuff." The Organizational Health Index (OHI) was developed by McKinsey & Company and offers a simple vocabulary and reliable measurements to make health as concrete and manageable as

finance or operations. Finally, "health is defined as an organization's ability to align, execute, and renew itself faster than competitors, enabling it to outperform competitors," according to the report.

The study proposes three steps to reform the industry in line with market dynamics: ensuring an adequately resourced and disciplined approach to transformation, and ensuring an appropriately resourced and disciplined approach to transformation. Over-indexing on external attention and aiming for concrete simplification

Any company is under the threat if its experiencing suboptimal communication and Slower speed of reaction. As the report interprets, this may be due to the change fatigue that is plaguing the organization and hence immediate corrective measures must be taken. This lesson after the review of the above report would help the researcher in framing right approach for the company to follow under similar circumstances.

Zoran Jovanović (2015) The study identifies the need for managers to respond with agility to the dynamic business environment. There is an elaborate review of 'limiting factors' inherent to managers and their influence on the managerial response to the changing business environment. This research suggests ways for managers and organisations to enhance their own preparation and flexibility, which is needed to respond quickly to changes in the business climate. In this analysis, different forms of organisational learning are discussed, as well as their relationship to strategy development and implementation. The researcher draws inspiration from the above study to develop new perspectives for the present study for the companies to deal with the dynamic business environment.

Muhammad Wasim Jan Khan (2014) Strategic planning, as stated by the research paper's author, is critical to the success and survival of any business organisation.

Strategic planning plays a greater role in small and medium companies, which are considered the cornerstone of every economy in today's world. Similarly, research on strategic planning in developed countries is limited, and empirical studies on small and medium enterprises in developing countries are severely lacking. As a result, the importance of the current research becomes clear.

Wageh A Nafei (2016) The study attempts to link organizational agility to the organizational performance with reference to the pharmaceutical industry.

According to the findings, there is a significant link between organisational agility and success. The discovery shows that 'OA' has an effect on 'OP' in every organisation. The study made a number of recommendations, one of which was to pay more attention to OA as a source of OP improvement.

Since modern organisations rely heavily on information in general, and information systems in particular, OA research is a growing academic effort in information systems fields. OA refers to an organization's ability to succeed by sensing and adapting to environmental changes, which has become increasingly relevant in today's highly competitive and volatile market climate. It is viewed as a critical business element and a possible enabler of a company's competitiveness.

Sensing Agility, Decision-Making Agility, and Acting Agility/Practicing are the three dimensions of organisational agility discussed in the review.

The research examines the impact of agility on performance among managers in the Egyptian pharmaceutical industry, with the aim of improving OP through OA. OA may have an effect on OP. It encourages staff to adhere to professional standards.

According to the study, OA may exist in Egypt thanks to top management in the pharmaceutical industry. As the author points out, this can be accomplished by considering the needs of workers. Absenteeism and turnover will be reduced as a result. Productivity and profit margins can increase. The study certainly provides hints to improve organizational performance by leveraging level of agility existing in the organizations of the study area.

Dr. Anil Kumar Singh (2015) The study claims that for any organization, strategic Robustness and resilience shape its competitive advantage/s. This study is in contrast with many other in the subject matter as thus far both were presented as distinct, this study probes the organizations for the similarity and mutual dependencies as well as puts forward a correlation frame work of organizational attributes with reference to Indian Pharmaceutical Industry. It is often found that business organizations are having a narrow view of their strategic orientation and behaviour, when they obsessed with robustness or resilience as two separate virtues. Thus, the study stands different by offering resilience and robustness as organizational capabilities which make the organizations futuristic and proactive. The study also provides clues as to how these capabilities may be translated in to competitive advantages. The themes of resilience and robustness, as well as their effect on organisational change capacity to drive competitive advantage, are also reviewed and examined in this paper. The current study will provide valuable insights into the factors that contribute to robustness, durability, and shift, all of which lead to superior efficiency, which is a sign of competitive advantage.

Abdel-Aziz Ahmad Sharabati (2014) The study's aim was to see how strategic management using the Balanced Scorecard (Balance Score Card elements) impacted the

financial output of Jordanian Pharmaceutical Manufacturing (JPM) companies. JPM Organizations have a significant implementation of balanced scorecard variables, according to the report, with learning and growth ranked highest on average, followed by internal processes, financial perspective, and customer perspective, in that order. The findings also reveal a connection between balanced scorecard variables and the business efficiency of JPM Organizations. Jo is directly influenced by strategic management (balanced scorecard elements).

Dr. Abdel-Aziz Ahmad Sharabati *etall* The impact of Intellectual Property Rights (IPRs) on the Business Performance (BP) of Jordanian Pharmaceutical Manufacturing (JPM) Organizations is the the moot point for the above research paper. Following a thorough investigation, a positive significant relationship between IPRs and Pharmaceutical Organizations' business success was discovered. Though the research has significant limitations and is restricted in scope, it cannot be used to make broad generalisations. It is, however, most important to the pharmaceutical industry. The findings of this study would support both academia and industry by demonstrating the components of IPRs and providing guidance on how to improve and increase them within their organisations. IPRs are a significant source of wealth for organisations, and they should be taken into account when developing the JPM Organizational strategy. With empirical evidence, this study adds to previous research's view of a linear relationship between IPRs and organisational BP. The researcher during his own primary investigations has realized that even the pharmaceutical companies in the study area have little regards for developing indigenous IPRs. However, the above study instigates the present research to further explore the industry in this regard.

V.VenuMadhav(2012) The study touches upon Indian pharmaceutical industry focusing on companies that are into life solutions catering to both domestic and global markets. As the author claims the industry is attracting global attention as a hub by virtue of its indigenous knowledge solutions achieved by Clinical trials, contract manufacturing and R&D. Drug and Pharmaceutical Industry has on its mandate such issues as environment safety, IPRs, FPIs/FDIs in the industry, Enhancing quality and making healthcare cost effective and more inclusive, and so on. The study mentions that this can happen only if there are Socio-legal and ethical /moral compliances by the industry. The study, while highlighting these issues suggests more attention on constant Research and Development, and policy intervention from the government. Thus, the study offers some orientation for the present study in this direction.

Bahjat Eid Al-jawazneh(2012) The aim of this research is to learn more about the effects of flexible manufacturing processes on the operational efficiency of pharmaceutical manufacturing companies in Jordan. For the 'flexibility,' the study looks at machine/equipment, output level, material handling methods, product mix, and routing methods. These were chosen to reflect the manufacturing flexibility factor, while operational efficiency was defined by quality, cost, speed, and reliability. Manufacturing flexibility is being adapted to a moderate degree, according to the study, while operational efficiency is impressively good. The study also found that manufacturing versatility dimensions have a major impact on pharmaceutical manufacturing companies' operational efficiency.

The study infers that by and large manufacturing flexibility is grossly neglected area and there is much more potential to take up academic research. As this study seeks to

cover different functional areas for agility and excelling in performance, the above study makes the researcher adequately equipped to deal with the area of operational excellence.

M.D. Nair (2010) Intellectual Property Act 2005 and other related legislations, have long term influence on the Indian pharmaceuticals industry. The above study looks into the prospects of these legislations in the coming years. The study discusses if the growth momentum of the Indian industry for the last few decades was adequate and sustainable, if the indigenous R&D are properly commercialized, and whether the global markets perceive India as a leader and cost effective supplier of quality drugs, and so on. Similar studies across the world have attempted to analyse patent regimes adopted by different countries.. In wake of the new patent regime, the present study becomes relevant on the part of all stake holders to clearly define and implement strategies which will convert challenges into opportunities.

NeetuDubey *etall* (2011) The paper is written in the context of the TRIPS Agreement's Patent Regime of 2005. As the author points out, the Indian pharmaceutical industry is experiencing major changes as a result of the 2005 Patent Act, which included the implementation of Product Patents in India. The study also looks at the success of the Indian pharmaceutical industry after TRIPS. The study successfully establishes that the pharmaceutical industry is in a strategic alignment phase to face the emerging competitive market climate. As a result, the Indian pharmaceutical industry, which has close ties to the global pharmaceutical market, will see increased integration.

The authors correctly point out that, on the one hand, business costs are rising, while on the other hand, consumers are seeking more creative pharmaceutical products at lower prices. The brand new patent regime has

certainly signalled significant shifts in market dynamics. Essentially, market leaders have been forced to reconsider their conventional business strategies on both a domestic and international basis.

Christina Sheela S (2015) The study has examined growth pattern of Indian Pharmaceutical Industry in terms of output, value, volume and number of units in contrast to the growth story of the Indian Economy. The above thesis has also studied select Indian Pharmaceutical companies over a period of 10 years to track their financial performance and presented a financial situational analysis of the industry in the backdrop of technological and economic challenges. Parameters like ratio analysis to gauge profitability position, asset utilization position, leverage position, liquidity position and growth analysis of the company. Overall, the thesis would help the present study in carrying out its own detailed analysis from financial perspective.

Shilpi Tyagi *et al* (2016) This paper evaluates the key drivers of profitability with reference to Indian drug and pharmaceutical industry. The authors point out that the Indian pharmaceutical industry has a history of poor ties in R&D initiatives. Owing to the shift in the economic climate as a result of post-TRIPS enforcement, the industry is realigning its strategies. Export intensity, advertising and marketing intensity, and the Post-Product Patent regime have all been found to have a positive impact on industry profitability. The study also shows that the debt ratio and operating expense to total assets ratio have a negative and statistically relevant effect, suggesting the need for companies to strengthen their fund

management and cost containment. As part of their long-term plan, companies should pay much more attention to optimising their operating costs, advertising and marketing expenditures, and improving their export orientation, according to the report. The current research may have similar consequences for companies in the study field.

Conclusion: The present review paper systematically analyzes the research objectives, findings and thereby the research gaps that can be filled by the researcher. Following research gaps were arrived at after completion of exhaustive literature survey:

1. Thus far, the research works on Pharmaceutical business environment were focused on large and established companies. Therefore, they could hardly provide a suitable template for business environment analysis and/or strategic formulation relevant to small/ medium Pharmaceutical companies.
2. An extensive study of Pharmaceutical industry in the state of Maharashtra, from academic point of view is found to be missing.
3. The present research work stands out unique because of the study period involving the global pandemic and its after-effects.

Thus, the researcher gains important insights and a clear roadmap to carry out the ongoing research work entitled “A study on impact of changing business environment on performance of selected Pharmaceutical Organizations in Maharashtra”.

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STUDY ON FINANCIAL PROBLEMS OF SHRIMP FARMING UNITS IN RATNAGIRI DISTRICT MAHARASHTRA

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ABSTRACT

The commercial shrimp culture was introduced in the last decade of 20th century and getting a climax in 1994 and thereafter it was suddenly declined in the Maharashtra state. The series of white spot syndrome eruptions, lack of investment of capital and present issue in shrimp units. Problem in quality brood stock, increased cost of production. While majority of the output comes from Maharashtra state, particularly the Ratnagiri districts. The present work was carried out on data collected from 18 shrimp farms along with farmers in different groups of Ratnagiri. The present trends indicate that the sector is set to revitalization, but the future prospectus of shrimp farming will also depend on the nourishment of white leg shrimp i.e. *Litopenaeus vannamei* that was introduced recently in India. Although it provided a hope and opportunity for sustainable shrimp farming. Some diseases are already reported. The main problems and constraints expressed by the farms are discussed according to the harshness in the farming practices in shrimp culture. Availability of healthy and disease-free seed is a major problem for them. The possible suggestions are identified by the shrimp farmers are also discussed.

Keywords: Shrimp culture, Maharashtra, Problems, Suggestions, Finance.

1 Introduction

“Necessity is the mother of invention”

Human being is one of the active animals busy in searching various things called as research or invention. The ever-increasing growth of world population and the continuous demand for food has made man to search for new means of producing food. Though green revolution has brought about considerable improvement in the nutritional standards, a large section of the population still suffers from malnutrition (Daily Lokmat, Mumbai Edition, 23rd June, 2019). To complete the nutritional needs, vegetables are not sufficient, thus the human started to take non-vegetable foods such as meat of animals, fish, etc. Science proved that Fish and shrimp are a major source of protein to control and to diminish malnutrition. The nutritive qualities of aquaculture products are better than those of the farm animals with high conversion efficiency. The last decade has witnessed a tremendous rise in interest in aquaculture industry as a profitable protein-rich food producing system. Aquaculture is one of the fastest growing food producing sectors in the world (FAO, 2005).

India has long tradition of aquaculture from time immemorial as a sustainable activity and is presently a leader in the world. China is the leading country in aquaculture, followed by

India, having contribution with 4.2% of the total global production in 2004 (FAO, 2006). Aquaculture technologies have undergone considerable advancement in the last three decades mainly because of the stagnation of fish supply from the capture fisheries sector. Shrimps form a valuable component of capture fisheries. The fish processing industry largely relies on shrimp landings since they constitute a major and most valued export-worthy seafood commodity. As a result of indiscriminate exploitation of the shrimp resources of the country, their catches appear to be declining in the recent years. At the same time there is an ever-increasing demand for shrimp in international as well as domestic markets. This situation has necessitated an immediate search for new resources from unexploited areas and the generation of new (additional) biomass through shrimp aquaculture. Among crustaceans, shrimps constitute the group that is widely cultured in recent days. At present Shrimp aquaculture has attracted many investors because of the profitable export propositions it offers. The major countries that are now engaged in shrimp farming are China, Japan, Indonesia, Korea, Malaysia, Philippines, Singapore, India, Thailand, Taiwan, Vietnam and the United States of America.

1.1 Shrimp Farming

Shrimp farming is an old age practice in India. Traditional shrimp farming in the coastal low lands like Pokkali fields in Kerala, Kharlands in Goa, Khazans in Karnataka and Bheri in West Bengal was in practice way back in 1960s, where production was achieved up to 0.5 tonnes per hectore per year. Because of its high value export potential, the importance of shrimp farming has been realized by Government and Semi-Government agencies. Having noticed the importance of shrimp farming, the Ministry of Agriculture (MoA), Government of India (GoI) established centrally sponsored shrimp farms in most of the maritime states during late 1970s and 1980s. However, these farms have not shown any appreciable impact in the enhancement of shrimp production from the aquaculture sector.

The ever increasing export demand for shrimp has continued to exert pressure on the fisheries resources available for exploitation in the natural water bodies. Over the years, the shrimp catches from the natural water resources have drastically declined due to over exploitation. Simultaneously, extensive type of shrimp farming was in practice in the states of Andhra Pradesh, West Bengal, Kerala, etc. where production ranged from 200 to 500 Kg per hectore within 4-5 months (Ganapathi, 1991). The major block in the development of shrimp farming on scientific lines was non-availability of hatchery produced shrimp seed and nutritionally rich balance diet during 1970s and 1980s. The shrimp farming was completely dependent on wild seed and traditionally prepared farm made wet feeds. It is resulted into very low productivity.

Studies on maturation and breeding of various commercially important shrimps were initiated by the Central Marine Fisheries Research Institute (CMFRI) in the early period of 1970s, when no commercial hatchery was established in India. Keeping in view of the ever increasing demand for shrimp seed, the Marine Products Export Development Authority (MPEDA) established the Andhra Pradesh Shrimp Seed Production and Research Centre (TASPARC) at Visakhapatnam, Andhra Pradesh and Orissa Shrimp Seed Production and Research Centre (OSPARC) at

Gopalpur of Orissa with American and French technologies respectively during the end of 1980s. These two hatcheries provided assistance for the establishment of a number of private hatcheries in Andhra Pradesh and Tamil Nadu during 1990s. At present about 237 shrimp hatcheries are in operation in India, with a total production capacity of 11.425 billion post-larvae (PL 20) per year (Anon, 2002).

2. Research Methodology

The increasing globalization of world economy and the ever-continuing information explosion has caused growth of world of fisheries. As a result, the state needs field research and surveys for updating policies and priorities to boost the economic progress of the shrimp farmers and of the state. As fishery is an important economic activity, the state should formulate policies to achieve higher productivity, remunerative prices and increased net income of the shrimp farmers. The area under shrimp culture in Maharashtra is about 720Kms. At the same time, the potential area under use is found suitable for shrimp culture. Therefore, an urgent solution is needed to frame policies to make a sustainable development of area under shrimp culture. Even though the state has been able to achieve the breakthrough in increasing productivity level well above the national average, the volume of production was not enterprising from 1991-92 to 2001-02. The percentage composition of brackishwater shrimp aqua farms indicates that more than 90 percent of aqua farms constitute small categories 1.78% of Maharashtra as against 49 percent at the national level. Similarly the medium and large farms constitute only 4 percent in Orissa as against 70 percent in the states like Karnataka and Maharashtra. This suggests that variation in composition of landholding pattern of shrimp farmers severely effects the production as well as the productivity of shrimps. Hence, research on production and marketing of shrimps in Maharashtra becomes more imperative. The state land reforms Act, 1960 has not incorporated any benefits to the shrimp farmers in the costal districts of Maharashtra. However, the lease policy for shrimp fanners

promulgated since 1980 may be studied to find out the amendment needed to suit the farming community for the development of shrimp culture in the coastal area. The post-harvest infrastructure available for brackishwater shrimp processing, storage, transportation, grading and updated market information is far below to the national standards. Therefore, urgent study is warranted to find out the actual need of the state to upgrade our processing efficiency. Brackishwater shrimp farming is influenced, and activated through intensive and super-intensive culture practices including monoculture and poly culture practices. The shrimp farm affluent treatment, hatchery and seed production techniques, reduction in seed cost, food cost and energy cost, treatment of different diseases, new trade policies specially on anti-dumping duties, certification requirement of USA, Sanitary restrictions of European countries and taxation problems, etc also influence production and marketing of shrimps. Hence, a research study is necessary to analyze shrimp farming in Maharashtra in comparison with other states of India and other shrimp producing countries of the world to ascertain the technological improvements designed for prawn production in the state. The significance of the study also relates to the reinterpretation and implications of the Honourable Supreme Court Order, 1996 to bring out the possible ways out with regard to Coastal Regulatory Zones (CRZ) and the restrictions on brackishwater shrimp culture in coastal. Moreover, this responsibility depends upon the investigator to ensure that the activity meets the requirements for the diversity of interests involved in sustainable development as contained in Agenda 21 of UNCED, namely, social acceptability, equitability, economic viability, technical appropriateness, environmental soundness and conversion of resources. Therefore, the present study on "Production and marketing of shrimps in Orissa" is undertaken to explore the research objectives:

1.4.1 Research Problem

Due to high demand for shrimp, shrimp unit can be profitable as there is sure production in a controlled management, however there is high capital investment, hence only rich

people are entering in this business. If adequate capital and low interest is charged then there has been more shrimp units in the study area. The newly elected Central Government has made financial provision to the 'group farming' in the country but many poor fishing community does not know such provisions. This business at present is in the hands of few capitalists but actually the coastal fishing community which has no sufficient fish yield, can be trained in shrimp farm, so present unemployment problem of the coastal community can be reduced.

The shrimp farms are useful not only to the owner of the farm but also it helps to the laboring class around the farm, such farms are run in the villages near the coastal area. Therefore, the fishing community those do not have job in the marine fisheries; such people can get the work in the shrimp farms. There are some jobs for the women also. Thus, women can also get full time and part time jobs, as there are no any risk to the life of concern workers. The shrimp farms require few skilled and semi skilled workers, the people residing near by the shrimp farms can get the job. The rearing of shrimp and grading them, and giving feed, medicine and water management are the jobs which requires education, thus educated youth in nearby area will get the money income for livelihood. Due to increasing population as well as change in consumption pattern, there is high demand for the fish and fish product, as the marine fishery is open to anyone; hence there is no assurance of certain amount of fish production. As result of such situation, the hotel owners as well as city consumers are also not getting the sufficient sea food, but due to the shrimp farms all these customers will get fish particularly the shrimp. Therefore, the tourism and hotel industry in the cities as well as on the coastal area will develop. Another important significance of the shrimp farm is the advantages of getting the foreign currency by exporting shrimp. The quality and the desired quantity of shrimp can be cultivated in the shrimp farms.

1.4.2 Sample Selection and Data Collection

Sample Selection

The present study covers Ratnagiri districts in the coastal region of Maharashtra state. At present there are 18 shrimp units in Ratnagiri district.

Maharashtra has 720 km. long coastline which is estimated to have about 80,000 ha of shrimp farming area. However, after carrying out macro-level survey during the period of 1979-1982, an area of only 14,555 hector was found to be suitable for shrimp farming.

Table 1.1: Sample Selection

Districts	Tehsils	No. of Shrimp Units	Sample Selection
Ratnagiri	Dapoli	03	03
	Mandgangad	01	01
	Guhagar	05	05
	Ratnagiri	06	06
	Rajapur	03	03
	Total	18	18

Source: Socio-economic Profile 2017-18

3. Results & Discussion

3.1 Financial Management of Shrimp farming units

3.1.1 Land Ownership Pattern

Land ownership pattern indicates the financial status of the shrimp farmers. It also indicates the investment of the farmer in the ponds and in the shrimp farming business. Thus, the researcher has taken this question and includes the land ownership pattern in to three parts such as own land, lease land and own + lease land. The data is given in table 1.2.

Table 1.2: Land Ownership Pattern of Shrimp Farmers

Pattern of Ownership	Ratnagiri	
	F	%
Own Land	15	83.33
Lease Land	02	11.11
Own Land + Lease Land	01	5.55

Field Data

The data presented in Table 1.2 reveals that the respondents practiced shrimp farming on own lands alone are 81.25%, followed by lease lands alone which are 12.5%. The farmers who are using their own land and lease lands are 6.25% in the Sample districts of study area. It

indicates that farmers need huge investment for purchases of land or the farmers who have their own land are doing farming.

3.1.2 Capital required for construction of shrimp pond

Construction of pond is one of the most important investments in the shrimp farming that without the construction of ponds it is unable to keep the shrimp seeds and to take production. Thus the researcher has studied this point to focus on the investment of the farmers for construction of ponds. The data is given in table 1.3.

Table 1.3: Investment in Construction of Ponds

Investment in Pond Construction	Ratnagiri	
	Frequency	%
<5 Lakh	02	11.11
5-10 Lakh	11	61.11
>10 Lakhs	05	27.78

Field Data

Table 1.3 indicates that majority 61.11% of farmers from the districts reported the construction cost from Rs. 5 lakh to Rs. 10 Lakhs, followed by 27.78% farmers who defined that the cost of construction of shrimp ponds is more than Rs. 10 Lakhs. Only 11.11% shrimp farmers defined expenses less than Rs. 5 lakhs that their ponds may be small and the cost of construction of ponds is based on the size of the ponds. With the above table it is realized that high cost of construction means large size of ponds and vice-versa.

3.1.3 Total amount required as fixed capital and working capital

Capital of the business works as the soul of the body that in the absence of capital, the business should have to close. The researcher classified this capital between two categories as working capital and fixed capital. In general the ratio of the working capital is always large compared to fixed capital. Table 4.24 indicates the classification of working capital and fixed capital required by the shrimp farmers in the study are.

RESULTS

Table 1.4: Classification of Invested Capital

Type of Capital	Investment Required	Ratnagiri	
		Frequency	%
Working Capital	<5 Lakh	02	11.11
	5-10 Lakh	11	61.11
	>10 Lakhs	05	27.78
Fixed Capital	<5 Lakh	02	11.11
	5-10 Lakh	12	66.67
	>10 Lakhs	04	22.22

Field Data

Table 1.4 indicates that working capital of the sample respondents is 61.11% which is between Rs. 5 Lakhs to Rs. 10 Lakhs of the sample districts, followed by 27.78% respondents who have required more than Rs. 10 Lakh as working capital. The required working capital in the study area is nearly equal. Fixed capital of the farmers is between Rs. 5 Lakhs to Rs. 10 Lakhs of the districts which is of 66.67% farmers, followed by 22.22% respondents having fixed capital of more than Rs. 10 Lakhs. Only 11.11% respondents have required less than Rs. 5 Lakhs in the districts of study area. It realized that in shrimp farming the ratio of required fixed capital is comparatively higher than working capital.

3.1.4 Owners' present net investment in shrimp ponds

Investment of the farmers is given in table 25

Table 1.5: Owners' present net investment in shrimp ponds

Actual Investment of Shrimp Farmers	Ratnagiri	
	Frequency	%
<5 Lakh	01	5.55
5-10 Lakh	10	55.55
10-15 Lakhs	04	22.22
>15 Lakhs	03	16.16

Field Data

From Table 1.5 it reveals that majority (55.55%) of the respondents have invested the amount of Rs. 5 Lakhs to Rs. 10 Lakhs, followed by 22.22% respondents who have invested the amount between Rs. 10 Lakhs to Rs. 15 Lakhs. 16.16 % respondents have invested the amount more than Rs. 15 Lakhs and only 5.55% respondents have invested less than Rs. 5 Lakhs in the shrimp farming. The invested amount of the shrimp farmers indicates the size of the shrimp farming units; lesser the investment means small units and vice-versa.

3.1.5 Sources of available capital

Shrimp farming units need large amount for establishment of business from availability of land till purchases of all types of basic material. The researcher has focused on this factor to know sources of capital used by the farmers to raise such amount of capital. Table 4.26 indicates the sources used by the sample respondents.

Table 1.6: Sources of Availability of Capital

Sources	Sources of Capital	Ratnagiri	
		f	%
Only Owned Capital	Only Own Capital	03	16.16
Own Capital + Other sources	Own Capital	15	83.33
	Friends/Relatives	07	38.89
	Cooperative Societies	12	66.67
	Banks	09	50
	Private Financial Institutions	03	16.16
	Others	11	61.11

Multiple Responses; Field Data

Table 1.6 shows that there are only 16.16 % respondents who have investment their own amount as capital for the business from the study area and remaining 83.33% respondents have used their own capital as well as raise the capital by using various ways of sources of

capital i.e. financial support from friends and relatives, loans from cooperative societies, loans from banks, loans from other financial institutions, etc. There are 61.11% respondents who have taken loan from private creditors/ money lenders. Majority of the respondents

are getting financial assistance from the private money lender which indicates that the financial institutions or banks, cooperative societies are not working properly or not giving sufficient amount of loan to the respondents.

3.1.6 Amount of Loan taken for shrimp units and Rate of interest

Table 1.7 indicates the amount of loan taken by sample respondents.

Table 1.7: Amount of Loan taken for shrimps with Rate of interest

Loan	Investment Required	Ratnagiri	
		Frequency	%
Amount	<5 Lakh	01	5.55
	5-10 Lakh	04	22.22
	10-15 Lakhs	07	38.89
	>15 Lakhs	03	16.16
Rate of Interest	No Interest	05	27.78
	<10%	07	38.89
	>10%	03	16.16

Field Data

From table 1.7, it reveals that only 82.82% sample respondents of the sample districts have taken loan from by using various means, in which highest proportion is 38.89 % who have taken loan between Rs. 10 Lakhs to Rs. 15 Lakhs, followed by 22.22 % respondents having loan of Rs. 5 Lakhs to Rs. 10 Lakhs. 16.16 % respondents have taken loan of more than Rs. 15 Lakhs and only 5.55 % have taken less than Rs. 5 Lakhs loan. From all the borrowers 27.78 % respondents have no interest on their loan that they have taken such amount from their friends and relatives. 38.89 % respondents have to pay loan with Rate of Interest of less than 10% and 16.16% respondents have to pay the loan with interest rate of more than 10%. The rate of interest of

government units is less than 12% but when the loan is taken from other private sources/money lenders, it is flexible according to the relations of the persons.

3.1.7 Government Subsidy

Government subsidy plays an important role in the development of the shrimp farming units. In case of any natural calamities, shrimp farmers get subsidy from government to cover the losses and to develop the farming units. Thus it has become necessary to study that how many farmers received the subsidy. Table 4.25 indicated the number of farmers who have received the government subsidy.

Table 1.8: Government Subsidy

Government subsidy	Ratnagiri	
	Frequency	%
Yes	16	88.89
No	02	11.11

Field Data

Table 1.8 shows that majority of 88.89 % sample respondents have received government subsidy after facing various natural calamities and 11.11 % respondents have not yet gotten any amount from government as subsidy, that these units may be newly established or not covered in the natural calamities.

3.1.8 Problems related to Finance

While carrying business units it is necessary to keep enough to solve the emergency issues. Many times it needs more money and farmers face the problems regarding it, thus the researcher has focused on the problems related to the finance and the collected data is given in table 4.29 in descending order.

Table 1.9: Problems related to Finance

Sources of Capital	Ratnagiri	
	F	%
Availability of funds	15	83.33
Insufficient working capital	12	66.67
Underestimating startup costs	07	38.89
Late client payment/ bills	09	50
Mispricing of products	03	16.16
Bad cash flow management	03	16.16

Field Data

Table 1.9 focuses on the financial problems of the sample respondents in study area, and it reveals that the problem of availability of funds on time is faced by 83.33 % followed by the problem of insufficient working capital by 66.67 %, 38.89% respondents are facing the problem of underestimating startup costs and 50 % facing the problem of late payment of clients/bills. 16.16 % and 16.16% respondents are facing the problem of mispricing of products and bad cash flow management respectively. It indicated that the farmer should have the sufficient knowledge regarding the shrimp farming units or have to take proper training regarding the management of shrimp farming units. Otherwise have to face such type of problems while running the business.

Findings on Financial management of Shrimp Farming units:

1. It indicates that farmers need huge investment for purchases of land or the farmers who have their own land are doing farming. Table 1.2
2. It is realised that the shrimp farming units need more capital for construction of the ponds. Table 1.3
3. It realized that in shrimp farming ratio of required fixed capital is comparatively higher than working capital. Table 1.4
4. The invested amount of the shrimp farmers indicates the size of the shrimp farming units; lesser the investment means small units and vice-versa. Table 1.5
5. It is found that the respondents are getting financial assistance from the private money lender which indicates that the financial institutions or banks, cooperative societies are not working properly or not giving sufficient amount of loan to the respondents. Table 1.6
6. The rate of interest of government units is less than 12% but when the loan is taken from other private sources/money lenders, it is flexible according to the relations of the persons. Table 1.7
7. Table 1.8 showed that the shrimp farmers have received government subsidy after facing any type of natural calamities.
8. It is realized that the shrimp farmers are facing various problems related to finance,

i.e. availability of funds, insufficient working capital, underestimating start-up costs, late client payments/bills, mispricing of products and bad cash flow management, etc. Table 1.9

3.1.9 Suggestions

The production and productivity of shrimp vary from place to place, farmer to farmer and culture to culture depending upon application of inputs, use of technologies and management practices.

Suggestions on problems

1. Make availability of provisional license and issue of permanent license in a particular period of time. Also provide patta to reserve/planned lands and leasing of lands for shrimp farming
2. Government Research Institutes should be set up for more and qualitative hatcheries and virus free Nauplius should be supplied to the private hatcheries.
3. There is need of safe guard shrimp farmers' interest for full fledged microbiology lab and technical guidance and thus it needs Cooperation among shrimp farmers.
4. The disproportionate land holdings of the shrimp farmers also greatly affect the growth of shrimp production, thus the government should take necessary steps to promote for production, marketing and trade of shrimps.
5. The state government should organize the programs for Planning, Monitoring and Evaluation to co-ordinate, analyze and offer training to the existing and new shrimp farmers of the state for the growth of shrimp farming.

4. Conclusion

Shrimp culture is the best alternative for the coastal fishing. It has more demand in the national and international market rather than coastal fishes. But due to the increasing demand of shrimps, it is necessary to the shrimp farmers to make regular supply of shrimps in the national market. There is also absence of facilities to export the material in the international market, thus the farmers are unable to supply it in the international market. Government of India has to focus for the

export of the shrimps which will be resulted into the development of the shrimp farming units.

The small and marginal farmers in the shrimp farming have also great importance in the shrimp farming. Land holding pattern of shrimp farmers in the coastal area of the Maharashtra state is increasing by providing liberalized and subsidized finance by the banks and the government. But the role of banks and government should have to increase for the development of the shrimp farming.

To increase the marketing as well as the export of shrimps, the following improvements may be instituted like proper product packaging as per the requirement of the customers, quality maintenance according to international market and HACCP principles, inclusion of shrimp as a dish in the menu of the hotels, introduction of sachet sells, establishing kiosks in markets

and highways, creation of super market chains and market linkages and a Fish Consumption and Promotion Board (FCPB) in line with NDDDB.

To make improvement in the quality of shrimps, there is need of trained and well skilled labours for shrimp farming units. Majority of the shrimp farmers had not undergone any specialized training on shrimp culture practices. Hence, there is an urgent need to train those shrimp farmers. Besides there should be a regular training program for the development of shrimp units which should be organized by Government at research centre related to the major issues of shrimps. It is high time that the scientific community and the shrimp farmers' community work together to find solution to many nagging problems and develop skill in every aspect of the shrimp industry.

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IMPORTANCE OF EDGE COMPUTING IN IT

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ABSTRACT

This literature review consists of the details of the emerging cloud computing technology, how it is being used all over the globe to solve real world problems in an efficient and standardized manner. It also covers the main global focus on the concept, architecture, features and implementation of the technology of 'Edge Computing' and how it being a sub category on the parent cloud computing technology holds a vital role amongst the future prominent technologies solving critical issues being faced in the technological world. Through the power of edge computing in relation to deep learning, how security is a major concern on edge devices at the endpoint. The various natures where edge proves to be the vital difference between calculations and response timings. As the world keeps improving, the technological accuracy and efficiency also plays a big part into the development cost and why even if a technology is costly, needs to be maintained and implemented because of its benefits and low disadvantages, much like edge computing.

Keywords: Cloud Computing, Global Focus, Technological World, Edge Computing, Accuracy

1. INTRODUCTION

This literature review should cover all the basic topics in relation to Edge computing its advantages and disadvantages. It should give an overview of the idea on Cloud Computing, moving onto Edge Computing and its many services and technology. It covers the various popular versions and improvements on Edge Computing even for mobile devices. How it provides the edge to research and innovation through IoT and deep learning integration as well. As human beings start to evolve they start to explore, upon exploring, they come across various previously unknown data and they note it down, data was hard to be shared between fellow humans of different countries. (A. C. Baktir, A. Ozgovde and C. Ersoy, 2017) With the rise of data sharing with the help of the Internet technology as usage of data sharing boosted, so did the volume of the total data all across the world, the global impact and rise of the total data being a surplus to access within fast time. Data in

bulk are now being used to even learn faster, understanding patterns throughout the entire data and creating calculations based on those analytical results. Thus followed the rise of IoT devices as well, according to a study of usage statistics, it is seen that the global use of IoT devices crossed 6 Billion during 2019. From the impact of the recent covid19, as people have been heavily dependent on technology now more than ever, the usage and development of IoT devices are even more now. The fact being the total processing time to process all these data in order to quickly render accurate calculations are getting even harder as time goes on and hence the emergence of edge computing. Although the CDN processed the data correctly and at a reasonably fast rate, it was monitored from a central cloud server. Edge computing processes the data being produced by the IoT devices at a far faster rate and is not centralized in nature as well.

The concept somewhat being able to be closer at every front of the world where there are usable data generated IoT devices at work in order to bridge the gap between the cloud and the user decreasing any latency issues with calculation or data transmission and even improving user experience all together with outstanding proficiency in performance. Cloud computing and CDN could handle self-automated home devices but when it comes to the accuracy and efficiency of the reaction time edge computing stands out above all. The best example being, it does not matter in the world of football, if a certain goalkeeper is the tallest in terms of height, the award for the best goalkeeper always goes to the person whose reaction time was the fastest, even in critically tough situations saving a goal from happening or making a vital difference even before mishaps begun. These features of edge computing always stands out in terms of other technologies even and especially for organizations having to use a reduced bandwidth.

2. JOURNEY TO THE CLOUD

Industrial age proved an un-denying fact of humankind's search and desire for more power. Developing devices that could handle complex algorithms and processing faster to produce accurate outputs. By my research considerations, travelling through the contributions of Alan Turing directly to Larry Page and Joseph Carl Robnett Licklider we land in the age of Cloud Computing and AI. Discovery of these two concepts have led to amazing breakthroughs in the field of speech recognition, automation, data recoveries and application integrations. Benefiting from these concepts have led several new industries to flourish including video monitoring, smart television

devices and human-robotic interactions making a positive impact on society and daily lives. The number of devices connected to the internet rose significantly. Cisco Annual Internet Report clearly pointed out to the world that by the year of 2023, we would be experiencing an approximate 5.3Billion of global internet users, per capita being 3.6 and an average fixed broadband for global would be around 110 Megabytes per second. Based on the massive growth of data in the information technology age through the power of the internet various data processing requirements are of high demand ultimately leading to flexibility and scalability of usage through cloud computing.

The designers of the concept of cloud focused themselves on targeting starting peers on the way thousands of nodes are connected to each other on the internet. (H. El-Sayed, 2018)The main reason why the term cloud had been given relates to its inner architecture of the cloud. A cloud would consist of densely clustered water molecules (H₂O) much like with a dense cluster of computers which works together and appears in such a way that, to a normal observer or user they all appear to be a single giant powerful computing object with a lot of resource power. It can also be explained as the on-demand delivery of Information Technology resources through the internet. It strictly follows a pay as you go mechanism with added benefits of low overall maintenance costs as compared to actual onsite servers. Organizations or Industries of every type or size are using cloud computing as one of their key structures for several different use cases. Cloud Computing in addition to maintenance also provides several internal services like data backup, email, virtual desktops, disaster recovery, big data analytics, software development and testing

and even web applications. On a large scale, there is virtually no upfront cost. Instead of buying a 100GB HDD having to buy more upon demand, the users would be using the concept of shared resources. Hence renting, a part of the hard-drive, a part of the bandwidth cost of the data-center and some of the power cost of the PC its using in the cloud. The biggest challenge that cloud computing faced during its initial launch was the cost. A person with a background in technical knowledge can easily buy separate hard drives forming RAID1, setting up an FTP server and forwarding the appropriate ports on the router. This would enable the person to utilize the approximation of five times the HDD space as compared to the space cloud companies are providing users with, without multiple monthly payments. However, the initial cost reduction aside the person has to be technically capable of maintaining and paying for all the money upfront with bare to minimum scaling facilities offered upon need. Not to mention, the services offer data protection. Hence, cloud being not limited to the person's bandwidth and providing a hassle free environment with variable expense technology appealed at a mass scale.

2.1. WHY EDGE

With the needs of people gradually increasing at a rapid rate along with intelligence in technology and environment, devices are spread all across the continent. These devices often referred to as Edge devices form a futuristic network with advanced nodes based on the several forms of distributed concepts to conjure up small stations for higher performance. (H. El-Sayed, 2018) Nowadays, with intense data accuracy, demand for the highest ultra-speed is at the maximum polls and this is where Edge computing comes in. The main purpose of the architecture being to shut off

all forms of latency to the maximum possible extent between the servers and the nodes providing advanced services and calculations at the network edge. Moreover, Edge wireless devices aims to provide the stable and smooth data organization with multitude of bandwidth and access to advanced computational resources. Leaving the future prospects of growth and real-time response more smoother.

3. OVERVIEW OF EDGE COMPUTING

The architectural cloud in cloud computing set by the founders of the concept of cloud computing focuses on it being mobile and reliable but faces a bit of latency issues when the right servers aren't available. This is where Edge Computing comes in (K. Cao, Y. Liu, G. Meng and Q. Sun, 2020), the very concept of edge computing in relation to the normal form of cloud computing seems very different to begin with. The Edge clearly defines the end-point, which defines the rest of the network. The core of the entire technology of edge computing relies on the idea of placing computers at the edge to bridge the distance between the source and the computer altogether, hence given the nomenclature of computing at the edge. The two links between the data transfer, namely the downlink (cloud service) and the uplink (IoT) handles all the network edge node execution. In general, IoT devices conjure up and gather so much data that the sheer volume of the entire data requires larger and more expensive connections even in comparison to other cloud computing networks. Edge computing advances mostly for critical time and helps in automation as well. For example, sensors in the core of a nuclear power plant or the valves at a petroleum refinery are always in a constant state of detection of any irregularity in its

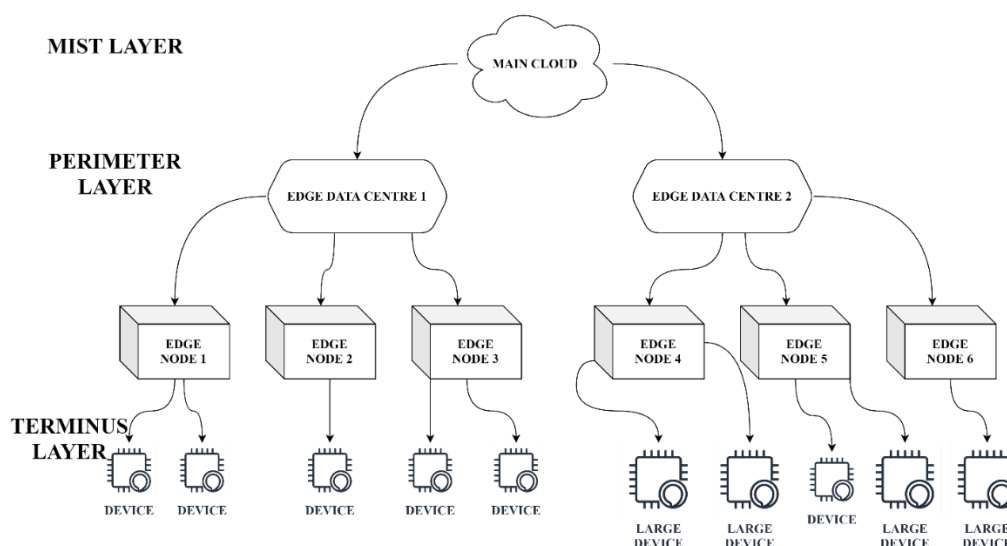
mechanism. According to those critical inputs, shutoffs are triggered after proper analysis of the response data. If automation is set up in the distant processing centers, the automatic shutoff function is triggered but the response time could take a multitude of Nano-seconds, which hinders calculations. However, with the power of edge computing, the processing powers are usually localized to the end devices, having low latency and that response is much faster. Hence, saving downtime or damage to any property or does not affect any critical calculations.

Even if the devices were at the edge, there would still be a need to connect themselves to datacenters. Data Centers could be placed either on premises or off premises (in the cloud). Edge devices can collect data, sort themselves performing predetermined analysis of the data, and send the acknowledgement quicker than general cloud computing architecture would even provide. Hence, the facilities provided by Edge Computing generally refers to faster processing and slows the growth of expensive connections in relation to storage centers. With every power comes the issue of security and privacy. Although edge computing could be considered a more

advanced subset of cloud, computing it much like its parent follows more or less the same prerequisites of privacy. When it comes to security, since most of the data is collected at the edge (IoT devices that connect to the edge devices), the highest form of security must be placed there instead. If one edge node is compromised, there is a possibility of the vulnerability of other nodes in the network. Network architecture needs to be set up at the edge in such a manner that supports backup and contingency plans in order to avoid network down time. The technological industry has gone a long way in investing heavily in edge computing and are making significant strides so far growing by largescale day by day. The entire technology would grow as real-time applications are utilized more.

4. ARCHITECTURE ON THE EDGE

Many researchers have defined the exact architecture of Edge Computing in many ways. But, the core parts of the architecture always boils down to three essential layers, (H. El-Sayed, 2018) Edge Device Layer also known as the user-end layer, Edge Server Layer also known as the Edge node layer and of course the Cloud Server Layer respectively.



The Terminus Layer: Also, referred to as the terminal/Edge Device/User-end layer consists of many devices that individually connect to the network. IoT devices are also included. Altogether, they not only consume data but also provide data for others. Here the device computing power does not calculate especially in order to reduce the overall delay. Therefore, this layer is responsible for hundreds and thousands of data inputs and uploads it to the next level layer for proper analysis and storage.

The Perimeter Layer: Also, referred to as the Edge server/Edge node/Boundary layer is the very holding piece that binds all the other layers. The servers that establish at the layer involve edge base stations, gateways and access points. This layer is responsible for supporting all entry, storage and computation of data given by IoT or other devices connected to the network. Since, the layer bridges distance between the devices and is close the calculation is suitable for real-time. After the analysis and calculation is, too heavy it would divide the work between other servers for faster processing or to a station possessing more computational power. Finally, control flows are automatically set and results sent to the end devices upon completion. This layer is responsible for holding the central security and authentication as well as data calculations, task separation and even data storage.

The Mist layer: Also referred to as the Cloud/Cloud Server layer. It is responsible for hosting the cloud and other data centers. Although the layer beneath is responsible for all the analysis and authentication part, this layer holds the most critical security algorithms. It also consists of huge arrays of powerful high performance machines and storage capable devices. If a data is so huge

that, even dividing the entire data between other edge servers in the perimeter layer is not enough, this layer could also provide a helping hand and integrate itself with the global information and does analysis of tasks whilst adjusting several algorithms to come in conscience with deployment strategies.

5. SERVICES ON THE EDGE

Providing everyone with on demand computing or storage services in relation to minimum latency on a centrally located legacy network is probably the best service of Edge Computing. It also supports a high number of nodes over any geographical area. Apart from the standard cloud computing services. Implementing intelligent workflows and automation into the edge drives faster processing capabilities with smarter and more dynamic operations. (J. Pan and J. McElhannon, 2018) By enabling Artificial Intelligence, it helps to give many insights into the point of operation. Since, there are many ranges of Edge devices available to us with more innovation incoming, thermal seniors or wearables may be able to identify persons or patient's health conditions quickly and alert safety concerns. Thus, researching with insights and integrating them with Machine Learning would ultimately benefit the automation process to a completely new level. The seamless integration of edge with advanced reinforcement learning technology provides accurate control mechanisms increasing rewards by hunting for policies for mapping of actions. Reinforcement Learning helps in speeding up critical thinking and decision-making processes enabling advanced automated communications and data analytics. From the general already included services of the

cloud, edge computing provides a standard level of load balancing, migration and virtualization much easier with reliable goals and accessible by all hardware devices.

Looking at the top cloud computing companies of the modern era in no particular order who is focusing their core technological services into edge computing. We discover a bunch of extra-specialized services that feature edge computing to be utilized in a different manner back hauling the general traffic by making data more accessible with ultra-reduced latency to drive through the core application platform. Data could be even categorized as micro data for the users responsible for analytics and statistics. 'Mutable Inc.' is taking the world into a revolutionary journey by improving the public edge cloud to be capable of handling the next generation applications like Drone technology / VR and IoT etc. capable of expanding the use of the public cloud overall. Compute points must not be wasted and hence it automatically prioritizes the workload to channel itself with the rest of the points and sells them to people who need it through the public cloud. 'Ori Inc.' is leading the way when it comes to the mobile edge computing platform much like 'MobileedgeX' as a Platform as a Service middleware service company. Its main services relying heavily on dynamic orchestration of their applications. However, what stands out in their implementation of edge is that their core vision is mostly for the developers with a fully customized integration with an analyzation tool, which displays the statistics of various edge servers in local areas as well. 'Hangar' have also dived into the world of robotics with the edge architecture of Robotics as a Service enabling it's personal drones to use the edge network to navigate and not need any or minimum human interaction overall.

Partnering with VaporIO and enabling the use of hyper local, micro and macro data centers within a limited infrastructure so far, the entire technology is gradually increasing in worth and implementation as well. These were just a few of the several services of edge computing as the standardized method following the anything as a service model the applications and the strategy of developing with edge at someone's disposal is limitless.

6. MOBILE EDGE COMPUTING

As both edge technology and market requirements rose, edge computing turned its interest towards deploying towards mobile devices and connections (latest 5G infrastructure) within Radio Access Network. The enterprises and service providers figuring out ways to monetize the entire field are making a tremendous investment into this technology including spectrum costs. The entire consumer base built on the possibility that users would invest more in buying new faster network capable items, which is unrealistic. With the invention of the MEC, service providers such as Netflix or Google Inc. heavily invested into buying that service from the respected service providers in order to utilize that technology onto their network for faster streaming, low to negative buffering capabilities for their servers at the edge, turning MEC to a more enterprise customer base for revenue growth.(A. C. Baktir, A. Ozgovde and C. Ersoy, 2017) Although while deploying the X86 infrastructure and applications running on top of that at the edge, the challenges faced by the service providers are mainly in relation to scaling. MEC provides greater efficiency, low power consumption, computer performance and low latency even over edge computing with the reduced cost of transport. Among the

nonprofit regulatory organizations, European Telecommunications Standards Institute has set the global requirements and standards for Mobile Edge Computing. Service providers may contact the respected operators willing to negotiate with their wireless network edges to other authorized and verified third parties to deploy services and apps for mobile users. Due to the gradual growth in mobile traffic as seen over the last few years, location awareness with reduced latency and low power consumption has always been a priority.

In the world of cloud computing on the edge and the 5G rollout, users are in demand of extreme capacity withstanding the current and even more demands of a faster and more stable network. The phrase minimal latency nowadays being used by edge computing are slowly being replaced by 'no latency' meaning the standardized telecommunications union upon rolling out several powerful core technologies integrated with the power of edge computing would declare no latency issues at all. Data rates being shot up to 20GBPS with less than 1MS of latency is negligible to a normal user but with users or developers eager to invest into the department, the entire codebase is an entirely distributed environment that is used to deploy services as well as applications and upload and store content at nearby mobile user locations.(S. N. Shirazi, A. Gouglidis, A. Farshad and D. Hutchison, 2017) Especially, with virtualization at the edge of radio access network the network operators can allow multiple third party vendors and companies to utilize the rest of the space to create a distributed but a standard low latency model around it. 2017 being the year of mobile computing established its way of dominance when anISG published a standardized content, which was divided into functional and nonfunctional content. The functional

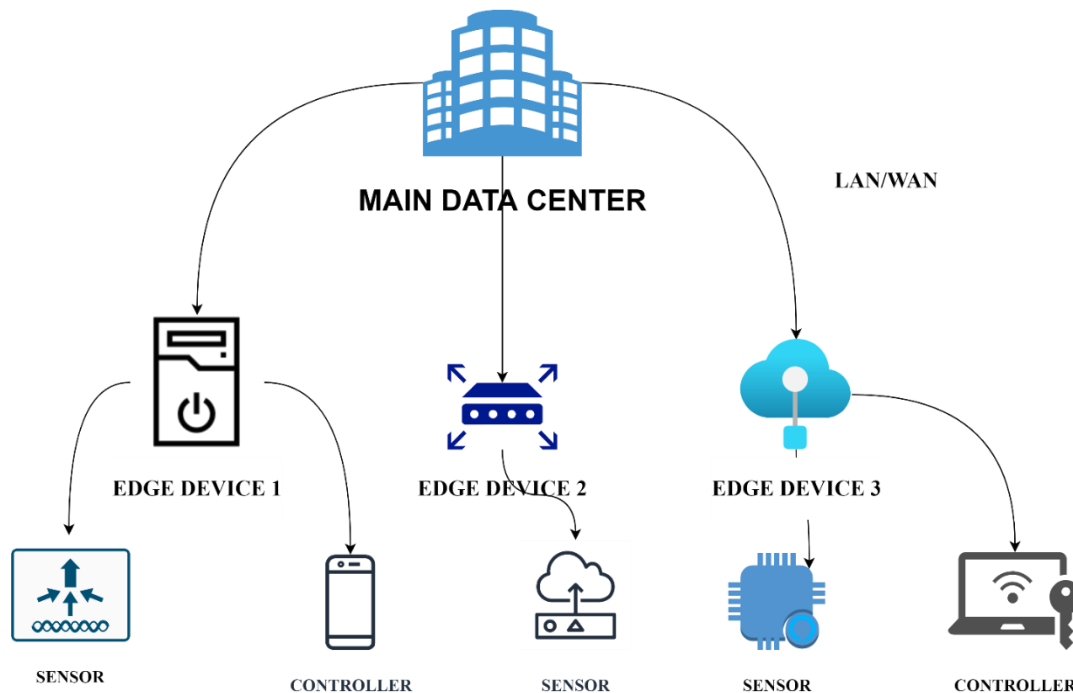
concepts covered the areas of energy efficiency, packet losses, latency and throughput of QoS. While the nonfunctional areas of course covered the concepts of satisfaction, availability and reliability. The core network of the entire technology depends on its capability to adapt with mobility and serving potentially billions of devices simultaneously and dissolving any issues with congestion at the internal network and hence the focus on 5G right now, instead of older network architectures. Utilizing cloud like resources and mobility management this would help the operators increase their overall service quality. Although there are always concerns about security and privacy of any technology in relation with downtime and potential loss or damage, there are significant improvements and standardizations are slowly beginning to be set.

7. IoT IN EDGE COMPUTING

The term IoT has different perspectives for different people. In general, IoT could be defined as physical things that are augmented with actuators, network connectivity having computing in mind. As the rapid growth of technology demands higher access to nearly every technological device the very concept of IoT is becoming more and more relevant in the modern world. Mobility being the key, electronic watches/pulse meters are all connected on a network. This helps in accurate data collection for knowledgeable information, which are processed in real time. In terms of several identification mechanisms for enhancing security and privacy, the very phone locks that we use have to respond to a frame in one-tenth of a second if not less to be worthwhile as a real world application. Through convergence of many big picture technologies such as IoT and ML, it is a lot easier to scale at large at multiple network

edges with even having on demand computational capabilities and diverse usage and access. Although there are some issues like high-resolution images processing in high volumes being one of them, as

technically challenging. The MEC and ML architectures are providing a huge cooperation to better understand and implement these technologies.



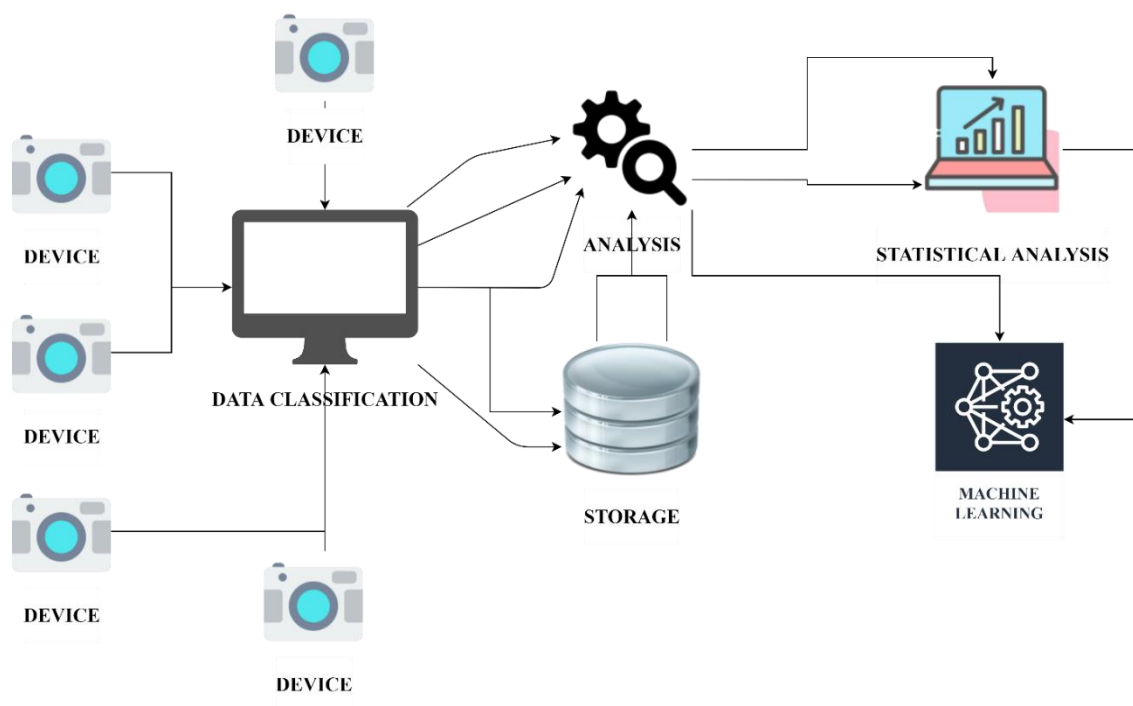
IoT uses all the things that we currently possess. The vast amount of data that is collected from the devices are to be intelligently processed with low response time and maximum accuracy, this is where Edge Computing comes in. Edge computing takes out the distance from the very start, more or less all data extracted from the devices are happening at the edge and all information is processed via the cloud/fog layer into the knowledge section. This is the basic foundational process of the power of edge computing clearly outranks that of a simple cloud computing based industry. According to the recent study by the big tech giants RedHatInc. without the power of edge computing IoT would simply be operating under the networking capacities of a cloud or datacenter. As IoT devices needs more attention towards packet

transfers than normal technical requests, the communication back and forth between the servers would result in slower response times and less operational facilities affecting network bandwidth as well. Edge computing powered by several complex deploy analytics algorithms enables this communication to flourish even under stressful server responses and data is pre-averterly aggregated together before being sent to a centralized server for further enquiry and analysis. For example, to operate/analyze routes and calculations of an autonomous vehicle. It need to process the analysis and the requests in real time faster than most other operations as the vehicle speed increases down the road to reach its destination, it is constantly given the operating and decision making choices of which odds to calculate further in favor of a

safe and smooth journey. If the vehicle were in need to turn or make a stop sending data back and forth between the vehicle and the cloud would prove costly. Allowing the processing speeds of the edge it could pick up the local request and process faster allowing the IoT sensors to process in real time and avoid an accident. Edge being separated into the categories of Thick, Thin and Micro proves to provide a more economical benefit to this as well. While cloud provides a fixed plan to maintain the resources with a pay as you use model of approach, it may not auto switch between the network traffic at real-time for more performance. Especially for moving vehicles, (M. S. Elbamby, 2019) the fact that the communication does not need to happen from the centralized point of view proves the difference amongst IoT sensor load. The sensors would firstly choose the thick load to boost their analytics and once it starts moving, according to its speed it could analyze the little variations of the minor details with edge using the thin or the micro services that edge is categorized into. Intelligent controllers and networking equipment could help determine the road to follow during the travel and the onsite traffic load that each road is facing at that point in real-time, while micro service could indicate the usage of edge to calculate the distance between other vehicles and the road and the stop signs and so on. As the IoT, devices increase their capabilities with edge the technology proves to be the difference in the market in an economical fashion by switching to the minor networks when needed hence, it being a flexible customer first technology altogether.

8. DEEP LEARNING WITH EDGE

Even for anyone, without being an expert in deep learning, it is clear that a lot of processing power is needed just for learning and proper implementation of deep learning onto the edge network. As we know, the power of processing and ability to respond in real time in edge computing is what drove the subset of cloud computing to rise above as a prominent technology. When referred to edge in deep learning methodology being implemented with edge, it usually means the computational power performed locally on the user side item. (X. Wang, Y. Han, V. C. M. Leung, D. Niyato, X. Yan and X. Chen, 2020) Deep learning mechanisms are costlier to implement and thus edge devices carrying those modules would in fact be a lot more costly and unaffordable. It being complex and tough to compute, services are used for handling requests through data centers. The field of online virtualization has shown a lot of prospect in implementing deep learning, having synchronized the complex deep learning algorithms for real-time video analysis, surveillance and augmented reality. The model of deep learning is to integrate itself with the cloud model. The cloud is responsible for stability in the system and updating parameters of models to achieve a global knowledge penetration. The cloud can thus provide a bit more insight into the specific integration for edge nodes to update the deep learning models. When large-scale datasets are provided the DNN becomes more accurate. With the dramatic rise of costs and outstandingly accurate result oriented tasks, it is traded off within a resource constrained edge network. Offloading of deep learning execution tasks and optimizing the frameworks are just but a few implementations of deep learning at the edge.

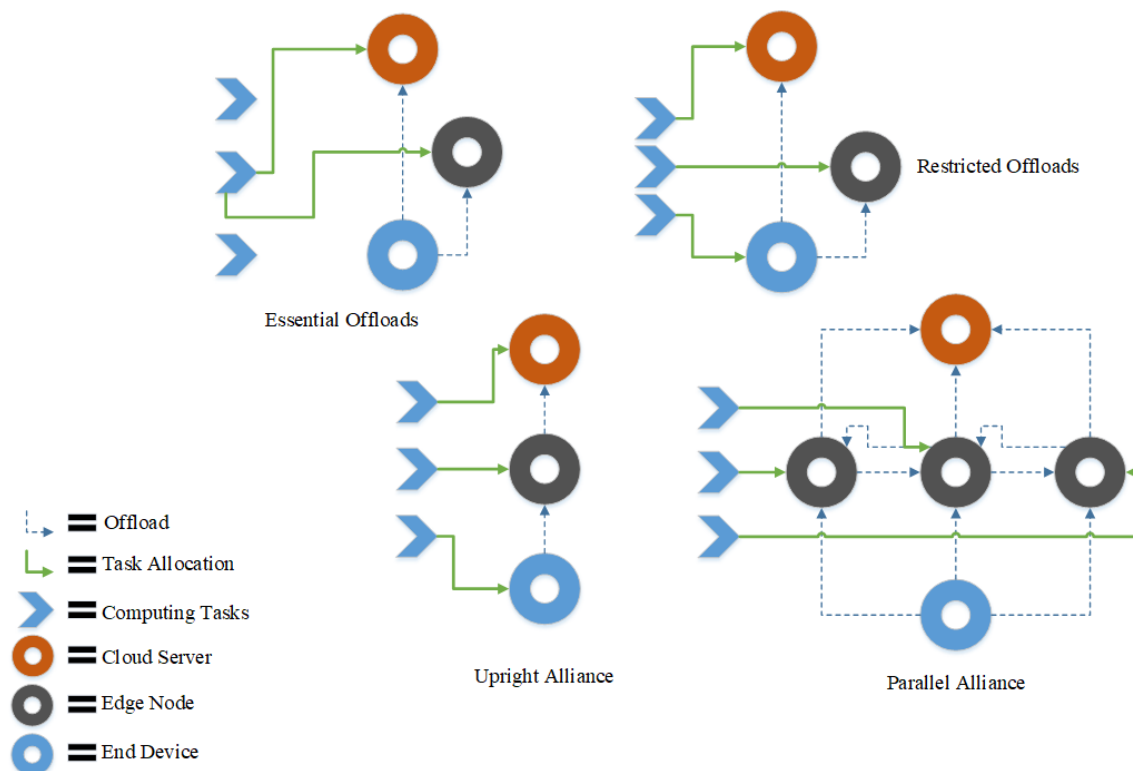


Thinking about the concept of why deep learning is at the technological core of advancement, (H. Trinh, 2018) one has to come to conclusion that everything nowadays depends on speed and artificial intelligence hence the more the demand for speech recognition or translation of languages or decision making the more deep learning should be enabled to handle the process. Researchers discover topics that enable them to make the next step in their research whereas deep learning is the automation of that process. The only difference being that human beings need rest but are not limited to RAM or ROM whereas deep learning solely depends its entire performance on energy, compute points and bandwidth. The wright brothers invented the plane in order to speed up the delivery of one person when travelling, the same concept is now being applied through edge computing to speed up the deep learning process to compute even faster than anyone thought before. Whenever movies have addressed a more futuristic view of our planet and civilization. They have enabled

the thought of automation of multiple objects including heavy equipments. Thus, the demand of automation through the integration of smart city deserves deep learning to perform at its best in every possible area applied. Through the power of both edge computing and deep learning, it is believed that the futuristic reality would be achievable. Smart cities would need deep learning inference and applications on the edge to perform navigation and maintenance in real time, having privacy constraints and optimization of the edge for computational offloads. The need of larger scaled datasets and complex architectures indirectly requires the cloud infrastructure to keep increasing their computational costs. Edge combined with deep learning would not even need cloud to start supplying the computational requirements at all. On input of data, would reduce the searching space from the raw input picture be still or video and run inference algorithms to ensure that the entire image does not need to be processed, rather a specific region or the ROI. The ability to deploy systems like this

at large scale dramatically increases the potential of the overall system development and the standard of safety and living even in

remote places completely disconnected even from the massive computational powers of the cloud.



To handle the number of collaborations and offloads frameworks like Tensorflow and Py(Torch) models got developed to adapt to the edge configurations with the best suitable computer resources and data. If the upload data is needed in essential priority it might switch to FL but DL models follow their own architecture all together to integrate with the edge devices.

9. EDGE COMPUTING AREAS OF SECURITY AND PRIVACY

The essential need of data privacy and security of any data centric technology has always been critical. Edge computing is open nature and the powers of decentralization asks for the need for proper authorization and authentication. The

security measures must be lightweight and easy to implement as well. When dealing with a multitude of edge nodes, it is very important to distinguish the correct routing path. With trusted network topologies, structures not running into a malicious DDoS edge attack (disruption of normal services by trying to gain access to a cluster of edge devices, sending streams of malicious packets from a compromised distributed device even for flood-based attacks) is highly likely. (D. Liu, Z. Yan, W. Ding and M. Atiquzzaman, 2019) Data is collected at the edge from edge devices also provides a massive impact on data privacy. Data could be in the form of location, bank records, recent visits, even health related confidential data hence are at a high risk if the original set of data records are incoming

directly from the edge nodes. Keeping that in mind, there has been a significant amount of investment into boosting security and data privacy over the years. Many software and security encryption patches have also been deployed like proxy re-encryption, attribute and homomorphic encryption, which allows someone to perform complex calculations of an already encrypted data without any form of decryption.

Even with the encryption models network stability, flexibility and availability must be kept intact across the entire network. It boils down to the responsibility of the cloud service provider to ensure that the security patches are regularly updated. In case of any malicious attacks, there must be extra security measures and prompt detection to limit the effects on normal operation. Irregularity event detections should be deployed so that alerts can be issued whenever the behavior changes for any node. Although there have been significant improvements, edge security is still at an evolving stage. (Y. Xiao, Y. Jia, C. Liu, X. Cheng, J. Yu and W. Lv, 2019) The IaaS model requires the consumer to patch updates to their respective software or data, while the cloud service provider is responsible for the underlying abstracted resources, thus penetration detection is a key factor here. In fact, if a customer decides to pre-encrypt their data and send it for data storage, the encryption of a third party server would not enable them to perform search functions for finding related files later on. Thus, searchable encryption was invented. It enables privacy and searchability of cypher text data to support any queries launched by the customer later on.

Apart from increasing security for edge devices, identity authentication for a single or cross domain serves a huge part in security. The entire architecture being a

distributed interactive computing environment, it is essential to establish a mutual form of authentication through deepened search algorithms from trusted domains with special form of digital certifications. Achieving cross-domain authentication through a time controlled tree-level hierarchy with generation of key layer at the top level of the architecture. Every key must have a specific period before their key validity expires, providing feasibility and efficiency.

As data centers are responsible for collecting the geographic locations of different users, high mobility combines into a different form of challenge for security measures. A particular data center cannot be in charge of collecting digital authenticated information about the users' locations, making any form of centralized authentication mute. Handover technology was researched providing strong real-time authentication of edge devices by handing over the encrypted device recognition patterns to a different data center when the geographic location changes for a particular user. (Z. Zhou, X. Chen, E. Li, L. Zeng, K. Luo and J. Zhang, 2019) This is an increasingly difficult point, when the security needs to be dispatched and handled at the edge nodes and is still the subject of thorough research from around the globe. With all the tools that are already available, it seems seemingly difficult to encrypt and patch a certain encryption without it causing a significant delay in the network standards of edge computing. Protection still needs pupilage, it is certain as more AI, ML is integrated with edge, and edge mobile computing the quality of processing as well as the security mechanisms would have a significant improvement.

10. CONCLUSION

We have seen that the increasing necessity for performance is driving technology

towards automation and thus leading towards edge rather than just cloud far more than before. Edge proving to provide the difference even under stress and complex decision-makings. The overall architecture of the cloud helps the network to be flexible and edge provides the real time performance support that was needed to operate in higher performances. Keeping in mind that the entire technology is being build using subpar network facilities until date, it still being mostly in research mode for the higher integrations like deep learning and the fragmented learning technologies and their frameworks so far. The entire technology is less dependent on its own, increases the profit and reduces the risks that cloud provides, leaving the future of technological advancement safe indeed. In conclusion, it is addressed that the future of heavy or light networking, software services and deployment are entirely dependent on the advancements of cloud computing at the edge. According to the advancements in the technological fields, if the prices were to be dropped even further as industrial standards improve, then edge computing would rule for the next several decades and improve security and data protection even more. When it also comes to security, the increased performance and less timing is a genuine proof to increase the security levels much higher than it is. Even leaving the servers less exposed to DDoS attacks and

tool clients, not giving time for the attackers and leaving monitoring to real time. Edge distributes processing, storage and applications across the wide range of platforms making it very difficult for a single range attack. Although, research is going on into the point of entry into the edge network through the edge devices, as access to those networks are at the point of time left a bit vulnerable but the performance and reaction time well enough makes up for it. As time passes and more research and advancements are made to the overall architecture of technology, edge would not only help the world but also give other technologies the ability to perform at the highest of levels providing business growth situated nearer to end-users. Less expensive, easier to maintain and no longer needing companies to be centralized or have private data centers, edge proves to be the difference between other one-track focus driven technological advancements and versatility for its reliability. Shifting the compute speeds to the edge network would also help the business owners in scalability and advance the growing number of IoT devices overall as well. Agility is in its very definition. With more advancements in the usage of internet and even in Blockchain with a more innovative approach, everyone is just scratching the surface of what edge computing has in its store so far.

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IMPACT ANALYSIS OF TECHNOLOGY ADAPTATION IN STOCK TRADING IN INDIA DURING PANDEMIC PERIOD

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ABSTRACT

The simplicity at which one can now invest directly in securities, as well as the low prices associated with it, has attracted hordes of young people to take a chance on the markets. Brokerages are not only putting in place cutting-edge technologies, but they are also delivering a variety of value-added offerings such as analysis and trading classes, which are attracting a huge number of young people to their application or apps and sites. Further, those in smaller towns will now try their luck, it just thanks to increased internet penetration. Indeed, technology has become so important in today's world that new-age discount brokerages seem to be gaining significant market share. The ease at which e-KYC can be completed has aided brokers in expanding their client base. This research observed that Investors opened a staggering 14.2 billion new DEMAT accounts in FY21, up threefold from the previous year. The present article shows that internet and mobile stock trading is expanding and will continue to do so as increasingly affordable cellphones improve mobile stock trading activity in the near future. The mutual fund SIP (Systematic investment plan) system is also discussed in this study, as well as its impact on individuals changing from traditional investing approaches to technology-based stock trading, thanks to technological improvements that have made stock trading easier.

Keywords: Financial Technology, Stock Market, Investors, DEMAT Account, Mobile Trading

Introduction

(Aldyan et al., 2019) Technology advances as a result of the globalization age. Various parts of technology have altered as a result of advancements. Indians are also going through a period of transformation, which includes demonetization and digitization. Demonetization with digitalization has resulted in the fast acceptance of e-wallets, credit and debit cards as payment methods in a relatively short period of time. Such digital payment use is now commonplace. It also has an impact on economy, such as the development of new commercial activities such as software, hardware, and other electronical systems that support business, such as an online trading system. Because of technology-based applications, the stock trading system in the stock market is advancing rapidly. As a result of this improvement, trading got easier for participants. Furthermore, technological advancements make it easier for investors to obtain information on stock trading in the stock market.

(Srivastava, 2011) The Internet has brought more clients access to financial

product and services and reduced geographical obstacles. Previous investors depended only on their brokers, but are now more involved in buying and selling shares on the Internet. E-trading saves time, energy and money because it enables to access the market wherever possible. (Goswami, 2003) The Indian Internet brokerage sites are currently being rapidly extended with new services. It provides a significant advantage to small-time investors who would otherwise be ignored by traditional brokers. Using the Online Trading technique, a qualified investor may make their own decisions. It was shown that knowledgeable investors usually make their investment decisions after browsing through several broker websites and conducting their own research. Securities, debentures, bonds, mutual fund units, IPOs, and other investment vehicles are available to investors.

In Indian financial market there different Modes of Trading in Indian Equity Market where investors able to invest at ease in market. During the Covid-19 lockdown, stock trading using mobile phones

increased more than internet-based buying and selling of equities as retail involvement increased. Trading institutes is the main player of Indian capital market; it's time to increase the role of computers and electronics gadgets for smooth buying and selling of shares and securities. Technological advancements have resulted in high-frequency trading, which has had a huge influence on the market as a result of the increased number of investors. Additionally Brokers have been able to extend their customer base because to the simplicity with which e-KYC may be accomplished. The present article shows that online commerce is expanding and will continue to do so as more affordable cellphones become available for trading. The mutual fund SIP system is also discussed in this study, as well as its impact on individuals who are moving to smartphone trading as a result of technology improvements.

Literature Review

1. Technology and Stock Trading: (Aldyan et al., 2019) Though, from the perspective of a researcher, Technical innovation has a good influence on stock trading and makes the process easier, but it also has a negative influence, such as stock trading infractions as a result of technological innovation. The advancement of technology has an impact on the creation of laws that are related to stock trading are enforced for future. (Dewangan & Ikhar, 2018) The effects of technology on the stock market were explored, including increased market liquidity, market transparency, accuracy dealing, and perfect market competitiveness. According to the demand for new technology in the field of securities trading throughout time, SEBI should alter its rules and regulations to allow for the adoption of innovative technology and effective stock market governance.
2. Stock Trading Education and Technology: (Htay et al., 2010) Business transactions have been affected and facilitated by technological advancements. Due to the IT revolution, banks and stock brokerage firms are now delivering on-line financial services, giving investors access to a variety of financial planning information, such as real-time stock pricing, portfolio management, and so on. The adoption of Internet-based trading might signal a shift in society's attitude toward trade. It also demonstrates that factors such as age, educational level, and income had a significant role in distinguishing innovators from early adopters. (Liivamägi, 2016) Education and technology are mutually beneficial. As one of the most important factors influencing investor involvement and risk-taking decisions is education. Investor trading behavior on the stock market is also influenced by education; with knowledge, investors will be able to make educated stock market investing selections. Investors develop trading expertise and display superior investment performance with the aid of technology adaption during the trading process. (Girnara & University, 2020) Online trading is the act of using a brokerage's internet-based proprietary trading platform to place buy/sell orders for financial instruments and/or currencies. Online stock trading is quick, takes less time, has more options, and provides more information. By surfing through multiple sites, online trading allows knowledgeable investors to make their own decisions while keeping a careful eye on market sensitivity. Online trading will undoubtedly expand quicker as a result of the growing number of knowledgeable investors and the assistance provided by laws and regulations. (Shah et al., 2019) Financial markets provide a unique

trading and investment environment, allowing trades to be conducted from any device with an Internet connection. People now have many routes to develop their investments thanks to the introduction of stock markets. Informal stock market education aids investors in making better investing decisions. However, today's stock markets are designed utilizing a mixture of technology, such as machine learning and expert systems that communicate with one another to help people make better judgments. The use of machine learning methods and other algorithms to analyze and forecast stock prices is an area with a lot of potential. (Singh & Yadav, 2016) Investors just respond to the information they have access to and act appropriately. Before investing in the stock market, a lot of thought should be given to it. The behavior of investors has changed dramatically as a result of technological advancements, including their risk appetite and ease of investing. It is their position that financial education is critical in assessing risk-taking abilities.

3. Stock Brokers and Technology: (Prateek Singh in Voices, Business, Finance, 2021) Investing is a talent rather than a science. Between April 2020 and April 2021, new DEMAT account additions reached an all-time high of 10.7 million, according to statistics from the Securities and Exchange Board of India (SEBI). According to reports, the number of new DEMAT accounts established in FY20-21 increased by double. What's more interesting is that, in line with the global trend, not only have there been an increase in first-time users, but certain worldwide data trends have also showed that in the post-pandemic world, younger or millennial investors in India have been creating DEMAT accounts to begin trading. However, investment and trading need far more

than a DEMAT account. (Rukhaiyar, 2019) With the advancement of technology, mobile trading has become increasingly popular. The rising adoption of smartphones, along with the availability of lower-cost data plans, has made the cellphone a popular platform for investors, particularly retail investors, to trade in the stock markets. Another aspect to consider is that most new-age cheap brokerages prefer that their clients trade using their mobile applications, which helps the brokerages save costs by reducing the number of dealers and relationship managers on staff. Brokerage trading applications are among the most popular in the finance sector on both Android and iOS. Traders gathered in the stock's trading area and started screaming to buy and sell the market when a stock moved on the strength of a news article. Today's high-tech & Fin-tech trading eliminates the need for screaming and provides investors with more efficient ways to analyze and buy stocks (ICRA, 2020) The stock market has reaped the benefits of the epidemic in an unexpected way. Working from home, along with restricted investment prospects due to the adverse economic climate and excellent prices following the March 2020 downturn, has sparked investor interest in capital markets. (ICICI Direct Research Desk, 2010) The Indian brokerage sector is transitioning from a percentage-based business model to a flat brokerage and subscription-based strategy. With increased financial savings and reduced interest rates, equities will continue to be an appealing asset class. (ETPrime, 2021) Because of digitalization and the influx of individuals from Tier-II and Tier-III cities, the broking sector is transforming. CDSL NSE 0.56 percent increased its customer base by roughly 35% this year, with digital players such

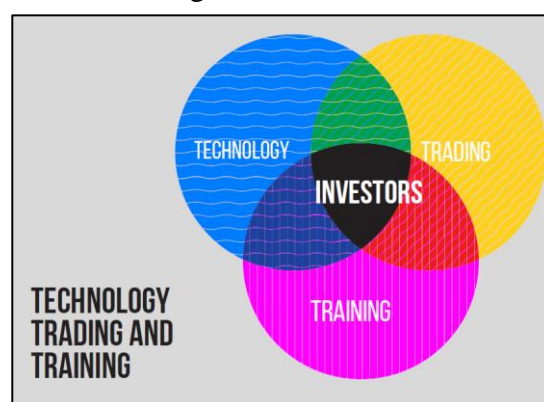
as mobile-based trading platforms accounting for 75% of the increase in new clients. Individual equities trading penetration in India is now between 4% and 5%, whereas China and Korea have approximately 12-13 percent. As a result, there is sufficient opportunity in India for the expansion of mobile trade through digitization and technological adaption. It was also noted that in the next 5 to 10 years, growth will be more favorable as a result of the increased engagement of the younger generation in the stock market. Because the younger generation is more objective and is more comfortable with technology, they employ numerous technological tools to examine equity market investments. Furthermore, it has been seen that Tier-II and Tier-III cities have experienced significant development. In terms of market strategy, Millennials and Gen Z are significantly more educated and savvy. They are better knowledgeable investors rather than risk takers. (Kshitij Bhargava, 2020) Winds of change may have started blowing in India's stock broking industry, with even traditional brokerage firms now cutting costs and offering retail investor's low-cost brokerage and research guidance as well. The traditional brokers have either tweaked their business or started a whole new venture for competitive offerings.

4. High Frequency - Digital stock trading: Trading is becoming more widely adopted because to technological advancements. Data science generates trading techniques that address investing difficulties, so investors no longer need to rely on professionals. (FINSMES, 2020) As a consequence of technology improvements, the way people do business has changed. Technological improvements have resulted in high-frequency trading.

High-frequency trading is also known as day trading. Many people's lives have been significantly impacted as a result of this. This is owing to the simplicity with which low-risk stock trading investments may be made.

5. Triple T- Model (Technology – Training and Trading): In today's world, technology – training and trading – are boosting the stock market and increasing market transparency. These three components will play a critical role in the Indian stock market in the future years.

Figure 1: T- Model



Source: Secondary Data

Research Methodology

Aim and Purpose:

The aim of this study is to learn how easy-to-use technologies combined with low trading fees are enticing small investors to invest in the stock market.

Data Source:

A literature review was conducted in order to better explain the change from old-school trading to technology and application-based trading. Further, to understand the pattern of investors and their priorities for investing in the stock market during the pandemic era Data is gathered from secondary sources, such as BSE & NSE corporate documents and analyses, NSDL market records, and monthly Mutual fund Systematic Investment plan data.

Limitations of study:

Data collected for the present study is from secondary source. Any limitation in the

accuracy of the secondary data carries forward to analysis made. Sample sizes is limiting factor as only past two years data has been considered. The results may vary in epitome circumstances.

Data (JEL) Classification: G1, G12, O1, O16, O33

As a result of technical improvements, large amounts of data have been collected, compiled, and archived, and are now publicly available for research. As a result, in order to better comprehend and assess the present situation, the current study takes use of an existing data base for research. Secondary analysis is employed in a number of ways in the current study; it is also an attempt to do empirical research using a systematic method and in an evaluative context.

To better understand the shift from old-school trading to technology and application-based trade, a literature analysis was done. moreover, to comprehend the pattern of investors and their goals for stock market investing during the pandemic era Secondary sources of information include NSE corporate papers and studies, NSDL market records, and monthly Mutual Fund Systematic Investment Plan data.

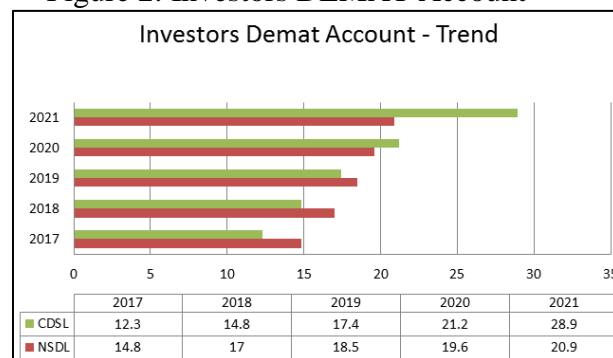
Data Analysis & Interpretation

Analysis of Evidence or Evidence Evaluation: The practice of increasing the number of clients is getting increasingly common. Client acquisition, a robust broking structure, and a shift to flat brokerage are all on the horizon.

Investors DEMAT Account:

An investor opens a DEMAT account with a depository participant in order to invest in assets such as stocks and bonds. The securities are stored digitally.

Figure 2: Investors DEMAT Account



Source: Secondary Data CDSL

According to the aforementioned statistics, investors are flocking to the stock market in the years 2020 and 2021, which are highlighted by Covid-19 Uncertainties. Many people are experiencing economic and financial difficulties during this time. According to the statistics, the number of DEMAT accounts opened in 2018 will double by 2021. According to statistics gathered from SEBI sources, the number of new Dematerialized or DEMAT Accounts has reached an all-time high. Total DEMAT accounts stood at 51.5 million, up from 40.8 million in 2020 and 35.9 million in 2019.

The number of retail investors with DEMAT accounts has risen significantly. This has been accomplished as a result of the smooth and simple to familiarize you with technology access to stock markets. The use of electronic know-your-customer and Aadhaar e-signing has aided the growth of the retail investor community and given them the confidence to enter the market. People are turning to the stock market for a variety of reasons, one of which is that they have more disposable income as well as more free time to learn and trade in the market. Another factor is that the majority of individuals worked from home, and non-essential expenditures were transformed into investments, allowing for short-term returns and an additional source of income.

Brokers Market Share:

The broking sector has seen significant changes and evolution over the last decade, owing to disruptions from bargain brokers, growing interest among diverse investment groups, buoyancy in equities markets, and digitalization.

Table No. 1: Brokerage Market Share

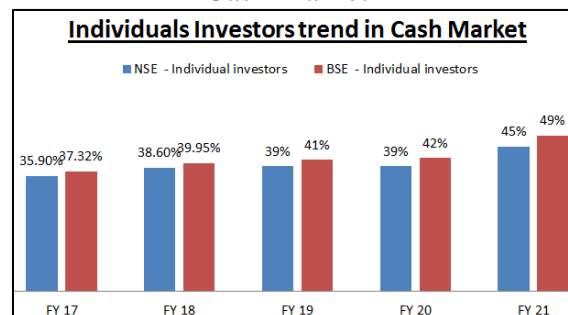
Broker	Market Share %
Zerodha	19.2%
RKSV Sec - (Upstox)	11.3%
Angel Broking	8.1%
HDFC Sec	5.6%
5Paisa Capital	5.0%
Kotak Sec	4.2%
Sharekhan	4.0%
Motilal	3.1%
Others	39.4%

Source: Secondary Data SEBI

Discount brokers like as Zerodha, Upstox, 5Paisa, and the recently launched Angel broking have reaped the benefits, particularly in terms of additional customer acquisition over the past year. In the same way as Zerodha's market share has risen over the last year, Upstox's market share has risen as well. Discount brokers have benefited greatly from the players spotting the trends in the stock broking market by gaining an early move and edge in this area. Digitalization, user-friendly applications and interfaces, and the service-oriented character of business are also said to have attracted more clients, particularly new and young investors. It has been noticed that the stock brokerage sector is experiencing a structural transformation from a percentage-based revenue model to a flat brokerage and subscription-based model as a result of technological adaption. The Indian broker business has also adopted a transaction fee model for services such as wealth management and investment advising, according to the report. While a move to a fee-based paradigm was already underway, with brokers concentrating on developing advisory models (wealth AUM), the epidemic has accelerated the speed of transition.

Retail or Individuals Investors trend in Cash Market – Spot Market:

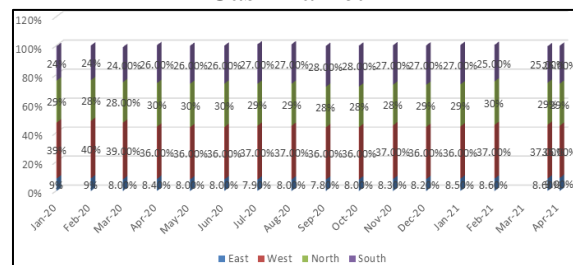
Figure 3: Individuals Investors Trend in Cash Market



Source: Secondary Data

During the previous six years, retail engagement in direct investment has gradually increased: The distribution capital market - cash segment has seen significant transformation over the previous six (fiscal) years. Individual investors' market share increased rapidly from 33% in FY16 to 45 percent in FY21, and has continued to rise substantially in the current fiscal year, offsetting the reduction in the proportion of FIIs, public and private corporations over the same period. This considerable increase in individual investor share in FY21 can be attributable to the increase in new investor registrations seen this fiscal year.

Figure 4: Region-Wide Distribution of Individual Investors Turnover in Cash Market

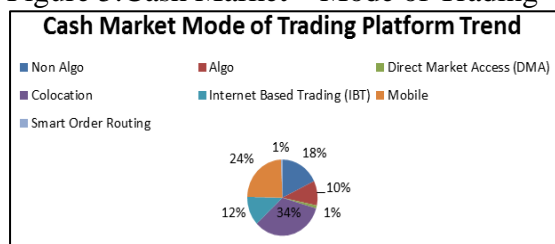


Source: Secondary Data

Individual investor turnover remained unbalanced among regions, similar to investor registration. Western and northern areas provided 37 percent and 29 percent

of total individual investor turnover in March 2021, respectively, which is much more than the other two areas. Over the month, the southern area supplied roughly 29% of total individual investors, while the eastern area provided the remaining 8.6%. During the previous fiscal year, the distributional pattern remained quite consistent. Though there is no clear aggregate statistics on the number of consumers in each tier 1 and tier 2 area, market commentary from exchanges and brokerage firms indicate that investor interest in other parts of India is growing, particularly among young people in the 25-35 age bracket. In addition, the bulk of new clients have come from Tier 2 and Tier 3 cities.

Figure 5: Cash Market – Mode of Trading



Source: Secondary Data NSE

BSE Mode of Trading:

There are three main types of trading in the Indian stock market; there are eight distinct forms of trading.

Table 2: BSE Mode of Trading Use by Different Investors

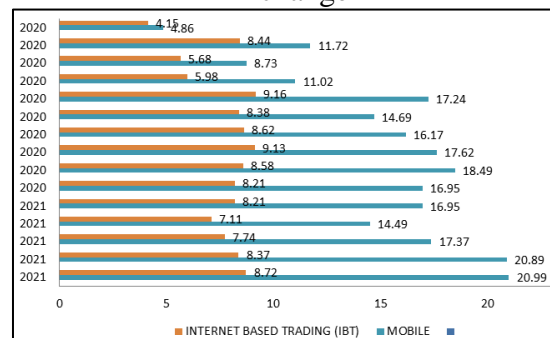
Mode of Trading	Used By
ALGO	Institutional Investors And Big Brokerage H
CO-LOCATION	Large Institutional Investors
FOW-NOW	Corporate Houses And Brokers
MOBILE	Retail Investors
INTERNET BASED TRADING (IBT)	Stock Broker And Sub Broker
NON ALGO (OTHER)	Institutional Investors And Big Brokerage H
SMART ORDER ROUTING (SOR)	Stock Broker And Sub Broker
DIRECT MARKET ACCESS (DMA)	Brokers And Financial Institutions.

Source: Secondary Data

Retail investors employ mobile and internet-based trading modes, which are among the eight primary modes utilized by institutional investors and broking houses or organizations. Online trading is used in both ways. During the Covid-19 lockout,

stock trading using mobile phones increased more than internet-based buying and selling of equities as retail involvement increased.

Figure6: Comparative Trend of Mobile and Internet Base Trading in BSE Exchange

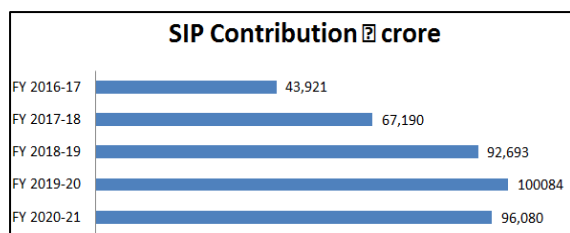


Source: Secondary Data BSE India

From March 2020 to April 2021, mobile trading turnover in the cash markets nearly doubled on the BSE Stock Exchange. Because of the shifting model of broking industry from fee based to service based, it has also been noted that mobile trading has risen month on month in contrast to internet-based trading. It is also clear that retail market involvement is increasing. This rising ratio indicates that more ordinary investors are willing to incur the risk of participating in the stock market. Furthermore, with the ability to work from home, people have more time on their hands to consider investing, and many appear to have begun doing so.

According to the statistics, mobile trading on the BSE market will overtake online trading in April 2020. Mobile trading has always had a large proportion of the market and will continue to do so. The economics and dynamics of trade have altered dramatically as a result of the covid 19 epidemic. Mobile penetration has been democratized thanks to low-cost smartphones and mobile data. Our mobile platform always had more users than our online platform in our situation.

Figure 6: Mutual Fund Trends – Switching To Stock Trading



Source: Secondary Data AMFI

In addition, contribution to SIP and inflows has decreased to 96080 crores in FY 2020-21 from FY 10084 crores in FY 2019-20. Because of the ease with which technology and its application may be used, it's likely that a child may wish to experience the excitement of trading on their own and redirect their finances to stock market trading. Investors have been attempting to diversify their portfolios with an equity mix over the past two years. Young people desire to take advantage of opportunities while also taking on the risk of bringing in equity, as seen by their usage of technology.

Findings

Investors opened a record 14.2 million new DEMAT accounts, a threefold increase over the previous year. The NSE Market Pulse report highlights the growing appetite for trading amongst individuals; the share of individual investors in the cash segment grew to 45% in FY21 from 38.8% in FY20 and only 33% in FY16. In terms of the average daily turnover in the cash segment, trading by individuals grew whopping 97%, to Rs. 27,810 crores in FY21 from 14,123 crore the previous year. On average, daily turnover through internet-based trading in the cash segment rose by 70%, to Rs. 15,400 crores in FY21 from Rs. 9,100 crores in FY20. Direct trading has hit mutual funds which have seen large outflows over the past year; inflows into SIP also declined to 96,080 crores in FY21 from 1,00,084 crores in FY20.

Suggestions

The findings illustrate the socioeconomic implications on the ease of using technology to draw small investors to the capital market. Furthermore, the COVID-19 epidemic boosts stock market engagement by providing numerous technology-based trading courses for inspiring as well as investing in stock market investing strategies. Increased participation of small investors in the stock market during COVID-19 outbreak at the micro-level could allow financial institutions and individuals to manage such circumstances more effectively in the future. The current study has a small scope. Future research may be conducted by surveys of wider samples and in diverse environments to obtain further insights into technology and stock market investing.

Discussion and Conclusion

Individuals who seek more control over their own money in order to work toward future objectives have a lower entrance hurdle thanks to technological advancements. Individual investors may expect technology to continue to assist them in finding new or more efficient revenue streams. Investors may now use more complex and automated online money management methods thanks to technological advancements. With so much financial data at their fingertips, technology will help to standardize formats and make it simpler for investors to reuse data from one platform to another in order to provide the most accurate data possible (Grealish, 2021). Because of technological advancements, the demographics and investment profile of individual investors have changed dramatically in the previous two to three years. According to the findings of this survey, retail investors have a bright future ahead of them and there is a lot of room for growth in the stock market. In India, the landscape of brokerage businesses has also evolved. The retail trading surge in

India has been fostered by pandemic-related restrictions and job losses, which have left millions of people stranded at home with nothing to do. Since March 2020, the stock market has been steadily rising, attracting more investors. And, with to advancements in technology, such as the growth of low-cost trading applications and social media—YouTube influencers, Twitter, and Telegram stock-tipping chat groups—hundreds of day traders have flocked to bargain brokers like Zerodha Broking. In terms of retail investor participation, China is unquestionably a model for what we may expect in India. Because India's economy is growing at a faster rate than China's, India's market

capitalization is anticipated to overtake China's in the next 5 to 10 years. Surprisingly no literature and satirical information is available about the enrollment of BSE and NSE on certification module & their conversion to stock market. The pandemic like COVID-19 gives an immense opportunity to investors to invest in volatile market. From an Indian stock market perspective the age group of 30 to 35 years is very important as they falls under high risk takers and they are technologically very advanced. They are also the potential long term investors in near future. Altogether this can give a boost to Indian economy.

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A STUDY OF STRATEGIC DRIVERS AND OBSTACLES IN VENDOR MANAGEMENT INVENTORY IN ORGANIZATION

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ABSTRACT

The motivation behind this paper is to investigate the exhibition increment accomplished by vendor management inventory (VMI) under various degrees of outside supply limit, request vulnerability, and lead time. With IT innovation and the quick advancement of vehicle producing the executive's hypothesis, auto assembling buying and inventory management procedure have changed enormously. A Vendor Managed Inventory (VMI) has arisen. It has advanced the staggered and complex flow channel among the early customary stock, stockpiling, and assembling into a way that providers work by outsider coordination's to makers. It mirrors the inventory network joining the board considerations and acknowledges extremely brief time frame renewal and high precision. It has adjusted to the lean creation prerequisites of the producers. For the study purpose researcher selected the 170 samples and collected these responses by using the structured questionnaires method and used the chi-square test of independence for testing the statistically significant relationship between strategic drivers and implementation of VMI in organization.

Keywords: Vendor Managed Inventory, original equipment manufacturers, inventory management.

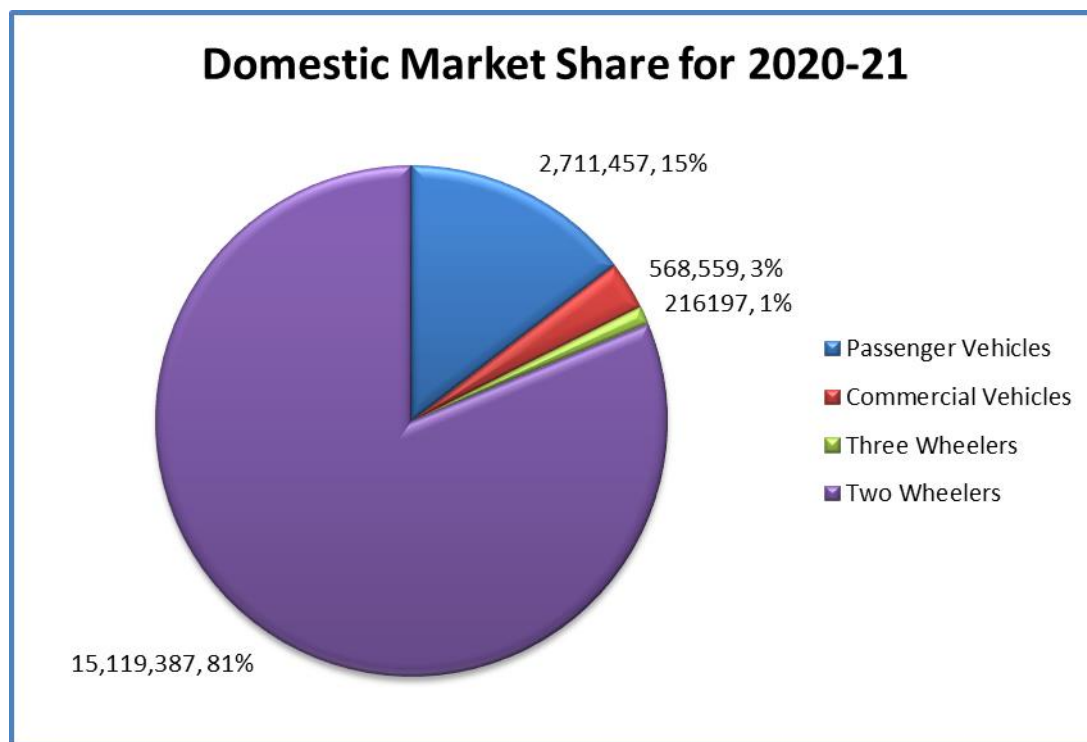
1. Introduction:

Productive and powerful inventory management is imperative part for any business to be fruitful. An indispensable piece of Supply Chain Performance is considered as Inventory the board of business. Latest things in Inventory Management like RFID, JIT and VMI assist the association with acquiring the benefits by decreasing the functioning capital, organization expenses, and builds effectiveness. A framework where the seller volunteer for the obligation of dealing with the retailer or client's stock with data progressively is called as Vendor Managed Inventory (VMI). In this plan of action the seller assume full liability of good/item on premise of data of creation/sell given by purchaser. Seller oversaw stock was first polished in mid 1980s by Wal-Mart, Procter& Gamble later this was sent to a few area like retail organizations, hardware parts industry, materials and auto assembling.

Indian Automobile Industry is viewed as a significant mainstay of world's economy. Looking for the requirement for maintainable benefit over the furious contest, the car ventures are working in close connection with merchant. VMI changes the connection between client and Vendor. Rather than reacting to conveyance plan seller deals with the client's stock this proposition benefit to the two players. Car industry is having important requirements to carry out the VMI regarding Product, Process and Demand.

2.0. Significance of the study

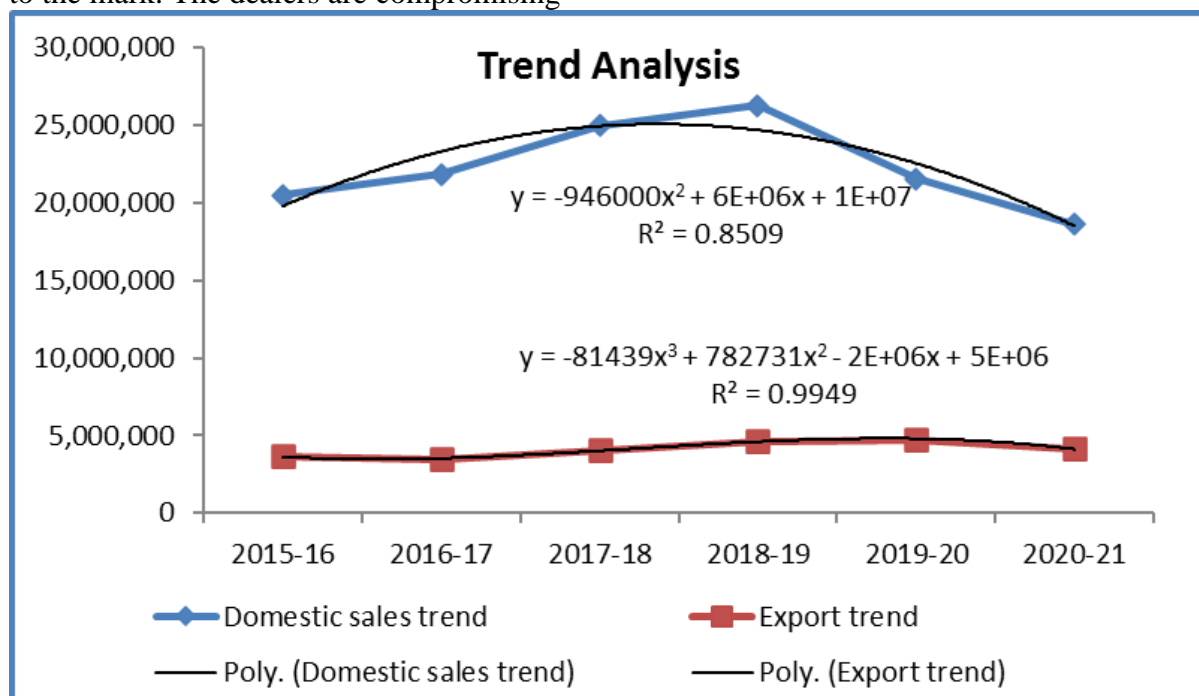
Society of Indian Automobile Manufacturers (SIAM) is the apex Industry body representing leading vehicle and vehicular engine manufacturers in India. Researcher used the reports of SIAM and found that the commercial share of commercial vehicle sector in domestic market is only 3%.



Source: <https://www.siam.in/statistics.aspx?mpgid=8&pgidtrail=14>

In this above pie diagram researcher observed that the large market share is two wheelers i.e., 81 %. The passenger vehicle market share is 15%, three-wheeler market shares are 1% and finally the commercial vehicle share is only 3%. There is very huge market is open for commercial vehicle sector but sales are not the up to the mark. The dealers are compromising

their own margins to retain market shares. There is needed to be focus on sales representative's consultative behaviour, increase the skill set of the sales representatives and improve the vendor management inventory to increase the share in domestic market.



Source: <https://www.siam.in/statistics.aspx?mpgid=8&pgidtrail=15>

In the above time series analysis there polynomial trend in both domestic and export sales trend. The R-square values of both trend lines are greater than the 0.7 that represents the both line best fitted polynomial trend line. Using this least square equation researcher can predict the future sales trend and try to minimizing the fluctuations in the trend can give the better results to improving the domestic and export sales trend for good sales results. There is good scope to increase the sales without scarifying the dealer's margin through delivering proper training to sales representative and maintain inventory management to increase the profit.

Scope of the study

The investigation is useful in the future as it portrays the transformation of merchant the board stock in the car business. The auto business is extremely serious and the organizations in this industry face vicious dispute at homegrown and global levels. In this manner, it is fundamental to bring merchant the executives stock into the strategic policies so unique creation exercises like stock control, improvement of client relations and others are performed adequately. The VMI helps the car business in Pune to carry out stock advancement and control frameworks with the assistance of an electronic stock structure so that keeping up with and situating of assets are executed viably. VMI additionally helps in overseeing provider claimed stock and lessens the tension on the business to perform exercises identified with distribution center stock administration. Thus, because of execution of VMI framework, the necessities of the clients are satisfied progressively effectively. Subsequently, it is exceptionally crucial for execute VMI into the working of vehicle industry with the goal that the business exercises, for example, inventory network, the executives, information investigation, modified revealing, and others will be performed viably. Moreover, the examination likewise gives data about the various parts like plan, control of seller oversaw stocks which are fundamental for the vehicle business to adjust to develop and grow its business exercises. It incorporates coordination's, building up between authoritative connections,

innovation, inventory network joint effort, and others. The appropriate execution and administration of these variables help in car organizations in Pune to incorporate and deal with their funds. VMI teams up the monetary undertaking asset arranging framework with the ERP framework which assists the organizations with acquiring solid data and settles on business-related choices viably. Consequently, one might say that the current examination is profoundly valuable in the future in giving important realities identified with VMI.

2.1. Aims and Objectives

1. To study organisation objective that lead to adaptation of vendor managed inventory.
2. To study strategic drivers that force adaptation of vendor managed inventory.
3. To study obstacles that observed in working of vendor managed inventory.

2.1.2. Research Hypotheses:

The hypotheses were developed based on the research question and theoretical review.

1. There is statistically significant relationship between strategic drivers and implementation of Vendor Managed Inventory in organizations
2. There is statistically significant relationship between obstacles and adoption of Vendor Managed Inventory in organizations

3. Research Methodology:

Sources of Data: The data is collected from following sources.

• **Secondary Data Source:** The main source of secondary data is various sources like the Reports published and various database of Government Organizations/Departments, newspapers published, magazines, related books, Research Journals, Internet etc.

• **Primary Data Source:** Primary data is collected personally from automobile companies located in Pune region and their TIER I vendor/Supplier companies. Managerial level professionals working in the field of supply chain functions are the respondent and source for primary data.

3.1. Type of research: Descriptive research

Descriptive research is research type which is used in current problems and issues through data collection process. It enables the researcher describe the situation more completely over other methods. Researcher has employed descriptive research with survey and observations methods. The process of phenomenon was studied for sample and then it was extrapolated to the population. The structured interview technique was opted by researcher because of its being more economical, providing a safe basis for generalization and requiring relatively lesser skill on the part of the interviewer.

3. Sampling Design: Sampling design is done in research in order to draw a representative sample from the population and reach reliable conclusions.

Population/Universe: The population/universe is considered as: „Original equipment manufacturer and their TIER I vendors“. Total 10 OEM are based in Pune region and each OEM has 3 vendors on an average who work in collaboration with OEM for inventory management. The companies under study taken by researcher are 40 companies.

Sampling Unit: The sampling unit in this research is taken as „All the OEM and the TIER I vendors located in Pune region“.

Sampling Frame: The sampling frame in this research consists of list of all the sampling units in the population. The sampling frame is collected from internet.

Sample Size: Sample size was determined using techniques “Sample size determination by mean method”. Variables in study were

measured using a 5-point measurement scale & then the mean method was adopted.

Formula: $N = (z^2 \cdot s^2) / e^2$

Where, „z“ is the standard score associated with confidence level (90% in the current case). Hence standard scores equals to 1.645 (borrowed from normal table) “S” is the variability in the data set, computed as a ratio of range / 6. Range is equal to 5- 1 = 4 (the difference between minimum and maximum value in the 5 point scale). 6 refer to ± 3 standard deviation values on the X axis of the standard normal curve, which takes in all the data set in study.

Hence $S = 4/6 = 0.66$

E is the tolerable error = 9% (in the current study).

Sample size $n = ([1.645]^2 \cdot [0.66]^2) / [0.09]^2 = 145$

The 20% of the sample size is taken as buffer to deal with non- responses. $145 \times 0.20 = 29$
 $145 + 29 = 174$, however, 4 questionnaires were discarded for incompleteness; hence the final sample size is freeze at 170.

4. Data Analysis: Hypothesis 1

Ho: There is not statistically significant relationship between strategic drivers and implementation of Vendor Managed Inventory in organizations

Against

H1: There is statistically significant relationship between strategic drivers and implementation of Vendor Managed Inventory in organizations

Table 1 Observed frequency table

Sr. No	Parameter	SA	A	N	D	SD	Total
1	Competition	50	59	52	9	0	170
2	Shorter product life cycle	0	83	28	9	50	170
3	Global supply chain	40	86	34	0	10	170
4	Corporate structuring	0	101	69	0	0	170
5	Scale of Operations of OEM	38	123	9	0	0	170
6	Scale of Operations of Vendor	0	83	62	0	25	170
7	Sole Sourcing	9	68	24	69	0	170
8	Improved Forecasting Ability	19	109	42	0	0	170
9	More Accurate Ordering and Fulfillment	77	49	9	25	10	170
10	Reduces the risk of errors in ordering	68	74	19	9	0	170
	Total	301	835	348	121	95	1700

Table 2 Expected frequency table

Sr. No	Parameter	SA	A	N	D	SD	Total
1	Competition	30	84	35	12	10	170
2	Shorter product life cycle	30	84	35	12	10	170
3	Global supply chain	30	84	35	12	10	170
4	Corporate structuring	30	84	35	12	10	170
5	Scale of Operations of OEM	30	84	35	12	10	170
6	Scale of Operations of Vendor	30	84	35	12	10	170
7	Sole Sourcing	30	84	35	12	10	170
8	Improved Forecasting Ability	30	84	35	12	10	170
9	More Accurate Ordering and Fulfillment	30	84	35	12	10	170
10	Reduces the risk of errors in ordering	30	84	35	12	10	170
	Total	301	835	348	121	95	1700

“The above Expected Frequency Table, researcher calculate the expected frequencies in Microsoft Excel by using the formula
Expected Frequency for each cell =
(Corresponding Row Total X Corresponding Column Total) / Grand Total of responses conducted through questionnaire”.

$$E_{ij} = (R_i \times C_j) / N, i = 1, 2, 3, \dots, n, j = 1, 2, 3, \dots, m$$

Where E_{ij} = Expected Frequency of
ith Row and jth Column.

R_i = Row Total of ith cell.

C_j = Column Total of jth cell.

N = Grand Total

Table 3 P-Value table of Chi-square test of Independence

Sr. No	Parameter	P-Value
1	Competition	0.0000000652
2	Shorter product life cycle	0.0000000000
3	Global supply chain	0.0038097672
4	Corporate structuring	0.0000000000
5	Scale of Operations of OEM	0.0000000000
6	Scale of Operations of Vendor	0.0000000000
7	Sole Sourcing	0.0000000000
8	Improved Forecasting Ability	0.0000004711
9	More Accurate Ordering and Fulfillment	0.0000000000
10	Reduces the risk of errors in ordering	0.0000000000

“In the above P-Value table, researcher used Chi-Square Test of R X C contingency table. Using Micro-Soft Excel researcher calculate the P-Values by using Observed Frequency Table and Expected Frequency Table. For calculation purpose, researcher used the following formula,

1st P-Value = ChiTest(Observed Frequency Table O1j, Expected Frequency Table E1j)”

$j = 1, 2, 3, \dots, m$

Similarly,

2nd P-Value = ChiTest(Observed Frequency Table O2j, Expected Frequency Table E2j)

$j = 1, 2, 3, \dots, m$ etc.

Decision Criteria

“The chi-square test is for testing the null hypothesis, which states that there is no significant relationship between the expected and observed result. If P-value is less than or equal to the level of significance i.e. alpha is less than or equal to 0.05 then researcher may reject the null hypothesis i.e. H_0 . Otherwise, researcher may accept the alternative hypothesis H_1 ”.

Interpretation:

In the above table of P-Values, researcher noticed that all the P-Values are less than the smallest level of significance i.e. 0.05 so

researcher may reject the null hypothesis H₀ and accept the alternative hypothesis H₁.

It means that, there is statistically significant relationship between strategic drivers and implementation of Vendor Managed Inventory in organizations

Hypothesis 2

Ho: There is not statistically significant relationship between obstacles and adoption of Vendor Managed Inventory in organizations

Against

H₁: There is statistically significant relationship between obstacles and adoption of Vendor Managed Inventory in organizations

Table 4 Observed frequency table

#	Parameter	SA	A	N	D	SD	Total
1	Ineffective organizational structure	50	59	52	9	0	170
2	Lack of suitable IT infrastructure	0	83	28	9	50	170
3	Improper decision support tool	40	86	34	0	10	170
4	Lack of trust and mutual understanding between supply chain partners	0	101	69	0	0	170
5	Internal/external integration	38	123	9	0	0	170
6	OEM demanding position	0	83	62	0	25	170
7	Infrastructure in India	9	68	24	69	0	170
8	Initial investment from both partners	19	109	42	0	0	170
9	Impact due to random trade promotions	77	49	9	25	10	170
10	Lack of clarity of scope, KPI, role and responsibility of both the parties	68	74	19	9	0	170
11	Technology capacity	0	38	78	54	0	170
12	Contractual relationship	19	124	18	9	0	170
13	Handling stock level- over and or obsolescence	59	92	9	10	0	170
14	User acceptance	18	43	60	39	10	170
15	Implementation of VMI strategy requires technological investment	38	28	74	30	0	170
16	IT upgrading requirements and frequency	9	83	9	59	10	170
	Total	444	1243	596	322	115	2720

Table 5 Expected frequency table

Sr. No	Parameter	SA	A	N	D	SD	Total
1	Ineffective organizational structure	28	78	37	20	7	170
2	Lack of suitable IT infrastructure	28	78	37	20	7	170
3	Improper decision support tool	28	78	37	20	7	170
4	Lack of trust and mutual understanding between supply chain partners	28	78	37	20	7	170
5	Internal/external integration	28	78	37	20	7	170
6	OEM demanding position	28	78	37	20	7	170
7	Infrastructure in India	28	78	37	20	7	170
8	Initial investment from both partners	28	78	37	20	7	170
9	Impact due to random trade promotions	28	78	37	20	7	170
10	Lack of clarity of scope, KPI, role and responsibility of both the parties	28	78	37	20	7	170

Sr. No	Parameter	SA	A	N	D	SD	Total
11	Technology capacity	28	78	37	20	7	170
12	Contractual relationship	28	78	37	20	7	170
13	Handling stock level- over and or obsolescence	28	78	37	20	7	170
14	User acceptance	28	78	37	20	7	170
15	Implementation of VMI strategy requires technological investment	28	78	37	20	7	170
16	IT upgrading requirements and frequency	28	78	37	20	7	170
	Total	444	1243	596	322	115	2720

“The above Expected Frequency Table, researcher calculate the expected frequencies in Microsoft Excel by using the formula Expected Frequency for each cell = (Corresponding Row Total X Corresponding Column Total) / Grand Total of responses conducted through questionnaire”.

$$E_{ij} = (R_i \times C_j) / N, i = 1, 2, 3, \dots, n, j = 1, 2, 3, \dots, m$$

Where E_{ij} = Expected Frequency of i th Row and j th Column.

R_i = Row Total of i th cell.

C_j = Column Total of j th cell.

N = Grand Total

Table 6 P-Value table of Chi-square test of Independence

Sr. No	Parameter	P-Value
1	Ineffective organizational structure	0.0000000210
2	Lack of suitable IT infrastructure	0.0000000000
3	Improper decision support tool	0.0000136534
4	Lack of trust and mutual understanding between supply chain partners	0.0000000000
5	Internal/external integration	0.0000000000
6	OEM demanding position	0.0000000000
7	Infrastructure in India	0.0000000000
8	Initial investment from both partners	0.0000000090
9	Impact due to random trade promotions	0.0000000000
10	Lack of clarity of scope, KPI, role and responsibility of both the parties	0.0000000000
11	Technology capacity	0.0000000000
12	Contractual relationship	0.0000000001
13	Handling stock level- over and or obsolescence	0.0000000000
14	User acceptance	0.0000000002
15	Implementation of VMI strategy requires technological investment	0.0000000000
16	IT upgrading requirements and frequency	0.0000000000

“In the above P-Value table, researcher used Chi-Square Test of $R \times C$ contingency table. Using Micro-Soft Excel researcher calculate the P-Values by using Observed Frequency Table and Expected Frequency Table. For

calculation purpose, researcher used the following formula,

$$1st \text{ P-Value} = \text{ChiTest}(\text{Observed Frequency Table } O_{ij}, \text{ Expected Frequency Table } E_{ij}) \\ j = 1, 2, 3, \dots, m$$

Similarly,
 2^{nd} P-Value = $\chi^2 \text{Test}(\text{Observed Frequency Table } O_{2j}, \text{Expected Frequency Table } E_{2j})$
 $j = 1, 2, 3, \dots, m$ etc.

Decision Criteria

“The chi-square test is for testing the null hypothesis, which states that there is no significant relationship between the expected and observed result. If P-value is less than or equal to the level of significance i.e. α is less than or equal to 0.05 then researcher may reject the null hypothesis i.e. H_0 . Otherwise, researcher may accept the alternative hypothesis H_1 ”.

Interpretation:

In the above table of P-Values, researcher noticed that all the P-Values are less than the smallest level of significance i.e. 0.05 so researcher may reject the null hypothesis H_0 and accept the alternative hypothesis H_1 . It means that, there is statistically significant relationship between obstacles and adoption of Vendor Managed Inventory in organizations

5. Conclusion:

In this research, researcher concludes that, there is statistically significant relationship between strategic drivers and implementation of Vendor Managed Inventory in organizations. The organization need to focus

strategic drivers like Competition, Shorter product life cycle, Global supply chain, Corporate structuring, Scale of Operations of OEM, Scale of Operations of Vendor, Sole Sourcing, Improved Forecasting Ability, More Accurate Ordering and Fulfillment, Reduces the risk of errors in ordering for effective implementation of Vendor Managed Inventory in organizations. Also researcher concludes that, there is statistically significant relationship between obstacles and adoption of Vendor Managed Inventory in organizations. The organization need to manage the following obstacles like Ineffective organizational structure, Lack of suitable IT infrastructure, Improper decision support tool, Lack of trust and mutual understanding between supply chain partners, Internal/external integration, OEM demanding position, Infrastructure in India, Initial investment from both partners, Impact due to random trade promotions, Lack of clarity of scope, KPI, role and responsibility of both the parties, Technology capacity, Contractual relationship, Handling stock level- over and or obsolescence, User acceptance, Implementation of VMI strategy requires technological investment and IT upgrading requirements and frequency while adoption of the Vendor Managed Inventory in organizations

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RELATIONSHIP ANALYSIS BETWEEN QUALITY OF WORK LIFE (QWL) AND LABOURS ORGANIZATIONAL COMMITMENT (LOC): A STUDY OF LARGE SCALE MANUFACTURING INDUSTRIES OF PUNE DISTRICT

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ABSTRACT

Quality of Work Life and Labours Organizational Commitment serve as a foundation for all commercial operations inside the company and hence the researcher has considered the Quality of Work Life and Labours Organizational Commitment being the most essential reason for which this research is being conducted. The objective of the present study was to find the relationship between Quality of Work Life (QWL) and Labours Organizational Commitment (LOC) of the large-scale manufacturing industries of Pune district. Data were collected from 390 respondents. Three independent structured close ended schedules were used as instruments for collecting primary data from respondents. Simple Linear Regression & Multiple Linear Regression was used to find the impact of Quality of Work Life and Labours Organizational Commitment. Pearson Correlation Coefficient (r) test was used for analysis of relationship.

Keywords: *Quality of Work Life, Labours Organizational Commitment and large-scale manufacturing industries.*

Introduction

Employees are the organization's most valuable resource and its core strength. Organizations frequently place a greater emphasis on technology and systems than on personnel. It is not well recognised that employees are the ones who drive an organization's technologies and systems. Employees are not individuals working in the organisation; they are social creatures who belong to a specific social structure, family life style, and culture. The relevance of "Quality of Work Life" (QWL) in an organisation is not effectively taken care of due to a lack of knowledge among employers and employees. Absence of QWL results in job discontent, greater absenteeism, a lack of motivation and morale, higher accident rates, and worse productivity, among other things. These are the primary causes of an organization's poor performance, outnumbering all other factors. In organisations, QWL is critical to the proper operation of the business. It also aids in

attracting and maintaining efficient and productive people for the appropriate job profile, which leads to the success of both employees and companies. To ensure that all employees are working at their maximum ability while remaining stress-free, the Work-Life Balance must be carefully maintained. Employee dedication can come in a variety of shapes and sizes. As a result, it's frequently regarded as a difficult-to-define HR variable. When it comes to the context, direction, and growth of commitment, as well as the extent to which commitment drives behaviour, there can be confusion and debate. The bond that employees have with their organisation defines their devotion to it. Employees who are committed to their company have a sense of belonging, a sense of knowledge of the company's goals, and a sense of belonging in general. Because they are more engaged to their work, more productive, and more aggressive in delivering aid, such employees have a higher added value. Employee commitment is critical because high levels of

commitment result in a number of positive organisational outcomes. It demonstrates how dedicated employees are to the organization's aims and how much they identify with it. In today's competitive business world, every company faces the challenge of attracting and maintaining qualified employees. To counteract this, all firms must maintain a high level of Workplace Quality of Life. According to the literature, QWL is a movement that is a continuous process that has an impact on employee performance. Employee morale, commitment, efficiency, and effectiveness all suffer when the level of QWL falls. As a result, when developing QWL for employees, companies must consider issues like as morale, employee dedication, and so on. Every employee's Quality of Work Life (QWL) should be enjoyable; else, that individual would feel uncomfortable and demotivated in the organisation. This type of setting, on the other hand, has a direct impact on job satisfaction, performance, and productivity, as well as their general contentment at work. It can be concluded from the preceding analysis that there is a strong correlation between "Quality of Work Life" (QWL) and Labours Organizational Commitment (LOC). Thus, QWL is no longer just for show; it has become a necessity for employers, as its implementation has resulted in attracting better employees and lowering turnover, as well as enhanced job satisfaction, retention, devotion, loyalty, attention, and performance.

Quality of Work Life (QWL):

The concept "Quality of Work Life" first appeared in study journals and the press in the United States in the 1970s. The term "quality of work life" was coined by Louis Davis. The inaugural International Quality of Work Life Conference was held in Toronto in 1972, and

the next year, the International Council for "Quality of Work Life" was established.ⁱ

The basic concept of QWL is moved around its eight criteria of employment i.e. characteristics of the individual's work experience or work environmentⁱⁱ. Richard E. Walton QWL is explained in terms of eight general conditions which consist of "Adequate and fair compensation", "Safe and healthy working conditions", "Opportunity to use and develop human capacities", "Opportunity for continued career growth and security", "Social integration in work place", "Constitutionalism in the work organization", "Balanced role of work in total life space" and "Social relevance of work"ⁱⁱⁱ.

Organizational Commitment (OC):

Organisational commitment is describe in a variety of ways throughout the last few years (e.g. Meyer & Allen, 1991; J. P. Meyer, D. J. Stanley, L. Herscovitch, L. Topolnytsky, 2002, I. R. Gellatly, J. P. Meyer, A. A. Luchak, 2006, Mowday et al., 1979). Organisational commitment is thus made up of the following three components:

- 1) "one's strong belief in and acceptance of the organisation's goals and values",
- 2) "one's willingness to make considerable effort on behalf of the organisation",
- 3) "one's strong desire to maintain membership in the organisation".

The following are major aspects of organisational commitment:

- 1. Affective commitment:** "refers to the employee's positive emotional attachment to the organization. The affective component means emotional commitment of an employee to the organization and identification with it. The persons with strong affective commitment continue their employment in the organization because they want to do so. The choice of the notion – affective commitment –

was conditioned by a belief that all factors involved in the development of this component are accompanied by strong positive feeling, and this is probably the most essential aspect of this form of commitment”^{iv}.

2. **Continuance commitment:** “refers to an employee’s commitment to an organization due to the fact that he calculates how high the costs of losing one’s organizational membership are. Such considerations might include economic costs (for instance, pension accruals) and social costs (relationships/friendships with colleagues might cease to exist) too”. Individuals feel that they “have to” commit to the organization. “The awareness of the costs associated with leaving the company is a component of the continuity component. Employees whose basic relationship to the company is based on the need to keep working there stay as long as they need to.”^v.

3. **Normative commitment:** “refers to an individual’s commitment an organization because of feelings of obligation. Such feelings might derive from the fact, for example, that the organization invested a certain amount of resources when employing the person (trainings, courses, etc.), which makes the employee feeling obliged to put considerable effort into the job and stay with the organization until repaying the debt. Furthermore, such feelings can also stem from personal reasons, triggered by some socialization processes, or one wishes to remain loyal to his family or any other person.” Therefore, the employee stays with the organization because he “ought to” do so. “These feelings arise out of a sense of duty or obligation. This particular component is affected largely by one’s personal experience, cultural

background, and socialization. There are cultures, for example, that of the Japanese, which are characterized by normative commitment, whereas affective commitment is typical of the Americans (János, 2005)”^{vi}.

The goal of this research was to find out more about large scale manufacturing companies of the Pune district. The existence of QWL programs in large scale manufacturing companies was essential in order to retain valuable employees as it also influenced their organizational commitment (OC). As a result, in order to establish the relationship between the two, “Quality of Work Life” (QWL) programs and “Labours Organizational Commitment” (LOC), the following questions is used:

Research Hypothesis:

H₀ : “There is no significant relationship between **Quality of Work Life (QWL)** and **Organizational Commitment (OC)**”.

H₁ : “There is significant relationship between **Quality of Work Life (QWL)** and **Labours Organizational Commitment (OC)**”.

Research Methodology

A. Research Design:

The present research is Diagnostic in nature as it is an in-depth study directed by hypotheses. Diagnostic inferential research design is used since, it focuses on relationship and association between variables such as QWL and OC. The Primary data has been collected in the form of feedback from sample blue collar labours to cogitate the impact of QWL on OC. Three independent structured close ended schedules were

used as instruments for collecting primary data from respondents.

B. Sample and Sampling Technique:

Labours working in the large-scale manufacturing industries of Pune district taken as samples. Simple random sampling method was used for sample selection since sample universe is large and researcher wants to obtain representative samples from each company. Samples of every company were approached in person to record the responses. There are 677 large scale manufacturing companies situated in Pune district out of which 114 companies were selected where the total employment is more than 500. The

sample universe of this research was 1,36,036. Researcher has used standard formula to calculate proposed sample size. Each company's samples added together to calculate actual sample size. The actual sample size of this research is **390 samples**.

C. Measurement:

The reliability analysis for final data of Schedule I, II & III was done by Cronbach's Alpha using of SPSS. Simple Linear Regression & Multiple Linear Regression has used to find the impact of impact of QWL on OC. Hypothesis was tested using Pearson Correlation Coefficient (r) test has used to find out relationship between QWL & OC.

Result and Discussion:

Table 1.1. Demographic Distribution of Samples

(n=390)

Sr. No.	Demographic Variables		Gender		Total	Gender		Total
			Male	Female		Male	Female	
			Frequency	Frequency		%	%	
1	Marital Status	Single	39	18	57	10.0	4.6	14.6
		Married	274	59	333	70.3	15.1	85.4
		Separated	-	-	-	-	-	-
		Widowed	-	-	-	-	-	-
		Divorced	-	-	-	-	-	-
		Total	313	77	390	80.3	19.7	100.0
2	Education	Illiterate	-	-	-	-	-	-
		School: Up to 4 years	61	0	61	15.6	0	15.6
		School 5-9 years	54	0	54	13.8	0	13.8
		SSC	94	42	136	24.1	10.8	34.9
		HSC	13	21	34	3.3	5.4	8.7
		ITI	91	14	105	23.3	3.6	26.9
		UG	-	-	-	-	-	-
		PG	-	-	-	-	-	-
		Other	-	-	-	-	-	-
		Total	313	77	390	80.3	19.7	100.0
3		Up to 5000	-	-	-	-	-	-

	Income (Monthly)	6000 to 10,000	-	-	-	-	-	-
		11,000 to 15,000	20	0	20	5.1	0.0	5.1
		16,000 to 20,000	65	43	108	16.7	11.0	27.7
		Above 20,000	228	34	262	54.5	8.7	67.2
		Total	313	77	390	80.3	19.7	100.0
4	Employment Status	35-40 Hours Per Week	81	48	129	20.8	12.3	33.1
		41-45 Hours Per Week	2	12	14	0.5	3.1	3.6
		More than 45 Hours Per Week	230	17	247	59.0	4.4	63.3
		Any Other	-	-	-	-	-	-
		Total	313	77	390	80.3	19.7	100.0
5	Job Title/Occupation/ Designation	Carpenter	-	-	-	-	-	-
		Electrician	81	0	81	20.8	0.0	20.8
		Fitter	17	0	17	4.4	0.0	4.4
		Operator	72	0	72	18.5	0.0	18.5
		Gardening, Landscaping, etc	-	-	-	-	-	-
		Maintenance	53	0	53	13.6	0.0	13.6
		Line Leader	27	23	50	6.9	5.9	12.8
		Quality Checker	13	48	61	3.3	12.3	15.6
		Mechanical	8	0	8	2.1	0.0	2.1
		Painter	-	-	-	-	-	-
		Plumber	-	-	-	-	-	-
		Driver	-	-	-	-	-	-
		Welder	10	0	10	2.6	0.0	2.6
		Skilled Technician	16	0	16	4.1	0.0	4.1
		Packaging	16	6	22	4.1	1.5	5.6
		Any other	-	-	-	-	-	-
		Total	313	77	390	80.3	19.7	100.0

(Source: Field Data)

The impact of Quality of Work Life (QWL) factors on Labours Organizational Commitment (LOC)

Table 1.2.

Coefficients						
		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
(Constant)		1.635	.084		19.446	.000
Adequate and fair compensation	X1	.053	.011	.136	4.788	.000
Safe and healthy environment	X2	.066	.009	.207	7.506	.000
Development of human capacities	X3	.116	.010	.271	11.331	.000
Growth and security	X4	.089	.009	.241	9.909	.000
Social integration	X5	.075	.009	.214	8.773	.000
Constitutionalism	X6	.081	.010	.224	8.480	.000
The total life space	X7	.070	.011	.190	6.660	.000
Social relevance	X8	.124	.014	.224	8.947	.000
Dependent Variable: Labours Organizational Commitment (LOC)						

(Source: Compiled by researcher)

In the above table a multiple regression calculated to predict Labours Organizational Commitment (LOC) based on Quality of Work Life (QWL) factors. Researcher has framed multiple regression equation to study the impact of eight Quality of Work Life factors (independent variable) on Labours Organizational Commitment (dependent variable).

$$\text{LOC} = 1.635 + 0.053 * X1 + 0.066 * X2 + 0.116 * X3 + 0.089 * X4 + 0.075 * X5 + 0.081 * X6 + 0.070 * X7 + 0.124 * X8$$

From above table it is clear that, Development of human capacities has more significant impact on Labours Organizational Commitment (LOC) with Beta value of 0.271 followed by Growth and security Social relevance & Constitutionalism with beta values 0.241, 0.224 & 0.224 respectively.

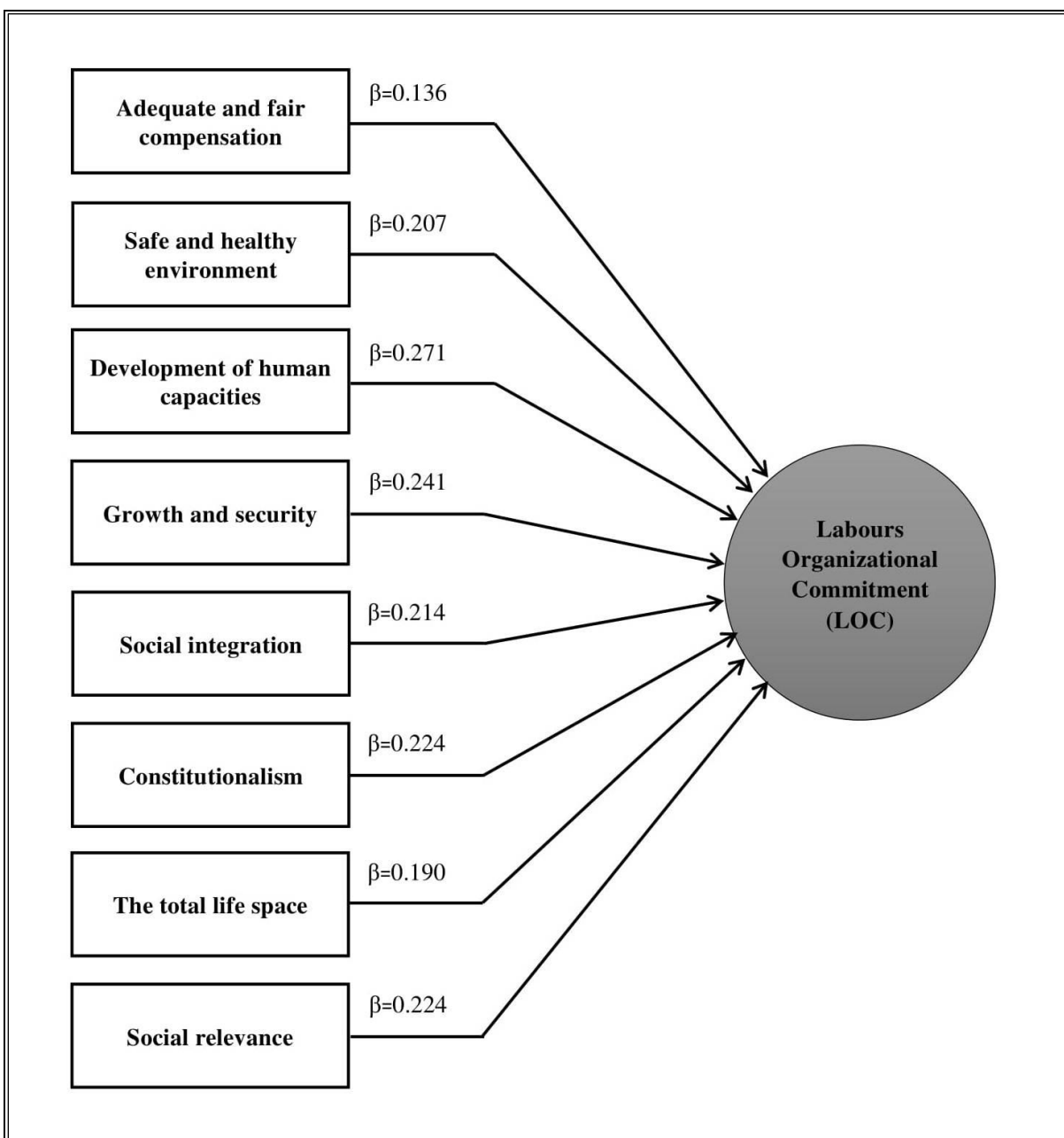


Fig: 1.1 The impact of Quality of Work Life (QWL) factors on Labours Organizational Commitment (LOC)

Table 1.3. The Correlation between Quality of Work Life (QWL) and Labours Organizational Commitment (LOC).

Correlations			
		QWL	LOC
QWL	Pearson Correlation	1	.948**
	Sig. (2-tailed)		.000
	N	390	390
LOC	Pearson Correlation	.948**	1

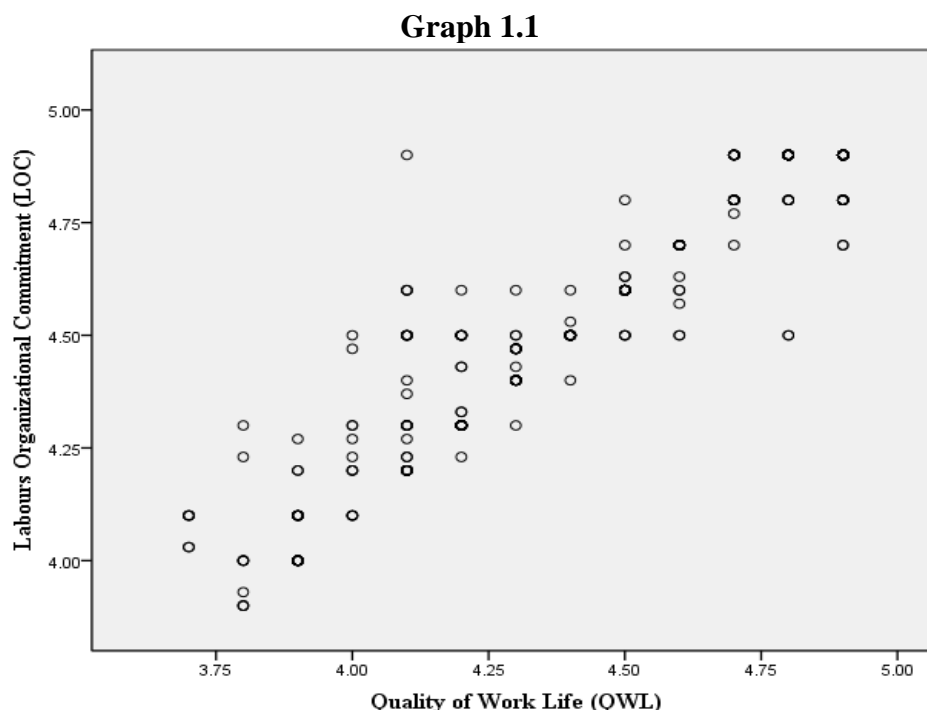
	Sig. (2-tailed)	.000	
	N	390	390

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

(Source: Compiled by Researcher)

Table No. 1.3 depicts the Pearson's r states correlation between the Quality of Work Life (QWL) and Labours Organizational Commitment (LOC) which is 0.948. The Pearson's r is 0.948 and this value is very much close to 1. However, it is revealed that there is a strong and positive relationship between Quality of Work Life (QWL) and Labours Organizational Commitment (LOC).

The Sig. (2-Tailed) value is 0.000. Thus 'P' value is 0.000 and this is less than 0.05 hence, null hypothesis is rejected and the alternative hypothesis i.e. there is significant relationship between Quality of Work Life (QWL) and Labours Organizational Commitment (LOC) is accepted.



The above graph states trend line slopes upward from zero therefore; positive correlation between **Quality of Work Life (QWL)** and **Labours Organizational Commitment (LOC)**. Increases in first variable are correlated with increases in second variable. Also decreases in first variable are correlated with decreases in second variable.

Conclusion:

As the industrial sector becomes more essential to the economies of developed countries, organisations claim that their most precious asset is their personnel. Employees are more likely to report higher levels of performance and dedication if they believe a company provides them with high-quality work in exchange for their participation. Employees' sense of commitment will

improve if they have strong relationships and are cohesive in the company. QWL and OC are multidimensional constructs that are the result of a workplace examination. Employee commitment enables superior performance as well as greater attraction and retention of the best personnel, boosting the organization's ability to provide higher-quality services. Workplace satisfaction and organisational

commitment are linked. Workplace satisfaction has been found to have a major impact on organisational commitment. This suggests that employees who have a good quality of life at work are more devoted and have great commitment towards organization in all dimensions with their employers than those who have a bad quality of life at work.

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A STUDY OF FINANCIAL PERFORMANCE INDICATORS FOR ENGINEERING INDUSTRY: A REVIEW

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ABSTRACT

The Current paper focuses on the study (review) of the nature of engineering industry and the financial indicators that can examine and evaluate the financial performance of the engineering companies. The main focus is on the study of financial tools and techniques that will be suitable for understanding the financial performance of Engineering Industry. The Researcher has made an attempt to understand the scope and nature of the engineering units and thereafter studied the analytical tools to be used for assessing the financial efficiency, profitability, solvency and financial position of the engineering units. The researcher has reviewed previously published work of financial performance analysis of companies belonging to other industries. The researcher concludes that Comparative statements, common size statement analysis, ratio analysis and trend analysis are more suitable for measuring the financial performance of selected engineering industrial units.

Keywords: Engineering Industry, Financial Performance, Financial Tools, Financial Techniques, Financial Indicators.

Introduction

The Evolution of Industry in India is very ancient. Indian artisans and craftsmen have been engaging themselves in manufacturing many products using small tools and manual skills. Weaving and handicrafts were the basic occupation along with agriculture in Indian villages. Slowly Cotton Textile industry started growing in India. Till the Industrial Revolution took place in Europe, Steel Industry, Silk Industry, Carving, Pottery, Metal works, Dyeing and Printing Industries developed in India. After the Industrial Revolution mechanization and modern factories started developing in India. The first large scale Iron industry (using Charcoal as fuel) was set up in the year 1830 in Tamilnadu. However it shut down by 1866. Therefore the large scale mechanized Cotton Textile industry set up in Mumbai in 1854 can be considered the first big factory in India. East India Company developed Jute, woolen, paper, breweries, war equipment Industries. The demand for cotton, jute, paper, cement, metals, sugar, explosives and arms and ammunitions rose during the Ist and IInd

World War which further gave impetus to the development of the Industries in India. In 1941 chemical, aircraft, metal fabrications industries were set up. Since 1941 many engineering industries to manufacture tools and machinery required for other industries were set up in India. During the first five year plan (1951-1956) the focus was on increasing the capacity of existing industries. New Industry policy framed during the second five year plan (1956-1961) gave emphasize on development of basic and heavy industries. In the third five year plan the need for improving and developing the basic industries arouse. Since then the Heavy and Basic Engineering Industries have been constantly developing, producing industrial tools, machinery, defense equipment, railway engines, electrical machinery, capital goods etc. In 1991 various industrial reforms like, liberalization, privatization, foreign direct investments further strengthened and developed the engineering industries in India. Currently steps are taken to create India as a global manufacturing hub. Many incentives to attract manufacturers from

other Countries under Make In India campaign have been announced.

Engineering Industries will play a major role in manufacturing Machines, Tools, Designs, Formulas, Electric Equipment, and Power saving devices required for the production of various goods by different manufacturing industries. The demand for engineering industries will keep growing due to rising demand of power, mining, oil and gas, refinery, automotive, construction equipment etc.

Engineering Industry can be considered as the largest industry in India, mainly because of its diversification. Engineering Industry in India is basically divided into two segments: Heavy and Light Engineering.

Table1: Segments of Heavy Engineering Companies

Heavy Engineering Companies		
Automotive	Heavy Electrical	Heavy Engineering and Machine Tools
Passenger Vehicles	Boilers	Machine Tools.
Auto Components	Turbines	Textile Machinery.
Agriculture Machinery	Transformers	Cement Machinery.
Tractors.	Switchgear	Material handling equipment.
Utility Vehicles	Control gear	Plastic processing machinery.
	Power transmission	Dies, moulds and tools industry
	Power distribution.	Process plant equipment.
		Transport equipment.
		Capital goods.
		Earth moving construction equipments
		Earth moving mining equipments.

Source: Secondary Data Report of IBEF

Table2: Classification of Light Engineering Companies

Light Engineering Companies	
Low Technology products	High Technology Products
Casting	Surgical Equipment.
Forging.	Medical Equipment.
Industrial Fasteners.	Sophisticated microprocessor based equipment.

Source: Secondary Data Report of IBEF

Diversified growth and development of engineering industry is quite visible from the above classification. The current paper is focusing to study the financial indicators required to study the financial performance of fast growing engineering industry.

Literature Review

Subramanyan K R (2014) in his book, "Financial Statement Analysis", has divided the book into three main areas: Financial Analysis, Accounting Analysis and Analysis Overview. First two chapters cover the overview of role of financial statements in equity analysis, credit analysis and business statement analysis. Next four chapters cover the procedure and clues for the analysis and adjustment of financial statements slit into financing, investing and operating activities. The last five chapters discuss the tools, methods, procedures and techniques to be used for financial analysis by various users for different objectives.

Singla (2013) in the research paper has made a comparative study of financial performance between two steel manufacturing companies. He concluded that the financial performance of Tata Steel Ltd was better than Steel authority of India Ltd.

Vanitha S & Selvam M (2011) examined the financial performance of companies restructured through takeovers and amalgamations. The concluded that the financial performance of the companies which were taken over by the companies which had better management, the financial performance of those companies also improved after the restructuring and takeovers.

Martin S Fridson and Fernando Alvarez (2011) in their book titled, "Financial Statement Analysis: A Practitioner's Guide", have explained the components of financial statements and the implication of such components to assess the financial performance. Credit analysis, equity analysis and forecasting of financial performance through the historical financial data has been discussed in few chapters. The authors have also explained the assessment of companies having mergers and acquisitions in addition to the

reliability on disclosures and audited reports of financial statements.

Charles Gibson (2009) in his book, "Financial Report & Analysis" 11th edition has covered the financial reporting statements and the basis of analysis. The book has covered the financial statement analysis procedure to be followed for the financial reports prepared by some special industries like banks, insurance, oil and gas, real estate, transportation, government, nonprofit entities.

Sury M M (2008) in his book, "India's Five year plans" has covered the process and procedure of economic planning in India. The book mainly focuses on the planning and transfer of resources for development of various sectors for all round growth and development of the Nation. It covers the Strategy, priority, and allocation of resources for the development of industries and sectors in each five year plan.

Narasimha Chary S (2007) in his book, "Industrial Development in India" has explained the pre Independence and Post-Independence gradual growth and development of various sectors and industries in India.

Many studies have been conducted on evaluating the financial performance of companies from various sectors having mergers, acquisitions, amalgamations, take overs etc. Researcher therefore makes an attempt to review the financial tools and techniques to review randomly selected two engineering companies.

Objectives of Research

1. To review financial tools and techniques those can be used for evaluating the overall financial progress of engineering industry.
2. To study the financial analysis tools to be used to assess the profitability of engineering firms.

3. To study the Financial analysis tools to be used to find the financial position of the engineering firms.

Source of Data

Financial Statements:

These are summarized financial reports of an organizations transactions and business taken place in a stipulated period of time. They may be annual, quarterly or half yearly statements. These are prepared to provide valuable information to the investors, suppliers, creditors, Government and Regulatory Departments, and any other user. These include:

1. Earning Statement or Income Statement or Profit & Loss Account Uses:

I. To find the earnings of the organization for the stipulated period of time.

II. To decide on how much of the profits can be withdrawn or distributed to owners.

III. To decide how much of the net profits can be retained in the organization.

IV. To calculate the income tax liability.

V. To make investment decisions.

2. Balance Sheet Uses:

I. To find the financial position and financial status of the organization as on a specific date.

II. Assess the net worth of the organization on a specific date.

III. Compare total assets with total liabilities.

IV. Compare current assets with current liabilities.

V. Compare owned capital and borrowed debts

VI. To identify the composition of various assets and liabilities.

3. Cash Flow Statement Uses:

I. Evaluate the cash position of the firm.

II. Project future cash flows.

III. Compare historical and projected cash flows.

IV. Assess short term liquidity of the firm.

V. Helps in planning repayment of debts and borrowings.

VI. Facilitate in purchase of fixed assets in future.

VII. Find the proportion of net cash flows from operating, investing and financial activities in the accounting period.

4. Fund Flow statement Uses:

I. Identify sources of funds and application of funds in the reporting period.

II. Calculate cost of capital from the sources of funds.

III. Suggests ways to improve working capital position of the company.

IV. Helps management to formulate and modify financial policy.

V. Asses the credit worthiness of the business unit.

VI. Decide future long term investment decisions.

Financial statements reveal and disclose the summary of transactions for the specific period of time, but to have a thorough financial performance these statements need to be further analyzed. Further analysis can be done by the following tools and techniques.

Tools and Techniques of Financial Analysis

1. Common Size Statements

I. These are used to build commonness in terms of structure and size of different companies.

II. The data in the financial statement is converted into percentage to facilitate comparison of different accounting periods and other firms with different size and structure.

III. Common size balance sheet discloses each asset and liability as a percentage of the total asset or liability.

IV. Common size Income statement shows every expense as a percentage of sales turnovers.

V. Common size cash flow statements show every cash inflow or outflow as a percentage of the total cash.

2. Comparative statements:

I. These statements can be used for inter and intra firm comparison.

II. Comparative balance sheet is used to compare each asset and liability increase or decrease in absolute value and in percentage.

III. They form the basis for trend analysis.

IV. Comparative income statement gives the increase or decrease in every expense and income in absolute value and in percentage.

V. Helps in measuring financial performance for different accounting periods.

VI. Locate any sizeable change in any item in different accounting periods.

3. Trend Analysis:

I. It is a tool used to forecast future financial performance based on the historical financial data..

II. Can be expressed graphically to enhance the impact of financial performance for a longer period of time.

III. Facilitates in making future decisions.

IV. Helps in making future inference based on the previous data.

V. Facilitates in measuring solvency and liquidity positions.

VI. Facilitates in measuring profitability positions.

VII. Useful to compare many components simultaneously.

4. Ratio Analysis:

These are quantitative relations between two financial items giving a comparative relationship.

4.1 Profitability ratios:

I. Gross Profit Ratios: Measures the absolute profitability of production or purchase.

II. Net Profit Ratios: Measures the profitability after deducting all expenses and taxes.

III. Operating Profit Ratio: Measures the profitability out of core business activities excluding financial cost and

taxes. It measures the operating margin of profit and operating efficiency of the firm.

IV. Return on Capital Employed: Measures the proportion of profit on total capital employed.

V. Return on Assets: Measures the profit margin in proportion to the total assets employed.

a) Return on Net worth: Measures the profit margin in proportion to the capital belonging to the owners.

b) Earnings Per Share: Measures the share of net profits belonging to one equity share.

4.2 Solvency Ratios:

I. Debt Equity Ratio: Measures the proportion of total borrowed funds to the owned funds.

II. Equity Ratio: Measures the proportion of total assets belonging to the owners.

III. Debt Ratio: Measures the proportion of total liabilities to the total assets.

IV. Solvency Ratio: Measures the ability of the firm to pay back its short term and long term liabilities

4.3 Liquidity Ratios:

I. Current Ratio: Measures a company's ability to pay the short term liability.

II. Quick Ratio: Measures the company's ability to pay the short term liability with most liquid assets.

III. Cash Ratio: Measures the company's cash proportion to the short term liability.

IV. Inventory Turnover Ratios: Measures the efficiency of the company to liquidate the inventory.

V. Interest Coverage Ratio: Measures the efficiency of the company to pay interest on the borrowed funds.

4.4 Efficiency Ratios:

I. Sales to Total Assets Ratio: Measures overall investment efficiency.

II. Sales to Fixed Assets: Measures efficiency of long term investments.

III. Sales to Current Assets Ratio: Measures efficiency of short term investments.

4.5 Valuation Ratios:

I. Price Earnings Ratio: Measures the demand value of a company's share to its profitability.

II. Price to Book value Ratio: Measures the demand value of a company's share to its Net worth value.

III. Price to Sales Ratio: Measures the demand value of a company's share to its sales turnover.

Data Analysis and Interpretation

Though there are many tools which are used for analysis of financial performance of companies, for the current study intercompany comparative statements and common size statement tool have been used. Two engineering companies which are situated in Pune and Listed on National Stock Exchange are randomly selected for the current study.

Table3: Common Size Income statement of Thermax Ltd for the Period 2015-2019 (See Appendix)

Financial performance of Thermax Ltd for the Accounting Period 2015 to 2019

1. The average operating profit margin for the period 2015 to 2019 is around 9%.
2. The average Profit before tax for the accounting period 2015 to 2019 is around 9%.
3. The average profit after tax for the accounting period 2015 to 2019 is around 6%

Table4: Common Size Income Statement of Thermax Ltd for the Period 2010-2014 (See Appendix)

Financial performance of Thermax Ltd for the Accounting Period 2010 to 2014

1. The average operating profit margin for the accounting period 2010 to 2014 is around 10%.

2. The average Profit before tax for the accounting period 2010 to 2014 is around 11%.
3. The average profit after tax for the accounting period 2010 to 2014 is around 7%

Table5: Common Size Income Statement of Cummins Ltd for the period 2015-2019 (See Appendix)

Financial performance of Cummins Ltd for the Accounting Period 2015 to 2019

1. The average operating profit margin for the accounting period 2015 to 2019 is around 15%.
2. The average Profit before tax for the accounting period 2015 to 2019 is around 18%.
3. The average profit after tax for the accounting period 2015 to 2019 is around 14%

Table 6: Common Size Income Statement of Cummins Ltd for the Period 2010-2014 (See Appendix)

Financial Performance of Cummins Ltd for the Accounting Period 2010 to 2014

1. The average operating profit margin for the accounting period 2010 to 2014 is around 17%.
2. The average Profit before tax for the accounting period 2010 to 2014 is around 20%.
3. The average profit after tax for the accounting period 2010 to 2014 is around 15%

Table7: Comparison of Common Size Income Statement of Engineering Companies 2010-2019 (See Appendix)

Comparative Financial performance of Thermax Ltd and Cummins Ltd for the Accounting Period 2010 to 2019

1. The average operating profit margin of Thermax Ltd from 2010 to 2019 is around 9.5% , whereas, the operating profit margin of Cummins Ltd from 2010 to 2019 is around 16%

2. The average net profit before tax of Thermax Ltd from 2010 to 2019 is around 10% , whereas, the net profit before tax of Cummins Ltd from 2010 to 2019 is around 19%
3. The average net profit after tax of Thermax Ltd from 2010 to 2019 is around 6% , whereas, the net profit after tax of Cummins Ltd from 2010 to 2019 is around 15%

Table 8: Shows the common size Balance Sheet of Thermax Ltd for the period 2015-2019 (See Appendix)

Financial Performance of Thermax Ltd for the Accounting Period 2015 to 2019

1. The average current assets are around 68% and current liabilities 50% for the accounting period 2015 to 2019
2. The average Long term debts are around 1% whereas shareholders' funds are around 48% for the accounting period 2015 to 2019.

Table 9: Shows the common size Balance Sheet of Thermax Ltd for the period 2010-2014 (See Appendix)

Financial performance of Thermax Ltd for the Accounting Period 2010 to 2014

1. The average current assets are around 72% and current liabilities 59% for the accounting period 2015 to 2019
2. The average Long term debts are around 2% whereas shareholders' funds are around 39% for the accounting period 2015 to 2019

Table10: Shows the common size Balance Sheet of Cummins Ltd for the period 2015-2019 (See Appendix)

Financial Performance of Cummins Ltd for the Accounting period 2015 to 2019

1. The average current assets are around 55% and current liabilities 25% for the accounting period 2015 to 2019
2. The average Long term debts are around 3% whereas shareholders' funds are around 72% for the accounting period 2015 to 2019.

Table11: Shows the common size Balance Sheet of Cummins Ltd for the period 2010-2014 (See Appendix)

Financial performance of Cummins Ltd for the accounting period 2015 to 2019

1. The average current assets are around 64% and current liabilities 31% for the accounting period 2015 to 2019
2. The average Long term debts are around 4% whereas shareholders' funds are around 65% for the accounting period 2015 to 2019.

Table 12: Comparison of Common Size Balance Sheets of Engineering Companies 2010-2019(See Appendix)

Comparative Financial performance of Thermax Ltd and Cummins Ltd for the Accounting Period 2010 to 2019

1. The average Long term debts of Thermax Ltd are around 1% and shareholders' funds are around 43%, whereas the average long term debts of Cummins Ltd are around 3% and shareholders' funds are around 69%, for the accounting period 2010 to 2019.
2. The average current assets of Thermax Ltd are 70% and current liabilities are 55%, whereas the currents assets of Cummins Ltd are 60% and current

liabilities are 28% for the accounting period 2010 to 2019.

Suggestions

Engineering companies can be considered for investment by prospective investors as the financial performance indicates strong financial position and profitability. Shareholders' funds are higher than the borrowed debts by the engineering companies and hence the finance cost is very low. Other Companies may be suggested to follow profit retention policy to improve profitability and reduce finance cost.

Conclusion

Operating profits, net profits before tax and profits after tax of both the engineering companies are indicating good financial performance of engineering industry. The average operating profit margins are around 17% among the engineering companies. The average net profits after tax are around 10%, among the engineering companies. The composition of external debts and the owner's funds indicate a favorable financial position. The composition of current assets and current liabilities are also favorable among the engineering companies.

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Appendix

Table 3: Common Size Income statement of Thermax Ltd for the Period 2015-2019

Particulars / Year	Mar 19	Mar-18	Mar-17	Mar-16	Mar-15	Average
Total Revenue	3,663.90	3,971.85	3,866.30	4,461.63	4,808.22	4,154.38
Other Income	122.80	103.98	102.65	109.85	110.81	110.02
Total Operating Revenues	3,541.10	3,867.87	3,763.65	4,351.78	4,697.41	4,044.36
Total Operating Expenses	3290.38	3496.5	3389.86	3963.21	4227.37	3,673.46
% of Operating Expenses	89.81	88.03	87.68	88.83	87.92	88.45
Operating Profit	250.72	371.37	373.79	388.57	470.04	370.90
% of operating profit	6.84	9.35	9.67	8.71	9.78	8.87
Finance Costs	5.26	8.04	3.59	0.61	19.69	7.44
% of finance cost	0.14	0.20	0.09	0.01	0.41	0.17
Depreciation	50.13	64.2	65.43	60.9	64.12	60.96
% of Depreciation	1.37	1.62	1.69	1.36	1.33	1.48
Other exceptional items	-47.85	-25	-132.84	0	0	-41.14
Profit before tax	270.28	378.11	274.58	436.91	497.04	371.38
% of profit before tax	7.38	9.52	7.10	9.79	10.34	8.83
Total Tax Expenses	109.26	139.86	129.75	131.39	161.1	134.27
% of tax expenses	2.98	3.52	3.36	2.94	3.35	3.23
Profit after tax	161.02	238.25	144.83	305.52	335.94	237.11
% of profit after tax	4.39	6.00	3.75	6.85	6.99	5.59

Source: Secondary Data Annual reports of Thermax Ltd

Table 4: Common Size Income Statement of Thermax Ltd for the Period 2010-2014

Particulars / Year	Mar 14	Mar-13	Mar-12	Mar-11	Mar-10	Average
Total Revenue	4,366.46	4,763.88	5,374.55	4,935.49	3,193.07	4,526.69
Other Income	64.3	73.01	70.49	83.13	131.04	84.39
Total Operating Revenue	4,302.16	4,690.87	5,304.06	4,852.36	3,062.03	4,442.30
Total Operating expenses	3892.95	4183.74	4720.15	4317.28	2759.19	3,974.66
% of Operating Expenses	89.16	87.82	87.82	87.47	86.41	87.74
Operating Profit	409.21	507.13	583.91	535.08	302.84	467.63
% of operating profit	9.37	10.65	10.86	10.84	9.48	10.24
Finance Costs	8.85	9.65	6.55	2.18	1.52	5.75
% of finance cost	0.20	0.20	0.12	0.04	0.05	0.12
Depreciation	57.77	54.86	46.95	43.33	40.42	48.67
% of Depreciation	1.32	1.15	0.87	0.88	1.27	1.10
Other exceptional items	0	0	0	0	0	0.00
Profit before tax	406.89	515.63	600.90	572.70	391.94	497.61
% of profit before tax	9.32	10.82	11.18	11.60	12.27	11.04
Total Tax Expenses	153.92	165.67	194.04	190.28	135.64	167.91
% of tax expenses	3.53	3.48	3.61	3.86	4.25	3.74
Profit after tax	252.97	349.96	406.86	382.42	256.3	329.70
% of profit after tax	5.79	7.35	7.57	7.75	8.03	7.30

Source: Secondary Data Annual reports of Thermax Ltd

Table 5: Common Size Income Statement of Cummins Ltd for the period 2015-2019

Particulars / Year	Mar 19	Mar-18	Mar-17	Mar-16	Mar-15	Average
Total Revenue	5,951.77	5,310.97	5,285.32	4,934.68	4,692.38	5,235.02
Other Income	292.77	228.47	207.98	225.86	286.58	248.33
Total Operating Revenues	5,659.00	5,082.50	5,077.34	4,708.82	4,405.80	4,986.69
Total Operating Expenses	4,794.90	4,350.05	4,275.52	3,933.71	3,670.75	4,204.99
% of Operating Expenses	80.56	81.91	80.89	79.72	78.23	80.26
Operating Profit	864.10	732.45	801.82	775.11	735.05	781.71
% of operating profit	14.52	13.79	15.17	15.71	15.66	14.97
Finance Costs	16.2	14.83	16.78	9.58	4.52	12.38
% of finance cost	0.27	0.28	0.32	0.19	0.10	0.23
Depreciation	110.32	93.79	84.78	81.01	79.72	89.92
% of Depreciation	1.85	1.77	1.60	1.64	1.70	1.71
Other exceptional items	0	56.12	0	0	0	11.22
Profit before tax	1,030.35	908.42	908.24	910.38	937.39	938.96
% of profit before tax	17.31	17.10	17.18	18.45	19.98	18.01
Total Tax Expenses	307.78	199.95	173.61	156.08	151.54	197.79
% of tax expenses	5.17	3.76	3.28	3.16	3.23	3.72
Profit after tax	722.57	708.47	734.63	754.30	785.85	741.16
% of profit after tax	12.14	13.34	13.90	15.29	16.75	14.28

Source: Secondary Data Annual reports of Cummins Ltd

Table 6: Common Size Income Statement of Cummins Ltd for the Period 2010-2014

Particulars / Year	Mar 14	Mar-13	Mar-12	Mar-11	Mar-10	Average
Total Revenue	4,154.38	4,796.10	4,240.55	4,122.90	2,966.07	4,056.00
Other Income	177.71	206.72	123.33	80.37	115.15	140.66
Total Operating Revenue	3,976.67	4,589.38	4,117.22	4,042.53	2,850.92	3,915.34
Total Operating expenses	3,279.94	3,754.5	3,419.97	3,279.14	2,317.02	3,210.11
% of Operating Expenses	78.95	78.28	80.65	79.53	78.12	79.11
Operating Profit	696.73	834.88	697.25	763.39	533.90	705.23
% of operating profit	16.77	17.41	16.44	18.52	18.00	17.43
Finance Costs	4.18	4.61	5.41	4.75	2.05	4.20
% of finance cost	0.10	0.10	0.13	0.12	0.07	0.10
Depreciation	52.75	47.25	41.98	36.64	36.08	42.94
% of Depreciation	1.27	0.99	0.99	0.89	1.22	1.07
Other exceptional items	0	61.59	51.44	0	0	22.61
Profit before tax	817.51	1,051.33	824.63	802.37	610.92	821.35
% of profit before tax	19.68	21.92	19.45	19.46	20.60	20.22
Total Tax Expenses	217.49	287.22	233.36	211.38	160.5	221.99
% of tax expenses	5.24	5.99	5.50	5.13	5.41	5.45
Profit after tax	600.02	764.11	591.27	590.99	450.42	599.36
% of profit after tax	14.44	15.93	13.94	14.33	15.19	14.77

Source: Secondary Data Annual reports of Cummins Ltd

Table7: Comparison of Common Size Income Statement of Engineering Companies 2010-2019

Engineering Company	Thermax Ltd			Cummins Ltd		
Year	2015-19	2010-14	2010-19	2015-19	2010-14	2010-19
Particulars	Average	Average	Average	Average	Average	Average
Total Revenue	4,154.38	4,526.69	4,340.54	5,235.02	4,056.00	4,645.51
Other Income	110.02	84.39	97.21	248.33	140.66	194.49
Total Operating Revenue	4,044.36	4,442.30	4,243.33	4,986.69	3,915.34	4,451.02
Total Operating expenses	3,673.46	3,974.66	3,824.06	4,204.99	3,210.11	3,707.55
% of Operating Expenses	88.45	87.74	88.10	80.26	79.11	79.68
Operating Profit	370.90	467.63	419.27	781.71	705.23	743.47
% of operating profit	8.87	10.24	9.56	14.97	17.43	16.20
Finance Costs	7.44	5.75	6.59	12.38	4.20	8.29
% of finance cost	0.17	0.12	0.15	0.23	0.10	0.17
Depreciation	60.96	48.67	54.81	89.92	42.94	66.43
% of Depreciation	1.48	1.10	1.29	1.71	1.07	1.39
Other exceptional items	-41.14	0.00	-20.57	11.22	22.61	16.92
Profit before tax	371.38	497.61	434.50	938.96	821.35	880.15
% of profit before tax	8.83	11.04	9.93	18.01	20.22	19.11
Total Tax Expenses	134.27	167.91	151.09	197.79	221.99	209.89
% of tax expenses	3.23	3.74	3.49	3.72	5.45	4.59
Profit after tax	237.11	329.70	283.41	741.16	599.36	670.26
% of profit after tax	5.59	7.30	6.45	14.28	14.77	14.53

Source: Secondary Data Annual reports of Cummins Ltd

Table 8: Shows the common size Balance Sheet of Thermax Ltd for the period 2015-2019

Liabilities / year	Mar 19	Mar-18	Mar-17	Mar-16	Mar-15	Average
Equity Share Capital	23.83	23.83	23.83	23.83	23.83	23.83
% of Equity Shares to Total Assets	0.39	0.44	0.52	0.48	0.49	0.46
Reserves and Surplus	2,712.02	2,541.73	2,385.93	2,463.29	2,242.99	2,469.19
% of Reserves to Total Assets	44.18	47.29	51.92	49.67	46.22	47.86
Total Shareholders Funds	2,735.85	2,565.56	2,409.76	2,487.12	2,266.82	2,493.02
% of shareholders funds to Total Assets	44.57	47.73	52.44	50.15	46.71	48.32
Total Non-Current Liabilities	58.6	70.26	69.21	66.14	46.88	62.22
% of fixed liabilities to Total Assets	0.95	1.31	1.51	1.33	0.97	1.21
Total Current Liabilities	3,344.40	2,739.31	2,116.63	2,405.89	2,538.94	2,629.03
% of Current Liabilities to Total Assets	54.48	50.96	46.06	48.51	52.32	50.47
Total Capital And Liabilities	6,138.85	5,375.13	4,595.60	4,959.15	4,852.64	5,184.27
Assets / year	Mar 19	Mar-18	Mar-17	Mar-16	Mar-15	Average
Fixed Assets	742.05	763.81	683.74	644.52	648.48	696.52
% of Fixed Assets to Total Assets	12.09	14.21	14.88	13.00	13.36	13.51
Non-Current Investments	767.48	639.29	639.73	667.18	474.19	637.57
% of Non Current Investments to Total Assets	12.50	11.89	13.92	13.45	9.77	12.31
Other Non-Current Assets	1,044.35	1,164.41	1,095.64	980.22	886.68	1,034.26
% of Other Non-Current Assets to Total Assets	17.01	21.66	23.84	19.77	18.27	20.11
Total Non-Current Assets	1,811.83	1,803.70	1,735.37	1,647.40	1,360.87	1,671.83
% of Total Non-Current Assets to Total Assets	29.51	33.56	37.76	33.22	28.04	32.42
Total Current Assets	4,327.02	3,571.43	2,860.23	3,311.75	3,491.77	3,512.44
% of Total Current Assets to Total Assets	70.49	66.44	62.24	66.78	71.96	67.58
Total Assets	6,138.85	5,375.13	4,595.60	4,959.15	4,852.64	5,184.27

Source: Secondary Data Annual reports of Thermax Ltd

Table 9: Shows the common size Balance Sheet of Thermax Ltd for the period 2010-2014

Liabilities / year	Mar 14	Mar-13	Mar-12	Mar-11	Mar-10	Average
Equity Share Capital	23.83	23.83	23.83	23.83	23.83	23.83
% of Equity Shares to Total Assets	0.49	0.58	0.60	0.66	0.76	0.62
Reserves and Surplus	2,001.16	1,845.44	1,577.35	1,268.51	1,026.96	1,543.88
% of Reserves to Total Assets	41.23	44.97	39.73	34.94	32.72	38.72
Total Shareholders Funds	2,024.99	1,869.27	1,601.18	1,292.34	1,050.79	1,567.71
% of shareholders funds to Total Assets	41.72	45.55	40.33	35.60	33.48	39.34
Total Non-Current Liabilities	173.56	67.04	45.02	31.28	43.63	72.11
% of fixed liabilities to Total Assets	3.58	1.63	1.13	0.86	1.39	1.72
Total Current Liabilities	2,655.30	2,167.83	2,323.53	2,306.90	2,044.24	2,299.56
% of Current Liabilities to Total Assets	54.71	52.82	58.53	63.54	65.13	58.95
Total Capital And Liabilities	4,853.85	4,104.14	3,969.73	3,630.52	3,138.66	3,939.38
Assets / year	Mar 14	Mar-13	Mar-12	Mar-11	Mar-10	Average
Fixed Assets	663.92	645.51	573.59	516.34	507.69	581.41
% of Fixed Assets to Total Assets	13.68	15.73	14.45	14.22	16.18	14.85
Non-Current Investments	462.08	393.69	350.97	260.91	378.16	369.16
% of Non Current Investments to Total Assets	9.52	9.59	8.84	7.19	12.05	9.44
Other Non-Current Assets	857.94	869.98	705.74	711.75	534.11	735.90
% of Other Non-Current Assets to Total Assets	17.68	21.20	17.78	19.60	17.02	18.65
Total Non-Current Assets	1,320.02	1,263.67	1,056.71	972.66	912.27	1,105.07
% of Total Non-Current Assets to Total Assets	27.20	30.79	26.62	26.79	29.07	28.09
Total Current Assets	3,533.83	2,840.47	2,913.02	2,657.86	2,226.39	2,834.31
% of Total Current Assets to Total Assets	72.80	69.21	73.38	73.21	70.93	71.91
Total Assets	4,853.85	4,104.14	3,969.73	3,630.52	3,138.66	3,939.38

Source: Secondary Data Annual reports of Thermax Ltd

Table 10: Shows the common size Balance Sheet of Cummins Ltd for the period 2015-2019

Liabilities / year	Mar 19	Mar-18	Mar-17	Mar-16	Mar-15	Average
Equity Share Capital	55.44	55.44	55.44	55.44	55.44	55.44
% of Equity Shares to Total Assets	0.95	1.00	1.10	1.23	1.28	1.11
Reserves and Surplus	4,075.01	3,930.63	3,686.73	3,425.86	2,831.08	3,589.86
% of Reserves to Total Assets	69.62	71.06	73.14	76.29	65.51	71.12
Total Shareholders Funds	4,130.45	3,986.07	3,742.17	3,481.30	2,886.52	3,645.30
% of shareholders funds to Total Assets	70.56	72.06	74.24	77.53	66.79	72.24
Total Non-Current Liabilities	200.26	103.31	91.12	114.86	207.89	143.49
% of fixed liabilities to Total Assets	3.42	1.87	1.81	2.56	4.81	2.89
Total Current Liabilities	1,522.86	1,441.85	1,207.59	894.31	1,227.33	1,258.79
% of Current Liabilities to Total Assets	26.02	26.07	23.96	19.92	28.40	24.87
Total Capital And Liabilities	5,853.57	5,531.23	5,040.88	4,490.47	4,321.74	5,047.58
Assets / year	Mar 19	Mar-18	Mar-17	Mar-16	Mar-15	Average
Fixed Assets	2,171.28	2,057.20	1,963.24	1,808.60	1,404.57	1,880.98
% of Fixed Assets to Total Assets	37.09	37.19	38.95	40.28	32.50	37.20
Non-Current Investments	42.57	42.68	44.16	49.48	45.72	44.92
% of Non Current Investments to Total Assets	0.73	0.77	0.88	1.10	1.06	0.91
Other Non-Current Assets	2,402.90	2,279.05	2,325.42	2,165.25	1,867.93	2,208.11
% of Other Non-Current Assets to Total Assets	41.05	41.20	46.13	48.22	43.22	43.97
Total Non-Current Assets	2,445.47	2,321.73	2,369.58	2,214.73	1,913.65	2,253.03
% of Total Non-Current Assets to Total Assets	41.78	41.97	47.01	49.32	44.28	44.87
Total Current Assets	3,408.10	3,209.50	2,671.30	2,238.17	2,408.09	2,787.03
% of Total Current Assets to Total Assets	58.22	58.03	52.99	49.84	55.72	54.96
Total Assets	5,853.57	5,531.23	5,040.88	4,490.47	4,321.74	5,047.58

Source: Secondary Data Annual reports of Cummins Ltd

Table 11: Shows the common size Balance Sheet of Cummins Ltd for the period 2010-2014

Liabilities / year	Mar 14	Mar-13	Mar-12	Mar-11	Mar-10	Average
Equity Share Capital	55.44	55.44	55.44	39.6	39.6	49.10
% of Equity Shares to Total Assets	1.47	1.51	1.79	1.38	1.66	1.56
Reserves and Surplus	2,509.71	2,331.29	1,987.71	1,766.67	1,521.40	2,023.36
% of Reserves to Total Assets	66.52	63.53	64.08	61.65	63.82	63.92
Total Shareholders Funds	2,565.15	2,386.73	2,043.15	1,806.27	1,561.00	2,072.46
% of shareholders funds to Total Assets	67.99	65.04	65.87	63.03	65.48	65.48
Total Non-Current Liabilities	183.79	177.17	113.4	120.27	32.97	125.52
% of fixed liabilities to Total Assets	4.87	4.83	3.66	4.20	1.38	3.79
Total Current Liabilities	1,023.79	1,105.72	945.14	939.12	789.82	960.72
% of Current Liabilities to Total Assets	27.14	30.13	30.47	32.77	33.13	30.73
Total Capital And Liabilities	3,772.73	3,669.62	3,101.69	2,865.66	2,383.78	3,158.70
Assets / year	Mar 14	Mar-13	Mar-12	Mar-11	Mar-10	Average
Fixed Assets	1,014.91	614.22	514.58	421.04	333.66	579.68
% of Fixed Assets to Total Assets	26.90	16.74	16.59	14.69	14.00	17.78
Non-Current Investments	53.39	53.39	75.51	58.65	732.92	194.77
% of Non Current Investments to Total Assets	1.42	1.45	2.43	2.05	30.75	7.62
Other Non-Current Assets	1,702.86	1,086.85	864.47	629.65	383.60	933.49
% of Other Non-Current Assets to Total Assets	45.14	29.62	27.87	21.97	16.09	28.14
Total Non-Current Assets	1,756.25	1,140.24	939.98	688.3	1,116.52	1,128.26
% of Total Non-Current Assets to Total Assets	46.55	31.07	30.31	24.02	46.84	35.76
Total Current Assets	2,016.48	2,529.38	2,161.71	2,177.36	1,267.26	2,030.44
% of Total Current Assets to Total Assets	53.45	68.93	69.69	75.98	53.16	64.24
Total Assets	3,772.73	3,669.62	3,101.69	2,865.66	2,383.78	3,158.70

Source: Secondary Data Annual reports of Cummins Ltd

Table 12: Comparison of Common Size Balance Sheets of Engineering Companies 2010-2019

Engineering Company	Thermax Ltd			Cummins Ltd		
Particulars	Average	Average	Average	Average	Average	Average
Liabilities / year	2015-19	2010-14	2010-19	2015-19	2010-14	2010-19
Equity Share Capital	23.83	23.83	23.83	55.44	49.10	52.27
% of Equity Shares to Total Assets	0.46	0.62	0.54	1.11	1.56	1.34
Reserves and Surplus	2,469.19	1,543.88	2,006.54	3,589.86	2,023.36	2,806.61
% of Reserves to Total Assets	47.86	38.72	43.29	71.12	63.92	67.52
Total Shareholders Funds	2,493.02	1,567.71	2,030.37	3,645.30	2,072.46	2,858.88
% of shareholders funds to Total Assets	48.32	39.34	43.83	72.24	65.48	68.86
Total Non-Current Liabilities	62.22	72.11	67.16	143.49	125.52	134.50
% of fixed liabilities to Total Assets	1.21	1.72	1.47	2.89	3.79	3.34
Total Current Liabilities	2,629.03	2,299.56	2,464.30	1,258.79	960.72	1,109.75
% of Current Liabilities to Total Assets	50.47	58.95	54.71	24.87	30.73	27.80
Total Capital And Liabilities	5,184.27	3,939.38	4,561.83	5,047.58	3,158.70	4,103.14
Assets / year	Average	Average	Average	Average	Average	Average
Fixed Assets	696.52	581.41	638.97	1,880.98	579.68	1,230.33
% of Fixed Assets to Total Assets	13.51	14.85	14.18	37.20	17.78	27.49
Non-Current Investments	637.57	369.16	503.37	44.92	194.77	119.85
% of Non Current Investments to Total Assets	12.31	9.44	10.87	0.91	7.62	4.26
Other Non-Current Assets	1,034.26	735.90	885.08	2,208.11	933.49	1,570.80
% of Other Non-Current Assets to Total Assets	20.11	18.65	19.38	43.97	28.14	36.05
Total Non-Current Assets	1,671.83	1,105.07	1,388.45	2,253.03	1,128.26	1,690.65
% of Total Non-Current Assets to Total Assets	32.42	28.09	30.26	44.87	35.76	40.31
Total Current Assets	3,512.44	2,834.31	3,173.38	2,787.03	2,030.44	2,408.74
% of Total Current Assets to Total Assets	67.58	71.91	69.74	54.96	64.24	59.60
Total Assets	5,184.27	3,939.38	4,561.83	5,047.58	3,158.70	4,103.14

Source: Primary Data Annual Reports of Thermax Ltd and Cummins Ltd.

INDIAN SHOPPING MALLS – A BLEND OF RETAIL AND RECREATION

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ABSTRACT

Shopping malls in India existed for ages in different forms. Historically shopping activities happened in open-air markets along with public functions and festivals. What we see today is the modern form of shopping malls. The organized form of retail went through a plethora of changes to attain the stature that it has now. The era of mall culture in India slowly began in 2000 and gradually started multiplying in the metro cities. Shopping malls are large organized retail developments owned by the private sector. The modern shopping malls are an amalgamation of product, entertainment, and service, all under a single roof and it provides a range of variety to customers with an ideal shopping experience. India has acquired great heights in the retail sector and the credit of this to a great extent goes to the 'Mall Culture'.

The result of this research paper shows that shopping malls are not just shopping destinations. Shopping malls are a blend of shopping, relaxation, and recreation. Malls are the one-stop hub that serves as community centers for shopping, hanging out with family and friends, window shopping, movies, dining and entertainment, and recreational activities all under one roof and that too with an excellent ambiance and a wonderful experience.

Keywords: Shopping, blend, relaxation, recreation, experience, ambiance.

Introduction

Early 2000 saw a breakthrough in the organized retail sector as shopping malls slowly began to develop in India with just three malls in the entire country. India did not adopt the mall culture in earlier days because of conservative shopping habits. Hence, in the beginning, the mall phase in India took baby steps but gradually it picked speed and developed into a culture. Modern society started to incline to shop in a vibrant, hygiene, comfortable, climate-controlled, and highly-enabled malls rather than in the usual 'Kirana shops and scattered individual stores. India offers an immense market opportunity because of increased income and the changed lifestyle of middle-class families. The growth started with 3 malls in 2001, this number grew to 343 by 2007. India had a total of 570 operational malls by the end of 2013 and presently there are almost 750 plus operational malls in India. The modern mall culture is an amalgamation of product, entertainment, and service, all under a single roof and it provides a range of variety to customers with an ideal shopping experience. India has acquired great heights

in the retail sector and the credit of this to a great extent goes to the 'Mall Culture'.

Literature review

- The dissertation entitled 'Mall Mania in India – Changing Consumer Shopping Habits' by Kanika Taneja, aimed at understanding the changing shopping pattern of consumers of the Indian society. It analyzed the various factors on which the choice shopping mall or unorganized markets of Indian consumers depended.
- Research article entitled 'Why Do People Choose the Shopping Malls? The Attraction Theory Revisited' by Maria D. De-Juan-Vigara, examined consumers' behavior towards a particular shopping mall to satisfy their retail needs and also attempted to analyze which factors in shopping malls influenced or attracted consumers.
- 'Customer Behaviour towards Shopping Malls – A Study in Bhavnagar (Gujarat State, India)' research paper by Dr. Archana Chanuvai Narahari & Dhiman Kuvad, this research was carried out in

Bhavnagar, Gujarat which investigated the buying behavior of shoppers in the shopping malls there.

- Research paper entitled '*Impact of Shopping Malls on Small Retail Outlets- A study in Kollam city, Kerala*' by Neethu M Mathews, this research study was done particularly in Kollam city. The main focus of this research study was to understand the effect of shopping malls on small retail stores.

Research Methodology

The methodology of this research paper is conceptual in nature. Secondary sources of information have been used by the researcher. These sources are new journal and newspaper published, publications of various organizations, institutes, news articles, online and offline reports, magazines and commercial journals, websites, and discussions regarding the research subject on various blogs.

Research objectives

1. To define analyze the concept of a shopping mall.
2. To understand the perception of people towards shopping malls.
3. To investigate the blending of various factors like retail and recreation in shoppings malls.

Scope of Study

This research paper defines and explains the concept of a shopping mall and clearly brings out the picture with regards to, what a shopping mall stands for as per the perception of the general public and in particular for the mall visitors. It is an in-depth study of the various elements or factors other than retail that are the real influencers in attracting foot traffic to a particular shopping mall. Further, this study will serve as a detailed understanding for the mall visitors to know the various entertainment and recreational activities that the shopping malls offer.

Concept of Shopping Mall

Originally 'Mall' is a North American term which means a large enclosed area for shopping with an advantage of no traffic. It can also be interpreted as a project of one or more huge buildings confined for shopping having a fusion of shops representing a group of traders having a common goal of canvassing sale and has an interconnected pathway that enables customers to easily walk between the stores.

A shopping Mall is a collection of shops under one roof serving towards an identical objective. It is a commercial establishment consisting of a carefully landscaped complex of shops, food court, multiplexes, fun zones, play areas, amusement parks, and a convenient parking area. A shopping mall is a modern version of the traditional marketplace.

Meaning of Shopping Mall

A Mall in its original meaning referred to the tracts for strolling. It is a human tendency to go strolling around either to relax or for a leisurely walk. Merchandisers acknowledged this habit of strollers by offering them enclosed air-conditioned zones named shopping malls with all possible options that would give them a unique environment for refreshing and socializing. Shopping malls today serve as tracts to stroll while you shop or shop in while you stroll. Today shopping malls are the largest form of organized planned retail facilities located mainly in metro cities and they play a very vital role in the retail industry. Malls in India have encroached in almost every city and is also reaching small towns and villages catering to millions of Indian populations. The ideal size of a mall generally ranges from 60,000 sq. ft. to 7, 00,000 sq. ft. and above.

Malls are no more just shopping centers for visitors but socialization and recreation center for them. Along with a variety of best brands to choose from they get the added benefit of entertainment such as multiplexes, amusement park, food court, free wi-fi,

parking facility and many other services and that too all under one roof in an environmentally protected atmosphere. All these facilities serve as a new art of living, a new way of living to visitors where they can pleasantly shop for all their needs in a single air-conditioned location and that too in one single trip. The food courts, multiplexes and fun zones are like value added services as they serve as major crowd attractors. It is a misconception that malls attract only youngsters. Malls visitors are from all age groups, children, youths and senior citizens. Overall, malls have architectural beauty and open spaces to allow visitors of all age and their families to hang-out.

Modern definitions of Shopping Mall

After going through the meaning of shopping mall it is necessary to study the definitions of mall. There is no single definition of a mall that covers all the features of malls. Hence, it is necessary to discuss the following few significant definitions:

I. *"A shopping mall is typically, a shopping complex connected by walkways. It provides shopping as well as entertainment options to the target consumers. It generally, contains one anchor store, which consumes twenty-five percent of its retail space. In addition, a mall contains specialty stores for clothes, accessories, home needs, books, as well as a food court, multiplexes, and entertainment zones."* (Sankar, 2005)

II. *"A place that not only provides suburbanites with their physical living requirements, but simultaneously serves their civic, cultural and social community needs, and as such it makes the most significant contribution to the enrichment of our lives."* (Gruen)

III. *"A mall is a shopping center which is typically enclosed, climate-controlled and lighted, flanked on one or both sides by storefronts and entrances. On-site parking, either surface or structured is usually provided around the perimeter of the*

shopping center." (ICSC-International Council of Shopping Centers)

IV. *"A shopping mall, a shopping center, or a shopping arcade is a building or set of buildings that contain stores, and has interconnecting walkways enabling visitors to easily walk from store to store. The walkways may or may not be enclosed."*

V. In nutshell, it is clear from all the above definitions that a mall is a large retail complex where customers can enjoy as well as take the advantage of shopping in a pleasant mood with family and friends.

Entertainment and Recreation Centres

The prime focus of shopping malls across the globe now is recreation and entertainment, while shopping is given a backseat. In an enclosed world-class ambiance malls are now offering over-the-top features including indoor ice-skating, indoor ski-range, indoor theme parks, indoor amusement parks, water parks, kids play zones, zoos, science centres, shooting ranges, and even an underground aquarium. To go a few steps ahead they further enhance the experiences of mall visitors by providing background music, seasonal decorations, festival celebrations, special events, games for the visitors, lucky draws, shopping points, and many more such attention-grabbing activities. These structural buildings, the so-called shopping malls, with movie theatres, bowling areas, gaming zones, restaurants, dining areas, hotels, food courts, comfortable lobby areas, free wifi, and air conditions are becoming a center of attraction as they are a hub of hanging out with friends and family for leisure and enjoyment.

Analysis of Top Malls in India

To closely scrutinize the highlight of the research paper 'Indian Shopping Malls – A Blend of Retail and Recreation', let's analyze a few top shopping malls in India. Here, we will check what factors and facilities or products and services these malls are providing.

1. Lulu Mall, Kochi

Lulu Mall, the leading tourist attraction in Kochi with retail space of 1.7 million sq.ft., is the largest mall in India. A gigantic 5 storey magnificent building is a retail hallmark with 215 retail outlets. Along with a Hypermarket, the other eye-catchers in the mall are a party hall, 3 fine dining restaurants, multiplex, a fabulous food court, entertainment zones, ice skating rink of 5000 sq.ft., bowling alley, indoor climbing, money exchange centres, arcade games and 5D PVR cinema.

2. World Trade Park, Jaipur

World Trade Park with two separate blocks on either side of a major street in Jaipur, is the first system of its kind in the world, known to display images on the ceiling and is a famous shopping, recreational and entertainment hub. The huge 11 storey attractive building is partitioned into two blocks which are connected by a foot over bridge for the convenience of mall visitors to explore the entire mall which is a hub of over 500 stores. The major crowd puller of the mall are the electronics and gadget stores. The mall houses a number of clothing stores, accessory and jewelry stores, footwear and bags shops luggage, gift and beauty care stores. It is a one-stop destination for shopping, food, amusement and recreation. Amenities such as hotels, food courts, health clubs, cinema screens, commercial office spaces and entertainment zones are the added attractions.

3. DLF Mall, Noida

A shopping destination of seven floors divided into five zones, accommodating 18 anchor tenants. It is a house of 333 retail outlets which makes it the largest tourist attraction. It is known for its finest food hub with more than 75 Food and Beverages choices along with 51 cafes, a wide range of fast-food restaurants and universal bistros, 7 screen PVR multiplexes, devoted children zone and amusement areas.

4. Phoenix MarketCity, Mumbai

This multi-storeyed mall is the largest mall in Mumbai. It offers a revolutionized shopping experience which makes it a

world-class tourist attraction. The mall extends the finest luxury brands. It houses over 600 global and national stores, 14 screen PVR multiplex and around 100 restaurants and kiosks. Mumbai's largest snow park, Snow World is the center of attraction. The blend of food and fashion, fun and games, culture and entertainment makes this place a grand place to visit with the entire family.

5. Select City Walk Mall, New Delhi

This is the second largest shopping mall in India and the biggest in New Delhi. The mall is well planned and designed which divides it into 2 parts; High Voltage for the youth and Traditional for family, Celebration for centre stage. The mall has around 6 acres of outdoor area and 100,000 sq.ft. open plaza. Besides this, there are fun and game zones, 6 screen PVR multiplex, gigantic food court area of 100,000 sq.ft. with innumerable food chain restaurants. It has a stand-alone Calvin-Klein store along with 2 flagship stores of Espirit and Tommy Hilfiger. Other than these the mall has around 180 retail outlets and more than 600 brands.

6. Elante Mall, Chandigarh

Elante Mall, being the second largest mall of Chandigarh, covers an area of 20 acres of outdoor space. The mall has 4 floors with an additional two-floor basement. The retail space area is facilitated with new-age technologies. This multi-storeyed mall is a hub of more than 200 Indian and global retail stores selling apparel, footwear and cosmetics. It has a fun floor for the kids and an 8 screen PVR multiplex. It boasts of a massive food court lined with umpteen eateries, a fantastic food hub, cafes and bistros.

7. UB City Mall, Bangalore

UB Tower is the tallest structure in Karnataka as on date with a height measuring up to 123 m. UB City is designed to produce the feeling of a city with the assimilation of four blocks with a distinctive look; Kingfisher Plaza, Concorde, Canberra and Comet block. Fashion brands like Estee Lauder, Rolex, Burberry, Jimmy Choo, Louis Vuitton, and Canali aptly justifies the title of India's first luxury mall. The place is

best known for high-end stores offering luxury beauty, shoes, jewelry and bags. Other highlights include an 800 seater Amphitheatre, internationally famed Oakwood Serviced Residences along with a Day Spa from Angsana. UB City is home to multi-cuisines ranging from Italian to Chinese and Japanese. Various events are also timely organized for mall visitors.

8. Phoenix Market City, Pune

The mall came up with a concept and vision to offer consumers the best brands, mind-blowing entertainment options, finest dining and overall an enjoyable shopping experience. It targets quality and brand-conscious consumers. It is one of the largest malls in the city that offers a revolutionary retail and entertainment experience. It has around 300 retail stores of product mix—flagship stores of renowned brands and around 20 Boutique Hotel Rooms. The state-of-the-art facilities for shopping, large food court, cafes, fine dining restaurants and unmatched entertainment and leisure options with an 11 screen multiplex, an IMAX theatre, an interactive gaming zone called IPlay and Family Entertainment Center it is a true 'Destination Mall'.

Shopping Malls turning into Profit Centres

The state-of-the-art facilities and luxurious shopping experience, splendid and adventurous gaming and play zones, bowling alley, amusement parks, multiplexes and cineplexes, community halls, cultural events, festivals and celebrations, offers and discounts, massive food courts, cafes, and restaurants serving multi cuisines, spa and beauty centers, well-organized parking facility, hygienic and clean ambiance, all such facilities and services convert a shopping mall into a family entertainment center. Such world-class facilities draw additional footfalls and

encourage regular visitors to spend more time and money in a single visit to the mall. The development of a variety of entertainment and recreational activities has positively impacted the sales of shopping malls. Malls that extend extensive recreational and entertainment facilities attract considerably increased revenue compared to the malls that just offer shopping, as visitors spend more time in the mall to enjoy these facilities and are prone to spending more money in a single visit.

Conclusion

Malls today cannot afford to stand tall with just a bouquet of brands. Shopping alone is no more the primary idea of any mall visitor. As such, shopping experiences can be flavoured by adding a pinch of entertainment and a fist full of recreation. Only retailing might just allow a mall to survive, but if continuous and sustainable growth is expected, malls have to create a competitive atmosphere conducive enough to catch the attraction of people in the society. There is a substantial growth in the standard of living of the Indian population. Eventually, the expectations of consumers move from basic to comfort and then to luxury. Consumers today, look for entertainment and experiences surpassing conventional shopping and want to spend quality time with family and friends. Shopping malls are no more just retail destinations. Malls have now blended into a retail, entertainment, and recreation hub. As such they successfully pull the attention of even the non-mall visitors. Malls are not just providing customers with a wide range of national and international brands but are efficiently encouraging mall visitors for repeated visits by enhancing their stay in world-class hygiene and comfortable atmosphere and engaging them with top-of-the-world entertainment and recreational activities.

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A STUDY OF GREEN ENTREPRENEURSHIP AND SUSTAINABLE DEVELOPMENT**H. A. Thorve¹, Rajesh Raut²**^{1,2}Modern Institute of Business Management, Pune.¹harsha.mibm@gmail.com, rajeshraut.mibm@gmail.com**ABSTRACT**

Green entrepreneurship is a trending concept of consciously addressing social and environmental problems with coming up brilliant ideas that brings solutions to the problems. World bank and other international organizations conducted various studies on different types of pollution. However, the adverse effects of this entails the scholar's attention. There is need to focus on core areas of Green Entrepreneurship in present environmental challenges. This paper attempts to investigate Green Tech entrepreneurs from Start-up India campaign. It is also highlighted the relationship of Green-entrepreneurship & sustainable development of Green-economy at global level.

Keywords: Green entrepreneurs, Sustainable development, Green Tech.

Introduction

Green Entrepreneurship is a practice to control environmental damages like global warming, climate-change. It is emerging concept that change the business approaches towards the ecofriendly business activities. A Green Entrepreneurship is not only an idea-innovation but a development of sustainable environment in the situation of Ecological imbalances; also works on technological development with the help of given freely available naturalistic production factors; having focus on Economic development of society.

But the pace of required growth is not getting realized in green areas of technology. Majority of nations even with high natural support to such developments are lacking behind majorly due to unacceptability of changes.

Green Growth with Economic development has vital importance in current scenario of unpredictable climate changes, depletion of natural resources resulting into environmental and health issues. And these negative points are critically linked to issues of employment and the sustainability of ecosystems, and consequently, issues of resource security and political stability. It's importantly bringing up the need of such entrepreneurs who can resolve those difficulties & can develop forward with sustainable growth. Green Entrepreneurs are those who are working in resolving Environmental problems with their

entrepreneurship skills & ideas to get a positive impact on nature with sustained development.

Literature Review

It is found that obstacle of environmental entrepreneurship on the basis of geographical locations. There is more need of financial support from government to solve the problem of uneven development of green technologies. (KAUR, 2014) The fact is that Developing countries get more benefit from Green Entrepreneurship for job creation and unemployment rates dropping at substantial rates. As per the researcher Afghanistan has a potential for green entrepreneurship. (Mohsen, 2018) New demands from consumers can be combined with environmentally friendly products and services; the changing shape of national and global economies is leading new forms of entrepreneurship. (Gibbs) Different sort of terminology used by green entrepreneurs, ecopreneurs, But environmental solutions are becoming more and more attractive and popular. Innovative technologies and digitalization of business process makes much wider possibilities for entrepreneurs to be environmentally oriented. (Inga Uvarova, 2020)

Data Analysis-For Data Analysis purpose OCED countries has taken into the consideration. The data analysis is from the period of 1990-2019.

Figure 1 - Mean population exposure to PM2.5

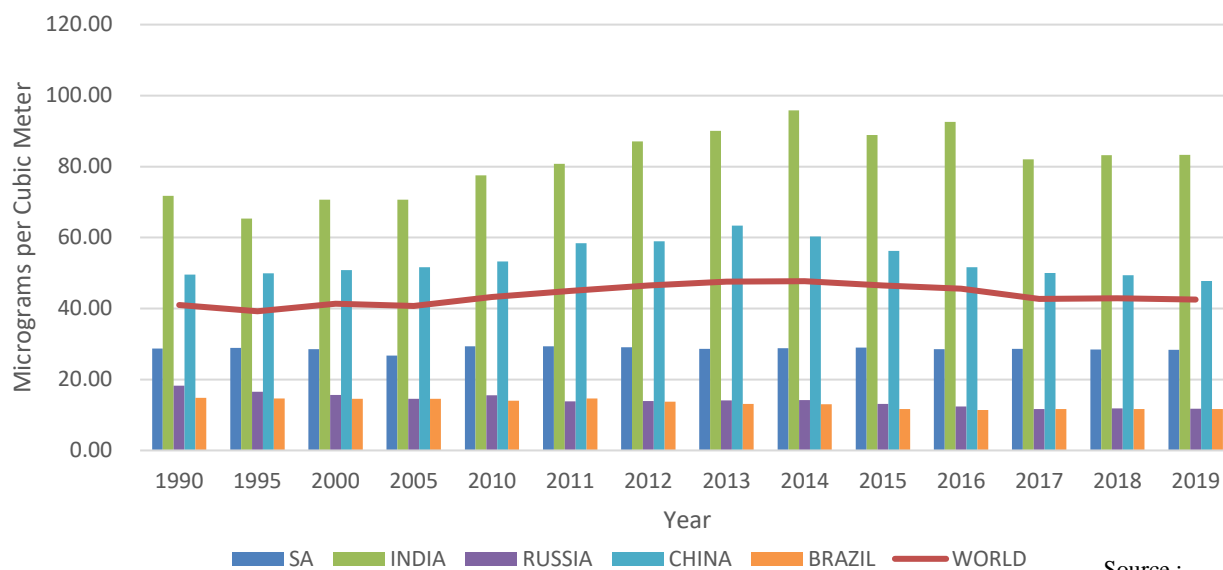
Source :
OECD

Figure 2 - Mortality from exposure to ambient PM2.5

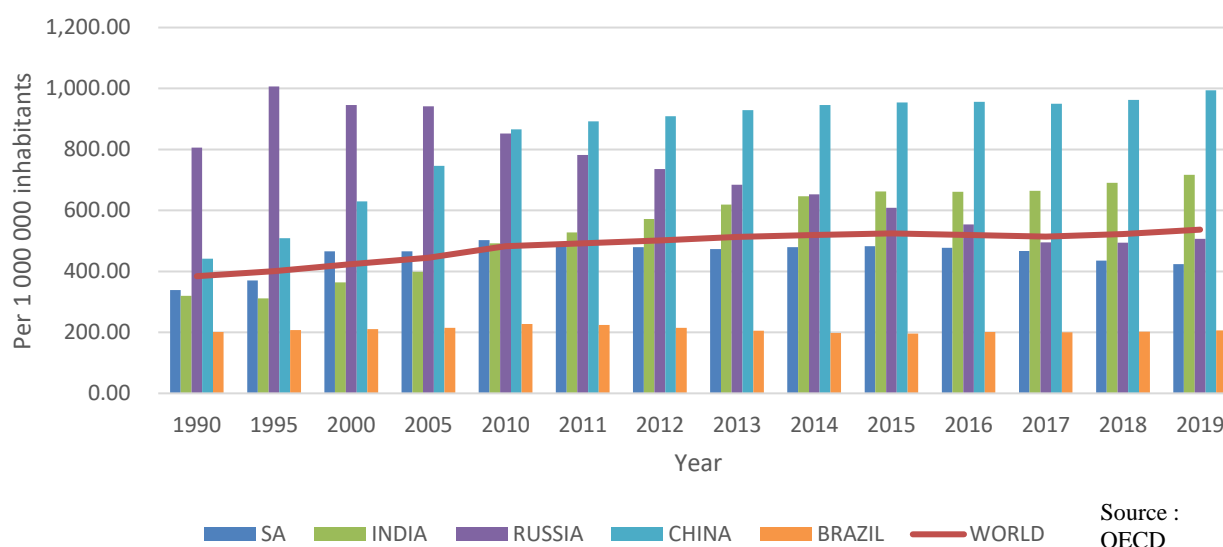
Source :
OECD

Figure 1 & Figure 2 shows relationship of BRICS (Brazil, Russia, India, China, South Africa {SA}) in comparison with world population exposure scale with measuring it with PM2.5 & with its negative effects due to high air high pollutant. India & China with heavy pollution exposure results to high death rates, which shows need of pharmaceutical

technology at cheaper rate via Natural methods. As comparison Russia is growing positively with diminishing death rates & developing society on a sustainable way because of increasing focus on ways of pharmaceuticals like less expensive medical education.

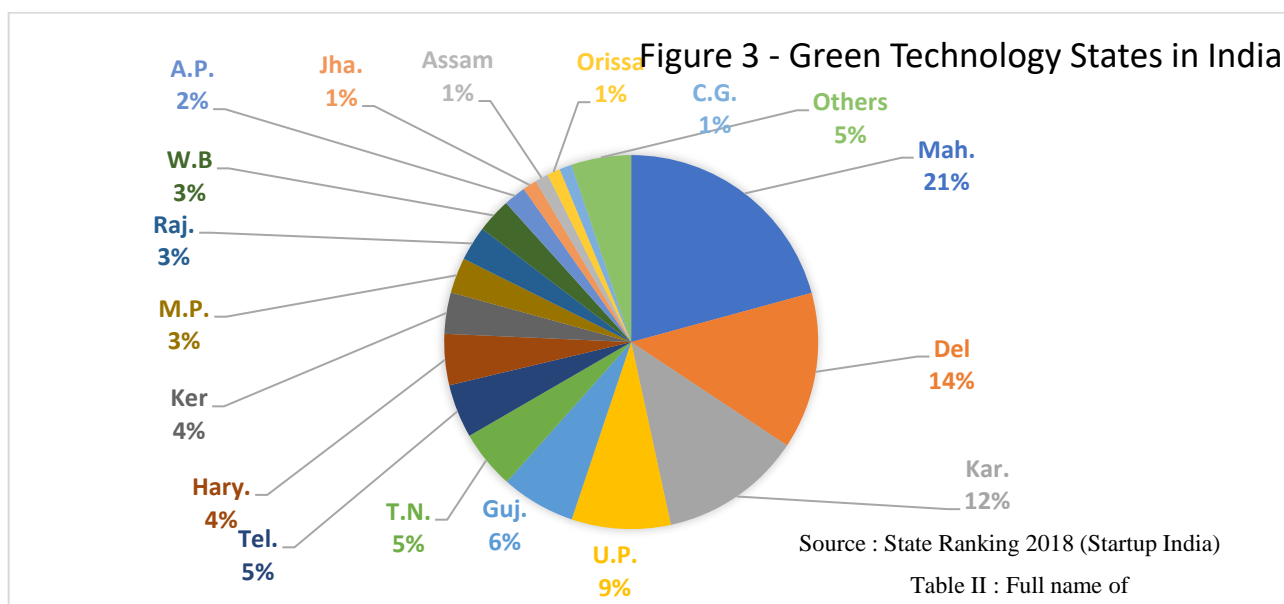


Figure 3 shows Indian states which holds 95% of Green Technology states. With 66318 Start-ups in 54 different industries till 2018, Indian entrepreneurs focused majorly on IT-sector with 8590 firms. Healthcare services & Education holds 2nd & 3rd rank; and green technology start-ups who work on

environmental areas is at 15th rank with 1404 firms. Maharashtra, Karnataka & Delhi going up with 47% share; due to developed financial & Technological sectors compare to other states. Southern states with Self Help Groups & academic institutes collaborate with industries & develop fields according to requirements.

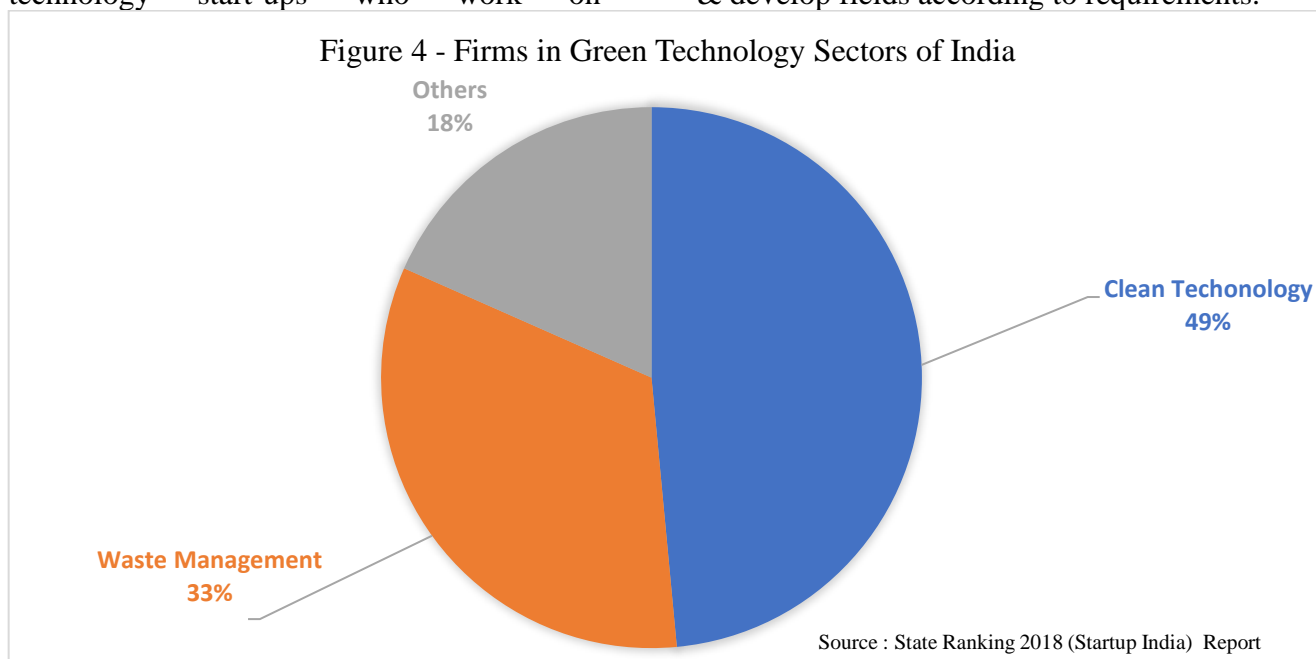


Figure 4 reflects the areas in which Indian firms are focused to different sectors in green technology industries. In Green technology industry, social service objective plays major role, importantly while tackling with less exposed population. Green Tech industries are divided as Clean Tech (solar, wind, ethanol, biomass, energy storage and more) with 49% share as demand is getting increase after price increment in non-renewable resources as well

as hazardous pollution products, Waste management (liquid waste, organic waste, recyclable, rubbish & hazardous waste) & other relative sectors are working on the environmental products. Due to lack of resources availability, highly educated youth motivate towards IT-services for getting global exposure & big compensations pushes back Green technology sector.

Challenges for Green Entrepreneur:

- Less Monetary Returns-Green Entrepreneurs needs to provide eco-friendly products in market. However, many times returns cannot be more in monetary terms as the purpose is to serve social objectives
- Gaining Consumer's Acceptance – Consumers are dependent on advertisement and other sources of information. Advertisement increases cost of products it creates effects consumers' interests compare to other consumer products.
- Limited Consumer's Education – Necessity of such products & upcoming issues due to environmental distortion's information is not available to consumers as expected. It majorly happens in rural areas due to less inclusive nation resulting on limited exposure
- Unpredictable Climate Changes - Sudden changes are happening in climate like global warming, heavy floods, ice melt etc. impact implementation of planned policies & designed. The requirements from sudden changes in market is not possible to immediately include in innovator's portfolio
- Dissimilar State Planning – Planning in environmental field must not majorly dependent only on central authority. Relatively similar planning in all states gives motivation & confidence to work on large market share. And not limited to any states. Dissimilarity results as unequal distribution of technology & impacting on price by various dimensions.
- Fluctuating Tax Policies- Long term planning can create impact on sustainability of a firm. Sudden changes in financial policies brings entrepreneur into debt. Many new entrepreneurs must rework on the financial model which consumes time & decline growth.
- Political Instability – Political environment reflects negativity to any investors and result pooling up startup capital as well as being small in size and cannot take burden of financial instability due to change in policy.
- Education at School Level - Environmental challenges & their negative impacts need to be added up' in education as it will develop ideas to improve those changes as wells can be build up informed consumers.
- Skill development in Higher Studies - Increases attitude as innovators & entrepreneurs via projects in green technology sector; and develops knowledge in society in professional way. As well as can grow students to think as an emerging opportunity in future.
- Inclusion of Green Sectors in SDGs – Sustaining green entrepreneurs can be obtained from SDG policies as it has an objective of long-term goals. India needs to include it with their economic growth policies.
- Dependency on Raw Materials– With Green entrepreneurs, sectors of raw materials to eco-friendly products should develop in same pace. Also, needs to target naturally grown states in their easily availability of resources.
- Develop Labour Intensive Products – Production from labour intensive techniques decreases cost of production & can also available products at nominal price, which is highly required from Low-income states. i.e., Labour-intensive techniques provide eco-friendly products, employment & income to utilize such products at low cost.
- Green Financing – For sustaining business models in environmental related products; Green financing plays major role by providing investment opportunities to investors.
- Products with Certification – Certification of these products needs to be done from signing authority under the guidance of subject experts. As it increases the trust of consumers towards product.
- Market Size Objective – Objectives of firm to have large market size instead of large profit margin; then only they can compete with low-cost global products & can also gain confidence. Only if these products don't increase consumer's expenditure.

- Collaborative Markets – Need to merge small villages as a big consumer & share the benefits at reasonable price. It can be utilized majorly in agriculture sectors.
- Attitude for Social Development- Entrepreneurs must have a social objective & not profit oriented one, which can be done by collaborating with Academic institutions & related NGO. As these institutes has trust from society & it will grow the firm with social development.
- Inclusion in CSR policy – Minimum margin of investment must include in CSR policies of large industries, as speedy changes in technology requires immediate & large capital to entrepreneur. Also, inclusion of brand name of large-scale industries exposes entrepreneurs to global environment.
- Restriction on FDI – To develop Indian entrepreneur, FDI must be restricted. Because of their easy availability of raw material & well-developed technology produces low-cost products, which negatively impacts Indian entrepreneurs market share.
- Measuring Green Entrepreneurs- OECD keep measuring green entrepreneur's performance from their innovation to implementation. Framework needs to be designed in such a work that any country can utilize it and it will answer policy-development from its implementation view.
- Triple Bottom Line (TBL), World Bank – The TBL approach needs to be include in India's start-up policies; it includes Financing to Human resource then Environmental development in path for any entrepreneur from bottom to the top.

Conclusion

Green entrepreneurship is depending on green policies; their frame work of having specific

objective of environmental protection at first than to keep that level sustained. Presently due to immediate environmental disasters, destroying not only at one place but impacting world with interconnected financial markets. Developed nations with collaborations are performing well designed qualitative analysis of measuring ecological balance on the basis of green entrepreneurs, even their profit value. Getting at social environment interconnectedness, with in BRICS nations; China is in positive direction with developing new ideas. South Africa & Brazil on the basis of large number of natural resources, getting sustained on own. Russia with help of reserves & stable political system can utilize environmental related products.

India is on developing path, but Entrepreneurs are more in profit-oriented objective, which attracts interests of large investors. Following which responsibility of investments comes to government at large scale. Highly educated & technologically advanced youth focus in IT services instead of environmental sector as latter doesn't have quick returns. Indian government is on verge of adopting foreign technology, which is expensive for consumers. Consumers are not able to afford until green products are being made according to their requirements & at minimized cost. Difficulties in getting finance impacts substantiality of entrepreneurs & not able to compete with foreign products.

For getting green products to be consumed at large scale in India. Society & Entrepreneurs requires to be interconnected with help of freely & easily understandable education and providing such skills, such that even if they don't want to be in green technology than at least would be an informed consumer who understands values of environmental balancing; only with help of sustained Green entrepreneurs & develop Green Economy.

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A PRODUCTION CONTROL USE A VARIOUS FUNCTIONS OF QUALITY FOR IMPROVING COST OF PRODUCTIONS IN PUNE ZONE

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ABSTRACT

Production Control can be looked up based upon the requirements and customer's needs. In return, it implicates need of verification with respect to quality on the parameters of improvement quality of services and articles. Speaking about the possible utilization of repairing methods in organization, mentioning the precise qualifications of criterion utilization of tools used in improvement in quality is necessary. Defects during casting, however, be revealed either during the machining, assembly, or component utilization phase. The customer may pass the resultant value-added costs or warranty costs onto the foundry. This research work consists of analysis of types of castings and their sub-products. It was observed quantity of defected castings and kinds of defects in the castings during the year. Besides quality management each step has its marked response to problems of environment and to problems of safety and risk. In most sized plants make the situation considerably make them create such administration pretentious and cost-effective integrated management systems. Production quality, safety, protection of health, and environmental protection in work atmospheres are an integral part in 'modern management systems.

Keywords: Production Control, Quality of Production, Improvement in PPC, foundry defects.

1. Introduction

Production Control has been a long-standing subject, especially the matter of 'quality of goods and services. During the period of 1970 BC the concept of product quality and liability into the building industry was introduced by King Hammurabi of Babylon. Until the advent of mass production, the maintenance of quality was one of the key functions of the craft guilds of the Middle Ages with only those workers who could achieve acceptable quality standards being admitted to membership. Monopolistic unions were structured for ensuring achievement of a high-level skill and quality through its membership as well as the trade. Quality during the Industrial Revolution was set in large factories which employed militaries of persons which was in turn giving rise to new ways of management. Scientific management as given by Frederick Taylor fetched efficient operations for increasing output by segregating jobs into various parts leading to mass production where each worker was assigned a single task.

Mass producing practices gained striking early dividends. Henry Ford (1863-1947) constructed over how mass production brought increased productivity. Ford then flow lines and workers did thoughtlessly monotonous tasks. In its part of cost control, for producing lower prices, Ford fixed the price and

confronted the organization for ensuring that the costs were sufficiently low to come across the figure. Scientific management emphasized disconnect of concept from its execution as well as labor substitutability. The concept of craftsmen vanished with Taylors. Inspection therefore endured the lone quality guarantor. Product was no longer built with Quality. The 'success in the war', thus led to establishment of institutes and associations as well as the publication of formalized quality of ideas. In 1919, the Technical Inspection Association was formed which became incorporated as the 'Institution of Engineering Inspection' in 1922 in Britain. In 1931, Economic Control of Quality of Manufactured Product was published by W. A. Shewhart of the 'AT&T Bell Laboratories'. Stern methods for observing and assessing everyday producing and improvement in quality were recorded. Konosuke Matsushita, Japanese businessman and one of the world's largest electronics group's founder was influenced greatly by Henry Ford's work. Suppliers, however, are also essential- Matsushita visited his supplier factories in 1930s and gave them advice based on effective production.

The industry was again bashed off-balance by the Second World War. More profound and longer lasting effects were found in North America. The War Production Board trained thousands of quality specialists and created the

American Society for Quality Control (ASQC). The ASQC memberships in 29 specialist divisions were expanded approximately up to 50000. One of the defeated nations, however, was the one to come up successfully with the quality thinking. A new nationalistic drive was launched by the Japanese to expand and pursue their economic goals rather than military goals. W. Edwards Deming was famous expert who served a key purpose in this upgradation process in collaboration with people like J. M. Juran from the United States. During the war as well as in the post-war period, Americans had an advantage of close participation over functioning with respect to sound quality systems. The Western method, the American Approach to Quality, the invention plan preferred by the U.S. after the war period considered to be policy in a period of economic resources low international competition and expanding markets. During that period, it is given highest importance to quantity than quality and management is interested in reducing cost and increasing production. It was made clear by Juran in the Harvard Business Review article (1993) during the 1950s, his Japanese audiences were the main managers of chief establishments while the North American viewers were mainly quality inspectors and engineers. In the Eastern approach, especially Japanese approach to Quality, managers took the advice about upcoming modifications in the customer's insight regarding quality as well as their future demands very seriously so that they could quickly develop their customer-oriented services and products. In short, these concepts were easy to work out with given the long-established Japanese tradition of attention to detail by miniaturization when it comes to fine craftsmanship. The strong statistical essence of early work with an emphasis over quantitative variant within quality suited very well for numbers with the Japanese penchants. Since, Japan was poor in terms of natural resources, the only option for it was to export good quality goods at lower rates in order to afford the food and other essentials that were needed.

2. Review of Literature

FEIGNBAUM A.V. (1991), mentioned that Production Quality, safety, health, and

environment protection in work environments are integral parts in modern management systems. 'Integrated management system' refers to a system incorporating management systems to a single continuous system allowing them in reaching the desired missions as well as goals.

According to PRIBULOVÁ A. (2010), the concept of Integrated Management System arrived as a Foundry Quality Management System is an example of continuous process of improvement in steel and iron foundry: research of occurrence of casting defects in steel and iron castings. Process of Foundry production consists of mold preparation as well as molding mixtures, preparation of liquid metal, casting, cleaning of castings, thermal and surface treatment of castings

Production of non-ferrous as well as ferrous metal castings takes place in the foundries. Ferrous castings include steel and iron, whereas non-ferrous castings mainly consist of copper, aluminum, zinc, tin, lead, magnesium, titanium, and nickel. Castings are formed by melting, pouring, and casting of non-ferrous and ferrous metals. Several foundries cast both ferrous as well as non-ferrous materials.

There are various number of casting techniques which involve construction of mold where a metal is melted and poured inside it. It is further divided into expendable and non-expendable mold casting. Expendable mold casting, very typical with respect to ferrous foundries even though they used in non-ferrous casting as well, use lost molds (e.g., sand molding). On the other hand, non-expendable mold casting, which is implemented mainly in non-ferrous foundries, involves usage of permanent molds (e.g. die-casting). Lost molds once used, cannot be reused, and are hence destroyed during the shakeout phase whereas, permanent molds are reused. Various methods are used in these two processes depending upon the melting, molding, and core-making systems, casting system, and the applied finishing techniques. The following processes take place in a typical foundry: melting and treatment of metal in the melting shop; mold and core preparation in molding shop; casting molten metal in the mold, cool down for solidifying and removal of casting from mold in casting shop; and

finishing shop where finishing of raw casting occurs. Electric arc furnaces or coreless induction furnaces are used in the melting process of Cast metal. The treatment of Cast steel consists of refining as well as deoxidization based on the metal charge as well as the quality requirement of the casting product (PRIBULOVÁ A. 2009).

Integrated Management System in foundry, thus arrives the idea of integrated management system is based upon the suitability of management systems according to the ISO 9000:2000, ISO 14000:2000 and OHSAS 18001:1999 standards. Discussion in Committee TC 176 caused the change: presently, integration of the standards isn't taken into consideration, nonetheless their compatibility and probability of "combination" has been discussed (EMMIMA E.M. 2008).

ISO 14000 and ISO 9000 systems have their compatibility defined in point 0.4 of ISO 9001, where there is a possibility for an organization for harmonizing or integrating its own Quality Management System with requirements of related system. However, the regular ISO 9001 is not containing total requests precise for the supplementary management systems, the organization can adjust its quality management system (ISO 9001:2000). A business know-how to adapt its Quality Management System (ISO 9001:2000) regardless about the fact that ISO 9001 doesn't consist of all requirements particularly for other systems of management.

The three above mentioned management systems have numerous similarities between them which are as follows:

- a. Commitment of organization's management.
- b. Control of documentation and records.
- c. Politics and goals of the management.
- d. Orientation to customer.
- e. Responsibility, authority, communication.
- f. Management review.
- g. Representative of Management.
- h. Source provision (human, financial, material, information).
- i. Analysis of casting defects
- j. Competence, education and training.
- k. Internal audits.

l. Metrology.

m. Monitoring and measurement.

Quality can be perceived on the basis of costumers' needs and requirements. It, in return, involves need of verification according to this, i.e. quality inspection. Separations in quality criteria take place for investigation of all phases of formation and utilization of products: preproduction, production and after production phase. Each phase is characterized by information sequence regarding quality as well as the quality features that occur in assured methods. Effect gathered norms in manufacture might be utilized or intended for active request of various types in analytical tools. According to OTT D. (1997), molding flaws may have a negative effect over the bottom-line of a foundry.

Identification of problem formations' sources has been made possible by Ishikawa's diagram (also known as the "fish bone diagram") which is generally a diagram for cause and effect. According to SIEKANSKI K. (2002), it also helps in identifying a sequence of problems causing challenges in the next phases: research, therapy and diagnosis select while making easy solutions for problems.

According to Fayol, "Control consists in verifying whether everything occurs in conformity with the adopted plan and established principles. The objective of control is to point out weaknesses and shortcomings, if any, in order to rectify them and prevent recurrence. It operates on everything viz. material, equipment, men, operations etc. For control to be effective, it must be applied within reasonable time and be followed-up sanctions." ..BY Henner Fayol 02

"Production is Management concerns itself with the conversion of inputs into outputs using physical resources."By- S.N. Chary 06,, Tata McGraw-Hill. Third Edition, Production and Operations Management .pp 02, Fourteenth reprint 2008 Just- in-Time Manufacturing System.

According to Schonberger, "Just-in-Time (JIT) is a system to produce and deliver finished goods just in time to be sold, sub-assemblies just-in-time to be assembled into finished goods, and purchase materials just in time to be transformed into fabricated parts."

The idea of just in time was originally developed by the Toyota motor company in Japan

. The idea was formalized into a management system when Toyota sought to meet the

precise demand of customers for different models and colors of cars with minimum delays. JIT is being used in wide variety of industries such as automobiles, consumer electronics, office equipment's etc.

Functions	Issues to be covered
Product Design & Development	Customer needs, market needs, availability of similar product, demand-supply gap, functional aspects, operational aspects, environmental aspects etc.
Demand Forecasting	Quantity, Quality, Demand pattern.
Capacity Planning	No. of machines, No. of tooling, workers, No. of flow lines, Quantity, Quality and rate of production, demand pattern.
Equipment Selection & Maintenance	No. of machines, type of M/c, Quality aspects, Quantity aspects, rate of production, Cost of equipments, support from the supplier, maintenance policy, storage of spare parts.
Tooling Selection	Compatibility between w/c steels, No. of tools, their cost, their material etc, storage policy.
Material Selection & Management	Types, specification, quality aspect, quantity aspect, cost, supplies reputation , lot size, inventory levels, setup cost, mode of transportation etc.
Process Planning	Generation of manufacture instruction, selection of M/c, tools, parameters, sequence etc.
Loading	Division of workload, assignment of tasks, uniform loading, matching between capability & capacity with job requirements.
Routing	Path selection for material movement as per the process plan and loading, minimum material handling and waiting time.
Scheduling	Time based loading, start and finish times, due dates, dispatching rules, re-scheduling.
Expediting	Operation Scheduling and order and progress reporting.

Important functions covered by production planning and control (PPC) function in any

manufacturing system are shown in Table 1 along with the issues to be covered.

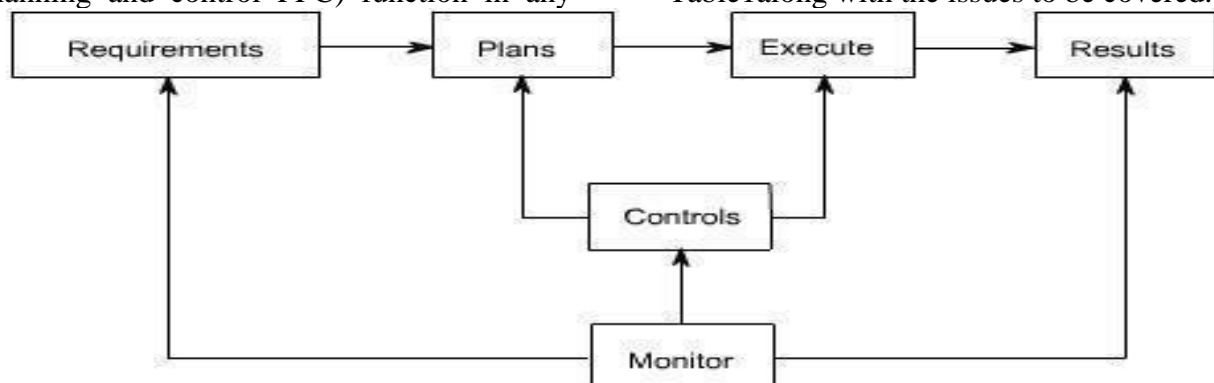


Figure 1: Architecture of Control System

2. The most common castings defects:

Casting process may come up with various defects which in turn reduces the total output of it alongside increases their production cost. Thus, it is important to consider and understand their causes, the imperfection or output that is obtained which is very contradictory to the quality requirements. There are basically three types of Casting Defects :

1. Major defects, that can't be rectified, which results in denial of the molding ultimately leading to entire damage;
2. Rectifiable Flaws which may be treated, however the repair cost may not be a justification for the attempt of salvage;
3. Minor defects, that undoubtedly allow economic salvation of the castings thereby leaving a reasonable profit margin.

Reasons for such defects:

- Unsatisfactory or Unsuitable raw resources utilized in main creating, molding or casting; Applying unacceptable casting or molding exercise thru single employee(s) or incorrect instructions by the supervisor;
- Usage of inappropriate equipment, tools, patterns or appliances; and
- Improper management policy techniques, out of order organization and lack of training or poor work discipline.

According to Garvin, "Quality is an oddly dicey concept which is easy for visualizing, yet irritatingly challenging when defining."

The quality usually expresses notions of vague factors which aren't readily tied down or measured. Quality expresses a positive implication whatsoever it is directed to. It can be a compelling value and is robust enough in pertaining towards products, service standards, innovations, and people's caliber Everyone at every level can do something about it and feel satisfied about making a difference. Providing quality service and making quality products that work can be identified with from ones' own experience. (Pascale, 1991)

Quality can be evidently defined through several approaches such as:

- Peters, (1989), mentioned about Quality means delighting the customer,
- Feigenbaum, (1983) mentioned that it is well-defined as being about value.
- Crosby, (1979) says conformance to specifications, standards or requirements.
- Peters and Waterman, (1982) mentioned about Quality as excellence.
- Juran, 1989, explains its fitness for use.
- Parasuraman et al., (1985), says that Quality deals with meeting or exceeding customers' expectations

Each approach when defined with quality has strong points with respect to generalizability, comfort of utility as well as measurement. Hence, the superiority as conformance to criteria method is further significant in an environment for engineering in influenced individual service industry alongside being of countless value to emphasize productivity and efficiency. Quality as superiority is perceived to be equally valuable to a motivational expedient in a 'general call to arms' when it comes to quality management movement. Workforces may yield superiority in functioning for an association whose mission and vision reports highlight over existence the greatest.

Besides all of the above, every approach has its own disadvantages. Hence, a quality vision for conforming to standards each and every time is very unlikely being as effective when compared with proves to be 'Quality as excellence' when appealing employee assurance towards quality. However, quality as excellence is very difficult to measure or operationalize.

3. Objectives of Research

1. To study the awareness and usage of Production Control in various functions of large-scale industries in Pune Zone.
2. To study the impact of Production Control in selected large-scale industries in Pune Zone
3. To understand the impact on cost of production.
4. To work on the Production Control to reduce the wastage of raw material.
5. To understand the different factors responsible for wastage.

4. Hypothesis

Based on the objectives following hypothesis can be worked on

H1: - There is significant difference across production control function helps to formulate

Policies to better performance of large-scale industries.

H0: - There is no significant difference across Production control function does not helps

To formulate policies to better performance of large scale industries

H2: - There is significant difference across production control function helps to formulate

Policies to better performance of large-scale industries.

H0: - There is no significant across production control function helps to formulate

Policies to better performance of large-scale industries.

H3: - There is significant difference across awareness and usage of Production Control in various

functions of large-scale industries in Pune Zone.

H0: - There is no significant difference across awareness and usage of Production Control in various functions of large-scale industries in Pune Zone.

5. Data and Methodology

a. Population and sample size: There are around 70 firms in and around Pune Zone. Randomly a few firms around 30 manufacturing units has been taken in to accounts. A Structured Questionnaire is designed comprising of 25 questions selected to understand Quality and Works managers was taken from Primary data collection.

b. These determinants were put on to a scale of five-point Likert Scale, where 1 being never used to 5 being extensively practiced.

c. Reliability of data: A 29-items questionnaire was framed and circulated among the Quality Assurance and Production Managers/Works Managers.

d. In order to understand the questionnaires' reliability, Cronbach's alpha test was run on 10 manufacturing units, which is considered as Pilot study.

e. Hypothesis testing can be carried out understand the reliability, applicability by performing Chi2, T-Test, Z-test and other tests were carried out.

6. Conclusion.

The paper presented, identifies the importance of Production Control for cutting short of wastages and damages in the manufacturing process and implementation of the same is difficult task to be carried out. The main finding of the research paper is Firstly, most of the production control in large scale Industries or manufacturing units are having ISO 9000:2000 standards.

Secondly, the manufacturing units differs in implementation of Production Control in the production processes. Thirdly, some of the units are following Production Control, TQM and Kaizen models but others are not.

7. Limitation and scope for further research:

The study was performed on selected production or manufacturing units of Pune Zone. Further studies can be focus on same type of production or manufacturing firm but for other areas. The period of study was executed during the month of April-May 2020-21. Firms that use the tools process management like failure mode, and effect analysis and quality functions deployments can further be studied like tools like Kaizen, TQM and the hurdles to implementation of the same methodology can be studied further. Due to COVID-19 pandemic scenario most of the firms suffers Lock-down, this could be other constraints before the researchers.

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IMPACT OF COVID-19 ON INDIAN ECONOMY: A STUDY REFLECTING POLICIES AND PROGRAMME

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ABSTRACT

The COVID-19 epidemic put a halt to social as well as economic life. The focus of this research is on evaluating the effect on the sectors involved like oil, MSMEs, capital markets, retail, tourism, and aviation. Internal mobility and International is limited, and travel and tourism revenues generated that contribute 9.2 percent of Gross domestic product, will have an important influence on the GDP growth rate. Revenues from aircraft would fall by US\$ 1.56 billion. For 18 years in March, oil has dropped to a level of \$22 per barrel, and "Foreign Portfolio Investors" have pulled massive quantities of approximately US\$ 571.4 million off India. If the deficit in the current account shrinks, the lower oil prices increase the reversal capital flows. The rupee continually depreciates. MSMEs are going through a big cash crunch. The crisis has seen an appalling mass migration of this floating migrant community on foot in the center of the country's lockdown. Their issues have been mainly working loss, everyday consumption, and lack of a social safety net. India should rethink and become more inclusive about its development paradigm. COVID 19 also offered India some exceptional opportunities. The risk that the COVID-19 may recession globally in 2020 and 2021 will be very high as the ending of all financial activities – output, trade, and consumption – to monitor the COVID-19 spread has been noted globally. There is a chance for global supply chain involvement; multinational corporations lose faith in China. Some reforms are needed to "Make in India" one of which is labour reforms.

Keywords: Sectorial impact, MSMEs, GDP growth rate, Import-export, Government, Economic impact, COVID-19, lockdown.

Introduction

The world has been experiencing many epidemics including the Spanish Flu of 1918, MERS: "Middle East Respiratory Syndrome", Ebola, SARS: "severe acute respiratory syndrome", an outbreak of AIDS/HIV. In recent years, India has been confronted with diseases like smallpox, polio as well as plague. But one of the biggest health problems in our history is the Novel Coronavirus COVID-19, which originated in China between November-December 2019 and spread rapidly over the next few months to almost all countries around the world.

The epidemic of COVID-19 has tremendously affected nations, in particular the national lock-ups that have brought social as well as economic life to a halt. A world that has been always full of events has remained quiet and has diverted all energy to the never-experienced crisis. The virus has a multisectoral effect, as nations have slowed their economic activities. What should be

remembered is a warning bell that the WHO: "World Health Organization" released in 2019 about the world failure to solve the world pandemic. In the 2019 World Bank and WHO joint study, the effects of an epidemic of this nature are projected to be 2.2% to 4.8% of the world GDP. This forecast seems to be accurate because we see this crisis in the world.

In a further study titled COVID-19 and the working world: The International Labour organization effects and policy responses clarified that the crisis had been an economic & labour market shock that had an effect not only on supply (goods & services production) but also on-demand (investment and consumption). The IMF: "International Monetary Fund's" Chief reported that the globe is facing unprecedented confusion around the depth as well as the length of this situation, and this was the biggest economic implications since the Depression of Great. For developing markets and advanced

economies, the IMF estimated external funding requirements of trillions in dollars. India too is storming under a pandemic and the economists are locking COVID-19 costs at US Dollars 120 billion, or 4 percent of GDP, as stated in the “Economic Times” reported on March 23, 2020 (*The Economist*, 2020).

This pandemic of COVID-19 has impacted the production as well as services sector — media, recreation, IT, health, education, real estate, hotels, hospitality, tours & travels banks, retail, healthcare, and others. The economy has begun and is rising fast. Although lock-downs and social inequalities contribute to productivity losses, on the one hand, consumer demand for goods and services on the other is drastically declining on the market, and subsequently, economic activity is collapsed. Lockdown and social separation are, nevertheless, the only economical instruments available to avoid COVID-19 spread.

Material And Methods

Earlier research experiments were carried out on simulation models to determine the economic impacts of epidemics. The neoclassical growth model was used to examine the effects of the Spanish flu outbreak in 1918 by Martin Karlsson (2014); the standard DID: “difference-in-difference” estimator was expanded to investigate different rates of flu mortality in Swedish areas. The policy brief released by the “Asian Bank” for Development in order to evaluate the economic effects of the avian flu pandemic in Asia's economies was conducted by macroeconomic simulations according to the model for the OEF: “Oxford Economic Forecast” that integrates both the supply side and demand and adjusts the shock to a new balance by Bloom (2005). Scientific evolution of the economic impact of SARS: “severe acute respiratory syndrome” outbreak is dependent on the global model of the “G-

Cubed (Asia-Pacific) model” that has been recommended by McKibbin and Lee (2004)

Economic implications of epidemics are determined by economic costs and due cost of treatment associated with illness or the loss of income caused by mortality as well as morbidity. The economic impacts of an outbreak in a world are shifting in the global economy from the interconnected supply chains and financial markets to other countries. The pandemic COVID-19 is triggered by new coronavirus infections and an experimental study is underway to examine and establish a potential cure for this infection in the human body. In the epidemiological estimates for this disease, there are several variables dependent on hypotheses like the trigger of infection, rate of infection, and the asymptomatic instances to symptoms. The mysteries and propagation of the disease will be uncovered by scientific experiments in the future. Closely related to the disease pattern epidemiological forecasts are economic estimates or simulations.

This study focuses on evaluating the harm to the sectors concerned from COVID-19, like the loss of overall production, retail, tourism, air, socio-economic effects of working hours lost, with an overview of development policies along with the consequences of the program.

Sectorial Implications of COVID-19 Pandemic in India:

Impact on Retail, Tourism, and Aviation:

Internationally, the tourism sector is the most influenced by the crisis of COVID-19. Estimates of a 20% to 30% decline in foreign tourist arrivals are provided by the UNWTO: “World Tourism Organization” (2020). These estimates, too, are focused on current conditions and will possibly rise or decline in the future. The industry is expected to lose millions of people their jobs. The travel as well tourism industries in India are thriving

and make a major contribution to the economy.

The research on 'Indian Inbound Tourism' by FICCI-Yes Bank: India has been defined as the biggest tourist powerhouse in South Asia by Unlocking Opportunities. India's tourism represented 9.2 percent of GDP and in 2018 created 247.3 billion USD, creating 26.7 million jobs. Presently, it is the eighth biggest GDP contribution state (Jagan Mohan, 2020). The report estimates that almost 53 million people will be provided with jobs in the sector by 2029. In 2017, 10 million FTAs: "foreign tourist arrivals" crossed. The Coronavirus pandemic though has limited global mobility and the GDP growth rate will be greatly affected by the revenue generated by this industry. The growth rate of GDP could decrease by 0.45%.

India has currently provided US\$72 billion of aircraft to Indian GDP. In the first quarter, the number of foreign tourists arrived has fallen. In the second quarter, the lock-down will have an important effect on arrivals. It will amount to 18 billion when we approximate a conservative 25 percent decrease in aviation contribution. In 2019, railways provided GDP with a contribution of US\$27.13 billion. A 21-day lockout will reduce revenues by 1.56 billion US dollars.

In FY 2019, the Indian retail sector amounted to US\$ 790 billion. It makes up more than 10% of the GDP of the country and about 8 percent of employment. Online retail has grown very rapidly in the past few years and the expected rise in online retail in 2020 showed a 30% growth (National Investment Promotion and Facilitation Agency, 2020). Quarter 2 revenue is impacted by a month-long retail closure. The suppressed demand in the retail sector appears to revive quickly, enabling the lifting of the lockdown.

Impact on GDP Growth Rate:

This COVID-19 outbreak continually increases and there are no containment signs by April 15, 2020, the economic growth of

the country is likely to have a very important negative impact. The United Nations warned that the pandemic with coronavirus could have a severe impact on the global economy along with GDP growth in India is forecast to reduce to 4.8% in the present economy ("United Nations" 2020). Likewise, the United Nations (UN) Economic and ESCAP: "Social Survey of Asia and the Pacific" 2020 suggested that COVID-19 should have significant socio-economic effects on tourism, trade, and financial interconnections in the region with flooding across borders (United Nations, 2020).

The 2019-2020 economic survey presented a projected 5.0% rise in real GDP in 2019-2020 in Table 1, compared to a 6.8% growth rate in 2018-2019. The nominal GDP for 2019-2020 amounts to an approximate ₹204,400 billion and is 7.5% higher than the interim GDP forecasts for 2018-2019 (to ₹ 190 million). The National Statistics Office has announced revised GDP growth figures, in the first quarter from 8 percent to 7.1 percent, in the second quarter from 7 percent to 6.2 percent, as well as in the third quarter from 6.6 percent to 5.6 percent on 28 February 2020. (Economic Survey: 2020; p. 100). Goldman Sachs projected GDP growth at 1.6 percent, down 400 basis points due to 21 days closures (Goldman Sachs, 2020). KPMG India has calculated that the GDP growth of India ranged from 5.3% to 5.7% for a fast retrograde COVID-19 pandemic worldwide by mid of May. In the second case, when India tracks the distribution of the virus, however, the global recession is important, the growth may range from 4% to 4.5%. KPMG India has forecast the GDP growth rate of India to fall below 3% in its study if the virus continues to spread and locks down (KPMG, 2020). Research by Motilal Oswal indicates that 14 to 19 basis points for annual growth could be shortened in a single lockout day (Oswal, 2020). The total cost of the shutdown in Barclays was

about USD120 billion, or four percent of GDP (Barclays, 2020). Former Indian Finance Minister Mr. Yashwant Sinha, estimate costs of a 21 daysnational lockdown at 1% point of GDP. A 2% decline in growth

rates may be triggered by 2020 to 2021 by the global recession and potential uncertainties.

Table I. Growth of GYA and GDP at Constant Prices (2011-2012) Percentage

	2017-18 1st RE	2018-19 PE	2019-20 1st AE	Percentage Points Change in growth rate in 2019-20 Over 2018-19 (Increase+)/Decrease (-))
GVA at basic prices	6.9	6.6	4.9	-1.7
Agriculture and allied sectors	5	2.9	2.8	-0.1
Industry	5.9	6.9	2.5	-4.4
Mining and quarrying	5.1	1.3	1.5	-0.2
Manufacturing	5.9	6.9	2	-5
Electricity, Gas, Water, supply and other Utility services	8.6	7	5.4	-1.6
Construction	5.6	8.7	3.2	-5.6
Services	8.1	7.5	6.9	-0.7
Trade ,Hotel, Transport, communication and services related to broadcasting	7.8	6.9	5.9	-1
Financial, real estate and professional services	6.2	7.4	6.4	-1.1
Public administration, defense and other services	11.9	8.6	9.1	-0.5
GDP at Market Prices	7.2	6.8	5	-1.8

Source: National Statistic Office, Year 2020

Notes: RE-Revised estimates, PE-provisional estimates and AE- advanced estimates

“Impact of COVID-19 Pandemic on Migratory Labour:

The “International Labour Organization” defines the worst global outbreak of the Coronavirus pandemic as the Second World War in its study. Approximately 400 million citizens in the informal economy in India (76.2% of total workers) are at deeper poverty risk as a result of the tragic influences of the virus. With half the world locked, 195 million full-time workers or 6.7

percent of working hours worldwide will be lost. A significant number of people work in low-paid, low-skilled positions with unexpected revenue losses (International LaborOrganization, 2020).

In rural India, seasonal labour migration is an all-encompassing reality. Millions of people move from countryside to commercial, urban as well as farming areas. In India major migration corridors in Maharashtra, Gujarat, Haryana, and Punjab are located from UP

and Bihar. Newer corridors are built from West Bengal, North East, and Odisha to Andhra Pradesh and Karnataka, from Tamil Nadu to Kerala, from MPs to Maharashtra & Gujarat as well as from Rajasthan to Gujarat. These immigrant workers are engaged in the brick kiln work (10 million), textile (11 million), domestic work (20 million), construction sector (40 million), mining, agriculture, and transportation (IIPS, 2001). 92.5% of employees missed 1 month of work during a lockdown. A study carried out between 27 March and 29 March by Jan Sahas (In North and Central India, 3196 migrant workers) demonstrates that 80% of

migrant workers were afraid of food being lost before lockouts end on 14 April and will not be returning to work afterward (Figure 1). The study found, that 55% of migrants earn a regular salary from ₹200 to ₹400, with 39% earning a minimum salary of ₹400 to ₹600. This is lower than the minimum salary. Just 4% of employees earn a minimum wage rate of approximately ₹600, which is similar. They operate in situations of exploitation are always indebted, and save tiny of themselves. Around 49.2% of those surveyed said they had no ration, and 39.4 percent said they have a ration to do so for around 2 weeks.

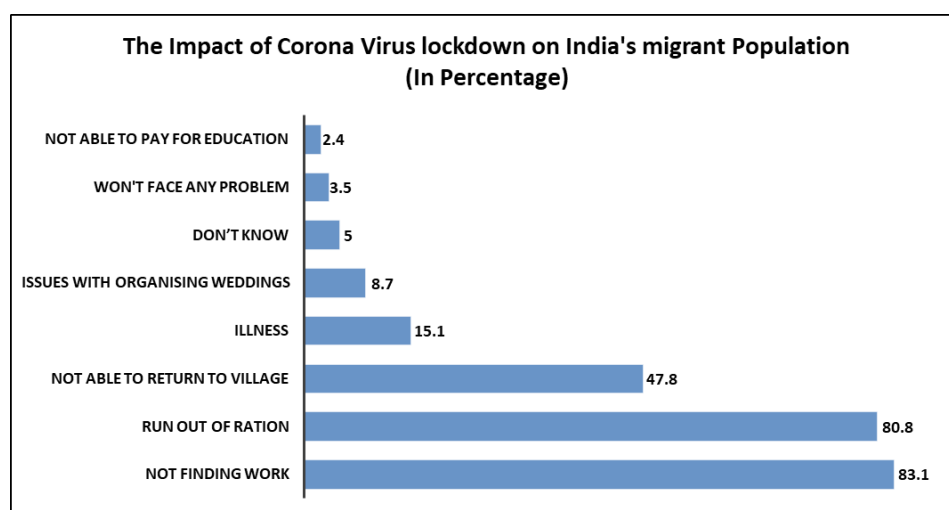


Fig. 1. COVID-19 impact on the population of migrants

In addition, the survey describes that approximately 99.2 percent of employees have “Aadhaar cards”, 86.7 percent have bank accounts, 61.7 percent have “ration cards” and 23.7 percent have BPL: “Below Poverty Line” cards. While an aid package of \$1,700 billion has been announced by the government, it will be difficult for most of them to benefit. These staff expected to obtain monthly assistance and financial support from the government (Jan Saahas Survey, 2020). The crisis saw such a floating migrant population on foot through the country's lock-in mass exodus. Their issues are largely due to job loss and the lack of a

social security network. Despite the government's promise, they kept returning to their homes. The disparities, poverty, and social isolation of marginalized people fail to cope with this unexpected outbreak.

The Supreme Court ordered a progress report from the Center on steps taken to avoid migratory workers' mass migration to their villages. Sudden jobs displaced by coronavirus would have far-reaching implications for the economy of India. Any of these employees could not back to work in the industrialized city of Gurugram, Mumbai & Surat. In their marginal farms or in the vicinity they may look for jobs. As

labour is not possible immediately after a lockdown, MSMEs and the agriculture sector will face the effects of behavioral changes forced by lock-downs. Unless handled correctly by legislation, global unemployment, inequality, exclusion, medium, and long-term disparities may also be exacerbated by the pandemic of the COVID-19 social crisis.

Implications on Capital Markets, Global Oil Market and its Impact on India:

Fears of coronavirus have shaken financial markets around the world. Indian capital markets envisage movements of funds into western equity markets due to rate cuts as well as the stock market falls across the world. According to the NSDL info, FDIs have withdrawn enormous amounts in India—₹247.76 billion in the stock exchange and ₹140.50 billion in the short 13-day period 1 to 13 March 2020, from debt markets. In the next 6 months, financial markets will be extremely volatile due to massive capital flows from one sector to another worldwide.

A historic fall in oil demand has decreased crude oil prices from US\$ 65 per barrel in January to 18 years below 22 USD per barrel in March. For all US \$5 a barrel of declining prices of crude oil has been estimated for India to save the US \$7 to US\$8 billion. Prices of crude oil will decline the Current Account Deficit in India by GDP 1.55 from 2019 to 2020 (Economic Survey, 2020). But India's capital flows will surpass the current-account deficit savings potential. The average INR to US dollar exchange rate was ₹ 70.4 per US dollar however, the mental obstacle to ₹75 per US dollar has already been stated. In the future, rupees (INR) could depreciate further, if Indian capital outflows persist.

Policy and Programme Implications:

Fiscal and Monetary Measures:

The outbreak of Coronavirus includes concerted efforts to deal with it in fiscal and monetary policy. Fiscal actions include payment of the pandemic health bill. Offering testing kits, gloves, medicines, quarantine wards, ICU beds, ventilators, personal protection equipment, masks, and other equipment will dramatically increase health care expenditure. In India, public health expenditure is 1.1% of GDP. In the current fiscal year, it is likely to rise. The State has announced a ₹1700 billion aid package to allow transfers of cash to the needy and disadvantaged parts of society. At least 2 percent of GDP can be reduced in tax receipts. Both of these fiscal policies will raise the fiscal deficit by 1–1.5%, currently 3.2% as economists forecast.

The crisis resulting from the spread of the coronavirus would reduce investment and demand for consumption. In the tradition, the market-based components of GDP are 72.1% consumed, of which only 11.9% are public consumption as shown in Table 2. The major risk to economic growth is an anxiety-led reluctance to spend. So as to raise demand, the government would have to raise expenditure. In order to improve investment, support must be given to various sectors. As part of a relaxed monetary policy, the Repo Rate was lowered by 75 basis points. The Federal Reserve had lowered its rate of interest by 1% point and agreed to retain it in the USA to 0-0.25%. Monetary policy is less efficient in the management of a pandemic as liquidity is not the only problem. The economic turmoil, as well as uncertainty of the future, minimize the feeling of investment. Frugality caused by anxiety between companies and stockholders reduces the appetite for investment.

Table 2. Consumption and Investment Demand in India

	2017-18 1st RE	2018-19 PE	2019-20 1st AE	Percentage Points Change in growth rate in 19-20 over 2018-19 (Increase (+)/Decrease (-))
Total Consumption	70.0	70.6	72.1	1.5
Government Consumption	11.0	11.2	11.9	0.7
Private Consumption	59.0	59.4	60.2	0.8
Gross Fixed Capital Formation	28.6	29.3	28.1	-1.2
Net Exports	-3.2	-3.9	-2.8	1.1
Exports of Goods and Services	18.8	19.7	18.4	-1.3
Imports of Goods and Services	22.0	23.6	21.2	-2.4

Source: National Statistical Office. Year 2020, Consumption and Investment Demand

Notes: RE- Revised estimates, PE -provisional estimates and AE-estimates.

Impact on Start-Ups and Micro, Small and Medium Enterprises (MSMEs)

“Micro, small, and medium Enterprises” with 114 million staff and 30% of GDP created more than 90 % of India's employment (Radhika Pandey, 2020) risks a serious cash shortage by extending the lockdown to eight weeks. Several of these MSMEs have loan commitments and EMIs payable on a monthly basis. Many may just vanish if the lockdown disturbs their cash cycles, and in such a case there are fixed costs. You need a loan repayment moratorium. RBI has made funding available to financial non-banking firms, some of which offer MSMEs finance. Furthermore, the flow of destructive goods is disrupted and thus the corporations are at immense losses. Without a thriving MSME market, India cannot have sustainable and real growth. The COVID-19 crisis would also test start-up resilience in India. Cross-border fundraising is the base for startups. Many other founders see their companies stopping. The receivable is spiraling and they have painful expenses to undertake control steps that must be taken in their undertakings.

The government must make funds available for the industry, as the global flows of capital could be confined to venture capital firms and supports for a little longer.

Economic Inequity and a Rethink on Developmental Paradigm for India

The survey on “Income Inequalities in India” by the OXFAM “Oxford Committee on Famine Relief” in 2019 produces some observations on the asymmetrical model of growth in India. In the survey, 73 percent of the wealth produced in the country accounted for the richest 1% of the population from 2017–2018. This group's wealth expanded by ₹20913 billion, comparable to the central government's budget in the same year. The richest 1% in the world possesses 953 million (below 70 percent of the population of the country) more than four times the income. In 2017-2018, the income of six hundred & seventy million Indians who make up the poorest half of the population increased by 1%. It is apparent that certain people in society have taken advantage of growth. High-income differences in this country illustrate why a significant proportion of the

population belonging to the living sector demands nothing more than food and shelter survival needs. A natural or pandemic economic shock drives back several into the subsistence industry. The COVID-19 pandemic has contributed to the country's leading growth. The fall of day-to-day salaries has forced much of the society to combat famine without an assistance measure is given to them.

DISCUSSION

A micro virus erodes riches, corrodes consumer trust, slows down investment and private consumption, disrupts employment, and distorted markets. The 2019–2020 Economic Study set out proposals to encourage network product exports, to incorporate “assemble in India for the world” into making India generate 40 million jobs by achieving the 5 trillion-strong economy by 2025. (“Economic Survey, 2020, p. 100”). The pandemic of COVID-19 compelled us to reconsider this strategy. Integration into chains of global supply also renders the country vulnerable to disruptions shocks in global supply. The study stated: “As no other country could match China in the wealth of its labour”, the space in labor-intensive industries must be emptied. The COVID-19 pandemic threatened the foundation of global manufacturing, as Chinese worker's migrant mobility was limited and action of output halted. Half of humanity is currently being locked, and the loss of revenue in Chinese businesses in the rest of the world would lead to layoffs, investment cuts, and a serious recession if the lockdown continues. A spike in product demand can increase prices when the virus is not contained, even when the world supply shock is present and the unemployment rate is high when stagflation is in effect. The Indian economy is largely safeguarded against these global upheavals because India's manufacturer is not active in global supply chains except in a few sectors.

Economists have projected different scenarios for the socio-economic effects of virus outbreaks and containment efforts through models of simulation. The first possibility is a viral containment by the end of May, and the third quarter saves the economy very rapidly. The second case is the spread of the virus to the population, which will take longer to control, and will not enable economic recovery until September. In the second case, basic goods will be a shortage, resulting in shocks to demand and inflation. A longer downtime would affect the supply of production companies and eliminate profits in the year. Healthcare costs will also rise and relief programmes should be increased. The third case is a 2nd or 3rd virus epidemic that happens during the year and all attempts to keep it safe. The third scenario is not regulated without the production of herd immunity or the inventing of a vaccine. If this does not happen, there will be a deep economic decline, high unemployment rates, major death losses, and millions of people forced into poverty.

Economists say that if the poor don't die of the corona, they'll be starving if the lockdown continues. There is a special framework in the Indian economy. 50% of households in Indian are still directly or indirectly dependent on agriculture. People are not entitled to unemployment benefits in the livelihood sector as the social safety net they are not included. They expect the administration to look after their food as well as a shelter during tough times. When basic requirements are taken care of, they can bounce back. In order not to suffer the poor and helpless, Government would have to make relief measures successful. Many philanthropists have established a private social security network as well.

However, several socio-economic and behavioral factors will rely upon employees after being lockdown back to farm and manufacturing houses. Labour can be hesitant

to return to other countries for jobs. They may choose to look for jobs in the vicinity or rely on marginal farms. The consequence is an industrial labour shortage. Industrial buildings and the construction industry will commence development by lifting a partial lockdown. Government and industry must put their faith in workers by ensuring that they are safe and economic to get them to work again. Returning the migrant workers to work will be a significant factor after the lock is removed, although if resistance is present, businesses are forced to work in a sub-optimal way, leading to a supply shock.

India must rethink its model for growth. Fair health and education access is an essential prerequisite for sustainable growth. A significant lesson learned by the pandemic of COVID-19 from policymakers in India is to improve the distribution of resources and reducing the disparity of incomes in the sectors. The COVID-19 has also taught a lesson that people are dependent on the agriculture sector in a crisis. India has a wide arable region however there are systemic problems in the agriculture sector. Even so, 50% of households still rely directly or indirectly on the agricultural sector. Enhanced aid to MSMEs, enhanced public health and training expenditure, and make the labour force a structured economic employee are some of the key milestones that the country has to act.

The pandemic of COVID-19 presented the opportunity to accelerate the labour reform process. Labour reforms would enable financial inclusion to raise incomes and minimize unemployment.

Social protection was primarily community centered in India before the advent of the modern state. In the village and in the town the society used to look after the aged, the needy, and the helpless. The sharing of food or food was an essential part of our culture and part of our everyday life as alms. Several charitable efforts were performed for the

community by people with wealth in the society. The State offered the funding at the time of the crisis however; the local philanthropists offered a great deal of support. Community-based social security services have been discontinued since the democratic state was formed. Measures of social security are divided. The time has come to offer all social security cards in the country with a unique identification number, and financial inclusion of 100%. This could be easily accomplished in India by the accessibility of advanced digital technology. Mass migration of migrant workers, reports about some of them dying as a result of miles of sunlight, and a lot of people still starving for days are some of the worst lockdown photographs. Duplication of relief activities without a structured social safety net and some of the facts that the pandemic brought on was without hitting the final mile where some of the population is left out.

It is time for every citizen of the country to build a strong national-sponsored social security net.

Conclusion

The overall spiraling COVID-19 pandemic has unpredictably and ambiguously skewed the prosperous global economy. But the current downturn seemed to vary dramatically mainly from previous recessions, that upset the world's economic order. Although the conglomerates, companies, nations, and multinationals fail to comprehend the significance of the outbreak, there is no question that it is time to plan for a future that is prosperous and structurally more feasible for working as well as the living.

Although the situation was unprecedented particularly during lock-down times, the economy has been seriously affected; the nation will be forced to take its lead in implementing fiscal measures. Security of

life and livelihoods is important according to the national government. After the workers are tested, economic activity should gradually begin. The industry must introduce strict preventive measures to protect the health of the employees. While policies and changes of government are needed to rescue the economy appropriately, communities, civil society, and Industry have an equal role in preserving balance. The principles of social isolation, the avoidance or cancellation of sets, and the usage of masks and sanitary devices ought to be a part of life before the virus can be eradicated. The economy conflicts with human social conduct at this moment, but it is not government alone that has responsibility for bringing back economic activity.

The demand shock and the collapse of the market were attributed to a supply shock and

the essence of the shutdown is unique for COVID-19. The economic recovery is dictated by the timing and scale of government aid and corporate debt and how businesses and markets cope with reduced demand. State help for the neediest (mainly established by unorganized industry, immigrants, as well as vulnerable populations) is a vital step towards saving many lives.

Each crisis, nevertheless, offers a unique opportunity for the growth of a human being, a culture, and a society to represent. In order for Indian economies to follow sustainable development models based on their autonomy and inclusive structures that are an environmental-friendly, the COVID 19 pandemic has a strong message.

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A REVIEW ON QUALITY CIRCLE AND ITS VALUE

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ABSTRACT

A Quality Circle is a management strategy for managing and improving an organization's overall quality. A Quality Circle's strength comes from the mutual trust that exists between managers and employees, which leads to a higher degree of mutual understanding. The goal of a Quality Circle is to foster positive relationships with employees so that they are more engaged and devoted to their work. Quality, productivity, and cost will all improve as a result. The Quality Circle concept is based on mutual respect, with no room for preconceptions or mistrust. A manager is the most qualified person to lead a small group. Employees that participate in Quality Circles can put all of their skills, knowledge, and creativity to use to improve their activities. They are able to turn difficult difficulties into possibilities with the solution they supply.

Keywords: *Quality, Mutual Trust, Positive Relationship, Productivity, Creativity*

Introduction

A group of workers known as a Quality Circle (QC) or Quality Control Circle. These workers perform the same or similar tasks. It is an employee work group that sets the meeting schedule and meets on a regular basis to discuss quality issues. In most cases, QC refers to a small group of people who work in the same area. This is due to the fact that individuals who perform similar tasks are familiar with the issues they face. The QC's size should not be too large so that certain members are unable to participate evocatively in its sessions. Normally, a QC with six to eight members is deemed ideal.

In the Quality Circles, employees are usually permitted to choose their own topics. Improvements in workplace health and safety, improvements in the workplace, and improvements in production processes and product design are all common topics that are ideal for debate in circles.

They meet on business time on a regular basis and are instructed by knowledgeable individuals (usually designated as facilitators). They offer their recommendations to management; workers then apply the solutions to improve the

organization's performance and motivate personnel.

When employees are eager to collaborate to explain and fix quality issues, they are more devoted and dedicated to their firm. This is the simplest way when dealing with smaller groups. It is essential for this that they join willingly in the quality circle and meet on a regular basis. It is vital that the members of the quality circle have a deep understanding of the subject and are qualified facilitators as well as people and employment relations professionals.

The notion of quality control was developed in the United States and spread to Japan in the 1950s. The principle of quality control allows Japanese enterprises to produce high-quality goods at affordable prices.

Professor Kaoru Ishikawa defined the term Quality Circles most succinctly in his 1988 manual, "Total Quality Control (TQC) is a word used to describe the process of ensuring The Japanese Way of Life "In 1960, the Japanese Union of Scientists and Engineers published a report that was widely distributed throughout Japanese industry.

Objectives Of The Study

1. To study the concept of Quality Circle.
2. To understand the features of Quality Circle
3. To examine the Quality Circle Tools
4. To evaluate the benefits of Quality Circles.

Research Methodology

This is undeniably a practical oriented paper, a combination of experience, practice and actual happenings at the work place. Hence author of this paper has endured an extensive study of literature and is rational with recent Quality Circle Processes. The main source of primary information is knowhow of industry and academia. The secondary data and basic primary pragmatic information has been collected from appropriate primary sources and farsightedly used to arrive at meaningful findings and prolific conclusion. Simple statistical tools, such as mean, average, tables etc., are used wherever necessary to right size and increase the trustworthiness of the information.

Significance Of The Study

Hence by virtue of this study, efforts are being made to understand the concept, benefits, features of Quality Circle. Quality management is concerned not only with the quality of a product or service, but also with the means of obtaining it. To achieve more consistent quality, quality management employs quality assurance and control of processes as well as products. To achieve product quality, management focuses on the establishment of Quality Circles within the business.

Statement Of The Problem

The dynamism and global competition has a lot more subsistence challenges with leadership tag. The innovative technology, management excellence, increased customer test and effective services in the changing environment are really great to get best results out of that. Hence it is necessary to maintain the quality culture in the organization and focuses on the continual improvement. Thus, looking to the societal need, researcher has made a sincere attempt, by virtue of this paper to focus on the quality circle importance and its benefits to the organization.

Literature Review; A Review On Quality Circle And Its Value

A QC is a assembly of workforces who share or have comparable job responsibilities. They meet on a regular basis to discuss various techniques to detecting and addressing problems related to their professions. These groups of people, mentioned to as a (QC) Cycle, are generally lesser (3-10) and lead by the supervisor.

Modest modifications to in what way work is done can be espoused by assembly accord, however larger complications approximately always demand presenting the answer to management teams.

History Of Quality Circles

QC were originated in the 1950s by W. Edwards Deming, who pioneered the concept. Toyota loved the concept and began implementing it in a number of ways across the company's manufacturing sites and other departments. Companies all across the world began to use this strategy, and by 1978, there were over a million circles in use, with 10 million people in Japan alone.

Quality Circles have fallen out of favour in many Western countries in recent decades, but they were a popular alternative in the year 2000. (1960s, 1970s, and 1980s). Some businesses are realising that Quality Circles may be effective again, especially when combined with other approaches such as Lean, Six Sigma, and others. QC was founded with the following goals in mind:

- An increase in the quality of the organization's products.
- Improvements in production procedures.
- Training and development of personnel who work in quality control.
- Increasing employee morale.
- Show humanity and create a positive work environment where people want to come to work.

Features Of Quality Circle

The following are the primary characteristics of QC:

1. Voluntary Groups:

QC is a self-organized group of employees that all work in the same department. There is no compulsion on employees to join QC from anywhere.

2. **Small Size:** The QC is generally lesser, with 6-8 members.

3. **Weekly Meetings:** QC assemblies are apprehended once a week for about an hour. Associates assemble in working hours, usually at the conclusion of the day, in coordination with the boss. Meeting times are usually arranged in advance in consultation with the manager and members.

4. **Agendas that are self-contained:** Each QC has its own agenda and terms of reference. As a result, each QC discusses its own problems and takes corrective measures.

5. Quality Focused:

By its own nature and goal, QC is solely concerned with quality issues. This is because the ultimate goal of QC is to increase product quality and service life.

A quality control circle is allowed to use any tools they desire to improve their roles. Some of these circles are more casual, with participants just talking and providing solutions to various professional difficulties. In this case, a simple notepad may be sufficient. While this is an excellent place to begin a quality control circle, it would be ideal if it evolved into something more official where more particular issues could be addressed.

When this occurs, some of the quality improvement tools listed below are routinely utilised to assist in identifying the root causes of problems and how to remedy them.

1. Flowcharts
2. Scatter Plots
3. Run Charts
4. Graphical Tools
5. Process Mapping Tools
6. Pareto Charts
7. Fishbone Diagrams

There are a lot of additional potential strategies that a group could apply depending on the specific difficulties that they are aiming to tackle. When equipped with the required tools, a quality control circle may more efficiently uncover issues and propose solutions, which is the primary goal of these groups.



QUALITY CIRCLE TOOLS

Quality Circles And Its Value



To ensure that things are truly having a positive influence in the workplace, quality circles must collect data and track their progress. When groups of people from one department get together and discuss solutions to difficulties, it might be tempting to try to get an agreement on how something should be done and then implement it right away.

This can cause a plethora of problems, but even if it does turn out to be a good answer, determining why it succeeded is difficult until data is collected. Before adopting a solution, the group should gather data on how things are currently working in order to establish a baseline.

By having all of the information available before making adjustments, the Quality Circle will be able to demonstrate exactly how much progress they have generated. This data will help to justify future process improvement activities and ensure that the corporation continues to support the concept of quality circles in the facility. Gathering this information may appear to take more time at first, but the work will be well worth it.

Benefits Of Quality Circles

In the QCs, there are no monetary incentives. However, there are numerous more benefits that primarily benefit the individual and, as a result, the business. These are the following:

- **Self-development:** QCs assist members in developing self-confidence, changing attitudes, and gaining a sense of accomplishment.
- **Social development:** The QC programme is a consultative and participatory programme in which all participants collaborate. This interaction helps to the growth of harmony.
- **Possibility of learning new knowledge:** QC members can gain new knowledge by sharing their thoughts, opinions, and experiences.
- **Leadership potential:** Because any member has the capacity to become a leader, each member is given the opportunity to develop his or her own leadership potential.
- **Improved communication skills:** Members' communication skills are improved through

joint problem solving and management presentations.

- **Job satisfaction:** QCs foster creativity by making use of an individual's underdeveloped intellectual potential. Individuals also engage in non-work-related activities, which increases their self-esteem and gives them with a high degree of job satisfaction.
- **A stress-free work environment:** QC's promotes a stress-free environment in which each employee loves, understands, and collaborates with others.
- **Organizational benefits:** When the individual benefits are combined, they have a synergistic effect, resulting in cost savings, waste reduction, enhanced quality, and greater productivity. All of these benefits are long-term and result in progress over time.

Findings

The Quality Circle is comprised of individuals who conduct similar duties. This, however, does not exclude the circle from talking with specialists or others. In reality, ideas and solutions can come from everywhere. In theory, quality circles are groups of workers who perform comparable work, but they can be made up of people from other positions as long as they operate in the same area and can identify common problems. The essential perception of the quality circle is that it should be a homogeneous and coherent unit working toward a single goal.

Conclusion

Quality circles have proven to be a blessing in disguise for firms in practise. Meetings may be held after a maintenance pause, a job transfer, or after the weekly work plan has been finished. Even in Japan (where this concept originated), meeting duration and frequency vary. It is advised that sessions last at least an hour and occur at least once a week. The circle members, on the other hand, should decide on the frequency and duration of each meeting, taking into account all parameters such as the severity of the problem, the urgency of the problem, the number of difficulties, and so on.

Quality circles have proven to be a blessing in disguise for firms in practise. Meetings may be held after a maintenance pause, a job transfer, or

after the weekly work plan has been finished. They might gather together at the start or end of the shift, or around lunchtime

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AWARENESS OF MATERNAL CARE AMONG REPRODUCTIVE WOMEN IN BARAMATI

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ABSTRACT

The main aim of this paper is to investigate awareness of maternal care among reproductive women in Baramati and to find factors which significantly affect the woman's maternal health during pregnancy. Data was collected through face-to-face interviews using questionnaire from 200 respondents. The findings are, on an average 72% of the reproductive women in Baramati are aware of maternal health care. Type of delivery may depend on the factors Mothers age, Living Area, Number of family members, Mothers age at marriage, Mothers sugar, Mothers weight, Pregnancy period till the delivery and Number of ANC visits. Baby's weight may depend on the Pregnancy period till the delivery. Number of ANC visits may depend on the Knowledge about danger sign of pregnancy. The study will further help the medical practitioners to improve upon the ways to aware the women regarding the Maternal Health care program undertaken by the Government of India.

Keywords: Maternal Health Care Service, ANC, Reproductive Women.

Introduction

The direct cause of the maternal deaths in India are due to the factors such as, excessive bleeding, infections, pregnancy induced hypertension, obstructed labor, and unsafe abortions. These factors arise in the delivery period due to lack of knowledge regarding the maternal health care programs for the reproductive women carried out in the hospitals.

Maternal mortality rate in India continues to be a National challenge despite of the various measures taken by the Indian government. Nonprofit organizations in and outside the country including the World Health Organization.

Women's health throughout pregnancy, delivery, and the postpartum period is referred to as maternal health. One of the most important aspects of promoting healthy motherhood is antenatal care. Antenatal care (ANC) is prenatal health care provided by a doctor or other health professional at a medical institution or at home. Minimum four antenatal checkups are needed for pregnant woman.

The objective of the study is to find out the awareness of the maternal care among reproductive women in Baramati and to investigate factors which affect the time of ANC visits, factors which affect the weight of delivered baby, and factors which affect the type of delivery.

Literature Review

Joanna Marie S.Alvaro & Ryan Michael F. Oducada (2015), carried out analysis and the study reveals that most of the respondents were highly aware of the Rural Health Unit (RHU) as a BEmONC facility and its services, most of them have utilized only the prenatal package also shows significant relationship between utilization of BEmONC services and employment status, income level, educational status, OB score, pregnancy status and awareness of services.

A.R.Johnson et.al (2015), carried out study which shows maximum awareness for maternal nutrition supplements under ICDS, the awareness of the schemes was significantly associated with education of mother, socio economic status of family, gestational age and parity index, awareness of schemes among antenatal mothers range from 0% to 83.6%.

W S Kingori et al. (2016), shows age, education, religion, marital status and employments have significant influence on awareness and level of education is the best predictor of awareness of maternal health systems initiatives, in the area of awareness of maternal health systems initiatives and FMS had the lowest awareness level.

Methods

Discussions were carried out with various gynecologists from Baramati to form the questionnaire. The questionnaire contains 55

questions. Two well-known hospitals from Baramati namely Rui Hospital and Silver Jubeli Hospital consider for the study. 200 married women of reproductive age who had at least one child or had delivered the last child within two years from the period of data collection (during Nov 2015 to Dec 2015) were interviewed.

Materials

The data entry was done on MS-Excel and the statistical analysis was carried out by using R Software. Chi square test of independence and Binary Logistic model are used for the statistical analysis.

Data Analysis

Table 1: Chi-Square tests for Delivery Type (See Appendix)

Source: Primary Data

Table 2: Chi-Square tests for ANC Visits

Selected Variables		ANC Visits			χ^2 Cal	p-Value
		≤ 2	3 to 6	> 6		
Living Area	Rural	28	33	93	0.112	0.946
	Urban	8	9	29		
Distance	< 10km	23	24	58	3.243	0.198
	≥ 10 km	13	18	63		
Knowledge about danger sign of pregnancy	Poor	17	16	21	16.021	0
	Better	19	26	101		

Source: Primary Data

Table 3: Chi-Square tests for Baby's weight

Selected Variables		Baby's Weight		χ^2 Cal	p-Value
		< 2.5	≥ 2.5		
Family Type	Joint	29	99	0.568	0.443
	Nuclear	13	59		
Mothers weight	< 45	13	44	0.157	0.692
	≥ 45	29	114		
Pregnancy Period	274-281	35	106	4.21	0.04
	<274 and >281	7	52		
New born baby's sex	Female	24	65	3.441	0.064
	Male	18	93		
Child Order	1	18	77	5.061	0.08
	2	21	72		
	3 and 4	5	5		
USE	≥ 3	20	70	0.147	0.701
	> 3	22	88		

Source: Primary Data

Table 4: Logistic Model by considering all the predictors: Type of delivery

Predictor	Coef	SE	Coef Z	P	Ratio	Lower	Upper
Constant	-19.543	9.462	-2.07	0.039**			
MOTHERS Age	0.3295	0.1322	2.49	0.013**	1.39	1.07	1.80
LIVING Area	1.5027	0.4603	3.26	0.001***	4.49	1.82	11.08
FAMILY Type	-0.4693	0.5624	-0.83	0.404	0.63	0.21	1.88
FAMILY Member	-0.1604	0.1158	-1.39	0.166	0.85	0.68	1.07
WORKING Status	0.0988	0.4677	0.21	0.833	1.10	0.44	2.76
FATHERS Age	-0.00481	0.08100	-0.06	0.953	1.00	0.85	1.17
MARRIAGE Age	-0.2602	0.1336	-1.95	0.052*	0.77	0.59	1.00
MOTHERS Age at Marriage	-0.3186	0.1394	-2.29	0.022**	0.73	0.55	0.96
MOTHERS Hb	-0.3128	0.1386	-2.26	0.024**	0.73	0.56	0.96
Mothers Sugar	-0.01686	0.01168	-1.44	0.149	0.98	0.96	1.01
Mothers Weight	0.07261	0.02162	3.36	0.001***	1.08	1.03	1.12
PREG. PER	0.06348	0.03315	1.91	0.056*	1.07	1.00	1.14
CHILD Order	0.2147	0.3304	0.65	0.516	1.24	0.65	2.37
BABY WEIGHT	0.3093	0.3489	0.89	0.375	1.36	0.69	2.70
ANC Visits	0.23345	0.06746	3.46	0.001***	1.26	1.11	1.44
USE	-0.0047	0.1422	-0.03	0.974	1.00	0.75	1.32
PLANNED Preg	0.3856	0.4568	0.84	0.399	1.47	0.60	3.60
VACCINAT	0.2685	0.4743	0.57	0.571	1.31	0.52	3.31
KNOWLEDG Abt	-0.4598	0.4731	-0.97	0.331	0.63	0.25	1.60
Danger Sign Of Pregnancy							

Log-Likelihood = -97.337

Test that all slopes are zero: G = 63.989, DF = 20,

P-Value = 0.000

(ANC: Antenatal care *** (p<0.01) Highly Significant, ** (p<0.05) = Moderately Significant, * (p<0.1) = Significant)

Source: Primary Data

Table 5: The Logistic Model is: Type of Delivery

= -19.543 + 0.3295 * Mothers Age + 1.5027 * Living Area - 0.4693 * Family Type - 0.1604 * Family Members + 0.0988 * Working Status - 0.00481 * Fathers Age - 0.2602 * Marriage age - 0.3186 * Mothers age at marriage - 0.3128 * Mothers Hb - 0.01686 * Mothers Sugar + 0.07261 * Mothers Weight + 0.06348 * Pregnancy Period + 0.2147 * Child order + 0.3093 * Baby's Weight + 0.23345 * ANC Visits - 0.0047 * USE + 0.3856 * Planned Pregnancy + 0.2685 * Vaccination - 0.4598 * Knowledge about danger sign pregnancy.

Source: Primary Data

Table 6: Logistic Model by Considering the Significant Predictors from Model I: Type of Delivery

Predictor	Coef	SE	Coef Z	P	Ratio	Lower	Upper
Constant	-18.478	9.253	-2.00	0.046**			
MOTHERS Age	0.3133	0.1302	2.41	0.016**	1.37	1.06	1.77
LIVING Area	1.6867	0.4442	3.80	0.000***	5.40	2.26	12.90
FATHERS Age	-0.02154	0.08067	-0.27	0.789	0.98	0.84	1.15
MARRIAGE Age	-0.2218	0.1287	-1.72	0.085*	0.80	0.62	1.03
MOTHERS Age at marriage	-0.2958	.1359	-2.18	0.030**	0.74	0.57	0.97
MOTHERS Hb	-0.3043	0.1370	-2.22	0.026**	0.74	0.56	0.96
Mothers Sugar	-0.01484	0.01155	-1.28	0.199	0.99	0.96	1.01
Mothers Weight	0.07125	0.02138	3.33	0.001***	1.07	1.03	1.12
Pregnancy Per	0.05644	0.03214	1.76	0.079*	1.06	0.99	1.13
Child order	0.1622	0.3171	0.51	0.609	1.18	0.63	2.19
Baby's Weight	0.3083	0.3472	0.89	0.375	1.36	0.69	2.69
ANC Visits	0.22792	0.06665	3.42	0.001***	1.26	1.10	1.43
USE	-0.0250	0.1398	-0.18	0.858	0.98	0.74	1.28
Planned Preg	0.4860	0.4439	1.09	0.274	1.63	0.68	3.88
Vaccination	0.2347	0.4594	0.51	0.609	1.26	0.51	3.11
Knowledge Abt	-0.4912	0.4648	-1.06	0.291	0.61	0.25	1.52
Danger Sign of Preg							

Log-Likelihood = -98.472

Test that all slopes are zero: G = 61.720, DF = 17, P-Value = 0.000

*** (p<0.01) Highly Significant, ** (p<0.05) = Moderately Significant, * (p<0.1) = Significant

Source: Primary Data

Table 7: Descriptors of the Logistic Model

Type of Delivery = -18.478 + 0.3133 * Mothers Age + 1.6867 * Living Area - 0.02154 * Fathers Age - 0.2218 * Marriage Age - 0.2958 * Mothers age at marriage - 0.3043 * Mothers Hb - 0.01484 * Mothers Sugar + 0.07125 * Mothers Weight + 0.05644 * Pregnancy Period + 0.1622 * Child order + 0.3083 * Baby's Weight + 0.22792 * ANC Visits - 0.0250 * USE + 0.4860 * Planned Pregnancy + 0.2347 * Vaccination - 0.4912 * Knowledge about danger sign pregnancy.

Source: Primary Data

Table 8: Logistic Model by considering the significant predictors from model II: Type of delivery

Odds	95% CI						
Predictor	Coef	SE Coef	Z	P	Ratio	Lower	Upper
Constant	-20.047	8.851	-2.26	0.024**			
MOTHERS	0.2939	0.1129	2.60	0.009***	1.34	1.08	1.67
LIVING A	1.6126	0.4249	3.80	0.000***	5.02	2.18	11.53
MARRIAGE	-0.1914	0.1178	-1.63	0.104*	0.83	0.66	1.04
MOTHERS	-0.2748	0.1247	-2.20	0.028**	0.76	0.59	0.97
MOTHERS	-0.3271	0.1356	-2.41	0.016**	0.72	0.55	0.94
Mothers	0.06881	0.02028	3.39	0.001***	1.07	1.03	1.11
PREG. PER	0.05820	0.03106	1.87	0.061*	1.06	1.00	1.13
BABY WEI	0.2822	0.3387	0.83	0.405	1.33	0.68	2.58
ANTENATA	0.23223	0.06336	3.67	0.000***	1.26	1.11	1.43
VACCINAT	0.0789	0.4420	0.18	0.858	1.08	0.45	2.57
KNOWLEDG	-0.4785	0.4438	-1.08	0.281	0.62	0.26	1.48

Log-Likelihood = -99.995
Test that all slopes are zero: G = 58.674, DF = 12, P-Value = 0.000

*** (p<0.01) Highly Significant, ** (p<0.05) = Moderately Significant, * (p<0.1) = Significant

Source: Primary Data

Table 9: Descriptors of the Logistic Model

Type of Delivery = -20.047 + 0.2939 * Mothers Age + 1.6126 * Living Area -0.1914 * Marriage Age -0.2748 * Mothers age at marriage -0.3271 * Mothers Hb + 0.06881 * Mothers Weight + 0.05820 * Pregnancy Period + 0.2822 * Baby's Weight + 0.23223 * ANC Visits + 0.0789 * Vaccination - 0.4785 * Knowledge about danger sign of pregnancy.

Source: Primary Data

Table 10: Logistic Model by considering the significant predictors from model III: Type of delivery

Odds	95% CI						
Predictor	Coef	SE Coef	Z	P	Ratio	Lower	Upper
Constant	-18.442	8.695	-2.12	0.034**			
Mothers Age	0.3019	0.1094	2.76	0.006***	1.35	1.09	1.66
Living Area	1.6347	0.4168	3.92	0.000***	5.13	2.27	11.61
Marriage Age	-0.2105	0.1134	-1.86	0.064*	0.81	0.65	1.01
Mothers Age at marriage	-0.2979	0.1193	-2.50	0.013**	0.74	0.59	0.94
Mothers Hb	-0.3264	0.1353	-2.41	0.016**	0.72	0.55	0.94
MothersWeight	0.06592	0.01990	3.31	0.001***	1.07	1.03	1.11
Pregnancy Per	0.05623	0.03050	1.84	0.065*	1.06	1.00	1.12
ANC Visits	0.22303	0.06135	3.64	0.000***	1.25	1.11	1.42

Log-Likelihood = -100.914
Test that all slopes are zero: G = 56.836, DF = 8, P-Value = 0.000

*** (p<0.01) Highly Significant, ** (p<0.05) = Moderately Significant, * (p<0.1) = Significant

Source: Primary Data

Table 11: Descriptors of the Logistic Model

Type of Delivery = -18.442 + 0.3019 * Mothers Age + 1.6347 * Living Area -0.2105 * Marriage Age -0.2979 * Mothers age at marriage -0.3264 * Mothers Hb + 0.06592 * Mothers Weight + 0.05644 * Pregnancy Period + 0.22303 * ANC Visits

Source: Primary Data

Table 12: Logistic Model by considering all the predictors: Baby's Weight
According to WHO new born baby is healthy if its weight is greater than 2.5, so we have categorized the baby's weight as less than 2.5 kg and more than 2.5 kg.

Odds	95% CI						
Predictor	Coef	SE Coef	Z	P	Ratio	Lower	Upper
Constant	-15.950	7.769	-2.05	0.040**			
Mothers Age	-0.0326	0.1169	-0.28	0.781	0.97	0.77	1.22
Living Area	-0.2464	0.4863	-0.51	0.612	0.78	0.30	2.03
Family Type	1.2184	0.5980	2.04	0.042**	3.38	1.05	10.92
Family members	0.1684	0.1169	1.44	0.150	1.18	0.94	1.49
Working Type	0.4759	0.5028	0.95	0.344	1.61	0.60	4.31
Marriage Age	0.0912	0.1244	0.73	0.464	1.10	0.86	1.40
Mothers age at marriage	-0.0273	0.1305	-0.21	0.834	0.97	0.75	1.26
Mothers Hb	0.1164	0.1390	0.84	0.402	1.12	0.86	1.48
MothersSugar	0.00201	0.01160	-0.17	0.862	1.00	0.98	1.02
MothersWeight	0.04725	0.02349	2.01	0.044**	1.05	1.00	1.10
Pregnancy per	0.05360	0.02530	2.12	0.034**	1.06	1.00	1.11
Child order	0.6241	0.3340	1.87	0.062*	0.54	0.28	1.03
New born baby's sex	0.8993	0.4113	2.18	0.029**	2.46	1.10	5.50
ANC visits	0.10317	0.06701	1.54	0.124	1.11	0.97	1.26
Health problems	-0.6896	0.5694	-1.21	0.226	0.50	0.16	1.53
USE	-0.3484	0.1573	-2.22	0.027**	0.71	0.52	0.96
ABNORMAL	-0.0868	0.5505	-0.16	0.875	0.92	0.31	2.70

Log-Likelihood = -89.513
Test that all slopes are zero: G = 26.557, DF = 17, P-Value = 0.065

*** (p<0.01) Highly Significant, ** (p<0.05) = Moderately Significant, * (p<0.1) = Significant

Source: Primary Data

Table 13: Descriptors of the Logistic Model

Baby's Weight = -15.950 -0.0326 * Mothers Age -0.2464 * Living Area + 1.2184 * Family Type + 0.1684 * Family Members + 0.4759 * Working Status + 0.0912 * Marriage age -0.0273 * Mothers age at marriage -0.1164 * Mothers Hb -0.00201 * Mothers Sugar + 0.04725 * Mothers Weight + 0.05360 * Pregnancy Period -0.6241 * Child order + 0.8993 * New born baby's sex + 0.10317 * ANC Visits - 0.6896 * Health problem -0.3484 * USE -0.0868 * Abnormality

Source: Primary Data

Table 14: Logistic Model by considering the significant predictors from model V: Baby's Weight

Odds	95% CI						
Predictor	Coef	SE Coef	Z	P	Ratio	Lower	Upper
Constant	-11.152	6.183	-1.80	0.071*			
Family Type	0.4154	0.3948	1.05	0.293	1.51	0.70	3.28
Mothersweight	0.03893	0.02131	1.83	0.068*	1.04	1.00	1.08
Pregnancy pe	0.04295	0.02207	1.95	0.052*	1.04	1.00	1.09
Child order	-0.3960	0.2750	-1.44	0.150	0.67	0.39	1.15
New born baby sex	0.9188	0.3852	2.39	0.017**	2.51	1.18	5.33
USE	-0.3060	0.1380	-2.22	0.027**	0.74	0.56	0.97

Log-Likelihood = -95.407
Test that all slopes are zero: G = 14.769, DF = 6, P-Value = 0.022

*** (p<0.01) Highly Significant, ** (p<0.05) = Moderately Significant, * (p<0.1) = Significant

Source: Primary Data

Table 15: Descriptors of the Logistic Model

Baby's Weight = -11.152 + 0.4154 * Family Type + 0.03893 * Mothers weight + 0.04295 * Pregnancy Period -0.3960 * Child order + 0.9188 * New born baby's sex -0.3060 * USE

Source: Primary Data

Table 16: Logistic Model by considering the significant predictors from model VI: Baby's Weight

Predictor	Coef	SE Coef	Z	P	Ratio	Lower	Upper
Constant	-10.232	6.098	-1.68	0.093*			
Mothersweight	0.03695	0.02064	1.79	0.073*	1.04	1.00	1.08
Pregnancy pe	0.03746	0.02163	1.73	0.083*	1.04	1.00	1.08
New born baby sex	0.9050	0.3812	2.37	0.018**	2.47	1.17	5.22
USE	-0.2586	0.1339	-1.93	0.053*	0.77	0.59	1.00

Log-Likelihood = -96.868
Test that all slopes are zero: G = 11.846, DF = 4, P-Value = 0.019

*** (p<0.01) Highly Significant, ** (p<0.05) = Moderately Significant, * (p<0.1) = Significant

Source: Primary Data

Table 17: Descriptors of the Logistic Model

Baby's Weight = -10.232 + 0.03695 * Mothers weight + 0.03746 * Pregnancy Period + 0.9050 * New born baby's sex -0.2586 * USE

Discussion

1. Type of delivery may depend on the factors such as Mothers age, Living Area, Number of family members, Mothers age at marriage, Mothers sugar Mothers weight, Pregnancy period till the delivery, Number of ANC visits and Health problems whereas
2. New born baby's weight may depend on pregnancy period till the delivery.
3. Number of ANC visits may depend on Knowledge about danger sign of pregnancy.
4. Binary Logistic Model is developed with response as type of delivery using predictors Mothers Age, Living Area, Marriage age, Mothers age at

marriage, Mothers Hb, Mothers Weight, Pregnancy Period and ANC Visits.

5. Binary Logistic Model is developed with response as weight of the new born baby using the predictors such as Mothers Weight, Pregnancy Period, New born baby's sex and USE.

Conclusion

The main aim of this paper is to investigate awareness of maternal care among reproductive women in Baramati and to find factors which significantly affect the woman's maternal health during pregnancy. Data was collected through face-to-face interviews using questionnaire from 200 respondents. The findings are, on an average

72% of the reproductive women in Baramati are aware of maternal health care. Type of delivery may depend on the factors Mothers age, Living Area, Number of family members, Mothers age at marriage, Mothers sugar, Mothers weight, Pregnancy period till the delivery and Number of ANC visits. Baby's weight may depend on the Pregnancy period till the delivery. Number of ANC visits may depend on the Knowledge about danger sign of pregnancy. The study will further help the medical practitioners to improve upon the ways to aware the women regarding the Maternal Health care program undertaken by the Government of India.

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A STUDY ON CRYPTOGRAPHIC HASH FUNCTIONS IN BLOCKCHAIN AND CRYPTOCURRENCY

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ABSTRACT

Hash functions is one of crucial part of cryptography that ensures integrity and authenticity of data. Cryptographic hash functions are extensively used in blockchain for verifying the legitimacy of transactions and building un-tampered chain of blocks. Crypto-currency is the new currency for this digital world. Bitcoin, Monero, XCurrency, Litecoin, Ethereum etc are few of the crypto-currencies that are being used for digital or electronic trade and transactions. Each transaction is treated as a block and these blocks are cumulated in a block chain. Block chains use hash functions extensively to verify the newly created block before making actual transactions. This paper discusses the basic structure of Merkle Tree to store blocks in blockchain and comparative study of few popular hash functions to implement authenticity and proof of work. It also focuses on the process of verifying a block and a transaction.

Keywords: Proof-of-work, hash function, cryptocurrencies, performance, Merkle Tree, block chain, Bitcoin

Introduction

The rapid development of digitalization in the sectors all over the world led to formidable rise in sensitive data. However, if this sensitive data is exposed to wrong hands, it can lead to leakage of data, misuse of data which in turn hampers the confidentiality of data. Cryptographic encryption techniques have emerged as propitious alternative to secure such huge amount of delicate data. It is technique used to transmit the sensitive data securely to intended receiver in presence of adversaries over the internet. It prevents the leakage of data from unauthorized access and achieve information securities in terms of data integrity, data confidentiality, data authentication and non-repudiation. Cryptography can be implemented using encryption techniques. Encryption is process of converting plain or readable text to unreadable or cipher text. Cryptographic encryption algorithms are broadly classified into 3 categories- symmetric (Private/Secret key) encryption algorithms, asymmetric (Public key) encryption algorithms and hash functions.

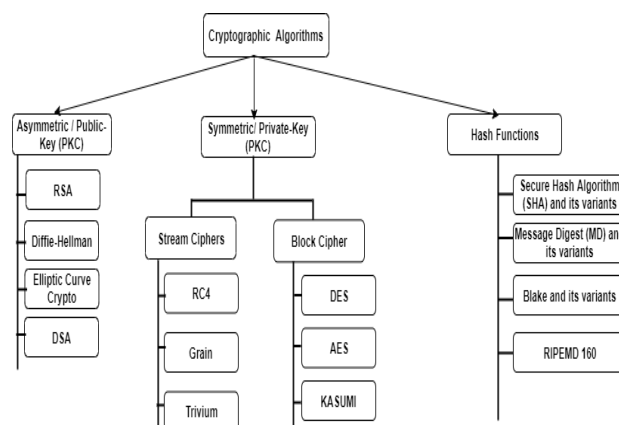


Figure 1: Taxonomy of Cryptographic Algorithms

A Symmetric algorithm is type of encryption algorithm which uses same key for encoding and decoding data. Whereas, an asymmetric algorithm is type of encryption algorithm which uses different keys for encoding and decoding the data. Both symmetric and asymmetric algorithms safeguard the data from invalid user and thus provide data privacy by transforming plain or readable data (encryption) and again back converting unreadable or cipher text (decryption). Hash functions are one of the most extensively-used cryptographic algorithms in blockchain technology that are designed to protect integrity of data. Hash functions provides data integrity by ensuring that correct data is received by receiver and is not altered in middle way during transmission.

Blockchain is defined as distributed ledger of growing chain of immutable data blocks which

is linked and secured using cryptography. In blockchain, cryptography plays a vital role to protect user privacy and ensure consistency and immutability of transaction data etc. [1]. At the fundamental core of Blockchain, asymmetric/public encryption algorithms and Hash algorithms are implemented. Blockchain uses public key cryptography in form of digital signatures that uses pair of private-public keys to sign and verify the transaction data respectively. Hash functions are responsible for secure binding of data blocks to one another so as to maintain the integrity of the data stored inside each block.

Hash functions own several features that prove to be useful to perform various blockchain operations. Blockchain widely make use of crypto hash functions to assure data consistency, data immutability, data integrity in turn led to overall enhanced security.

This paper aims to explore the performance of few popular Proof-of-Work based hash functions used in blockchain like SHA-256, Ethash, Equihash, Keccak, Scrypt, X11, Cryptonight, Blake256, X11 etc.

Figure. 1 shows the Euler diagram which depicts the several hash functions that exists in Proof of Work at a glance.

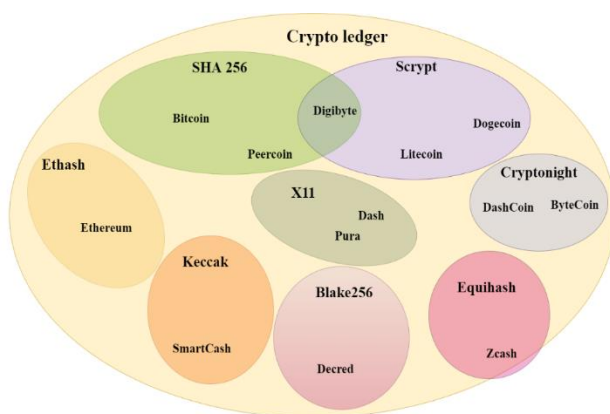


Figure 1: Few popular POW based hash functions

We compared and analysed the performance of these hash functions using hash rate, block time or confirmation time used for hashing the block in blockchain. Also, through our study we tried to find out which is better hash function in terms of its performance and speed.

The remaining part of the paper is structured as follows:

Section 2 defines study methodology with the term Cryptographic Hash functions and the related properties. Section 3 explains the terms involved in evaluating performance of hash functions. Section 4 presents the previous work done on hash functions in blockchain. Section 5 describes various cryptographic hash functions that exists in Proof of Work. Section 6 compares all the cryptographic hash functions discussed in section 3, based on their performance. Section 7 concludes the paper and section 8 discusses about the future work.

Cryptographic Hash Functions

Cryptographic Hash functions are functions that uses message of arbitrary or random length and produces fixed length output called hash-value, hash-code, digest or simply hash [2]. If this message or data is changed after calculating its corresponding hash value, then this hash value or digest will no longer remain valid. Thus, Cryptographic hash functions provide a mean to assure message integrity and message authentication too.

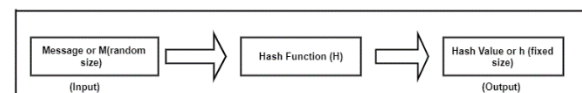


Figure 2: Simplified Hash Function

Here, hash Function H takes random length message M to produce fixed length hash value h as output. It can be symbolically represented as $h=H(M)$. A well-designed hash function must possess the following properties [3]:

1. Efficiency- It should be computationally easy to calculate and verify hash value on given message.
2. Collision Resistance- Ideally it should be computationally not possible to have two different messages colliding to same hash value.
3. Pre-image Resistance- For given message digest y , it is difficult to find a message M such that $H(M) = y$ i.e. There should be only one hash value for one message (using any given hash function each time).

4. Second Pre-image Resistance- For given message M and its digest $H(M)$, it is difficult to find another M' such that $H(M) = H(M')$ i.e. It should not be possible to generate or even assume the original message from the given hash value.

5. Randomness- The final output of hash function should be totally random. There should be no relation of any output with previous or next output.

Hash Functions are also called one-way encryption algorithms which means once the original message is converted to hash value, there is no way to recover that data.

Few more terms involved in performance of hash functions, such as:

a. Hash rate- Hash power or hash rate indicates the number of hash values calculated per second. Hash rate is usually expressed as hashes per sec (h/s). Hash rate of hash function in blockchain depends on type of hash algorithm used, mining device or rig and difficulty level.

b. Block Time or Latency- The time required to generate new block in the chain is called Block time. In simple words, it is time between submission and first confirmation of transaction in the blockchain.

Proof of Work

Proof- of-work is the original and most popular consensus algorithm used in blockchain technology that is used for many popular cryptocurrencies. In proof-of-work, group of people (called miners) uses computational power and nonce (number used only once) to solve difficult mathematical problem which validate and confirm transaction records inside each block in network.

While making any transaction, the transaction block is prefixed with 'n' number of zeros. This string of zeros is called "challenge string". This pre-padding makes task of miners more complex. The miner recalculates the hash on the block, verifies it against the received hash and if it matches then new transaction is converted into block and added to the block chain. Before completion of this verification process, the miner may need to reassume the challenge string again and again, until precise requirements are contented. This process of verifying challenge string before adding block to block-chain, is called proof-of work [4].

Following are two basic two terms are involved in proof of work:

a. Nonce: The nonce is 32-bit number which varies input to hash function. It is part of block header which is manipulated to meet the hash criteria. It is one of inputs given to hash function.

b. Target value or Difficulty level: It is number that determines how long it takes miners to add new validated block of transactions to blockchain. The difficulty value is adjusted after every 2016 blocks to ensure blocks of transactions are added to blockchain at regular intervals.

In proof of work, for each iteration nonce is incremented to get the output hash value with predefined leading zero bits. The exponential to the number of zeros in correct hash indicates average work performed for a particular block. Once the output hashed value is less the target difficulty level, the transactions within block are verified and are added to new block wherein new block gets added to end of longest chain in blockchain. This denotes that Proof of Work needs a high level of computation on the verification process.

Proof-of-work is extensively used for crypto mining. Crypto mining is the process of introducing new cryptocurrencies by verifying and adding the transactions between the users to a global public ledger of the blockchain. In crypto-currencies, an array of inputs and an array of outputs form a transaction. This entire transaction is hashed using a specific hash function for that crypto-currency. The hash output of each transaction is used as transaction ID in each subsequent step [5]. The security of crypto mining depends on the hash rate. The hash rate is the sum of all the processing power utilised to mine and process transactions in a proof-of-work chain. The higher the network's hashing (computing) power, the more secure and resistant a coin will be to attacks.

Literature Review

This section covers the literature review of papers which have been already published on cryptographic hash functions.

Table1 summarize the literature review for the given context.

Sr. No	Author name	Architecture/Hash function/Performance criteria used for Hash functions been covered	Specification
1.	B. Seok , J. Park, J.H. Park. A[6]	A Lightweight Hash-Based Blockchain Architecture for Industrial IoT	For Industrial IoT, the author proposed a lightweight hash-based blockchain architecture. QUARK, PHOTON, and SPONGENT were compared in the suggested architecture based on hash function security and performance. The top ten hash functions for blockchain-based currency are also presented in this study.
2	Kuznetsov, Alexandr Shekhanin, Kyryl Kolhatin, Andrii Kovalchuk, Diana Babenko, Vitalina Perevozova, Iryna[7]	Performance of Hash Algorithms on GPUs for Use in Blockchain	On GPUs, the author compared the performance of various cryptographic hash functions. The cryptographic hash function is chosen depending on its ability to work well on a variety of devices.
3.	Kuznetsov, Alexandr Oleshko, Inna Tymchenko, Vladyslav Lisitsky, Konstantin Rodinko, Mariia Kolhatin, Andrii[8]	Performance Analysis of Cryptographic Hash Functions Suitable for Use in Blockchain	The author analyzed 80 distinct algorithms, including both internationally accepted hash functions and lesser-known specialized algorithms, using hash rates computed on a variety of processing platforms, including desktop PCs and GPUs.
4.	Kuznetsov, Alexandr, Maria Lutsenko, Kateryna Kuznetsova, Olena Martyniuk, Vitalina Babenko, and Iryna Perevozova[9]	Statistical Testing of Hash Algorithms in Blockchain	To analyze statistical security criteria of different hash functions, the author used 15 statistical tests from the NIST STS statistical test suite, which is approved by the National Institute of Standards and Technology in the United States. This research shows that the hashing technique RIPEMD160 has low statistical security values, and that hash functions like DJB-2, DJB-2 XOR, and LOSELOSE are not suitable for usage in cryptographic applications.
5	Wang, Maoning, Meijiao Duan, and Jianming Zhu[10]	Security criteria of Hash function based on hiding and puzzle-friendliness	Author compared hash functions based on two security parameters-hiding and puzzle friendliness. The study proves that hash functions which ensures both hiding and puzzle-friendliness is more difficult to defeat or crack and most suitable for application in blockchain.

5. Blocks in Blockchain and use of Hash Functions

Block Chain is the base for Crypto-currency. As the name suggests, in block chain, a new transaction is added as a new block into the chain of previous blocks. Every time a transaction is verified, its hash is generated and stored for future reference and verification by miners [11]. The block consists of many entries including block header, and Merkle Tree (also known as Hash Tree). The block header contains hash of previous block, timestamp of block creation, difficulty level of block hash computation, nonce etc [12].

Merkle Tree are binary trees that store the hashes of data block in a specific manner so that verifier need not take all previous blocks of chain to verify the newly inserted block or transaction in the sequence. At the last level of the tree, which is at leaf level, hash of specific block is stored. Each parent node of Merkle Tree stores hashes of both of its children nodes, in concatenated fashion. The root of the tree stores hashes in the similar manner as all other parent nodes. This concept can easily be shown with following Figure 2:

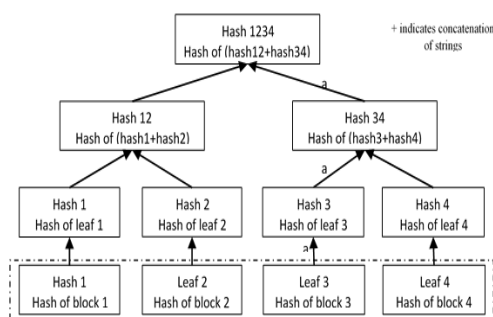


Figure 3: Design of Binary Merkle Tree (Hash tree)

Because the Merkle Trees are binary trees, therefore they are always expected to contain leaf nodes in even number. Leaf nodes represent individual transactions. So, there may be cases when number of transactions is odd, and a node has only one child instead of two for storing concatenated hash. In that situation, the last leaf node will be duplicated once, so that last hash is also duplicated. The structure of Merkle Tree helps in reducing time, effort and cost of verifying a transaction significantly [4]. For example, to check block 3, all nodes that are there with the path labelled as 'a', need to be verified only, complete tree with all existing blocks need not be verified and retrieved.

As its name suggests, Blockchain is a list of blocks that are linked to each other with help of cryptographic validation lock called hash function. This hash function is responsible for generating hash value for each new transaction. Each block includes the hash value of the previous block to ensure that transactions on the blockchain are processed in the correct order. Finally, the hash of the preceding block results in a sequence of blocks to form an immutable data structure. The integrity of transactions can be assured by storing the hash of the previous block in the current block. If the transactions in a block are altered, the hash value in the following block will be invalidated, which will have an impact on all subsequent blocks on the blockchain. [12]. Thus, the hash value is of extreme importance in blockchain technology, as it provides methods for verifying transaction detail without considering all previous transactions into account [13].

Apart from this, there are various other operations performed by hash functions in blockchain which are as follows:

- i. It is used for mining the coins by solving cryptographic puzzle in the proof of work.
- ii. Used for verifying and confirming transaction in blocks (in the Merkle tree).
- iii. Digital signatures internally use hash function to check authenticity of transaction.
- iv. Bitcoin uses hash functions like SHA-256 and RIPEMD 160 for its address generation [14].

In this section, we analysed and compared different hash functions under proof-of-work.

1. SHA256

SHA stands for Secure Hash Algorithm. SHA256 is a member of SHA-2 family. SHA256 is hashing algorithm developed by National Security Agency (NSA) in the USA. SHA256 is core part used of bitcoin blockchain. In bitcoin, SHA-256 hashing algorithm is used for confirming transactions via Proof of Work consensus mechanism and for creation of Bitcoin addresses [15]. Bitcoin (BTC), Bitcoin Cash (BCH), and Bitcoin SV (BSV) are three well-known coins that uses SHA-256 hashing algorithm [16].

2. Cryptonight

Cryptonight is a memory-hard hash algorithm that use the Keccak hashing function and employs a scratchpad to perform a series of random reads and writes. The desired hash is obtained by hashing the entire scratchpad after performing a number of read and write operations on it. Cryptonight is resistant to ASICs since it generates hash values solely from scratchpad memory. Cryptonight's hash rate is hashes per second. Cryptonight also presents the concept of "equalitarian proof of work," [17] which allows everyone to participate in the mining process using any modern CPU or GPU. Cryptocurrencies mined using cryptonight algorithm are Monero (XMR), Bytecoin (BCN), Boolberry (BBR), Dashcoin (DSH), DigitalNote (XDN), DarkNetCoin (DNC), FantomCoin (FCN), Pebblecoin (XPB), Quazarcoin (QCN) etc [18].

3. Scrypt

Scrypt is a password-based key-derivation hash function that requires lot of memory compared to other key -derivation functions making it difficult to perform using FPGA and ASIC enabled custom Hardware. Scrypt uses Salsa20/8 Core [19] as its internal hash function. It uses large vectors of pseudorandom strings that are produced from the last block and accessed in a pseudorandom order to output the derived key [20]. Hash rate of Scrypt is expressed in kilo hashes per second (KH/s), which translates to one thousand hash computations per second. Popular Cryptocurrencies mined using Scrypt algorithm are Litecoin (LTC), Dogecoin (DOGE) Einsteinium (EMC2) Syscoin – SYS, Monacoin - MONA etc [21].

4. Ethash

Ethash is ASIC resistant proof-of-work hash function used in Ethereum blockchain. It was originally called as Dagger-Hashimoto algorithm because of its utilization of two

different algorithms: Dagger and Hashimoto [22]. At its core, it also employs the keccak hash function. Dagger Hashimoto was used in Ethash to provide ASIC resistance by being IO-bound while also achieving memory-hard computations and memory-easy validations. Ethash represents the scratch pad with a 1 GB custom-generated direct acyclic graph (DAG) dataset that is re-generated every 30,000 blocks. The DAG dataset is a two-dimensional array of 4-byte unsigned integer values that allows miners to run memory-intensive calculations on the scratch pad. Mega-hashes per second (MH/s) are used to measure the hash rate of the Ethash algorithm. The cryptocurrencies that are mined using this algorithm are: Ethereum, Ethereum Classic, KodakCoin, Ubiq etc [23].

5. Equihash

Equihash (also known as ZCash) is a memory-bound POW algorithm. This approach is based on a generalisation of the birthday problem [24], which finds hash values that are clashing. It's also known as an ASIC-resistant proof of work algorithm because it computes hash values entirely in RAM. As a result, the quality of memory used by the required hardware determines the mining process. Hash rate of Equihash algorithm is measured in hashes per second. The key advantage of Equihash is that it makes decentralised mining easier. Zcash, Zcoin, Zclassic, Bitcoin Gold, Komodo, ZenCash, and others [25] are among the cryptocurrencies mined with this algorithm.

6. X11 Algorithm

X11 algorithm is called chained POW because it it employs 11 different chained hashing methods, each of which is run in sequence. These hashing algorithms are blake, bmw, groestl, jh, keccak, skein, luffa, cubehash, shavite, simd, and echo. It is an ASIC-resistant and can be mined using both CPU and GPU. In comparison to Scrypt, the X11 algorithm uses

just 30% less electricity because it is 35 to 50% cooler and more energy efficient. As a result, using X11 is highly recommended. Its hash rate is measured by Mega-hashes per second (MH/s) [26]. Hash rate of X11 algorithm is measured in Mega-hashes per second (MH/s). The amount of chained hashing functions varies in different variations. X13, for example, employs 13 hashing functions, while X15 employs 15. X11 cryptocurrency is used to mine a variety of major cryptocurrencies, including: Badgercoin (BDG), BankCoin (BANK), Bantam (BNT), Capricoin (CPC), Checkcoin (CKC), ChipCoin (CHIP), CryptCoin (CRYPT), DarkCash

(DRKC), Dash (DASH) DigitalPrice (DP), ESportsCoin (ESC), EuropeCoin (ERC) etc [27].

Table 2 Few popular hash functions used for crypto currencies

S. No.	Hash Function	Specific feature	Used to mine following crypto currencies
1	SHA-256	a. Hash rate is at Giga hashes per second. b. Can be performed on ASIC H/W.	Bitcoin, BitcoinCash, Namecoin, Devcoin, Betacoin, Bytecoin, Ucoin, Zetacoin, Titcoin etc.
2.	Script	a. Hash rate is at Kilo hashes per second. b. Can be performed on CPU, GPU or ASIC H/W.	Litecoin, Latium, Bitmark, Goldcoin, Ekrona etc.
3.	X11	a. Hash rate is at Mega hashes per second. b. Can be performed on GPU. c. Energy efficient 30-50% cooler than Script.	Dash, XCurrency, StartCoin etc.
4.	CryptoNight	a. Hash rate is at hashes per second. b. Suitable for PC CPU. c. Based on open-source protocol. d. Depends on all the previous blocks for each new block.	boolberry, DigitalNote, Monero etc.
5.	Dagger Hoshimoto-Ethash	a. Hash rate is at Mega hashes per second.	Ethereum, Expanse, Ethereum Classis etc

		b. Can be used on shared memory hardware.	
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Following Table3 gives little information about various crypto-currencies along with their hash function

S. No.	Name of Crypto-Currency	Name of Hash Function used	Time to mine crypto-currency
1	BitCoin	SHA-256	10 minutes
2	Ethereum	Ethash	12 seconds
3	BitCoin Cash	SHA-256	10 minutes
4	LiteCoin	Scrypt	2.5 minutes
5	Dash	X11 or SHA-3	5 seconds
6	NEM	SHA-256	1 minute
7	ZCash	Equihash	2.5 minutes

In block chain technology, hash functions are used to trace genuine property of the message or block that is received now and is yet to be appended to the block chain. This checking and appending process can be summarized in given flowchart in Figure 4:

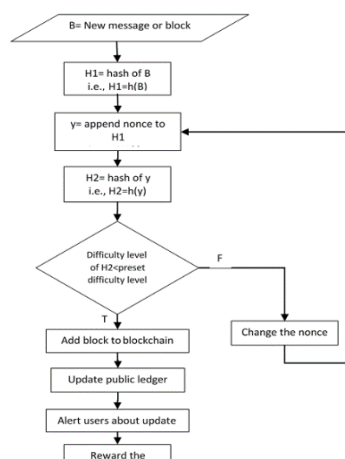


Figure 4: method of verifying block and adding to block chain

A block can be added to block chain if following requirements are fulfilled:

- If it is the last block in the chain. New block is always added at the end of the chain.
- If block hash of previous block correctly matches with calculated block hash for verification.
- If calculated hash for new block is correct.
- If difficulty at the current level is lesser than pre-decided block difficulty.
- If all transactions stored in block chain are valid.
- If sum of O/P transaction = sum of I/P transaction + block miner's reward.
- If there is no double spending transaction in that block.
- If for each block chain there exist only one reward transaction and one fee transaction.
- Similarly, a transaction is valid in a block if following requirements are fulfilled:

- j) If hash of transaction is equal to calculated hash and thus the hash is verified.
- k) If public key of group is used to sign all data for all of I/P transactions.
- l) Sum of O/P transaction < sum of I/P transaction. The difference indicates transaction fees.
- m) The block is not creating a duplicate entry in block chain.
- n) The block chain contains all unspent I/P transactions.

Conclusion

Now-a-days, cryptographic hash functions are used in most of security applications. The cryptographic hash function is a most crucial part of the blockchain technology. Essentially, it is a security feature that provides processed transactions more security by making them immutable. unchangeable. Blockchain makes extensive use of hash functions to safeguard the immutability and integrity of the data recorded on the distributed ledger. Immutability of the ledger is crucial due to the fact that it is kept in

a decentralised manner with each node retaining its own copy. Otherwise, nodes could alter their copies of the ledger to benefit themselves at the expense of the network as a whole.

As a result, the integrity of the hash function is critical to the security of the blockchain. As soon as the hash function of a blockchain becomes weak or compromised, the entire system's security breaks down.

There is wide range of Crypto currencies available in the digital market. Crypto currency work in a concept, known as block chain, which is a consecutive arrangement or chain of valid transactions, known as blocks. All transactions performed using crypto-currency, need to be validated by miners, who use proof-of-work algorithm and after validating add a transaction into block chain in the form of a new block. This paper emphasizes on cryptographic hash functions, proof-of-work and basic terminologies involved in comparison of these hash functions and blocks in the block chain technology.

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COMPARING THE PERFORMANCE OF DATA MINING ALGORITHMS IN THE PREDICTION OF TEACHER'S PERFORMANCE

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ABSTRACT

Teachers are the most significant part of the educational system in terms of improving student learning and ensuring their future success. Teacher's performance has a direct impact on student learning and student progress. The performance of a teacher in the classroom is based upon various factors such as Lecture preparation, teaching method/communication ability, Utilization of teaching aids, Coursework and day-to-day living are inextricably linked, distribution of Study materials, Subject-matter expertise, Completion of the curriculum preparation Punctuality and regularity, Class control and behavior with students. The aim of this paper is to predict a teacher's performance by using various Machine learning algorithms. For prediction of teacher's performance, we develop models using Decision tree (CART), k nearest neighbor(KNN), Naïve Bayes's Classifier, Support Vector Machine (SVM) and Artificial Neural Network (ANN). We consider above 10 Independent variables to develop models. We collected primary data from students by designing a questionnaire which is called feedback form. Data analysis was done by using R studio. This study observe that Artificial Neural Network (ANN) had higher accuracy than other algorithms.

Keywords: *Decision tree, KNN, Naïve's, SVM, Artificial Neural Network(ANN).*

Introduction

Teachers are responsible for developing knowledge and culture in children. God is the creator of the entire world, and a teacher is the creator of a whole nation, a teacher is a precious gift from God. A teacher is a pivotal factor in a student's life since his knowledge, devotion, and love shape the student's entire life. A teacher utilizes creativity in the classroom to help students focus on their studies.

The teacher shapes the future and present of the students. He also contributes to a good society by being a good student throughout his life. In order to acquire quality objectives related to students, teachers play a crucial role in the education sector. As a result, all educational institutions are concerned about teacher performance.

A proper system for evaluating a teacher's performance has yet to be developed, and there has been little related work done to examine the performance. Using various ways, they are aiming to construct a good evaluation system for the same.

Teachers can educate to assist students in understanding knowledge and concepts that are not included in the textbook. Students will have a better understanding and awareness of the subject if teachers connect with them using relevant, real-life examples, occurrences, and so on. They can apply their learning to a variety of subjects while using real-life examples. Sample of 100 teachers' were used for this study according to 10

questions teacher's performance was evaluated and categorized. For prediction purpose machine learning algorithms like Decision tree, KNN, Naïve Bayes's, SVM, Neural network algorithms were used. Neural network algorithm shows greater accuracy rather than other algorithms.

Literature Review

Patil V V. et.al. (2019) have used Naive Bayes classifier technique for prediction of teacher's performance and also estimates accuracy of the model. Bansal et.al (2018) has developed models using machine learning algorithms to detect Dementia and then compare those algorithms by their accuracy of classification. Huapaya et.al (2020) focuses on the classification of machine learning algorithms and the determination of the most efficient algorithm with the help of accuracy and precision.

Objectives

1. To predict a teacher's performance by using various Machine learning algorithms.
2. To find the best predictive machine learning model for the prediction of teacher's performance.

Methodology

For evaluation of Teacher's performance college collect feedback of teachers from students. A questionnaire type feedback forms are given to

the students which contains questions like Preparation of lecture, teaching method/communication skill, Use of teaching aids, Correlation of curriculum with day to day life, Supply of study, Depth of subject knowledge, Syllabus completion-Exam preparation, Regularity and punctuality, Behavior with students and Class control. Each question got a 10 rating from the students. They were divided into different categories such as Outstanding, Very Good, Good, Satisfactory, Fair, and Average. College evaluates the teacher's overall performance based on these questions. Overall performance is used as a response variable for classification. For further analysis, college uses weighted mean to analyze the performance of the teacher. And this calculated weighted mean is used to categorize the teacher according to the classes such as Outstanding, Very good, Good, Satisfactory, Fair and Average.

1) k-fold cross validation:

K fold cross validation is a technique in which initial data randomly partitioned into k mutually exclusive subsets or folds, D_1, D_2, \dots, D_k and testing is performed k times. In iteration i^{th} partition D_i is reserved as a test data or test set and remaining partitions are collectively used to train the model. That is, in the first iteration subset of dataset D_2, D_3, \dots, D_k collectively use as a training set to obtain a first model which is tested on D_1 . The second iteration is trained on $D_1, D_3, D_4, \dots, D_k$ and tested on D_2 and so on. In general 5 to 10 folds cross validation is used.

2) Decision Trees:

Decision Trees (DTs) are a one of the non-parametric supervised learning method used for classification and regression. The purpose is to learn simple decision rules from data attributes to create a model that predicts the value of a target variable. A decision tree classifier can be built without any domain information or parameter settings, making it suitable for exploratory knowledge discovery. In the machine learning domain, CART is one of the most often used methods for constructing decision trees.

CART develops a binary decision tree by splitting records at each node based on a single attribute's function. CART uses the GINI Index for best split. The initial split generates two nodes, each of which we try to split in the same

way, resulting in a root node. To identify the candidate splitters, we go over all of the input fields once more. We label a node a leaf node if no split is identified that significantly reduces diversity of that node. Eventually, just a leaf node remains, and we have built a whole decision tree. Because of overfitting, the complete tree that is not to be treated does not do the greatest job of classifying a fresh batch of records. Every record from the training set was assigned to a leaf of the full decision tree at the end of the tree-growing procedure. A class can now be assigned to each leaf. High-dimensional data can be handled via decision trees.

3) Naïve Baye's classifier: Naive Baye's classifier assumes that the presence of a particular feature in a class is unrelated to the presence of any other feature. Bayesian classifiers are statistical classifiers that predict probabilities of class membership, such as the probability that a given tuple belongs to a specific class. Naïve Baye's classifier is based on the concept of Bayesian classifier. When used to big data sets, Bayesian classifiers results showed great accuracy and speed.

4) Support Vector Machine (SVM):

The Support Vector Machine is a one of the best supervised machine learning algorithm for classification and regression. It can solve both linear and non-linear problems and widely used. SVM algorithm uses the nonlinear mapping to transform the original training data into higher dimensions within this new dimension. It searches for the linear optimal separating hyper plane (that is a decision boundary separating the tables of one class from another) with an appropriate non linear mapping to sufficiently high dimensional data from two classes can always be separated by hyper plane. The SVM finds this hyper plane by support vectors (essential training tuples) and margins (defined by support vectors)

5) k-nearest neighbors (KNN) algorithm:

k-nearest neighbors (KNN) algorithm is one of the simple procedures that can be used for classification. When large samples are involved, it classifies them based on the category of their closest neighbors. This classifier used some or all the pattern available in training set to classify test pattern. The basic idea behind this classifier is to detect similarities between the pattern and every

other pattern in the training set.

Without making any assumptions about the distribution from which the training examples are selected, the nearest neighbor approach achieves consistently high performance among the various method of supervised learning. The distances to the nearest training case are used to classify the sample. The KNN algorithm amplifies this idea by taking the k-nearest points and assigning the class of majority. It is normal to choose k small and/or break ties (typically 1,3 or 5). Large k values help to reduce the effect of noisy point within the training data set and the choice of k is often performed through cross validation. An object is classified according to majority vote of the class of the neighbors.

- The object is allocated in the class with the most members among the k-nearest neighbors.
- If $k = 1$ then it becomes a nearest neighbor algorithm (NN).
- This algorithm gives you a more correct classification for boundary patterns than N-N algorithm.
- The value of k has to be specified by the user and the best choice depends on data.
- Larger value of k reduces the effect of noise on the classification. The value of k can be arbitrarily increased when the training data set is large in size.
- The k value can be chosen by using the validation set and choosing the k value giving the best accuracy on the validation set.

6) Artificial Neural Network (ANN):

A neural network is a network of connected input-output units with a weight assigned to each connection. The network learns by modifying the weights during the learning phase so that it can anticipate the right class label of the input tuples. However, Artificial Neural Network algorithms have certain advantages, including a high tolerance for noisy input and the capacity to classify factors for which they have not been trained. They can be used when you may have little knowledge of the relationship between attributes and the classes. There are many different types of neural networks and neural network algorithms. Back propagation is the most famous neural network method.

Data Analysis:

We use 10 –fold cross validation for all the

algorithms to predict teacher's performance. Using 10-fold cross-validation the following results are obtained.

Decision tree (CART): A

Decision tree was build by using CART i.e. Classification And Regression Tree

Table 1: Results of Decision tree using 10-fold cross validation

cp	Accuracy	Kappa
0.04166667	0.59	0.3685185
0.13333333	0.56	0.3248966
0.35000000	0.49	0.1999374

Here, highest accuracy (0.65) corresponds to $cp = 0.04166667$

The final value of cp which was used for the model was $cp = 0.04166667$.

K-nearest Neighbor algorithm (KNN):

Table 2: Results of KNN using 10-fold cross validation

k	Accuracy	Kappa
5	0.65	0.4529262
7	0.62	0.4018927
9	0.62	0.4028476

Here, highest accuracy (65%) corresponds to $k=5$

Therefore, the final value of k which was used for the model was $k = 5$.

Support Vector Machine (SVM):

Table 3: Results of SVM using 10-fold cross validation

Accuracy	Kappa
0.59	0.3740053

The SVM Model is obtained with accuracy 59% Tuning parameter 'C' was held constant at a value of 1

Naïve Baye's classifier:

Table 4: Results of Naïve Baye's using 10-fold cross validation

usekernel	Accuracy	Kappa
FALSE	0.2555556	-0.07440561
TRUE	0.2555556	-0.07440561

The Naïve Baye's Model obtained with accuracy **Artificial Neural Network algorithm (ANN):** 25.5556%

Table 5: Results of ANN using 10-fold cross validation

size	decay	Accuracy	Kappa
1	0e+00	0.57	0.3399217
1	1e-04	0.66	0.3399217
1	1e-01	0.62	0.4113711
3	0e+00	0.54	0.2952031
3	1e-04	0.51	0.2586085
3	1e-01	0.56	0.3263785
5	0e+00	0.60	0.3965171
5	1e-04	0.58	0.3649415
5	1e-01	0.56	0.3229756

The highest accuracy 66% corresponds to the size = 1 and decay = 1e-04.

The final values of size and decay which was used for the model were, size = 1 and decay = 1e-04.

Results & Discussion

Comparative analysis of machine learning algorithms

Table 6: Classification Accuracy of all models

Sr.No.	Method	Accuracy
1	Decision tree	59%
2	SVM	65%
3	KNN	59%
4	Naïve Bayes	25%
5	ANN	66%

As shown in the table the Neural network algorithm shows greater accuracy (66%) than other algorithms. SVM shows 65% accuracy which can also be considerable. The accuracy of the Naive Baye's algorithm, on the other hand, is only 25% which is not considerable for prediction purpose.

Conclusion

Teacher performance evaluation is essential to

meet the institute's quality objectives, as we all know, but the most important thing is to make accurate predictions of teacher performance. Correct prediction can be achieved by using a model with high accuracy. In this case, the optimum model for predicting teacher's performance is an Artificial Neural Network (ANN). Therefore, for teacher's performance prediction, a neural network algorithm is helpful.

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COMPARISON OF PREDICTIVE MODELS USING LINEAR REGRESSION AND LOCAL LEAF NODE REGRESSION

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ABSTRACT

The Multiple Linear regression is most common technique incorporated in traditional statistics. Usually, this regression method is applicable when the dependent variable is of continuous in nature. In the field of Statistics and Machine learning, decision tree is used for splitting the data into new subset with homogeneity in nature. Here, the outcome variable is continuous variable hence regression tree algorithm is used for splitting data. A new subsets or leaves are obtained from regression tree.

A large dataset is taken from UCI (Machine learning Repository) incorporated for this research work. In this paper, we are focusing on the concepts of Linear regression, Regression tree. We use linear regression and regression tree to develop a Local leaf node regression. In this study we compare linear regression, regression tree and Local Leaf node regression on the basis of Mean Sum of Square (M.S.E.). We observed that Local Leaf node regression gives better results than traditional linear regression.

Keywords: Multiple Linear regression, CART, Regression tree, Local leaf node regression, Mean Sum of Square (M.S.E.).

Introduction

The data mining techniques incorporates machine learning algorithm to extract valuable information from collected data. The machine learning is very closely associated with data mining and predictive modelling. The machine learning techniques are techniques which combines collected data with some statistical tools for predicting the output. This output is utilized to predict decisions in corporate, forecasting, claiming a policy in insurance, retailing and loans in banking sector [1] [2]. In machine learning most of research has been occurred for Classification and Regression which are mainly used in predictive modelling. If the output variable is categorical variable then Classification technique is incorporated and if it is continuous variable then Regression techniques is applied. In fact, most of research is focused on classification and regression problems.

Generally, If the outcome variable is continuous type then Linear regression method is used.

Multiple linear regression:

If there are more than one independent variable and single dependent variable then it is called multi variable regression or multiple regression. It also states that the value of y differs with a constant rate of the value of change of any independent variable and it is given by,

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n + \epsilon_{ij} \quad \dots \dots \dots (1)$$

Where, Y is the dependent or response variable, α is the intercept, X_1, X_2, \dots, X_n are the independent variables, $\beta_1, \beta_2, \dots, \beta_n$ is the coefficients of independent variables or unknown constants and ϵ_{ij} is the error term [3].

Regression tree:

Classification and Regression Tree (CART) method was firstly develop by Breiman et al [4]. In Machine Learning, Decision tree is commonly called as CART algorithm as it builds for both purposes namely, for classification and regression. If the variable is in form of categorical then use classification tree methodology and if the variable is in form of continuous then use regression tree. This tree algorithm has non-parametric approach and has ability to handle missing data. There is no requirement of additional input constraints in regression tree as compared to another techniques. A regression tree analysis is an advanced and innovative technique and applied for solving engineering problems in several arenas of science and engineering such as epidemiology, software engineering, production management, fisheries management, criminology, information technology [5][6][7][8]. The decision tree deals effectively with high dimensionality taking variables on its high priority [9]. This type of decision tree or regression tree is including

Roots, Leaves, Branches and Nodes. Generally, nodes are represented by circles, branches are represented as associations between nodes. In the terminology, a variable is selected as first node as root node and then it is divided into various internal nodes built on homogeneity. It is top-to-down structured where root is placed at the top. At the last stage of tree, a chain is formed of root, branch and node is referred as Leaf [10]. These trees are constantly used for easy description, understanding, interpreting and visualization of results. Basically, regression tree is formed by using binary recursive partitioning. Recursive partitioning is an iterative method where data is splitted into small partitions or branches. Each splitting partition is selected on the basis of minimum mean sum of square among all partitions [11].

In this paper, using linear regression and regression tree we develop a Local leaf node regression and compare this model with linear regression and regression tree on the basis of Mean Sum of Square (M.S.E.). We also identified the accurate predicted models for each leaf nodes of regression tree.

Methodology

Local Leaf Node regression:

In the predictive analysis, the researchers have first choice is regression analysis and traditional linear regression method. Generally, linear regression is applied on whole data and making a single global prediction model. The Linear regression has global approach in which a single predictive model belongs to entire data. When this data has a many feature and these features are interacted with complicated and nonlinear

ways, then a single global model becomes very difficult and quite confusing. An alternative method is to divide or partition the data into smaller subsets in which interactions are quite manageable. We partition the data into many sub divisions or small subsets is called recursive partitioning [12]. In real life situations, due to large expansion of data, it occurs in heterogeneous in nature. So, the traditional method was not able to predict values correctly as data is in heterogeneous. To remove this heterogeneity or error from data, split the data using decision regression tree. A regression tree is grown on whole datasets, terminal nodes are obtained. These terminal nodes show more homogeneous group as compared to whole population. The study focuses on terminal nodes as compared to root node. At this terminal node, homogeneous data as subset is obtained. From this subset we identify observations of that homogeneous groups and then applying Multiple linear regression on these leaf nodes (homogeneous groups). This leaf size should be appropriate according to data. Here, appropriate means the size of leaf node is neither be less nor more and maintain homogeneity within the group. We get regression model for each terminal node. It is observed that instead of applying regression model on whole data is more accurate than applying linear regression on leaf node regression tree. This leaf node regression is referred as Local leaf node regression. Similarly, we are applied multiple linear regression on each leaf node of regression tree and calculated M.S.E. for each leaf.

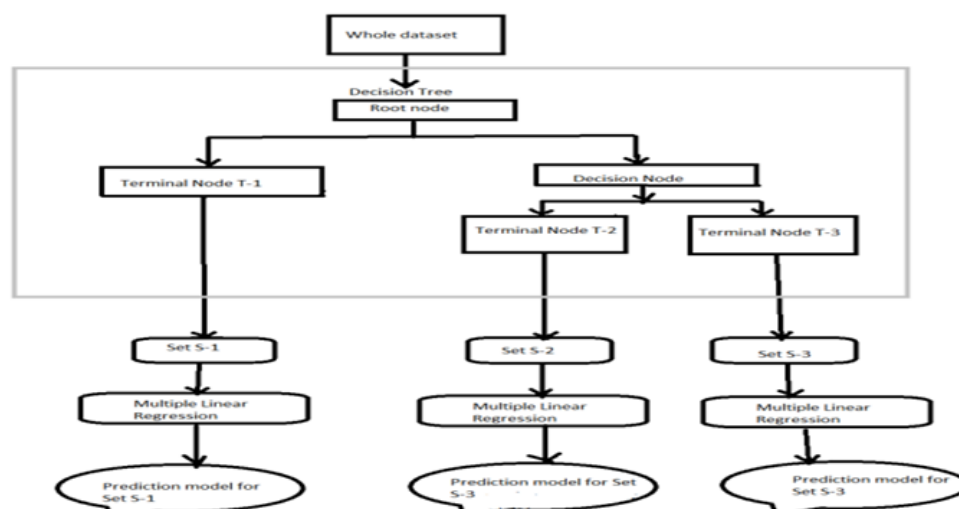


Fig.1 The structure of local leaf node linear regression

The following figure 1 showing the structure of local leaf node linear regression.

We compare the Mean Square Error (M.S.E.) of Multiple linear regression, Regression Tree and Leaf node regression. It is given by,

$$\text{Mean Square Error (M.S.E.)} = \frac{1}{N} \sum_{i=1}^{i=N} (Y_i - \hat{Y})^2 \dots\dots\dots (2)$$

Also, to develop each local leaf node linear regression model on each terminal node and compare their MSE values with traditional linear regression and Regression tree to find accurate predicted values.

In this study paper, we have used Concrete Compressive Strength dataset from a UCI Machine Learning Repository dataset. This data contains 1030 instances and 9 attributes for 8 input quantitative attributes with single

quantitative output. There is brief description of dataset having data type, measurements and description of attributes in Table-1

Sr. No.	Variable Name	Type of variable	Measurement unit	Description
1	Cement	Quantitative	kg in a m3 mixture	Input variable
2	Blast Furnace Slag	Quantitative	kg in a m3 mixture	Input variable
3	Fly Ash	Quantitative	kg in a m3 mixture	Input variable
4	Water	Quantitative	kg in a m3 mixture	Input variable
5	Superplasticizer	Quantitative	kg in a m3 mixture	Input variable
6	Coarse Aggregate	Quantitative	kg in a m3 mixture	Input variable
7	Fine Aggregate	Quantitative	kg in a m3 mixture	Input variable
8	Age	Quantitative	Day (1~365)	Input variable
9	Concrete compressive strength	Quantitative	Mpa	Output variable

Table-1 Brief description of dataset with measurement

In this study, we have taken Input variables are independent variables and Output variable as dependent or response variable. Here, concrete compressive strength is the dependent or response variable for regression analysis. All the statistical analysis has been carried out by using R software with caret package. A popular classical statistical method namely, Multiple regression analysis is carried out by considering concrete compressive strength as response variable and rest of all are independent variables. In the analysis all the P-values are less than or equal to 0.05 Hence all the independent variables are statistically significant with 95% and final multiple regression model is obtained. The MSE is measured and calculated using R software. Table-2 depicts the result of final Multiple regression analysis with significant variables and M.S.E.

On the other hand, A regression tree has grown

as top-to-down manner by considering root node. This tree algorithm is obtained by using R-part package in R software. The performance measure such as MSE is calculated for regression tree. The Fig.1 depicts the regression tree. The Table-3 shows the summarized result of the multiple Linear models for each tree leaf and M.S.E value for each tree leaves.

Result and Discussion

The model was implemented in R software version 3.5.3 and results were obtained. The Multiple linear regression is applied on data and final model is obtained. The M.S.E. is calculated for whole data by using previous formula. The following Table-2 shows the result of analysis using Multiple Linear regression and M.S.E.

Table-2 depicts the result of final Multiple regression analysis with significant variables and M.S.E.

Independent variables	Estimates	Standard Error	t-value	P-value
Regression Coefficients (β)				
Cement	0.1197	0.0084	14.110	< 2e-16
Blast Furnace Slag	0.103847	0.0101	10.245	< 2e-16
Fly Ash	0.087943	0.0126	6.988	5.03e-12
Water	-0.15029	0.0402	-3.741	0.000194
Superplasticizer	0.290687	0.0935	3.110	0.001921
Coarse Aggregate	0.018030	0.0094	1.919	0.055227
Fine Aggregate	0.020154	0.0107	1.883	0.059968
Age	0.114226	0.0054	21.046	<2e-16
Intercept (α)	-23.1637	26.5884	-0.871	0.3838
Multiple R-squared	0.6155			
Residual deviance	10.4			
Adjusted R squared	0.6125			
F-statistic	204.3			
Mean Square Error (M.S.E.)	107.2118			

The final Multiple linear regression model becomes,

Concrete compressive strength

$$\begin{aligned}
 &= -23.1637 + 0.1197 * \text{Cement} \\
 &+ 0.103847 \\
 &* \text{Blast Furnace Slag} \\
 &+ 0.087943 * \text{Fly Ash} \\
 &- 0.15029 * \text{Water} + 0.290687 \\
 &* \text{Superplasticizer} \\
 &+ 0.018030 \\
 &* \text{Coarse Aggregate} \\
 &+ 0.020154 * \text{Fine Aggregate} \\
 &+ 0.114226 * \text{Age}
 \end{aligned}$$

The following figure-2 shows the regression tree which contains 13 Terminal nodes with Root node as Age.

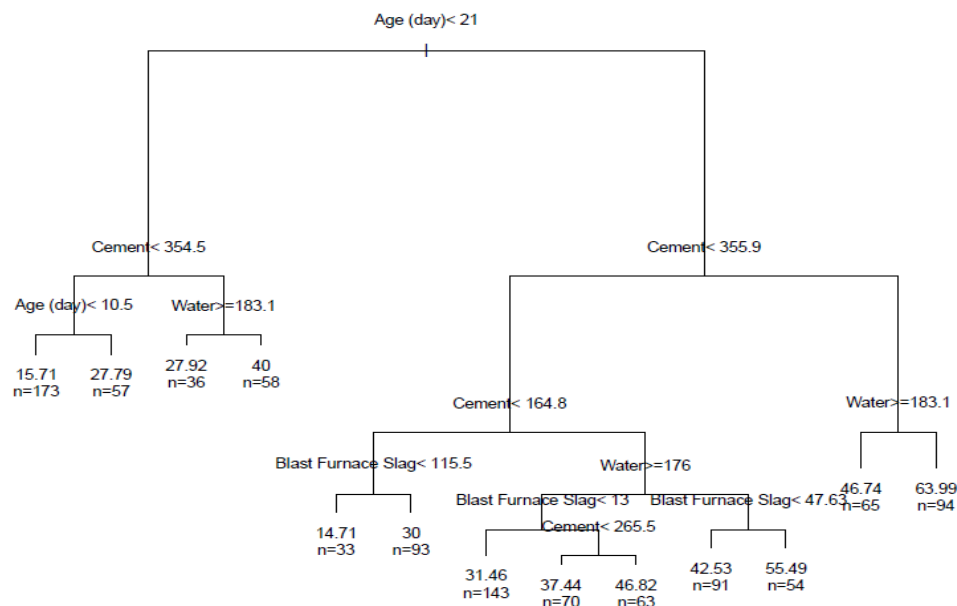


Fig.2 Regression tree.

In the above regression tree, it has total 107 nodes in which 94 internal nodes and 13 terminal nodes. For growing a regression tree, root node considered as entire dataset of 1030 cases. The splits are chosen by the rank of all the variables. In this tree, the variable "Cement" contributes more so it takes for splitting firstly, then according to importance of remaining variables they are used for splitting. The order of remaining variables are as follows, Cement, Age, Water, Superplasticizer, Blast Furnace Slag, Fine Aggregate, Coarse Aggregate and Fly Ash. For every internal node, there are two types of splits are given such as, primary splits and surrogate splits. The total number of instances and mean sum of square is given for every internal and terminal node. In the regression tree minimum value of mean sum of square for a variable is considered for splitting the variable. This tree has

13 terminal nodes or leaf nodes or subgroups. Then the observations can be identified from each leaf nodes of regression tree. Once the observations are obtained then applying linear regression on each leaf node we get Local leaf node regression. The local leaf node regression model of each node and corresponding M.S.E. values are given in following table-3.

Table-3 shows the summarized result of the multiple Linear models for each subsets and M.S.E value for each node.

Sr. No	Leaf nodes	M.S.E.	Local Leaf node Regression
1	leaf node 1	11.8705	$\text{Concrete compressive strength} = 21.354895 + 0.068277$ $\times \text{Cement} + 0.027701$ $\times \text{Blast Furnace Slag}$ $+ 0.025017 \times \text{Fly Ash}$ $- 0.060174 \times \text{Water}$ $+ 0.708840 \times \text{Superplasticizer}$ $- 0.013054$ $\times \text{Coarse Aggregate}$ $- 0.012877 \times \text{Fine Aggregate}$ $+ 1.420071 \times \text{Age}$
2	leaf node 2	13.1916	$\text{Concrete compressive strength} = -120.2746 + 0.19989$ $\times \text{Cement} + 0.16862$ $\times \text{Blast Furnace Slag}$ $+ 0.13459 \times \text{Fly Ash} - 0.03607$ $\times \text{Water} + 0.46174$ $\times \text{Superplasticizer} + 0.03425$ $\times \text{Coarse Aggregate} - 0.06517$ $\times \text{Fine Aggregate}$

3	leaf node 3	16.6573	$\text{Concrete compressive strength} = 134.1846 + 0.04798$ $\times \text{Cement} + 0.005294$ $\times \text{Blast Furnace Slag}$ $- 0.057467 \times \text{Fly Ash}$ $- 0.170753 \times \text{Water}$ $+ 1.340939 \times \text{Superplasticizer}$ $- 0.046255$ $\times \text{Coarse Aggregate}$ $- 0.083045 \times \text{Fine Aggregate}$ $+ 1.620760 \times \text{Age}$
4	leaf node 4	29.1286	$\text{Concrete compressive strength} = -164.00356 + 0.20923$ $\times \text{Cement} + 0.19980$ $\times \text{Blast Furnace Slag}$ $+ 0.15281 \times \text{Fly Ash} - 0.13775$ $\times \text{Water} - 0.19812$ $\times \text{Superplasticizer} + 0.05589$ $\times \text{Coarse Aggregate} + 0.06531$ $\times \text{Fine Aggregate} + 2.92440$ $\times \text{Age}$
5	leaf node 5	1.6786	$\text{Concrete compressive strength} = -280.433 + 0.15875$ $\times \text{Cement} + 0.20191$ $\times \text{Blast Furnace Slag}$ $+ 0.15028 \times \text{Fly Ash} + 0.16175$ $\times \text{Water} + 0.26435$ $\times \text{Superplasticizer} + 0.11963$ $\times \text{Coarse Aggregate} + 0.11993$ $\times \text{Fine Aggregate} + 0.12754$ $\times \text{Age}$
6	leaf node 6	24.2484	$\text{Concrete compressive strength} = 30.71432 - 0.02090$ $\times \text{Cement} + 0.11067$ $\times \text{Blast Furnace Slag}$ $+ 0.03476 \times \text{Fly Ash} - 0.08632$ $\times \text{Water} + 0.17954$ $\times \text{Superplasticizer} - 0.01169$ $\times \text{Coarse Aggregate} + 0.00382$ $\times \text{Fine Aggregate} + 0.07562$ $\times \text{Age}$
7	leaf node 7	16.9471	$\text{Concrete compressive strength} = -122.9 + 0.1819 \times \text{Cement}$ $- 0.5260 \times \text{Blast Furnace Slag}$ $+ 0.1736 \times \text{Fly Ash} - 0.07877$ $\times \text{Water} - 0.2343$ $\times \text{Superplasticizer} + 0.04344$ $\times \text{Coarse Aggregate} + 0.08025$ $\times \text{Fine Aggregate} + 0.03593$ $\times \text{Age}$

8	leaf node 8	45.3595	$\text{Concrete compressive strength} = -206.411 + 0.08753$ $\times \text{Cement} + 0.10323$ $\times \text{Blast Furnace Slag}$ $+ 0.07798 \times \text{Fly Ash} + 0.23835$ $\times \text{Water} + 0.86578$ $\times \text{Superplasticizer} + 0.09238$ $\times \text{Coarse Aggregate} + 0.08650$ $\times \text{Fine Aggregate} + 0.05902$ $\times \text{Age}$
9	leaf node 9	54.1080	$\text{Concrete compressive strength} = -67.0759 + 0.107447$ $\times \text{Cement} + 0.082128$ $\times \text{Blast Furnace Slag}$ $+ 0.031638 \times \text{Fly Ash}$ $+ 0.16659 \times \text{Water} + 0.741105$ $\times \text{Superplasticizer} - 0.003536$ $\times \text{Coarse Aggregate}$ $+ 0.046913 \times \text{Fine Aggregate}$ $+ 0.040387 \times \text{Age}$
10	leaf node 10	27.8297	$\text{Concrete compressive strength} = -243.3544 + 0.1987$ $\times \text{Cement} + 0.0969$ $\times \text{Blast Furnace Slag}$ $+ 0.18129 \times \text{Fly Ash} + 0.08731$ $\times \text{Water} + 0.72839$ $\times \text{Superplasticizer} + 0.10628$ $\times \text{Coarse Aggregate} + 0.09358$ $\times \text{Fine Aggregate} + 0.17081$ $\times \text{Age}$
11	leaf node 11	52.2158	$\text{Concrete compressive strength} = -306.1342 + 0.245 \times \text{Cement}$ $+ 0.17863$ $\times \text{Blast Furnace Slag}$ $+ 0.22232 \times \text{Fly Ash} + 0.10383$ $\times \text{Water} - 0.77052$ $\times \text{Superplasticizer} + 0.12921$ $\times \text{Coarse Aggregate} + 0.15244$ $\times \text{Fine Aggregate} + 0.13311$ $\times \text{Age}$
12	leaf node 12	41.8808	$\text{Concrete compressive strength} = -36.0782 + 0.130107$ $\times \text{Cement} + 0.11506$ $\times \text{Blast Furnace Slag}$ $+ 0.047276 \times \text{Fly Ash}$ $- 0.091739 \times \text{Water} + 0.43236$ $\times \text{Superplasticizer} + 0.002878$ $\times \text{Coarse Aggregate}$ $+ 0.050196 \times \text{Fine Aggregate}$ $+ 0.041980 \times \text{Age}$

13	leaf node 13	51.7864	$\begin{aligned} &\text{Concrete compressive strength} \\ &= -13.2736 + 0.13129 \\ &\quad * \text{Cement} + 0.18222 \\ &\quad * \text{Blast Furnace Slag} \\ &\quad + 0.11756 * \text{Fly Ash} - 0.21123 \\ &\quad * \text{Water} - 0.58137 \\ &\quad * \text{Superplasticizer} + 0.02315 \\ &\quad * \text{Coarse Aggregate} + 0.02529 \\ &\quad * \text{Fine Aggregate} + 0.05855 \\ &\quad * \text{Age} \end{aligned}$
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Using Multiple linear regression for entire data the M.S.E. is obtained as 107.2118 and using regression tree, the M.S.E. value is 72.4042. By observing M.S.E of nodes we can say that M.S.E. of each local leaf node regression is less than M.S.E. of Multiple linear regression and M.S.E of regression tree.

Conclusion:

In the Machine Learning and traditional statistics, Multiple linear regression method is very important in many predictive modelling applications. The error is obtained more due to

applying linear regression on whole dataset. To reduce the error, it is necessary to divided dataset into more subsets according to its homogeneity using regression tree. Multiple linear regression is applied on each terminal node and obtained Local leaf node regression for each node. This study observed that each leaf node regression models gives best linear regression model with less MSE than multiple linear regression. As a result, the study has suggested that instead of taking multiple linear regression for the whole dataset, use local leaf node regression for subset or leaves from regression tree.

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EQUITY RESEARCH ANALYSIS OF SELECTED PUBLIC SECTOR BANKS

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ABSTRACT

This paper covers the equity research on selected Indian public sector banks. Equity share is generally described as a common stock, which constitutes a partial ownership as the shareholder undertakes the equal business risk of the enterprise. The main purposes of this paper were to examine how the fundamental analysis helps in arriving at an investment decision, to study the trend in the stock of banks and the volatility in their stock prices. In India, individuals are appreciating that common stock has ability to provide the attractive returns in comparison with rest of the investing opportunities. Nevertheless people are unaware about valuation of equity, they just put money in equity shares after considering the suggestions given by brokers, friends or family members. It is not considered as investment in equity shares rather it is obvious gambling and risking money which majority of the investors do not wish to. Equity valuation starts with analyzing the particular sector where the investment has to be made. If the sector at all is feasible, then analysis of several players in the sector needs to be done. After sectorial and competitors' analysis is done, then the specific company analysis should be done using fundamental analysis to evaluate its performance and financial strength. This paper starts with the analysis of the fundamentals i.e. EIC-economy, industrial and company evaluation of the selected banks. i.e SBI and PNB. The selected companies were evaluated based on both qualitative and quantitative aspects. The stock price besides P/E ratio partake been considered to compute EPS. Once the end value is calculated, the variation was shown between calculated amount and the then current market price to draw the conclusion about top performing company. Lastly, conclusion and suggestions are prearranged on the basis of the result.

Keywords: Public Sector Banks, Investment Decision, Stock Prices, Quantitative Aspects, EIC-economy

Introduction

An equity share is normally stated as a common stock also. The shareholders are considered as owners of that company and they have the right to vote.

How The Investment To Be Made In Equity Shares?

Stockholders may purchase the shares of a company through financial market either primary or secondary. Primary market is that which provides a way of selling securities which are issued for the first time. It also provides opportunities for issuers of securities, both public sector entities and private sector entities, to raise finances to fulfill their investing needs.

People can purchase shares of a company in case of the shares are issued for the first time by the company and once the shares are open to the public, they are exchanged through secondary market. An investor wishes to purchase shares of

a corporate can purchase from secondary market.

Why To Make Investment In Equity Shares?

Investment made in equity shares can give shareholders two types of benefits namely- dividend and capital gains, but at the same time the investment in equity shares is considered as very risky also.

Objectives Of The Study:

1. To explain how the fundamental analysis helps in arriving at investment decision.
2. To interpret the ratios of the selected banks.
3. To offer an outline of the Indian banking sector in order to make investment decision.

Introduction Of Public Sector Banks

India is considered as one of the world's

top economies, with a massive opportunity for Indian banking sector to prosper. Over the last couple of ages, there was considerable growth in the amount of operations out of Automated Teller Machines, Net Banking and Mobile Banking.

Around 12 PSBs are located alongside the Payments banks owned by the states in India. The PSBs are very active in their turnaround efforts, whether in the field of technological adoption or the pruning of their missing funds. Retail lending, which has represented a large segment of the range of financial products of the majority of the banks, had lost some weighting on bank portfolios on account to the risk weighting. Banking sector in India is highly backed by RBI and has managed to handle much recession with relative ease, and the sector now is also foreseeing the growth and investment through Foreign Direct Investment. Current financial system in India, which has developed over many years, played extensive role in meeting finance and banking services requirements. There is various growing tiers in current financial system in order to meet the diverse and varying needs of various clients.

Government Policy For Public Sector Banking

Banks operating in most countries must comply with strict legislation, the laws imposed by central and state authorities to regulate the banking services and the way they develop and extend their

services to best provide the community. The bank is meant to offer the financial services like lending money, receive deposits and offer other services to their client.

Following are the key reasons that banks are strongly controlled:

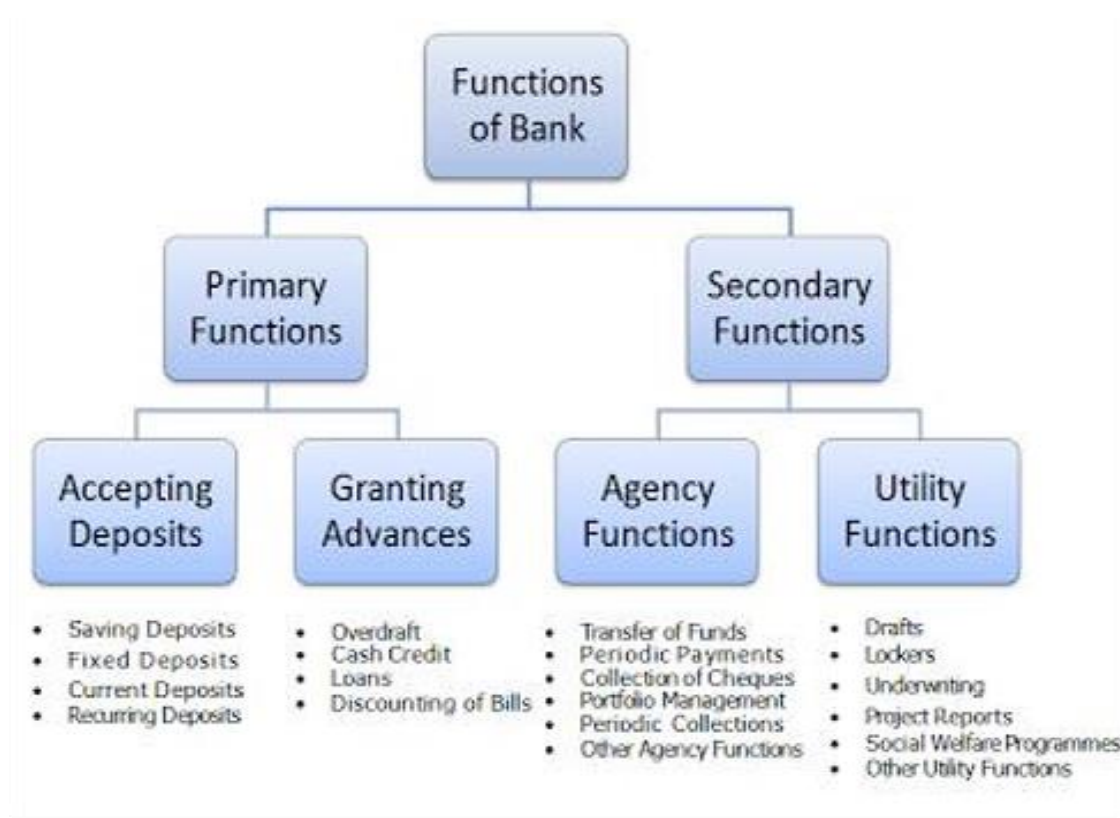
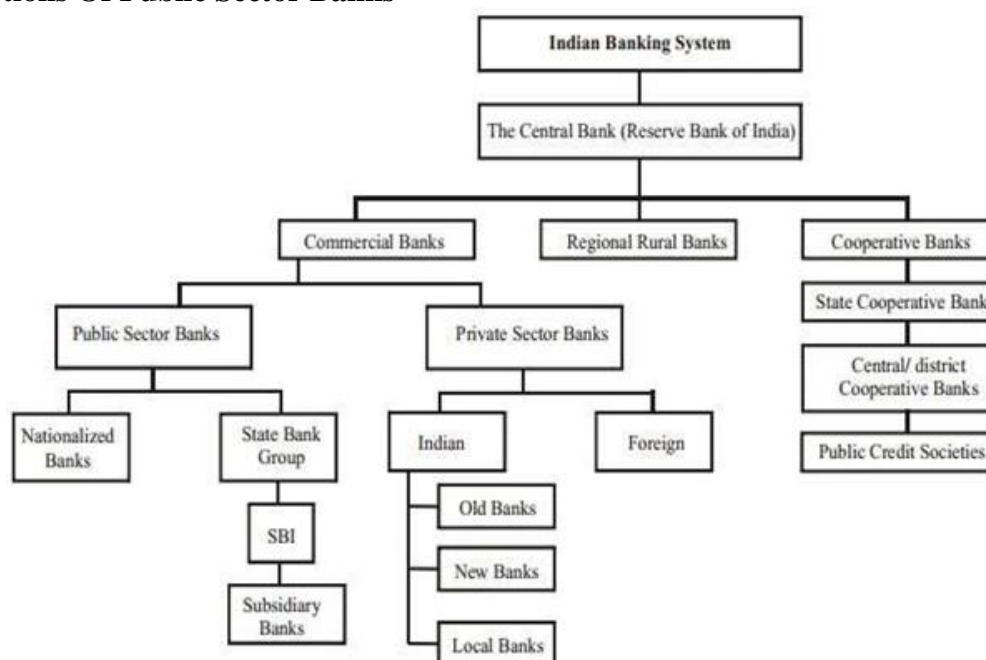
- To ensure the health of the investments made by the taxpayer.
- To promote consumer trust in the financial system such that investments are made easily and effectively.
- To prevent the growth of economy influenced by handful of the entities.
- Provide credit, tax income and other services to the State.
- To support segments of the financial system that have unique financing requirements, e.g. Housing, small enterprise, farm loans, etc.

Significance Of Banking Sector

Banking system has entirely transformed individuals' lives. The relation of banks and its clients had profoundly augmented. The reliance on banks is drastically increased may it be any aspect of financial transaction. This is possible as the banks also have made their processes simple and customer friendly. Due to different initiatives taken by Government, it has become possible for all strata of the society to access banking service and make their lives more comfortable in financial terms.

Due to advancement of the technology, it has become very convenient to make the banking transactions in few seconds.

Functions Of Public Sector Banks



Source- insightsonindia.com

Porter's 5 Model for Banking Sector-

A. Threat To New Participants:

Since any business deals with other investors' capital, and new entrants realize it hard to get going with financial

records. Thanks to the complexity of the sector, individuals are more likely to put their trust in the big name, well-known, global banks that

they find to be trustworthy. In the end, barriers to entry are fairly small for the banking industry.

B. Power Of Buyer: The banking industry's users' strength has grown tremendously as a result of technological advancements. Consumers' comfort and costs have been greatly improved as a result of technological advancements.

, mutual funds, and fixed income securities are just a few of the many banking services that non-banking organizations provide.

D. Competitive Rivalry:

As a result, banks must gather consumers away from other player banks. They accomplish this by offering less expensive capital, better rates, more investment resources, and greater flexibility than their contestants.

E. Power of Suppliers:

The strength of the sellers is mostly dependent on the market. Their strength is frequently believed to range between medium to high.

Pestle Analysis

1. Political Factors: Political regulation impacts the status of the financial industry. The government will intervene in banking matters at any moment, making the sector open to constitutional intervention. It involves collusion within political parties or particular regulations, such as labour rules, export controls, taxes and democratic peace.

2. Economic Factors: The banking industry and the financial system are linked with each other. How revenue flows, whether the economy is streams swiftly or hardly remaining during a recession, have an effect on how much investment banks can gain access to. Financial conditions, and the factors behind them, affect whether consumers

C. Availability Of Substitutes:

The majority of the most significant substitution challenges to the banking industry come from non-commercial actors rather than competitive banks.

In terms of deposits or withdrawals, the industry faces no serious risk of alternatives, but insurance

deposit or invest money in banks.

3. Socio Cultural Factors: Cultural factors like buying behaviors and prospects, impact how individuals view and support for credits appropriate for commercial, house and education. Customers are looking for expertise from bankers about savings accounts, plastic money, savings, and so on. Customers hope for a smooth banking experience. Growing technology is facilitating customers to purchase goods and availing services in easier manner, without needing support from banks.

4. Legal Factors: The banking business follows stringent regulations on the subject of confidentiality, customer regulations, and trade constructs to verify contexts within the business. These arrangements are necessary for consumers in the allotted nation and for worldwide clients.

5. Environmental Factors: Due to emergence of technology especially Mobile Banking, the use of paper is considerably diminished. In fact, the necessity to travel to a bank for doing transaction is also reduced. This prevents the use of document and results into better environment.

Literature Review

- Parveen & Sameera, 2016 has conducted analysis of Punjab national bank and State bank of India using ratio analysis. The author has said that public sector banks are financially sound and good in their performance. Whereas the other bank is attractive in their stock

valuation and good for investment. In addition, the author has urged investors to lay emphasis on the current market conditions and nonmonetary factors while taking their investment decisions.

- Jeevitha & Sravani, 2018 has conducted fundamental analysis for three public sector banks. The study was conducted with the objective to help in Investment decision making. The author has conducted three tier analysis i.e. economic, industry and company analysis for the selected public sector banks. The author has used various ratios for identifying the financial position of these banks.

- According to Sodhi and Waraich (2016), fundamental analysis investigates the many financial, economic, and industrial aspects that influence the risk-return of securities and aids in investing decision making.

- Undavia, 2016 has stated that the Indian banking system is unique in the world and has evolved a lot in the last five decades. Indian Banking system has a vast growth potential but also facing from some of the formidable challenges like increased level of competition and increase in the level of nonperforming assets. The author has used various financial factors like net profit margin, operating profit margin, earning per share and return on equity for analysing the selected banks. The author has concluded by suggesting South Indian Bank as the best stock from selected private sector banks and Punjab national bank as the best stock from public sector bank.

Research Methodology

The paper is based on equity research analysis research of two banks in public sector banks. Hence study has been done on the basis of secondary data i.e. news, magazines, research papers and so on. This investigation concluded with a fundamental analysis of the banks.

Secondary data was gathered from the websites of the selected companies, as well as yearly and quarterly reports for the current fiscal year, indicating their successes in the current market setting.

Daily stock market values were watched while preparing this project, and the yearly reports of the companies reviewed were taken into account for evaluating corporate performance.

Data Analysis

State Bank Of India

The State Bank of India (SBI) is a public sector bank and a statutory body for financial services. It is a statutory government organisation headquartered in Mumbai, Maharashtra. SBI is ranked 236th on the 2019 Fortune Global 500 list of the world's largest firms. It is India's largest and most powerful bank, with a 23 percent market share in assets and a one-fourth part of the total loan and deposit market. The bank descended from the Bank of Calcutta, which was created in 1806, through the Imperial Bank of India, making it the oldest commercial bank in the Indian subcontinent. The Bank of Madras merged with British India's other two "presidency banks," the Bank of Calcutta and the Bank of Bombay, to form the Imperial Bank of India, which ultimately became the State Bank of India in 1955. In 1955, the Government of India took over control of the Imperial Bank of India, with the RBI purchasing a 60% stake and renaming it the State Bank of India.

Punjab National Bank

The Punjab National Bank (PNB) is a government-owned banking and financial services institution located in New Delhi, India. The bank was founded in 1894 and is India's second largest public sector bank (PSB) in terms of both business and network.

Following the merger of United Bank of India and Oriental Bank of Commerce on April 1, 2020, the bank now has over 180 million customers, 10,910 branches, and 13,000 ATMs. PNB has a banking subsidiary in the United Kingdom (PNB

International Bank, with seven divisions in the United Kingdom), as well as divisions in Hong Kong, Kowloon, Dubai, and Kabul. It has demonstration offices in Almaty, Kazakhstan, Dubai, United Arab Emirates, Shanghai, China, Oslo, Norway, and Sydney, Australia (Australia). It controls 51 percent of Druk PNB Bank, which has five branches in Bhutan. PNB owns 20% of Nepal's Everest Bank Limited, which has 50 branches. Finally, PNB controls 41.64 percent of JSC (SB) PNB Bank in Kazakhstan, which is divided into four sections.

The decision of investment in equity is done on the basis of following two types of analyses-

1. FUNDAMENTAL ANALYSIS
2. **Technical Analysis**

Fundamental Analysis

Fundamental analysis considers several factors that influence stock prices, including sales, the price to earnings (P/E) ratio, profitability, earnings per share (EPS), the current ratio, and Company and industry specific features. Fundamental assessment contains:

1. Fiscal analysis
2. Sector analysis
3. Company analysis

The intrinsic value of the common stock is determined based on the studies indicated above. This is thought to be the stock's genuine value. If the intrinsic worth is more than the market price, it is advised that the share be purchased. If it is equal to the market price, keep the share; if it is less than the market price, sell the share.

Types Of Fundamental Analysis:

1. Qualitative Aspects
2. Quantitative Aspects

The numerous fundamental components can be classified as quantitative or qualitative.

1. **Qualitative** - related to the character or quality of something, as opposed to its size or quantity.

2. **Quantitative** - able to be measured or expressed numerically.

Qualitative Factor – The Sector

Each company's customer base, market share among firms, industry-wide growth, competition, regulation, and business cycles differ. Knowledge how the industry works will provide an investor with a better understanding of a company's financial health.

• Customers

Some businesses cater to a small number of clients, while others operate with a large number of people. In most circumstances, it is undesirable for a company to rely on a small number of customers for a substantial amount of its sales because each customer's loss can have a significant impact on revenues.

• Market share

Understanding a company's current market share can offer information about its revenue. In actuality, any company with a market share of more than 85% is regarded as the best performer in its industry. Furthermore, this can indicate that the company has some form of "economic moat," or a competitive barrier that serves to protect its current and future profitability, as well as its market share. Because of economies of scale, market share is vital. When a company is larger than its competitors, it is better able to bear the high fixed expenses of a capital-intensive industry.

Qualitative Factor – The Company

Before delving into a company's financial statements, consider some of its qualitative qualities. The following are the company's qualitative factors that investors should be aware of:

Business Model

One of the most important issues that should be addressed is, what exactly does

the firm do? This is referred to as a company's business model. Is this how a corporation makes money? By checking a company's website or annual report, you can obtain a solid idea of its business plan.

Past Performance

Another effective way to obtain a sense of a firm's expertise is to look at how managers have performed in other organisations in the past. On most company websites, you may find profiles of key executives. Distinguish the companies where they previously worked and conduct a search on those companies and their efficiency.

Qualitative Factor-The Economy

The banking industry represents a critical juncture in almost all financial activities. Interest rates, inflation, house sales, and general economic productivity and growth are among the most important data. Each bank's investment decision should involve an evaluation of the bank's fundamentals and financial health.

• Gross Domestic Product and Productivity

Because banking and financial intermediation involve a wide range of market transactions, banks tend to see more business while the economy is expanding. Investors can utilise gross domestic product (GDP) to determine current economic health and efficiency levels as an indicator of the banking sector's future economic health.

• Inflation

A growing inflation rate tends to raise the rates on credits. The cost of funds for banks increases. This takes the lead to a growth in home loan interest rates, among other loan rates, and subsequently an increase in EMIs.

Quantitative Factors

Now that we've covered the qualitative aspects of fundamental assessment, let's move on to the quantitative aspects of fundamental analysis. Analysis of the

company's financial statements is one of the quantitative factors.

Ratio Analysis

Earnings per Share (EPS): It is used to understand the portion of total earnings per each share that is outstanding. This gives the Net profit received by each shareholder of the company. If EPS is higher, it means that profit per share is higher. It implies profitability of the company.

$$\text{EPS} = \frac{\text{NET INCOME} - \text{PREFERENCE DIVIDEND}}{\text{NO. OF EQUITY SHARES}}$$

NO. OF EQUITY SHARES

Return On Equity:

Return on Equity is calculated as the total of net income repaid as a percentage of shareholders' equity. Return on equity measures a company's profitability by demonstrating how much profit it generates with the money stockholders have invested. Return on net worth is another name for it.

Return on equity is calculated as

$$\text{ROE} = \frac{\text{NET INCOME}}{\text{NET WORTH}}$$

PE RATIO: The PE ratio is determined by the market's perceptions of risk and anticipated profits growth. When compared to a corporation with a greater PE ratio, a company with a low PE ratio means that the market perceives it as having higher risk, weaker growth, or both. The PE ratio of a listed business's share is the outcome of the market's collective view of how hazardous the firm is and what its profits growth prospects are in comparison to other companies. If the investor believes that his perception is superior to the market's, he can decide whether to buy or sell.

$$\text{PE RATIO} = \frac{\text{MARKET PRICE PER SHARE}}{\text{EARNINGS PER SHARE}}$$

EARNINGS PER SHARE

Current Ratio:

It is an assessment of current assets in comparison with current liabilities, calculated by dividing your current assets by your current liabilities. Prospective investors use the current

ratio to measure a company's liquidity or ability to pay off short-term debts.

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

CURRENT LIABILITIES

Long-term debt. The greater ratio reveals that assets have been primarily funded by proprietor's finances and the long-term credits are sufficiently protected by assets.

$$\text{TOTAL ASSETS TO DEBT RATIO} = \frac{\text{TOTAL ASSETS}}{\text{TOTAL DEBTS}}$$

**COMPARISON SHEET**

EPS	SBI	PNB				CURRENT RATIO	SBI	PNB			
2017	0.31	5.78				2017	0.37	0.3			
2018	-5.32	-54.71				2018	0.39	0.31			
2019	2.58	-29.68				2019	0.33	0.33			
2020	22.15	0.8									
EPS=NET INCOME -DIVIDEND/NO.OF EQUITY SHARES.						CURRENT RATIO=CURRENT ASSETS/CURRENT LIABILITIES					
ROE (%)	SBI	PNB				PE RATIO	SBI	PNB			
2017	0.13	3.01				2017	947	51			
2018	-2.21	-31.26				2018	-48	-4.57			
2019	0.98	-22.82				2019	124	-10.81			
2020	7.87	-0.68				2020	89	246			
ROE=NET INCOME/NET WORTH						PE=MARKET PRICE PER SHARE/EARNINGS PER SHARE					

INTERPRETATION

- EPS of PNB Bank has smallest ratio in all years and it slightly decreased in 2018. SBI have parallel levels and it has highest ratio in 2017.
- PE ratio of SBI is highest in 2017 i.e 947 while PNB has its highest in year 2020 i.e 246.

- Current ratio has a minor difference for SBI Bank and in case of PNB it is in increasing trend from 2018
- ROE of SBI is better than PNB as PNB shows higher ROE in the year 2017 i.e 3.01 and later it is in a decreasing trend.

BALANCESHEET (STATE BANK OF INDIA) (Cr)

Particulars	March 2016	March 2017	March 2018	March 2019	March 2020
EQUITY & LIABILITY					
Share Capital	776.28	797.35	892.46	892.46	892.46
Total Reserves	1,43,498.16	1,87,488.71	2,18,236.10	2,20,021.36	2,31,114.97
Deposits	17,30,722.44	20,44,751.39	27,06,343.29	29,11,386.01	32,41,620.73
Borrowings	3,23,344.59	3,17,693.66	3,62,142.07	4,03,017.12	3,14,655.65
Other Liabilities	1,59,276.08	1,55,235.19	1,67,138.08	1,45,597.30	1,63,110.10
Total Liabilities	23,57,617.54	27,05,966.30	34,54,752	36,80,914.25	39,51,393.92
ASSETS					
Balance with RBI	1,29,629.33	1,27,997.62	1,50,397.18	1,76,932.42	1,66,735.78
Balance with Banks	37,838.33	43,974.03	41,501.46	45,557.69	84,361.23
Investments	5,75,651.78	7,65,989.63	10,60,986.72	9,67,021.95	10,46,954.52
Advances	14,63,700.42	15,71,078.38	19,34,880.19	21,85,876.92	23,25,289.56
Particulars					
Net Block	9,82,016	42,82,017	39,20,018	38,50,019	38,023.39
Interest Earned	1,63,998.30	1,75,518.24	2,20,499.32	2,42,868.65	2,57,323.59
Other Income	27,845.37	35,460.93	44,600.69	36,774.89	45,221.48
Other Assets	1,40,408.41	1,54,007.72	2,26,994.20	2,66,327.70	2,89,613.55
Interest Expended	1,06,803.49	1,13,658.50	1,45,645.60	1,54,519.78	1,59,238.77
Operating Expenses	23,57,617.54	27,05,966.30	34,54,752	36,80,914.25	39,51,393.92
Total Provisions	29,483.75	35,992.72	75,039.20	53,128.55	43,330.37
Profit Before Tax	13,774.05	14,855.17	-15,528.24	2,307.48	24,802.24
Taxes	3,823.40	4,371.07	-8,980.79	1,445.25	10,314.13
Net Profit	9,950.65	10,484.10	-6,547.45	862.23	14,488.11

Adjusted EPS (Rs.)	12.82	13.15	-7.34	0.97	16.23
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Profit & Loss Account-Observations-

- In case of loans, the bank informed 6.38 %. If you see 3 years advance growth, it stands at 13.96 %.
- High Cost to income ratio of 52.46%.
- The bank has a very low ROA track record. Average ROA of 3 years is 0.06%
- Share capital does not show a major change from 2016-2020
- Operating expenses is increasing gradually.

Balance sheet (Punjab National Bank) (cr)

PARTICULARS	Mar-16	Mar-17	Mar-18	Mar-19	Mar-20
Equity & Liabilities					
Share Capital	392.72	425.59	552.11	920.81	1,347.51
Total Reserves	37,917.42	41,671.87	40,522.19	43,866.32	61,009.97
Deposits	553051.13	6,21,704.02	6,42,226.19	6,76,030.14	7,03,846.32
Borrowings	59,755.24	40,763.34	60,850.75	39,325.92	50,225.43
Other Liabilities	16,273.94	15,765.73	21,678.86	14,806.29	14,236.68
Total Liabilities	667390.46	7,20,330.55	7,65,830.10	7,74,949.46	8,30,665.91
Assets					
Balance with RBI	26,479.07	25,210	28,789.03	32,129.13	38,397.85
Balance with Banks	49,144.02	63,121.65	66,672.97	43,158.91	37,595.18
Investments	157845.89	1,86,725.44	2,00,305.98	2,02,128.22	2,40,465.64
Advances	412325.80	4,19,493.15	4,33,734.72	4,58,249.20	4,71,827.72
Net Block	5,222.73	6,273.25	6,349.33	6,224.85	7,239.07
Other Assets	16,372.94	19,507.06	29,978.07	33,059.15	35,140.45
Total Assets	667390.46	7,20,330.55	7,65,830.10	7,74,949.46	8,30,665.91

Profit And Loss Statement (PNB) (Cr)

PARTICULARS	Mar-16	Mar-17	Mar-18	Mar-19	Mar-20
Interest Earned	47,424.35	47,275.99	47,995.77	51,310.25	53,800.03
Other Income	6,000.05	8,951.37	8,880.87	7,377.41	9,274.13

Interest Expended	32,112.57	32,282.82	33,073.36	34,153.94	36,362.24
Operating Expenses	9,972.45	9,379.38	13,509.07	11,538.48	11,973.37
Total Provisions	17,077.26	12,553.62	29,869.28	28,341.01	13,999.56
Profit Before Tax	-5,737.89	2,011.54	-19,575.08	-15,345.77	738.98
Taxes	-1,763.49	686.74	-7,292.26	-5,370.28	402.79
Net Profit	-3,974.40	1,324.80	-12,282.82	-9,975.49	336.19
Adjusted EPS (Rs.)	-20.24	6.23	-44.49	-21.67	0.5

Observations

- Company has a low ROE of -19.05% over the last 3 years.
- The firm has produced weak profit growing of -36.69% over the past 3 years.
- Other income of the company is increasing in an increasing trend
- Interest earned is stable from 2016-2020.
- Share capital is showing a positive change from 2016-2020. Recently it is 1,347.51.cr

Findings And Suggestions

- With a population of more than a 1.3 billion people, India represents a massive market for Banking sector to invest, with very positive growth in the future
- Stagnation has a major negative impact on this sector
- Financial environments is highly dependable on banking sector
- PNB is trying hard to cross the position of SBI
- SBI shows more Market Capitalization as compared to PNB.
- Through fundamental analysis it has been observed that these 2 Banks are presently showing a descending trend in the market
- Share capital of PNB is highest in 2020 which shows the future growth of the bank.

- The study advises the investor to use knowledge about the qualitative factors and current market situations while taking Investment decisions.
- The shareholders should know the past performance of the firms prior to investing in the shares of those companies.
- Investors should understand the limitations used in Fundamental analysis

Conclusion

From the analysis, it can be decided that Public sector banking is flourishing after recession and there will be a decent progress in next few years. India has become a Good destination for investors to Invest.

The financial development of the nation is an appropriate sign for the development of the banking sector. The Indian financial system is expected to flourish and the country's banking sector is projected to replicate this growth. These days, banks in India are turning their focus to servicing clients and improving their technology infrastructure, which can help better customer experience and give them a competitive edge. Since Indian economy is observing robust development, the requirement for banking services.

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STATISTICAL MODEL FOR GENDER INEQUALITY

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ABSTRACT

Gender disparity stymies a country's development efforts around the world, particularly in developing countries. Gender equality means that men and women are both free to develop their strengths and make their own decisions. Gender inequality research is critical for society to improve its attitudes toward women. To test the effects of social issues on gender inequality, we used logistic regression to model. Using stepwise regression, we pick a collection of key issues. We were able to properly verify the model's sufficiency. We conclude that gender equality is unaffected by location, social class, or appreciation of women's role in religious activities. Age, nature of marriage, religious belief, dowry concerns, and equal voice in decision-making largely effects on gender inequality, according to the logistic regression. These factors can help you modify your social situation.

Keywords: Gender equality, Logistic regression, Stepwise regression, Naïve-Bayes' classification, Decision tree.

Introduction

In our country, from the ancient culture women is worshipped as a goddess. Women play important role in our society in every era. Afterward, traditional patriarchal customs and norms have relegated women to a secondary status within the household and workplace.

In the world, women face gender discrimination everywhere. But less gender equality creates problems for women as well as society. Women must have equal rights as men in the family as well as in society. The effect of gender discrimination on the different sectors and also social growth of any nation is the motivation of the study. In this paper, we are interested to find out the reasons behind gender inequality.

Gender equality refers to equitable treatment of men and women based on their individual needs. Gender inequality impacts on:

- Women's health over their lifetime.
- Women's educational attainment and economic conditions
- Women's Political empowerment

Although the constitution of India grants men and women equal rights, gender inequalities remain. Different inequalities occurred in various areas like Economic Inequalities, Educational Inequalities, Political Inequalities, Religious Participation, etc.

Literature Review

This research study looked into the reasons that contributed to gender disparity in Kyebi, Ashanti Region of Ghana.

Mavis Dako-Gyeke and Prince Owusu (2013) explored factors that perpetuated gender inequality in Kyebi, in the Ashanti Region of Ghana. Four causes were discovered to be at the root of gender inequality in the Kyebi community. These were cultural and traditional practices, gender socialization, poverty and discrimination in access to land.

The impact of relative socioeconomic position and perceptions of gender inequality in the marital relationship, in combination with domestic labour, on psychological discomfort was explored by L. Harryson et. al. (2012) using logistic regression analysis.

Sumanjeet S. (2016) explores numerous mechanisms that help countries close gender gaps as they grow. Why has the sex ratio gotten increasingly male-skewed with development, according to the author of the study? In addition, the author outlines several legislative options for addressing gender inequality.

Objectives

- To find out the causes of gender inequality in the Baramati Region.
- To study which factors most impact gender inequality.

- Develop a statistical model for gender inequality.

Methodology

In the Baramati region, the study depicts gender inequality in rural and urban areas. As a result, we chose four places for pilot research, two of which are rural regions and the other two are urban areas.

Malegaon and Jalgaon Supe are two villages in the rural area. Rui-paati and Kasba are both located in the urban area. Then, for a pilot study, we create a questionnaire. We take a sample of 25 women from each area for the pilot study and analyse the data to develop the questionnaire.

We chose 40 questions for the final study, and the response question is "Is there gender equality in your house or your village?". These 40 questions are the 40 variables, and these variables are coded as Q1 to Q40. Out of which Q40 is the response variable. The primary data were collected with the approval of the Baramati municipality and the village Sarpanch from 371 women.

Our response is dichotomous, which means it has only two options: "Yes" or "No," therefore we used Logistic Regression to determine which factors are important in determining gender inequality.

Logistic Regression (LR):

Linear regression is typically employed when the response or dependent variable occurs on a continuous basis and the residual errors are normally distributed. We perform logistic regression when the dependent or response variable is not continuous. This regression shows a categorical or dichotomous variable regression model. The association between several independent variables and categorical dependent variables is investigated using logistic regression, often known as the logistic or logit model.

For example, Y can represent values such as "success" or "failure," "Yes" or "No," "Like" or "Dislike," all of which can be represented by the numbers 0 and 1.

The logistic regression model is:

$$\log\left(\frac{p}{1-p}\right) = \ln(\text{odds}) = \ln\left[\frac{p}{1-p}\right] = \alpha + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k$$

Where p is the probability of desirable outcome, X_1, X_2, \dots, X_k is independent variable, α is intercept and $\beta_1, \beta_2, \dots, \beta_k$ are regression coefficients.

The assumptions of Logistic regression as follows:

Errors are independent but not normally distributed.

Binary logistic regression is used if dependent or response variable is in binary in nature.

It can hold non-linear relationships between all variables, including independent and dependent variables, and it can also convert non-linear logs to LR.

In comparison to linear regression, this regression requires a large sample size because maximum likelihood approximations have low power for small samples.

Stepwise Regression:

The forward and backward selection approaches are combined in Stepwise Regression. Stepwise Regression is a kind of modification of forward selection in which all regressors previously entered into the model are appraised using their partial F (or t) statistics at each step. Because of the relationships between it and other regressors in the equation, a regressor introduced earlier in the process may be redundant. If a variable's partial F (or t) statistic is less than F OUT (t OUT), it is removed from the model.

Stepwise regression requires the use of two cutoff values: one for entering variables and the other for deleting them. Some analysis prefers to choose F IN (or t IN) = F OUT (t OUT), although this is not necessary. Frequently we choose F IN (or t IN) > F OUT (t OUT), making it relatively more difficult to add a regressor than to delete one.

Confusion Matrix

A confusion matrix is a table that shows how well a classification model (or "classifier") performs on a set of test data for which the true values are known. It is useful to calculate Sensitivity and Specificity.

True Positives (TP): These are cases in which we predicted YES (they have the disease), and they do have the disease. Sensitivity can be calculated by formula as,

$\text{Sensitivity} = \text{TP}/\text{actual yes}$

True Negatives (TN): We classify NO, and they don't have the disease.

Specificity can be calculated by formula as $\text{Specificity} = \text{TN}/\text{actual no}$

False Positives (FP): We classify YES, but they don't actually have the disease. (Also known as a "Type I error.")

False Negatives (FN): We classify NO, but they actually do have the disease. (Also known as a "Type II error.")

Statistical Analysis

Logistic Regression

This is suitable regression analysis used where response variable is occurs binary in nature. We apply this on our data.

Initial Model: $\text{fit1} = \text{glm}(\text{Q40} \sim., \text{family} = \text{binomial}(\text{link} = \text{"logit"}), \text{data} = \text{d1})$

Table 1: Table for Coefficients of initial Logistic Regression model

(Intercept)	Q1	Q2	Q3	Q4	Q5	Q6	Q7
14.618378	0.008588	0.264677	-0.121454	-0.721143	0.117977	0.018066	-0.012936
Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
-0.051111	0.082232	-0.179252	0.745625	-0.091411	-0.10271	-0.015852	-0.141884
Q16	Q17	Q18	Q19	Q20	Q21	Q22	Q23
0.725171	0.247032	0.564258	-0.145317	0.01547	-0.207072	0.460606	-2.212649
Q24	Q25	Q26	Q27	Q28	Q29	Q30	Q31
-0.086223	-14.07962	1.286363	-0.924711	0.05523	-0.484673	0.72801	1.121051
Q32	Q33	Q34	Q35	Q36	Q37	Q38	Q39
0.399346	-0.610032	0.537779	-0.016188	1.108892	0.387874	-0.133588	-0.139423

Residual Deviance: 336.8 AIC: 416.8

From the analysis of deviance, we observe that the Q11(Do you think that both men and women should share household works equally?), Q23(What is your opinion about dowry system?), Q26(Do you agree that both boys and girls are getting quality education equally from school?), Q36(Would women in decision making improve delivery of basic services?) are significantly affected on the response factor "Is there gender equality in your house or in your village?"

Adequacy of the fitted model: p-value = 0.02488.

So, from the adequacy of the fitted model we observe that the p-value = 0.02488, is less than the level of significance(α). Hence, for getting better adequacy we use stepwise regression technique.

Stepwise Regression:

Final model of stepwise regression:

$\text{Q40} \sim \text{Q2} + \text{Q4} + \text{Q11} + \text{Q18} + \text{Q21} + \text{Q23} + \text{Q26} + \text{Q29} + \text{Q30} + \text{Q31} + \text{Q34} + \text{Q36}$

Table 2 : Table for Coefficients of Final model of stepwise regression.

(Intercept)	Q2	Q4	Q11	Q18	Q21	Q26
0.05615	0.26938	-0.77296	0.81079	0.65894	-0.29246	1.24195
Q29	Q30	Q31	Q34	Q36	Q23	
-0.48863	0.66106	0.96636	0.56877	1.21725	-2.0661	

Null Deviance: 413.4

Residual Deviance: 347 AIC: 373

Results and Discussion

The AIC of initial model is 416.8, but the AIC of final model of stepwise regression is 373. It shows that final model given by stepwise regression is better. The difference between the null and residual deviances indicates how well our model performs in comparison to the null model (a model with only the intercept). The wider this gap, the better.

Confusion Matrix

Response	FALSE	TRUE
0 (NO)	30	61
1 (YES)	12	268

True Positive Rate:

TP/ (actual yes) = $(268/280) = 0.9571$

It is also known as "Sensitivity" = 95%.

True Negative Rate:

TN/ (actual no) = $(30/91) = 0.3296$

It is also known as "Specificity" $\approx 33\%$

Adequacy of the Final model:

X-squared = 5.4227, df = 8, p-value = 0.7116

Hence, from the p-value = 0.7116 we can say that model is adequate.

Accuracy of the final model is 0.8032345 i.e. 80.32%. It means stepwise logistic regression, is very much useful for identifying the variates, that relates to gender inequality.

Conclusion

Gender inequality is still a reality in the Baramati region, if not the entire world. This situation will change soon if society's perspective on domestic chores, religious belief, dowry system, quality education, and the position of the decision maker in the home and society changes. In the Baramati region, it is hoped that by expanding education and opportunity for women, gender disparity would be eradicated.

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A STUDY OF PERSONAL FINANCIAL PLANNING OF HOUSEHOLDS WITH SPECIAL REFERENCE TO BARAMATI IN PUNE DISTRICT OF MAHARASHTRA STATE

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ABSTRACT

The financial planning as well as financial product awareness among the rural people is the need of the Indian Society. The people feeling the importance of budgeting, record keeping balance for households. However, they are unable to practice this thing because of lack of awareness and lack of guidance. The financial products like Pension and Insurance having great importance in the minds of Indian citizens, but majority of them are unable to get such a product due to lack ease of access and availability. Analysis of data also depicts less preference towards the institutional borrowing due to unavailability of credit to many people. Hence, unfortunately, they have to go for private money lenders. The researcher has identified this research problem, designed descriptive research for this. Collected primary data through online questionnaire. Secondary data from various publishers and website is used for this study. The hypothesis tested using Z test. The results are presented in the form of graphs. In the concluding part solutions are provided to overcome the problem of rural households.

Keywords: Financial Plan, Rural Households, Investment, borrowings, risk, insurance, etc.

Introduction

Even though a personal finance is one of the most significant factors in our lives, we are spending least time on managing them. We are not answerable for personal financial goals and results. When we plan personal finance properly, we can contribute larger time to every area of life.

Financial Planning- It is a step by step process to ensure that we plan and invest in a way so that we are constantly in sight of our goals and the effort that is required to achieve them.

Rural Financial Cooperatives- In rural India, the cooperative credit system is mostly adopted by rural families. It is bringing together individual farmers and their production capacity through cooperatives.

Objectives:

Thinking about the own life, you'll be aware that the financial goals, and the ways you go about trying to achieve them, can be influenced by social factors such as the values, culture or religion as well as by economic factors. In terms of religious values, for example, the taking or paying of interest is prohibited under sharia law, as it was by the Roman Catholic Church in earlier centuries. Approaches to charitable donations, the giving of care and financial support to family members are also affected by contextual social factors.

Methods

Even though a personal finance is one of the most significant factors in our lives, we are spending least time on managing them. We are not answerable for personal financial goals and results. When we plan personal finance properly, we can contribute larger time to every area of life.

Research Problem- Origin of Research The researcher founds that, there is need of financial planning in the life of each and every citizen. There is much awareness among the urban people about the financial planning, but in case of rural!!! It is worst condition among the rural citizens of India. This is the attempt to know, analyse and spread of awareness of financial planning among the rural Family.

Objectives of the Study- This study the financial planning of rural Family, the researcher sets following objectives as:

1. To study the awareness of financial planning among the rural Family
2. To study the availability of financial planning avenues to the rural Family
3. Hypothesis- To conduct research on the financial planning of rural Family, the researcher sets following Hypothesis for to be tested:

1. Null Hypothesis H0: There is financial literacy among the rural Family
2. Alternative Hypothesis H1: There is not financial literacy among the rural Family

Scope of the study

1. Geographical Scope: Baramati Territory (Maharashtra- India) has selected for the data collection
2. Time Horizon: Data is collected During the Financial Year 2017-18, 2018-19 and 2019-20
3. Content scope: this project is limited to the financial data of the family

Significance of the study in the context of current status

The research has very much scope in the rural financing. The financial institutions and banks are asking to generate need of financial planning among the rural Family. This study will be benefited for following:

1. To all rural Family in their personal financial planning
2. To all Banking institutions in the customizing the financial products for rural Family
3. To all Non-banking and banking institutions to design plans for rural market
4. To government for drafting new policy for rural Family

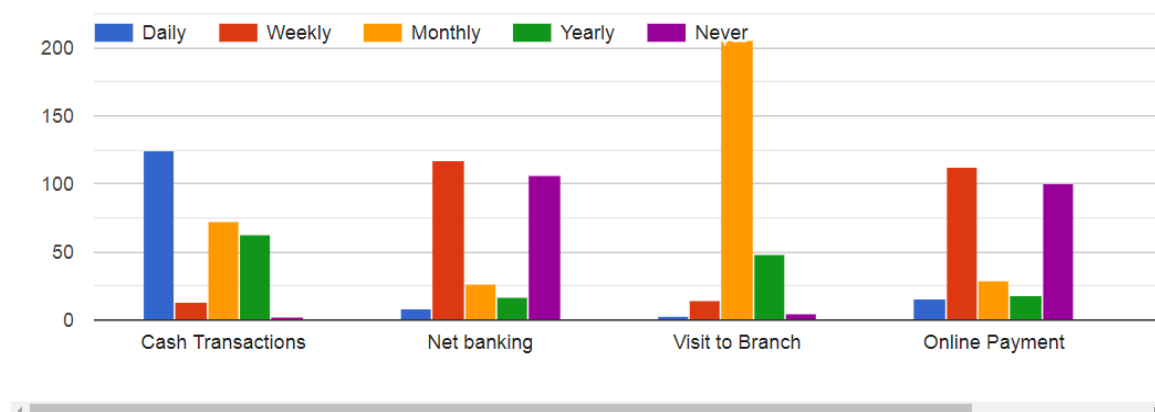
5. To NGO's related to micro financing the rural market of India

Research Design

1. Data Required: To suffice said objectives and testing of hypotheses following data is collected. Primary Data- The Survey is collected with preparing schedule via online google form and collected through research buddies on convenient sampling that is non-probability sampling method is used. Secondary Data- The secondary data various published books on financial planning, personal finance, etc.
2. Sources of Data: Both Primary and Secondary sources of data are utilized for this study. Secondary sources: To gather the information secondary sources viz. Books, Journals, Magazines and Periodicals are used. Primary Source: To collect the information of primary source of data collection using a questionnaire is used.
3. Instruments/ Research tools- For data collection structured questionnaire is used and collected data with direct visit to the respondents.

Result

Use of Banking Services



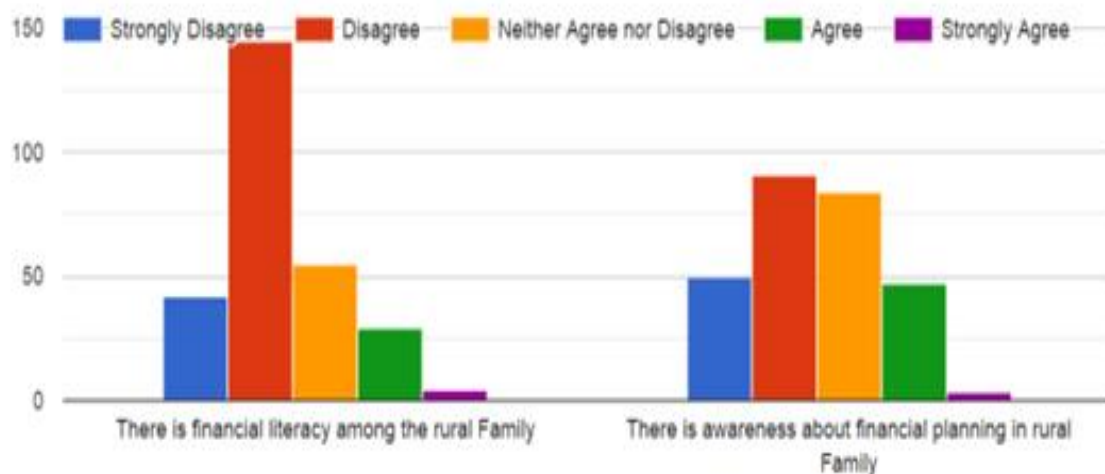
Source: Primary data collected

Interpretation

From the above graphical representations researcher made interpretation regarding the frequency of use of banking services is that, majority of them are dealing with cash

transactions on daily basis. Rural people are using weekly net banking used by majority people. Monthly visit to the branch but they visit ATM on daily basis because of cash transactions. Weekly online payments are also in use.

Awareness Analysis



Source: Primary data collected

Interpretation

From the above graphical representations researcher made interpretation regarding the hypothesis statements, that the statement is at disagree side. The hypothesis testing has shown the acceptance of alternative hypothesis statements.

Testing of Hypothesis

The statement Examined was, "There is financial literacy among the rural Family". For this statement, respondents were asked to give their view on a Five-point scale, from 5 meaning strongly agree to 1 meaning strongly disagree. Responses to this question, along with the means and standard deviations, are given in table. While the data were obtained using an ordinal Five-point scale, in calculating mean and standard deviation, the researcher was treating this statement as if they were measured at an interval level.

For this variable, test whether the mean response is on agree side of a neutral response, that is, test whether the mean exceeds 3. Use the 0.05 level of significance. Assume this sample is a random sample of all respondents.

Table: Responses to the statement

Response criteria	Responses
5 - Strongly Agree	4
4 - Somewhat Agree	29

3 – Neutral	55
2 - Somewhat Disagree	145
1 - Strongly Disagree	42
Total (n)	275
Mean (Weighted average) (\bar{x})	2.3018
Standard Deviation (s)	1.12

In order to determine whether the sample mean \bar{x} is within the critical region or not, it is necessary to determine the distance \bar{x} is from the hypothesized mean μ . This can be determined by obtaining the Z-value associated with the sample mean - that is, how many standard deviations \bar{x} is from the hypothesized mean of $\mu = 3$.

Calculations for Overall respondents

That is, the z value is 10.34 which is above the hypothesized z value. This is above the critical cut-off point of +2.33, so this Z-value is in the critical region for the test. That is, the sample mean is 10.34 standard deviations above the hypothesized mean of 3, a great distance, and one that is extreme enough to be in the right 0.05 of the distribution.

Since this Z-value is in the critical region, the conclusion of the test is to reject the null hypothesis H_0 and accept the alternative hypothesis H_1 .

The conclusion is that the opinion of overall respondents is on the disagree side of neutral, a conclusion made at $\alpha = 0.05$ level of significance. This provides quite strong

evidence that overall Respondents on average are not neutral on this issue but tend to Disagree.

Interpretation

From the above analysis researcher made conclusion that, there is not financial literacy among the rural Family.

The researcher has set up the hypothesis to study the statement. As per the calculations of testing of hypothesis, the researcher accepts the alternative hypothesis i.e. there is not financial literacy among the rural Family.

Findings of the Study:

Findings are based on the Primary data as follows:

1. The data collected from the rural region only. As research focused on the rural part of India, the rural respondent's data has considered by filtering in Excel sheet.
2. The Number of Family members in the rural family is around 5 members on an average.
3. The Chief wage earner in the rural family is having male dominating families.
4. The occupation of Chief of Family in the rural is either employed or self-employed in the similar proportion.
5. Annual Income Family in the rural is earning below 250000 per annum on an average.
6. Type of House of in the rural Family is having Pucca house on an average.
7. House Ownership of in the rural Family is having their own house.

Discussion and finding

Central to the situation is the goal of a comfortable retirement. The need is to have enough income throughout retirement to finance a certain standard of living. The

amount required will be determined largely by expectations of spending in retirement. This raises a question: whose spending needs? Should the financial plan look at the individual or the household? The danger of basing the plan on the household is that many households change over time as, for example, couples split up, family members and friends decide to share a home or leave, or people die. Traditionally, married couples have adopted the household approach, and the resulting financial plans have often proved inadequate in the face of death or divorce. This is a key reason why women account for such a high proportion of the poorest pensioners today. The advantage of a retirement plan based on the individual is that each member of the household has their own pension arrangements, which they retain even if the make-up of their household changes.

Result

As per the analysis of data, interpretations, and the findings, The Researcher has reached to the conclusion that, the alternative hypothesis is accepted. The financial planning as well as financial product awareness among the people is not in the India Society. The people feeling the importance of budgeting, record keeping balance for households. However, they are unable to practice this thing because of lack of awareness and lack of guidance. The financial products like Pension and Insurance having great importance in the minds of Indian citizens, but majority of them are unable to get such a product due to lack ease of access and availability. Analysis of data also depicts less preference towards the institutional borrowing due to unavailability of credit to many people. Hence, unfortunately, they have to go for private money lenders.

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TECHNOLOGY LITERACY - THE MANTRA OF SURVIVAL OF MANKIND**Prabha Kumari¹, M. K. Singh²**¹Dr. D.Y. Patil Arts, Commerce and Science College, Pimpri, Pune.²Vinoba Bhawe University, Hazaribagh, Jharkhand.¹prabha.kumari@dypvp.edu.in**ABSTRACT**

Technology innovations are rampant in our times. The pace of changes in the technology domain is astonishing. To keep up with this swiftness, there is a demand on the humans to acquire the digital skills. These skills are required in our day to day living. We require these digital skills to earn a living for ourselves. The work discusses some of the scenarios highlighting the need for digital literacy. Some cases are discussed where the hindrances to technology literacy are discussed and the methods adopted to overcome them. The digital literacy is discussed at the backdrop of the technology acceptance model in this paper. The technology acceptance model comes handy in terms of digital literacy. The relevance of the model is significant when chalking out the demands of technology education. The technology literacy here is referring to the knowhow of digital system to use them to their potential. The paper tries to uncover some prevailing aspects of digital literacy in contemporary times.

Keywords: Digital Literacy, Technology, Digitalization, Technology Acceptance Model.

Introduction

This is no secret that we could do away with technology in the 21st century. We need to be with the times no matter what the age is. This is the mantra to survive in the world. As technology comes in our lives in one form or the other, being technology literate is not a privilege anymore, but a necessity. The machines are made for us (Legris et al, 2003). We need to be equipped with the knowledge to dictate them. We need to be educated enough to make use of the digital machines to improve our standard of living. These machines are ways to upgrade our lives (Robey, 1979).

New technologies of course would take time to be absorbed by the mankind (Subramanian, 1994). The acceptance of the technologies is dependent on the human attitudes and perceptions towards the technologies along with the relevance of the technologies to the environment (Tornatzky & Klein, 1982). The affordability of the technologies also is an important aspect along with the ease of its use. These things form one side of the coin. The other side of the coin represents the ability of the humans to handle the technology systems (Fishbein & Ajzen, 1977). This is the point where the technology literacy could help command the digital systems.

The business and job opportunities heavily rely on technologies. Technology literacy is not the domain of engineers and technicians only anymore. It is true that these people deal

with the digital systems in detail, but the common people need to know the knowhow of the technologies. Our country after demonetization has encouraged using online financial transactions. To make this work, one should be acquainted with these digital systems to thrive in the society. These are the needs of the time.

The education system itself has adopted digital medium to its core. The young generation by default has absorbed the digital systems in their lives. It is the older generations who need to adjust to the digital transformations. This adjustment is not a compromise but an investment to be future ready.

Digitalization and our lives

The acceptance of technology depends on number of factors. Digital literacy plays an important role in bridging the gap of technology acceptance. We have witnessed number of technology inventions used to build devices and not been widely accepted (Ajzen, 1987). While some technology inventions are readily accepted and have wide acceptance in the society (Yang & Yoo, 2004).

The kiosks or the vending machines are widely in use in the advanced countries. These systems are now in use in our country as well. The beverage vending machines now are a common sight at public places and offices. The Automated teller machines too are digital systems which are not a novelty now. These

now common systems were a novelty some time ago. What makes these innovations popular or common? What makes some technologies more popular than other? The answer to these questions could be found in the theory of Technology Acceptance Model.

Case Study

In the context of COVID-19, a popular fast-food chain installed digital kiosks to order food in their restaurant. This was to reduce the human interaction. The digital systems allowed the customers to browse the menu on the screen and place orders. The bill payment was also routed through the digital systems to make the entire food ordering process without any intervention of the restaurant employees. This system was observed in one of their restaurants. Three such touch screen devices were installed at the restaurant. Along with these digital systems, the routine manual order accepting counter was kept open too. The customers were observed for their responses towards these installed systems silently in the restaurant.

The customers initially were completely unaware of such systems and their utility as well. The manual counter was partially manned. The employee at the manual counter was urging the customers to use the newly installed food ordering systems. The customers when introduced with the new system found the restaurant menu on the big touch screen. The customers had to select the food items and put it into the digital cart. On finalizing the order, the customer had to check out and go for paying the bill. The bill payment system was similar to the digital payment systems used in the online shopping systems. Card swiping or tapping machines were kept too to accept the payments. The overall system was similar to the food ordering process available on the food delivery applications.

While observing the attitudes of the customers towards this new system of ordering the food, a large number of customers had inhibitions to order through these systems. These customers turned to the manual order taking counters for ordering the food. The customers who were reluctant to use the new systems were majorly middle aged. On the contrary, the youth were excited to use the new food ordering systems.

The behaviors of the customers were only observed with no probing about why the customers did or did not prefer the new ordering digital systems.

The customers who were reluctant to use the digital system were overheard complaining about the systems requiring human touch to the screens which are used by number of customers raising hygiene concerns. This was a deterrent for most of the customers to use the new technology. Though hygiene measures were carried out by placing sanitizer bottles at the kiosks, the idea to use hands on the screens to place orders and then having their food did not go down well among the customers. The purpose of the systems was to decrease human intervention, but it proved the other way.

The other observation was during the rush hours, the customers using the digital systems had the waiting queue on back of their minds. There seemed a pressure on the customers to place the orders within time so as to give the waiting customers their turn. A long time to handle the system and place the order meant the customer was unable to use the system. This was a kind of embarrassing situation for the customers. The need to be digitally competent at least in front of the customers in the vicinity could be seen through the customers' expressions. This led many customers to stay away from the systems and go to the manual ordering process.

In the above scenario, it was evident that the customers lacked the knowledge to use the systems. There was no initiation from the restaurant brand to educate their customers about such system in place and its way of handling. After considering the above observation, the management decided to deploy their employees at the kiosks to guide the customers through the ordering process. As there were three kiosks, three employees need to be employed. These three numbers of employees were greater than one employee which manned the manual counter. However, the ordering process proved to be faster, serving more customers than usual during the rush hours. The customers seemed comfortable knowing they had guidance to use the digital system. The fear of touching the screens also was eliminated as the employees

handled the screens taking recommended precautions.

This investment in educating the customers in terms of employees and time was required to ease the employees through the digital systems. It is not the case that the systems were too complex to operate, and it resembled the process of online shopping. Yet the novelty of the systems was a hindrance in putting the systems to use to their full potential. The communication by the brands about the technology systems put up at their place needs to be done before hand to make the stakeholders comfortable. The knowledge about these digital systems would make the stakeholders aware of the benefits of the systems.

Theory - Technology Acceptance Model

The technology acceptance model explains about the acceptance of technology by user using two prominent factors – Perceived Usefulness (PU) and Perceived ease of use (PEOU) (Davis, 1989).

Perceived Usefulness (PU) – It is the extent to which a subject believes a technology would enhance the job performance.

Perceived ease of use (PEOU) – It is the extent to which a subject believes a technology requires minimum efforts to use.

The digital literacy should include the above factors to make it effective. When imparting digital education, one has to be vigilant about the above two factors (Venkatesh, 2000). The model explains the significance about the preconceived notions of the users about the technologies and their utilities. These are a sort of hindrances in absorbing technology by people. The communication of the innovations and technologies is needed to be done in an effective manner to create an environment about the new systems.

Generation GAP

The youth seems to be more comfortable with the technology innovations. The older generation though competent in the skill department there seems to be inhibitions while using the technologies. This is evident through our day-to-day experiences. The middle aged and older people need lots of guidance to use the digital devices. Even after continuous

guidance the ease of use found is not at par with that of the younger generation. There are exceptions to this, but this seems the general pattern. The times when the Automated Teller Machines were introduced, there seemed reluctance in the usage due to novels and lack of knowledge to use the systems. Even today, due to digital illiteracy, many people stay away from using the ATM's and prefer manual banking operations (Davis et al, 1992).

There is a need for the technology giants to make people digital literate to expand their customer base. The digital illiteracy is a major block to generating revenues for this technology-driven companies. The social media giant Facebook has been recently advertising their offerings targeting the older generations. Same goes with the messaging application 'WhatsApp'. No doubt, these platforms are super popular with the young masses. However, the neglected chunk of older generation could generate revenues for these companies by making them digital literate. The commercials could be seen conveying the ease of use and the benefits to the x and y generations.

The older generations are vulnerable to digital hacks owing to their limited knowledge of the digital devices. This aspect needs to be taken care when involving the older generations into the digital arena. What is to be done and what should not be communicated when imparting digital education. Careful handling of the technologies is required rather than only making people aware about the utilities of the system. The digital literacy is a way to bridge the generation GAP, allowing the generations to hold hands and improve the quality of their lives.

In the times of COVID-19 pandemic, there was a need to resort to digital systems to continue with the life. The digital systems had to be used irrespective of the age of the users. One had to learn the digital skills to live through the tough times. There was no alternative but to go through the digital transformation.

The household appliances are generally used by the women at home. This is a general trend in our country and the scene more common in tier II cities and downwards. For the appliance companies it becomes imperative to see that

the user is well acquainted with the handling of the appliances. The brands cannot rely only on user manuals and training guides. The literacy of the women in terms of handling the appliances is important to make a breakthrough in sales. The brands are seen to educate the women about the appliances and giving real time support. The companies deploy their teams to look after the demonstration sessions and real time handling of the appliances. This also contributes to the customer relationship management. The digital literacy or in other words the technology literacy is the need of the hour to bring equality in the society.

Conclusion

The technology literacy is inherent in the lifestyles of the current ecosystem. This trend

of technology education is by default imparted to the younger generation in their way of lives. The middle aged and younger generations need to make investments and exert efforts to be aware about the technologies prevailing in the system. The companies and the Government too need to take efforts to spread the culture of digital literacy in the society to make people aware about the technologies. Technologies are double edged sword where it can have harmful effects on the lives of the society. It is the responsibility of the mankind to be aware of the new entities in our lives – The Digital Machines. Digital literacy is the key to survive in this new ecosystem of digital transformation.

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DESCRIPTIVE AND DIAGNOSTIC STATISTICAL ANALYSIS OF STRESS

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ABSTRACT

Dealing with life's stressors is an unavoidable part of being alive. They occur when a person is confronted with life situations for which he or she has no prepared replies. Stress is an unavoidable aspect of modern life. The occurrence of some unpleasant and unwelcome events early in life can sometimes stress an individual's capacities to the point that mental and physical disability, ill health, and even death might result. We collected student stress scale questionnaires and health reports from several faculties' students, including their diet type, gender, and BMI level, for this investigation. The major goal of this study is to conduct a diagnostic examination of student stress utilizing various statistical technologies

Keywords: Stress, BMI, Health Problem, ANOVA.

Introduction

In general, young people experience physiological, social, and cultural changes as a result of family home abandonment and peer group influence during this period, which can be linked to harmful habits that affect health. In this regard, it is critical to understand how students cope with stress or which factors have the greatest impact on 'student stress,' as well as why students engage in non-adaptive behavior.

We're curious about how various aspects of stress and diet are linked to measures (such as BMI, MM, B-Fat, and BMR) and at a cognitive level (such as perceived well-being, stress or another psychosocial factor). According to research, stressful periods might lead to maladaptive behavior such as poor eating or sedentary behavior. The following research questions are presented in this study in order to address the requirement to create action in order to establish an active lifestyle that allows for the improvement of negative psychological states that are developed in university content: Is there a link between academic stress and its various dimensions, such as gender, BMI, Education levels (PG, UG), income, faculty and diet quality?

It's critical to investigate the causes of underweight and overweight. In most circumstances, overweight persons may lose a lot of weight by eating less but healthier food and exercising more. People must consume more food, more frequently, and in a healthy manner in order to acquire weight. However,

eating, particularly healthy food that contains a lot of proteins, is costly. Even if students are in good health, they can be influenced by psychological (stress, anxiety) and health issues (digestion problem, bulimia). The purpose of this study is to find out is there any significant difference in the average stress with faculties, BMI level and gender and its hypnotized as follows

H1: There is significant difference in the average stress scores of various dimensions with faculties.

H2: There is significant difference in the average stress scores of various dimensions with BMI levels.

H3: There is significant difference in the dimension of stress scores and Gender.

Literature Review

S Lakshmi Priya, J Lakshmi and K Naresh Kumar (2018)

The topic of this study was "BMI and Stress Level of College Students in Pondicherry." The primary data for this paper was gathered. In the academic year 2015, college students in Puducherry completed a questionnaire. a two-stage process the sampling approach is stratified random sampling. The population is separated into three strata in the first round of sampling. Colleges were categorised based on the kind of institution in the second stage of sampling (government or private). According to the sampling technique, 250 samples were gathered and statistical analysis was

performed on some colleges randomly picked from all colleges.

Ramón Chacón-Cuberos, Félix Zurita-Ortega, Eva María Olmedo-Moreno, Manuel Castro-Sánchez (2019)

Physical activity (PA), adherence to the Mediterranean diet (MD), and health have all been linked in several studies. Despite this, there are few studies that show a link between these practices and academic performance, particularly academic stress. This descriptive, non-experimental, cross-sectional study uses the KIDMED, PAQ-A, and the Scale of Academic Stress as key tools to examine the relationships between these variables in a sample of 515 university students. Women had higher levels of academic stress than men in the university students studied, particularly in terms of academic commitments and communicating one's own thoughts. Furthermore, university students having a body mass index (BMI) associated with being overweight or underweight were found to be the respondents with the highest levels of stress. Finally, students who did not adhere to MD had higher stress levels related to communicating their own views, but PA had no effect on academic stress. There were no relationships between stress and food quality when sex and BMI factors were adjusted in the regression model. The findings of this research have important implications for the treatment of academic stress. Although stress was not linked to food or physical activity, it was linked to a worse state of health in those who were overweight, with the treatment of stress in women being of particular importance.

Research Problem

In comparison to our parents' generation and their offspring's generation, this generation in the age range of 18 to 25 gets weary more readily than their parents. We ran across similar problem at our college, where faculties are divided into groups based on their BMI. So, we discovered that the cause of their exhaustion was their tension, which was caused by various levels of stress. Exam stress, indifference in attending lectures, and

difficulty to understand a subject are all issues that students confront in today's highly competitive environment. Academic stress is defined as mental suffering related to upcoming academic challenges or failure, as well as the fear of academic failure. Academic pressures can be found in many places in a student's life, including school, home, peer relationships, and even their neighborhood.

Objectives

1. Whether there is faculty wise any effect of different dimensions of Stress.
2. Is there any dependency of stress on gender?
3. Which activities students prefer to deal with stress?

Research Methodology

This project undergoes with primary data collection. The questionnaire was filled by the college students in Tuljaram Chaturchand College, Baramati, in academic year 2019-20. The population is divided into Arts, Commerce, and Science of age between 18 to 25 i.e. students of UG and PG of T. C. College. This project focused on "Body Mass Index (BMI) with stress level of college students". We had collected data from 492 participants & analysis was carried out on it. To count Stress level of a student's, permission was taken from Psychology Department for Standard Student Stress Questionnaires. The Questionnaire included some personal and social-demographic profile of students as well as 64 items stressors. The total stressors were divided into following dimensions:

1. Financial Stress
2. Family Stress
3. Social Stress
4. Educational Stress
5. Not attending Education Objectives
6. Irregular University Functioning
7. Lack of Study Facilities
8. Teacher-Students Relationship
9. Ego Threat
10. Bereavement
11. Separation
12. Personal Set-back
13. Health of Others.

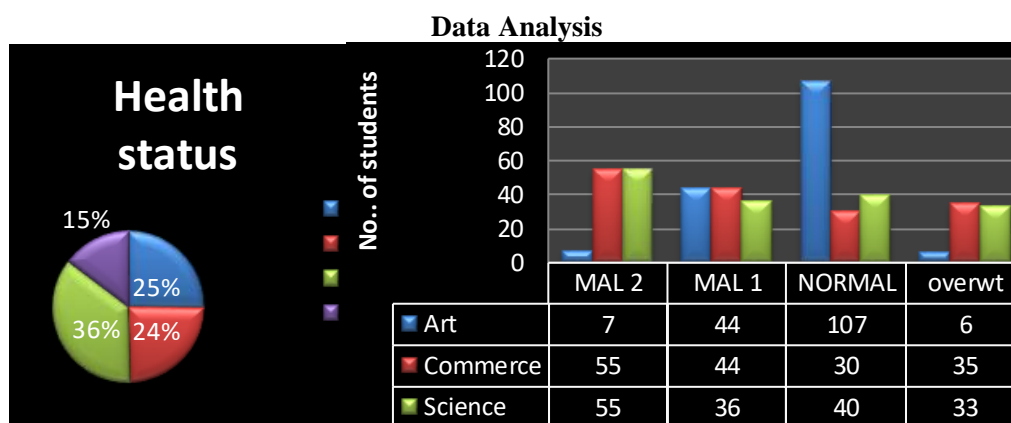


Figure 1 Health Status

Figure 2 Faculty and BMI level

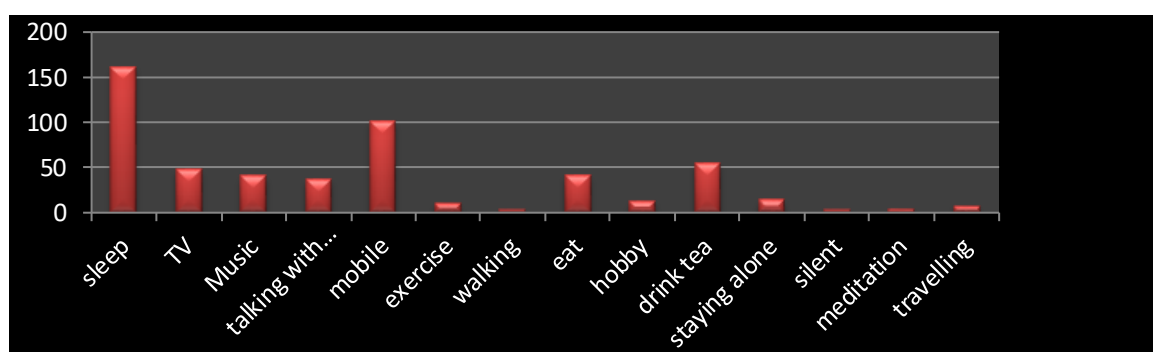


Figure 3 preferred activities by students to reduce stress

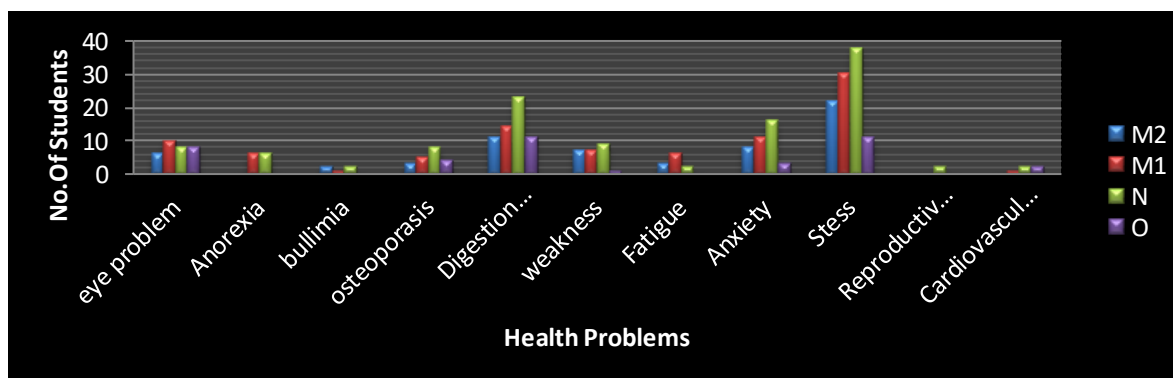


Figure 4 No. of Students Suffering from Health Problem at different Levels of BMI

	BMI	M2	M1	N	O
Diseases					
eye problem		6	10	8	8
Anorexia		0	6	6	0
bullimia		2	1	2	0
osteoporosis		3	5	8	4
Digestion Problem		11	14	23	11
weakness		7	7	9	1
Fatigue		3	6	2	0
Anxiety		8	11	16	3
Reproductive/Hormonal Disfunction		0	0	2	0
Normal		20	22	40	12
Cardiovascular Disease		0	1	2	2

From figure 1 we see that Out of total population 50% are observed in Malnutrition level. From

figure 2 we see that Arts students are observed in Normal BMI level whereas other faculty are

approximately equally distributed in other BMI Levels. From figure 3 we see that Most of students choose to Sleep, Mobile & Tea to reduce stress which leads to unhealthy life. From figure 4 It is observed that even students have normal BMI level

they get affected by health problems (Digestion problem, Weakness, osteoporosis) & Psychological dis-function (Stress, Anxiety, Fatigue) in age group 18-25.

Table 1 ANOVA table of Faculty and Financial stress

Dimensions	Faculty	Mean	Variance	F-value	P-value
	Arts	20.02747	5.354992		
Financial	Commerce	19.94963	21.9021	1.7315	0.1781
	Science	20.71951	22.06808		
	Arts	28.27481	9.386483		
Family	Commerce	29.75933	63.20433	3.8654	0.0216
	Science	30.14634	53.47539		
	Arts	14.00849	2.815307		
Social	Commerce	13.37292	18.5643	1.3663	0.256
	Science	13.7439	16.47389		

In the table 1 Financial stress is insignificant as the p-value is 0.1781 which is more than 0.05 hence we cannot reject the null hypothesis. It can be said that there is no difference among Arts, Commerce, and Science in financial stress. In family table the p-value was found to be significance as the p-value is 0.0216 which is less than 0.05 hence here we accept the null hypothesis. It can be said that there

is significant difference among Arts, Commerce, and Science in Family stress. Social stress is insignificant as the p-value is 0.256 which is more than 0.05 hence we cannot reject the null hypothesis. It can be said that there is no difference among Arts, Commerce, and Science in Social stress.

Table 2 ANOVA table of Faculty and Educational Stress

Dimensions	Faculty	Mean	Variance	F-value	P-value
	Arts	29.79824	11.68884		
Education (a)	Commerce	27.69108	69.1039	6.0236	0.002604
	Science	29.96341	52.19497		
	Arts	12.05131	1.30427		
Education (b)	Commerce	11.00419	13.38996	6.5531	0.001554
	Science	12.01829	11.84629		
	Arts	21.49086	6.755568		
Education (c)	Commerce	21.16328	52.24878	0.12823	0.8797
	Science	21.34756	45.43061		
	Arts	10.17591	3.327496		
Education (d)	Commerce	10.68087	14.81526	2.8239	0.06034
	Science	11.02439	14.41658		

Education (a): Educational Objective, Education (b): irregular college functioning.

Education (c): lack of study, Educational (d): teacher's student relationship.

In the table 2 Educational objective stress is significant as the p-value is 0.00260 which is less than 0.05 hence we reject the null hypothesis. It can be said that there is significant difference among Arts, Commerce, and Science in Educational objective stress. In irregular college functioning

table, the p-value was found to be significance as the p-value is 0.001554 which is less than 0.05 hence here we reject the null hypothesis. It can be said that there is significant difference among Arts, Commerce, and Science in Educational stress. lack of study stress is insignificant as the p-value is

0.8797 which is more than 0.05 hence we cannot reject the null hypothesis. It can be said that there is no difference among Arts, Commerce, and Science in Educational Stress. teacher's student relationship stress is insignificant as the p-value is 0.06034 which is more than 0.05 hence we cannot reject the null hypothesis. It can be said that there

is no difference among Arts, Commerce, and teacher's student relationship stress.

Table 3 ANOVA table of Faculty and Personal Stress

Dimensions	Faculty	Mean	Variance	F-value	P-value
ego threat	Arts	33.17059	19.03386		
	Commerce	31.42832	116.4013	2.0085	0.1353
	Science	32.96341	89.76552		
bereavement	Arts	19.64351	5.565038		
	Commerce	18.93519	33.2248	2.6718	0.07014
	Science	20.11585	26.07852		
Separation	Arts	12.98795	1.654096		
	Commerce	12.99509	13.96114	1.1034	0.3326
	Science	13.40244	11.68981		
personal setback	Arts	31.11264	14.63701		
	Commerce	30.20303	94.73277	3.2626	0.03913
	Science	32.29268	56.19602		
health of others	Arts	20.93968	8.534907		
	Commerce	21.7119	45.36941	7.818	0.000455
	Science	23.20732	29.84633		

In the table 3 ego threat, bereavement, Separation stress is insignificant as the p-value is more than 0.05 hence we cannot reject the null hypothesis. It can be said that there is no difference among Arts, Commerce, and Science in Personal stress. In personal setback, health of others tables the p-value was found to be significance as the p-value which is less than 0.05 hence here we reject the null hypothesis. It can be said that there is significant difference among Arts, Commerce, and Science in personal stress.

In this research for checking significance between different stress score with respect to BMI level we carried out t-test and we get p value of financial stress and separation is 0.03045 and 0.0273 respectively which is less than 0.05 hence we reject the null hypothesis. It can be said that there is significant difference in financial stress and separation with respect to BMI, also we check there is any dependency between different dimension of stress scores and gender by using t-test we get the result average stress score and gender are insignificant.

Result and Discussion

While ANOVA test was conducted in Faculty and Financial stress here, we could not find any

significance difference in financial and social stress. The p-value of financial stress is 0.1781 which is more than 0.05 hence we failed to reject the null hypothesis. The p-value of social stress is 0.256 here we failed to reject the null hypothesis as the p-value is more than 0.05. For Faculty and Educational stress, we find there is insignificant difference in lack of study and teacher students' relation. For faculty and personal stress, we find there is insignificant difference in ego threat, bereavement and separation. Also, in this research we find that there is significant difference in financial stress and separation with respect to BMI, also we check there is any dependency between different dimension of stress scores and gender.

Conclusion

However, parents and teachers can watch for short-term behavior and physical symptoms that manifest when stress becomes a problem. Since age plays a major role in how stress effects on students, the stress score will help the teachers and parents to identify the major source of stress and area requiring Emotional and Professional support.

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MARITAL PROBLEMS AND THEIR EFFECTS ON THE SOCIETY: A STATISTICAL ANALYSIS

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ABSTRACT

The amount of satisfaction of the married couple determines the success of the marriage. Meeting the expectations of the spouse is frequently related with satisfaction. The current paper analyses the data on bridegrooms and brides about their personal data and their spousal expectations. The personal information includes age, height, blood group, education, profession and monthly income. The expectation are obtained on height, education, profession and any other specific expectation. The information was gathered in Pune, Nagar, Nashik city, and Nashik district. The survey covers six gotras of the Lad-Wani community: Kashyap, Khalap, Mandav, Gahilam, and Gaut. To link personal information to expectations, statistical analysis is used. In addition, detailed analysis is carried out according to the study region. The analysis' findings are given in graphical, tabular, and other formats as applicable. In light of the findings, marriage difficulties and possible solutions are examined.

Keywords: Marital status, correlation, regression.

Introduction:

Marriages should be very sacred in India and should be considered once-in-a-lifetime. The event of marriage is part of social traditions and rituals in which both sides of family members are emotionally involved and their communities are involved to bless happy married life. However, recently, more and more married couples have suffered distress and incompatibility. Because of the different socio-economic elements, the rate of divorce and separation has increased rapidly in India as a result of discontent marriages. This unpredictable social disaster is caused by the sudden bombardment of cases involving marital problem cases, families and other courts, the police administration and various counselling cells.

It is a custom in India that in matrimonial disputes many social and legal concerns are expressed for women, but husbands and their families are ignored. The husband and his family are fatally affected if the trivial marriage disputes give the wife the form of the cruelty due to the demands of dowry made by a promiscuous woman's false intentions.

In 1983, the Indian Penal Code (IPC) introduced the Criminal Law (second amendment) Act of 1983 in order to deal with Dowry / Harassment cases. The Indian Penal Code (IPC) (Act No. 46 of 1983). It reads that whoever is subject to a cruel treatment (mental

or physical) for a sentence of up to three years and may be liable to a fine by anyone who is the husband or relative of the husband of a woman.

A section analysis reveals that four types of cruelty are addressed in this law: 1) Every conduct likely to lead a woman to suicide, 3) harassment to force women or their relatives to give some property, or 4) harassment because a woman or her relative is either incapable of ceding to the demand for money or does not share the property. 2) A behaviour which causes serious injury to women's life, limbs or health.

Wani is a Maharashtra caste; Ladshakhiya Wani are prominent among them Family names such as Yeole, Kotkar, Pate, Kothawade, Amrutkar, Shirude, Chinchore, Gahiwad and Talware are prominent among Wani families. Wani is also a surname for people particularly in the Kashmir Valley, who came for business or business from the Persian Gulf, brought craftsmanship and many other technical skills to the Kashmir Valley. In Wani there are several sub-castes. Shakhiya Wani, Wani, Wani, Wani and others. Lad, Wani, Wani, etc. Wani. Every caste person is in small companies. In northern India this caste is referred to as BANIYA. Born in the Baniya family, Mahatma Gandhi. Wani had a population of 52,814 since the 2001 Indian census. Males make up 51% of the population

and 49% of females. The average Wani literacy rate is 74%, higher than the national average, by 59.5%: men's literacy is 80%, and women's literacy is 68%. 13% of the population of Wani is under the age of 6 years. Wani was known as 'Wun' in earlier times. Wani was under British rule a District Headquarters. Subsequently Wani and his district of Dhule became taluk. Wani is located on Dhule-Chalisgaon Road, about ten kilometers from Dhule, on the east side of Dhule District.

Statistical studies have been discussed in this paper on Wani Samaj's marital problems and their social impact.

In Indian society, marriage becomes a social issue. In addition, urbanization in Maharashtra is causing increasing family disputes. This problem has become more serious over the past several years because it affects future generations. Marriages become problematic, families quickly break up, the divorce rate is rising and is not limited to the uneducated or rural part of society. Higher education people participate in more family disputes probably because of ego problems or higher education complexes. This could also have happened due to excessive media exposure and the glamour of rapid changes and western life.

It is an attempt to identify the reasons for these problems, but one of the major reasons for that phenomenon is the lack of education or balanced education. Why does our education have an imbalance? Why does society have inequality? The causes of this imbalance are very important to find. Is it because of marriages with lowly qualified couples between highly skilled people? If a physician marries another physician, marriage will succeed. Other professionals such as engineers, designers, managers, etc. are also asked the same question. If the spouses belong to various professions, is it better? If a person marries by choice, is the marriage successful (generally known as love marriage? Or are organized marriages better because several family members, including parents, evaluate the spouse? Are inter-caste marriages only a mode or a more homogenous society? Are they? Social scientists raise these and several other questions, but they are often rarely dealt with or answered due to lack or lack of data.

In society, marriages are an important body. The foundation of a stable and expanding society is marriage. To live in a healthy atmosphere, a society must base its marriage traditions and practices on sound principles and strong foundation. In the last 50 years and so, after Indian independence, the average age at marriage has progressed. Some of the main reasons for this phenomenon are higher education, urbanization and high expectations by the spouse and the lawyers. What's the correct marriage age? Unless this age can be reached, should you marry sooner or later? The younger generation is concerned about these and such issues. If you make a mistake and enter a failed marriage, you are accused. There are several people to claim the credit if they enter into a successful marriage. Parents are included. Friends in the family, lawyers and even family and neighbors.

Not only the involved (often the divorced) couple have the socio-economic and psychological effects of a fading marriage, but also their direct and prolonged family, friends, neighbors, and even distant families have the same impact. That is why we believe this subject to be extremely important and to be addressed seriously. The results are not limited to the limited range of the three districts chosen for the study. These findings will apply to the entire state of Maharashtra and to the entire country, with certain possible modifications. A good understanding of the marital issues will surely help us contribute to Samarth Bharat's dream. The country can only advance and prosper with well-wedded young people. When he/she is happily married, everyone is more creative and has a positive behavior. The attitudes of its citizens are determined by national integration. National growth depends on its young generation's social, economic and mental stability. We therefore believe that the research project proposed is of major importance for the understanding of marital problems and the development of appropriate approaches to address potential future problems.

Material and Methods:

Data is collected via a sample survey. After a pilot survey, the sample design, size and estimation methods were decided. The

opinions of experts were also obtained following the pilot survey prior to the actual survey. The survey activity included travel to various geographical areas. The survey proposed to include the three districts of Pune University, namely Pune, Nashik and Ahmednagar. A laptop is used to compute the survey data to complete data entry on time.

A two-stage survey questionnaire is developed. First, an initial questionnaire is provided for a pilot survey. The items are finalized for the survey by means of the analysis of this questionnaire. The pilot survey is used to determine sample sizes in urban-rural, caste or educational background for various social groups.

We have collected the information of 1000 bridegrooms out of which we selected 100 samples randomly for analysis. Out of population of 1000 bridegrooms, some are from abroad, out of state, Mumbai, Pune like megacities, District places, Towns, Cities, Taluka and rural areas in Maharashtra.

Here Dependent variable is Y (Marital Status) and Independent Variables are Education(X1), Age(X2), Height(X3), Income(X4), Position

of Profession(X5), Profession Place(X6), Economical condition of Family(X7), No. of Members in Family(X8), Look of bridegroom(X9), Living Place(X10), Working Hours(X11)

Various data analysis statistical methods are used for survey data. The data analysis is performed on the entire data and on data spread across different categories such as urban, rural, common-secular, caste, education, socioeconomic status, blood groups, occupation, genealogical background like gotra, astrology through horoscope (kundali).

The main methodology for the present work is sample survey. Further, interviews and literary reviews are also used. A suitable statistical methodology is used during the data collection. The statistical methodology is data verification, data validity and reliability, correlation and regression modelling and any other statistical methodology that may be relevant during the project.

Data Analysis:

Correlation for first 100 samples

		Marital Status	Education	Age Group	Height	Monthly Income	Position of Profession	Place of Profession	Economical condition of family	Members of Family	Look of Candidate	Place of Living	Hours of Profession(Working)
Marital Status	Pearson Correlation	1	.226*	.092	.012	.117	.319**	.012	.192	-.086	.235*	.049	.208*
	Sig. (2-tailed)		.024	.361	.906	.247	.001	.906	.056	.392	.019	.627	.038
Education	Pearson Correlation	.226*	1	.127	.226*	.239*	.665**	.439**	.377**	-.306**	.126	.454**	.192
	Sig. (2-tailed)	.024		.209	.024	.017	.000	.000	.000	.002	.212	.000	.056
Age Group	Pearson Correlation	.092	.127	1	-.206*	.007	.153	.039	-.152	.032	-.189	.109	.133
	Sig. (2-tailed)	.361	.209		.040	.944	.128	.697	.130	.756	.059	.280	.188
Height	Pearson Correlation	.012	.226*	-.206*	1	.234*	.202*	.252*	.211*	-.026	.187	.245*	-.135
	Sig. (2-tailed)	.906	.024	.040		.019	.044	.011	.035	.799	.062	.014	.181
Monthly Income	Pearson Correlation	.117	.239*	.007	.234*	1	.550**	.304**	.469**	-.152	.306**	.280**	-.017
	Sig. (2-tailed)	.247	.017	.944	.019		.000	.002	.000	.130	.002	.005	.866

Position of Profession	Pearson Correlation	.319*	.665**	.153	.202*	.550**	1	.453**	.418**	-.288**	.300**	.468**	.191
	Sig. (2-tailed)	.001	.000	.128	.044	.000		.000	.000	.004	.002	.000	.057
Place of Profession	Pearson Correlation	.012	.439**	.039	.252*	.304**	.453**	1	.107	-.100	.113	.922**	-.114
	Sig. (2-tailed)	.906	.000	.697	.011	.002	.000		.291	.324	.262	.000	.260
Economical condition of family	Pearson Correlation	.192	.377**	-.211*	.469**	.418**	.107	1	-.270**	.235*	.145		-.012
	Sig. (2-tailed)	.056	.000	.130	.035	.000	.000	.291	.007	.018	.149		.903
Members of Family	Pearson Correlation	-.086	-.306**	.032	-.026	-.152	-.288**	-.100	-.270**	1	-.151	-.109	-.078
	Sig. (2-tailed)	.392	.002	.756	.799	.130	.004	.324	.007		.134	.282	.443
Look of Candidate	Pearson Correlation	.235*	.126	-.187	.306**	.300**	.113	.235*	-.151	1	.073		.035
	Sig. (2-tailed)	.019	.212	.059	.062	.002	.002	.262	.018	.134	.472		.733
Place of Living	Pearson Correlation	.049	.454**	.109	.245*	.280**	.468**	.922**	.145	-.109	.073	1	-.057
	Sig. (2-tailed)	.627	.000	.280	.014	.005	.000	.000	.149	.282	.472		.572
Hours of Profession(Working)	Pearson Correlation	.208*	.192	.133	-.135	-.017	.191	-.114	-.012	-.078	.035	-.057	1
	Sig. (2-tailed)	.038	.056	.188	.181	.866	.057	.260	.903	.443	.733	.572	

Correlation for first 9 influenced factors:**Correlations^a****Correlations^a**

		Marital Status	Position of Profession	Education	Look of Candidate	Hours of Profession(Working)	Economical condition of family	Monthly Income	Age Group	Place of Living	Place of Profession
Marital Status	Pearson Correlation	1	.319**	.226*	.235*	.208*	.192	.117	.092	.049	.012
	Sig. (2-tailed)		.001	.024	.019	.038	.056	.247	.361	.627	.906
Position of Profession	Pearson Correlation	.319**	1	.665**	.300**	.191	.418**	.550**	.153	.468*	.453**
	Sig. (2-tailed)	.001		.000	.002	.057	.000	.000	.128	.000	.000
Education	Pearson Correlation	.226*	.665**	1	.126	.192	.377**	.239*	.127	.454*	.439**
	Sig. (2-tailed)	.024	.000		.212	.056	.000	.017	.209	.000	.000

Look of Candidate	Pearson Correlation Sig. (2-tailed)	.235 [*] .019	.300 ^{**} .002	.126 .212	1 .733	.035 .733	.235 [*] .018	.306 ^{**} .002	-.189 .059	.073 .472	.113 .262
Hours of Profession(Working)	Pearson Correlation Sig. (2-tailed)	.208 [*] .038	.191 .057	.192 .056	.035 .733	1 .903	-.012 .903	-.017 .866	.133 .188	-.057 .572	-.114 .260
Economical condition of family	Pearson Correlation Sig. (2-tailed)	.192 .056	.418 ^{**} .000	.377 ^{**} .000	.235 [*] .018	-.012 .903	1 .000	.469 ^{**} .000	-.152 .130	.145 .149	.107 .291
Monthly Income	Pearson Correlation Sig. (2-tailed)	.117 .247	.550 ^{**} .000	.239 [*] .017	.306 ^{**} .002	-.017 .866	.469 ^{**} .000	1 .944	.007 .005	.280 [*] .005	.304 ^{**} .002
Age Group	Pearson Correlation Sig. (2-tailed)	.092 .361	.153 .128	.127 .209	-.189 .059	.133 .188	-.152 .130	.007 .944	1 .280	.109 .280	.039 .697
Place of Living	Pearson Correlation Sig. (2-tailed)	.049 .627	.468 ^{**} .000	.454 ^{**} .000	.073 .472	-.057 .572	.145 .149	.280 ^{**} .005	.109 .280	1 .922 ^{**}	.922 ^{**} .000
Place of Profession	Pearson Correlation Sig. (2-tailed)	.012 .906	.453 ^{**} .000	.439 ^{**} .000	.113 .262	-.114 .260	.107 .291	.304 ^{**} .002	.039 .697	.922 [*] .000	1 .000

Regression for all 11 variables:

ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	4.222	10	.422	1.921	.052 ^a
	Residual	19.568	89	.220		
	Total	23.790	99			

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.421 ^a	.177	.085	.469

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.490	.466		-1.051	.296

Education	.008	.058	.019	.134	.894
Age Group	.035	.051	.075	.696	.488
Height	-.014	.062	-.023	-.220	.827
Monthly Income	-.033	.041	-.107	-.817	.416
Position of Profession	.127	.073	.285	1.751	.083
Place of Profession	-.073	.100	-.194	-.734	.465
Economical condition of family	.027	.035	.096	.786	.434
Look of Candidate	.094	.053	.187	1.755	.083
Place of Living	.026	.073	.093	.357	.722
Hours of Profession(Working)	.066	.061	.113	1.081	.282

Regression Model: For two independent Variables Look of Candidate and Profession of Position
Regression Model is

$$Y = -.543 + .006X_1 + .038X_2 - .034X_4 + .128X_5 - .073X_6 + .027X_7 + .093X_9 + .025X_{10} + .068X_{11}$$

ANOVA

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	4.212	9	.468	2.151	.033 ^a
Residual	19.578	90	.218		
Total	23.790	99			

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.421 ^a	.177	.095	.466

Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-.543	.399		-1.361	.177
Education	.006	.057	.015	.105	.917
Age Group	.038	.049	.080	.762	.448
1 Monthly Income	-.034	.040	-.110	-.853	.396
Position of Profession	.128	.072	.286	1.768	.080
Place of Profession	-.073	.099	-.193	-.734	.465

Economical condition of family	.027	.034	.096	.787	.433
Look of Candidate	.093	.053	.185	1.751	.083
Place of Living	.025	.072	.088	.342	.733
Hours of Profession(Working)	.068	.060	.116	1.126	.263

Result and discussion:

If $Y \geq 0.5$ then candidate having chances to married. Position of Profession, Education, Look, Working Hours, Economy Condition of family,

Monthly income are the most affecting factors for marriage of bridegroom.

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ROLE OF HR IN FOSTERING HUMAN RESILIENCE TO TACKLE TOUGH TIMES

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ABSTRACT

This study deals with role of HR in fostering human resilience to tackle tough times. The role of HR is very vital in preparing a resilient workforce to deal with any crisis such as the covid-19 pandemic. This study is based on secondary research. The literature review is done using Google Scholar with search term "HR role and employee resilience". The research is also based on analysis of various articles and blogs focused on role of HR in building employee resilience. Based on the study, five strategies pertaining to the changes HR needs to make to build employee resilience are offered.

Keywords: HR, employee resilience, stress, mental health, skills, capabilities

Introduction

Strong employees have a ton to bring to the table – they are bound to be certain communicators, they are better positioned to deal with difficulties, they are more useful and are less disposed to be influenced by pressure at work. Consequently, taking everything into account, their entire wellbeing will be great also. Shockingly, it's an astounding reverse for a worker whose strength is low – they need certainty, drive and assurance, frequently achieving truancy and in the long haul, are likely going to be more powerless against infirmity, achieving non-appearance from the workplace. Affecting their psychological well-being, yet their entire wellbeing.

The workplace has become more many-sided with numerous employees working from home. This along these lines implies the lines among home and work continue to be progressively obscured. Workplace culture and standpoint needs to continue to adjust to be steady, shared and persuading. Administrators who have the entire wellbeing of their employees, will benefit from a strong workforce that are excellent and upheld to confront difficulties at home and at work (Toor, 2021).

Below are four steps for building and sustaining employee resilience:

1. Acknowledge and understand employee needs: For a business, perceive that resilience levels, causes of stress, and

copied mechanisms can vary – what causes stress for one individual could be totally unique for another. Building employee resilience will not be achieved in short time, it should be sustained and cultivated within the workplace.

2. Advance good mental health in the workplace: HR needs to guarantee the workplace is a safe space to talk straightforwardly about mental health issues giving employees a platform where they can easily communicate with their managers. This can be finished by offering guidance and training to employees to start a dialog with their managers.
3. Give more than essentially a conventional protection bundle to help the entire soundness of employees: As close to home wellbeing and the consideration on emotional wellness transforms into an undeniably significant piece of people's lives, there is likewise a creating assumption that these advantages are continued to the workplace. Accordingly, the proactive plan of worker wellbeing programs is transforming into a basic piece of building a more grounded workplace culture that can help draw in and hold talent.
4. Energize sound practices and cultivate a culture of wellbeing: Employers should instruct employees on psychological wellness issues and flexibility, bringing issues to light with regards to mental flourishing and giving work-life balance

preparing. Besides, the rollout of emotional wellness related projects that proposition pressure the executives training to employees and admittance to exhorting gatherings with clinical experts will help with empowering a cheerful and drew in workforce with help and sympathy at the core of the organization.

Following this introductory section, a literature review focused on HR role in building employee resilience is presented. Subsequently, the research methodology is briefly touched upon. It is followed with analysis and discussion section, where strategies for changes in HR to build resilience are presented. The study is concluded with findings and conclusion section.

Literature Review

There is ample research on the topic of HR role in building employee resilience. Below are a few abstracts from the recent literature.

1. Khan et al. (2019) have posited that, there has been expanding interest in understanding the factors that add to the development of employee resilience. Regardless of such interest, there is a shortage of exploration analyzing the contributory role played by HR practices in enhancing employee resilience. Taking a look at the setting of Pakistan's telecommunications sector and conveying a qualitative methodology, this paper inspects the effect of HR practices on employee resilience. The discoveries show that four critical spaces of HR practices – job design, information sharing and flow within an organization, employee benefits (monetary just as non-monetary), and employee development opportunities – empower the development of employee resilience. Subsequently, the compelling execution of HR practices here has been the critical factor for the development of employee resilience.
2. Nizamidou and Vouzas (2020) have argued that, this paper investigates how resilience may mitigate the impacts of a crisis and at the same time encourage business excellence. Additionally, it looks to analyze the role of HR department (HRD) in cultivating resilience and crisis awareness. All together for the authors to assess their hypotheses, a research model was conceptualized and tried by leading an empirical study in Greek organizations that enroll the largest number of employees in Greece, having a place with various corporate sectors. Following the survey of the relevant literature on resilience, business excellence and crisis management (CM), the research model and research hypotheses are introduced. The empirical area illustrates the statistical analysis of the collected data and the trial of the research hypotheses. The authors managed to validate their research hypotheses through the research. The research demonstrated that advancing resilience and crisis awareness in a business excellence climate can build up the role of HRD aiming to beat emergencies.
3. According to Douglas (2020), this paper aims to introduce how resilience can mitigate workplace adversity and human resource practices (HRPs) to construct capacity for resilience in employees. A survey of the literature was led for employee resilience. Resilience can mitigate the negative impacts of occupational and workplace adversity on employees. HRPs through job design, training and development and social help were found to encourage capacity for resilience in employees and backing organizational performance. Organizations can utilize the discoveries to fabricate organizational and human resource (HR) strategies to foster employee resilience.
4. Rodriguez-Sanchez (2021), has opined that, we are living in turbulent and uncertain times and organizations need to battle with these circumstances to achieve their goals. More than ever, resilience capacity is an added value that organizations need to work to react to obstacles in these challenging times.

Resilience is a capacity of individuals, teams, organizations, networks, even society, that make them to defeat setbacks (such crises, changes, or turbulences) such that they not only survive but also emerge stronger. Past research on resilience at various range of settings and gatherings show that resilience is a capacity that can be trained or develop. Therefore, the goal of this chapter is to audit the main lines of action available to organizations that want to encourage resilience at work. The chapter will audit theoretical research on workplace resilience, and empirical research that joins Human Resources Management and workplace resilience. Aspects covered incorporate the role that corporate social responsibility toward employees, career development or work–family balance have in creating resilience. The chapter closes with a conversation of some practical rules for HR managers and practitioners.

5. As per Cooke et al. (2021), consolidations and acquisitions have been a well-known system for firms to expand their upper hand. Existing exploration has uncovered a wide scope of suggestions for the workforce and human resource management (HRM) starting from M&As. Regardless, inadequate with regards to consideration has been paid to issues identified with worker flexibility. We contend that worker versatility, a thought that is still to acquire boundless consideration in HRM research, is vital to organizations wishing to deal with their M&As successfully, particularly in the post-M&A coordination. We encourage a lot of integral suggestions, present an exploration framework, and demonstrate headings for future assessments.
6. Myllykoski (2021), has set that, reliably changing working life might put pressure on progress for organizations and their employees. Along these lines, flexibility has been perceived as a fundamental determinant of progress for both at the hierarchical and the singular level. Besides, organizations work in a stunning

environment, where organizations face different difficulties and vulnerabilities. Right when organizations expect to respond to difficulties adequately, employees' capacities and particularly strength have been perceived as basic accomplishment factors. This examination explores strength and its invigorating in organizations. The inspiration driving the examination is to look at how strength can be conceptualized in working life and how versatility can be sustained in organizations through human resource management rehearses. The objective is to give new data on an effective and generally little-focused on subject and to foster comprehension of the topic.

7. As per Ngoc Su et al. (2021), this review builds up how the travel industry and cordiality organizations in Vietnam made authoritative flexibility to persevere through the principle wave of the Covid-19 emergencies. With employees recognized as a basic estimation in the travel industry and cordiality benefits, the review focused in on how human resources (HR) rehearses were embraced to encourage authoritative flexibility during the emergency. Start to finish gatherings were driven with 20 the travel industry and accommodation supervisors during Vietnam's lockdown. The disclosures uncover significant HR strength building rehearses that these organizations did previously, during and after the lockdown. The results add to our comprehension of how HR practices can support the travel industry workforce and improve hierarchical strength despite a worldwide pandemic.
8. As per Ramlall (2009), this paper analyzes the conventional jobs of HR and proposes an adjusted framework concerning how HR would be a basic accomplice in helping organizations with building strength and have the choice to fight in the worldwide economy during outrageous financial occasions. Essential and optional information are used to perceive systems being used by HR bosses across the world

to alleviate the different monetary difficulties. Accentuation is put on how pertinent HR practices can be used as methods of managing pressure in dealing with the effect of these difficulties. An idea to everything is that worker attributes and surprisingly their sentiments are essential for authoritative life and an imperative game plan of elements that should be considered in upgrading hierarchical reasonability. What better way is there to collect versatility than through certain associating even in occasions with outrageous uneasiness and challenges?

9. Bardeel et al. (2014), have thought that, given fierce monetary occasions, the possibility of worker flexibility is standing out enough to be noticed in numerous organizations. This paper brings the discussion of representative versatility into the field of human resource management (HRM). We investigate the establishments of versatility in speculations of positive brain science and the protection of resources (COR); we look at its significance for HRM and cultivate a bunch of testable theories to coordinate future exploration. The chief key finding of this paper is that the possibility of strength can be made from solid hypothetical establishments. Second, a rational arrangement of strength upgrading HR rehearses can possibly add to employees' mental capital, perspectives and conduct, and to hierarchical execution in violent conditions just as during seasons of relative quiet. Given the hypothetical outlining, formal versatility preparing should be viewed as a lone piece of a more extensive, lucid arrangement of flexibility improving HR rehearses.

Research Methodology

This study is based on secondary research. The literature review is done using Google Scholar with search term "HR role and employee resilience". The study is also based on analysis of various articles and blogs focused on role of HR in building employee

resilience. Based on the study, five strategies are offered pertaining to the changes HR needs to make to build employee resilience, which are presented in Analysis and Discussion section.

Analysis and Discussion

Based on the study, five strategies and expected changes, are presented which HR should focus in order to build employee resilience.

1. The first and most basic is a shift from focusing in on building abilities to a vow to developing capacities first and abilities second. Those human abilities credits that are all around pertinent and ever-enduring, similar to interest, cooperation, innovativeness, and compassion outfit workers and organizations with more prominent flexibility to address both the present and the upcoming issues. Truth be told, in conditions where human capacities are developed and upheld, workers can reskill and rehash quicker and with greater supportability.
2. Second is a shift from making explicit workforce abilities to meet transient requirements to taking advantage of workers' interests to help with handling inconspicuous and future issues. Developing workers' interests could mean developing workers' hankering to have an effect, empowering workers to look out difficulties to work on their own presentation, or propelling a communitarian environment where workers group up and create organizations with others to acquire new pieces of information. Via doing these actions, organizations can make an interpretation of worker enthusiasm into supported hierarchical execution.
3. Third is the shift from a consideration on proper preparing to an accentuation on learning in the progression of work. Exploration shows that learning through

experience yields favored learning gains and upkeep over customary homeroom guidance. The combination of learning into the progression of work makes it more close to home to the individual and considers figuring out how to be passed on at supported occasions and in designated ways, permitting workers to all the more promptly get, outline and influence the substance.

4. Next is changing how the organization rewards people. Given the significance of consistent reevaluation to business endurance in the present violent world, organizations need to make impetuses that rouse people to constantly learn, adjust and improve. Organizations can do as such by remunerating workers dependent on ability advancement, as opposed to solely on work yield.
5. The last shift to building flexibility is secured on another authoritative reality—the ascent of biological systems. As the world ends up being more related than any time in recent memory, customary limits are obscuring and bringing about different models of work. At the authoritative level, there is the ascent of the social undertaking an organization whose mission consolidates pay advancement and benefit making with the need to respect and support its current circumstance and partner network (Volini, 2020).

These progressions in the HR strategy will assist with building worker strength in intense and testing times.

Findings and Conclusion

HR plays a vital role in ensuring employee resilience. It assumes great importance especially in testing times such as the current covid-19 pandemic. Only a resilient workforce can navigate the organization in these tough times. Resilient employees are confident communicators, better placed to handle challenges, more productive and less inclined to be affected by stress at work.

In order to build and sustain resilient employees, organizations need to — acknowledge that different employees have different needs; ensure positive mental health at the workplace; focus on whole health of employees and foster a culture of wellness.

The maximum benefits an organization can derive from a resilient workforce will depend on the HR strategy and shift in their outlook towards employees. First, the focus needs to be changed from skills to capabilities. Second, is to tap employees' passion to deal with the uncertain and unknown future. Third, is to learn on the job. Fourth, rewarding increase in skills and capabilities. Lastly, the focus should be on the entire ecosystem of the organization, not just monetary profits.

These strategies and changes in the focus will ensure employee resilience to equip the organization face any crisis.

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EDUCATION THROUGH DIGITAL METHODOLOGIES: LEARNING IN MODERN AGE

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ABSTRACT

In the modern era each field has been growing up drastically, similarly in the education field many reforms have been seen. The main transformation is happening into the educational area, it is the progression of gaining of abilities, information, skills and knowledge through study. In the present times, learning process has been reformed using Digital tools, electronic devices, multimedia etc. it can be referred as digital learning or e-learning. The term Digital Learning implies learning facilitated by the digital technologies which empowers learner to experience a freedom to do the learning in his/her own time, place, platform and pace. E-Learning or digital learning can be used for discussions, communicating views, sharing thoughts, recommending books, internet sources, videos, news or any other content related to topic. Paper carves with different parts; First part has acme the modern digital technologies in teaching - learning process. Second part defines innovative methods and implemented practices: Outlook Ballot, Smart e-Learning. These are digital techniques used to learn electronically and boost students' curiosity towards learning process. Given time and pace as per student's capability will help to boost confidence of students and help achieving effective and efficient learning process.

Keywords: e-Learning, digital learning, Use of Modern Tools in Teaching, Quality Education, mobile learning, social media in education.

Introduction

Education contributes major share on overall growth of nation. Many reforms implied on the education field. Learn with digital technology is one of them. Digital learning isn't simply learning on the Personal Computers but instead it is a blend of innovation or technology, contents and guidance gave through advanced methods. Technology incorporates the way to convey the contents to students. It very well might be combination of web, sites and equipment like desktops, tablets, advanced mobile phones (smart phones) and so on. Content is the real material to be given to the student. It might contain audio/ video recordings, power point presentations, documents, and contents in animated form. It might likewise be an intuitive programming or site created to furnish a study hall like interface with educating and evaluation of the equivalent. Instruction is the angle which requires the educator or instructor to be in a consistent touch with the digital learners and give direction and even evaluate their performance.

Thus, digital learning is a student-centric teaching process where Educators only act as

guides and develop the content for learning through various tools. The study described in different section as section II covers different

digital aids in education system, section III

describes fresh proposed method for learning. At the end, conclusions are explained in section IV.

Digital Aids

Many teaching aids are used for teaching and make teaching effective. There are various tools and pathways through which students have benefited a lot. Some of the available digital tools are as below.

Digital boards: Digital boards also called as smart boards are an effective instruction tools which has potentially replaced the age-old black boards in the classrooms for a more advanced and effective teaching and learning experience. It is a smart display screen that can be connected to a computer and serves dual purpose of a screen as well as a touch-screen board that enable teachers to draw various diagrams with ease in a short time.

These smart boards have replaced the typical

overhead projectors and have become a state-of-the-art infrastructure in many modern schools

E-books: E-books are books made available in digital format accessible through internet or various e-book apps on any desktop, tablets, kindle or even smart phones. While these books may be available free of cost, some publications however offer the books only after buying them. The main advantage of e-books is that it saves space and can be accessed anywhere, anytime unlike libraries.

Cacoo: With the help of graph, flow diagrams complex data will be described to students and suggest alternate solutions for that.

Class DoJo: Teachers used this tool mainly for student behaviour in the classroom and Performance of students which is informed to parents.

SWAYAM: SWAYAM is an initiative by the MHRD, Government of India to make education available to all without any Age limit or boundaries or other limitations. It is a whole new learning experience which can be accessed anytime and anywhere. The digital divide faced by most students in remote areas of the country is bridged through an indigenous developed IT platform than facilitates hosting of several courses taught in the classrooms from 9th class till post-graduation.

All the courses are available for free of cost and prepared by more than 1000 specially chosen teachers from across the country. Seven national coordinators have been appointed viz. the NPTEL, UGC, CEC, NCERT, NIOS and IGNOU. The courses have 4 parts such as recorded lectures, study material, assessment tests and MCQS/quizzes and discussion forums. SWAYAM is a digital platform. It provides personalized browsing experience by use of cookies.

Moodle: Moodle is a free open-source software mainly developed for learning management written in php which is providing digital control to institutions for

managing learning process in their institutions. It helps institutes create their own effective online courses, assessment etc.

Virtual Labs: It is an initiative by the Ministry of Human Resource Development (MHRD) under the National Mission on Education through ICT. Its participating institutes include all IITS, AMRITA VISHWA

VIDYAPEETHAM, AYALBAGH UNIVERSITY, NIT KARNATAKA, and COE PUNE. Areas covered by Virtual labs can be broadly classified into different domains like: Physical Sciences, Chemical Sciences, Electronics & Communications Engineering, Computer Science & Engineering, Electrical Engineering, Mechanical Engineering, Chemical Engineering, Biotechnology Engineering, Biomedical Engineering, Civil Engineering, etc.

To provide remote access to Labs of various disciplines of Engineering and Science, to encourage students to conduct experiments and develop the sense of curiosity in turn facilitating them to learn and understand basic and advanced concepts to share costly equipment and pool in resources for remote experiments are some of the objectives of the virtual Labs.

MOOCS: Abbreviation for Massive Open Online Courses is another online learning classroom which is an extension of the non-profit edx.org a global open source courses which is a leader in online learning and education. It provides courses and programs in key fields of computer science, data science, business management etc. from many institutions, composed of both leading global universities and colleges, and a diverse group of prominent organizations from around the world. Like SWAYAM, edx.org offers free courses and one can obtain a certificate for the course with minimal charges.

NPTEL: NPTEL is an initiative for obtaining certification for various courses it offers through 850 web and video courses across 23

disciplines by selected faculty members of the various IITs in India.

Spoken tutorial: Spoken tutorial is initiated by MHRD mainly focus on education through ICT and it developed IIT Bombay. It provides courses in the software training by demonstrating activities performed on the screen with audio explanation alongside. It

also provides a discussion forum where you can participate in existing discussion or start a discussion on a new topic. Registration is free.

Webinars: These are simply seminars held over the internet enabling people to attend conferences and live seminars without physically attending them through web conference.

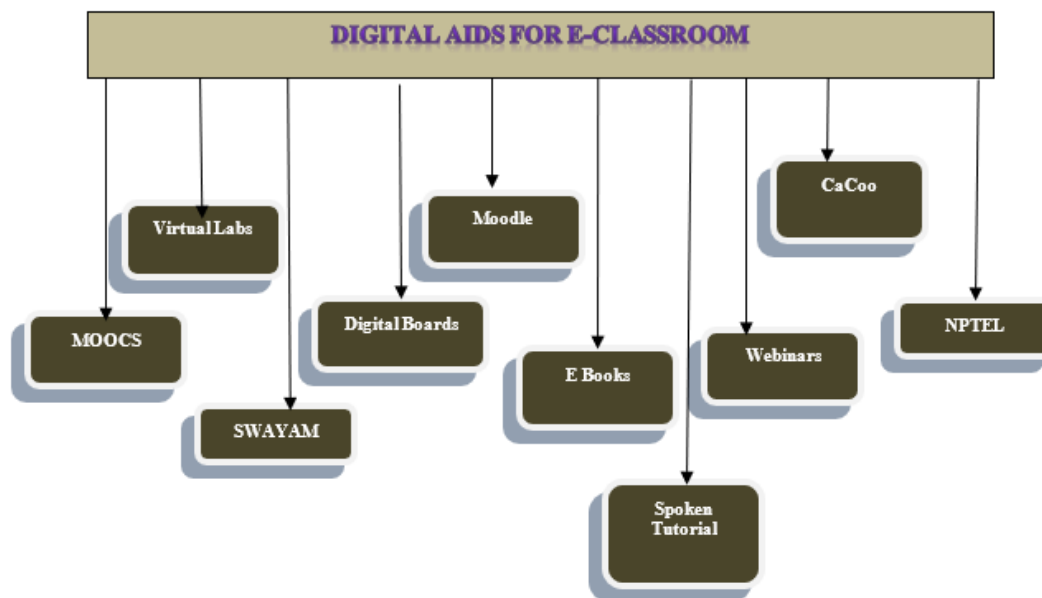


Figure 1. Digital Aids

Proposed Method

Author has proposed and implemented some new and innovative methods for students and encourage their active participation in study to make effective teaching-learning process.

1. Outlook ballot:

Author has created a group of all students and teacher. After class, group members or teacher can share the views, discussions, videos related to specific covered topic in lecture. Following is one activity shown with its implementation.

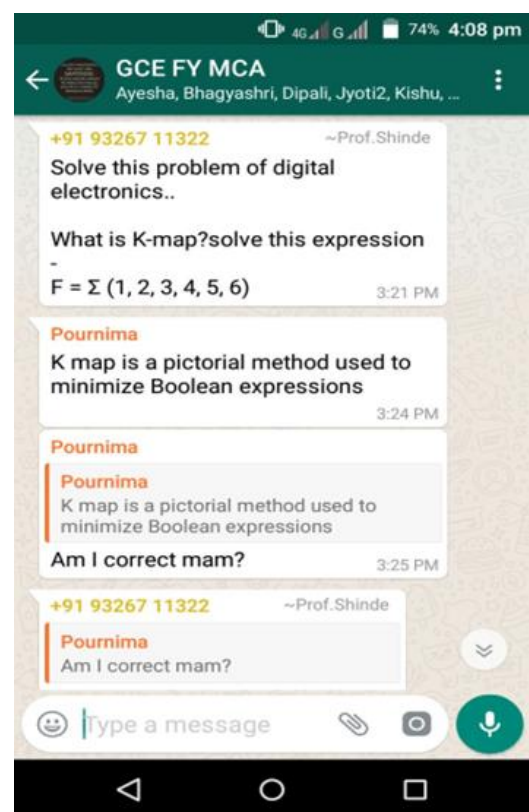


Fig 2. Teacher assigned problem on group

Fig 2. Shows that teacher has assigned problem on the group, student's shares difficulties, some members ask tricks for getting answer, shares different ways to solve the problem, discuss about correct solutions etc. Fig 3. shows how ballot is used for the learning.

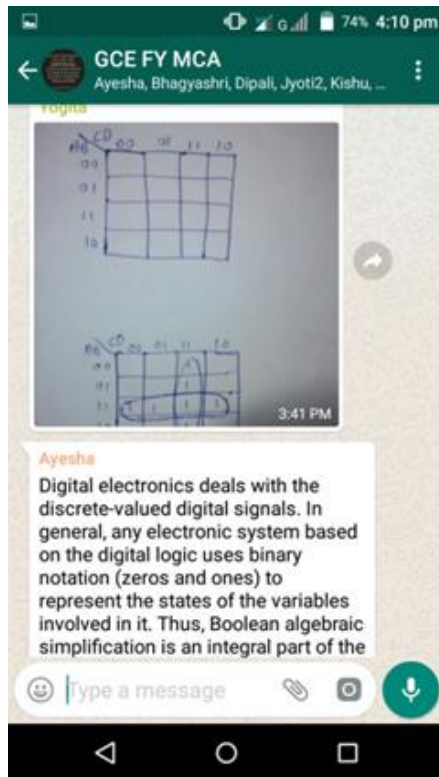


Fig 3. Learning with outlook

Observations:

After the implementation of said method author has observed that:

1. At the starting, few students are participating in the ballot. After some days' participation of students is increased and all students are available on the outlook and share their views.
2. Students are motivated to complete the assignment, because of inspiration and participation of group members.
3. Students are attracted towards subject, hence gain lots of knowledge.
4. Availability of on-the-go gives handy access to students.

2. Smart E-Learning:

Teacher can share documentation files - notes, presentation etc. to all students, on their smart mobile phones. When teacher explains the topic from file, students has the source documentation file so they can make interpretation of points in document and the explanation.

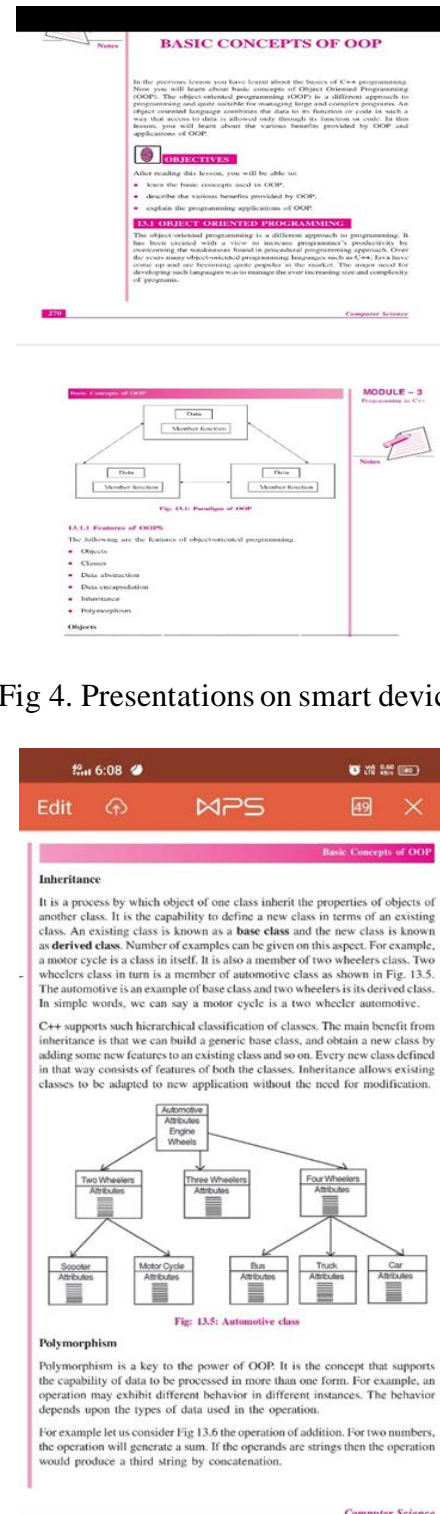


Fig 4. Presentations on smart device

Fig 5. Presentations on smart device



Fig 6. Learning with Smart Phones

Observations

1. It has been observed that students give more attention in a class.
2. Students can highlight important points; can note extra points or shortcuts into document digitally.

3. It is observed that with this aid, involvement of students is high than other techniques.

4. This technique has some benefits like save the time to draw diagrams; students can view notes any time even in travelling also.

Conclusion

The study describes different digital aids in education field. Some novel methods Outlook Ballot and Smart E-Learning are introduced to make learning effective and efficient. Recommended innovative methods implemented and it is observed that participation of students is high which cultivates learning process, enhance understanding and overall development of students. Proposed methods are useful for the individual or group study and can be used at home as well as at college also. Some benefits can provide the proposed methods are access to e-learning material, collaborative learning, communication etc. Handiness of proposed methods makes it even better as compared to conventional learning methodologies.

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N.S.S. FOSTERING HUMAN RESILIENCE: CATALYST FOR MANAGEMENT, SCIENCE AND TECHNOLOGY: Post Special Camp CASE Study

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ABSTRACT

In the era of Globalism, society traversing in fusion of 'science, management and technology'. Such fusion produces several changes, challenges and chances to enhancement for society especially youth. In such environment, minor mistake in appreciation due to perceptual and misperception aspects is create lot of unsolvable problem in youth profile. In such a situation, if there is 'Resiliencies' in human instincts, it helps in recovering quickly from difficulties and concrete the way for progress. This study expounds the role of 'National Service Scheme' creating Resiliencies' in youth instincts for pioneer of youth profile. With the motivation of "Horizon is nothing but Appreciation of boundaries".

Keywords: Youth, Youth profile, Factors affect youth profile, Resiliencies.role of NSS in creating Resiliencies'

Introduction

In today's age, world is traversed in fusion of sciences, management and technology, based on the concept of globalization. While globalization has led to a massive increase in trade and cultural exchanges, the world has become increasingly interconnected. As a result, the competitive environment tends to increase. In such an environment, a minor mistake, misunderstanding, or misunderstanding can cause a lot of problems. As a consequence, such the problems become more sensitive in the stressful lifestyle, increasing urbanization and single-family arrangements. Furthermore, it creates an uncertain lifestyle with a 'depressing or motivating' as fusion environment. As a result, mankind needs to adopt 'Resilience' to overcome such a fusion environment.

The aim of this paper is to abstract the role of national service scheme (N.S.S), in fostering Human Resilience of the 'Youth profile'. Section II defines role of national service scheme fostering Human Resilience of the 'Youth profile'. In section III, Definition of Research Methodology used in study, In section IV, Observation and Discussion, way to pioneer the youth profile. In section V, Conclusion and feature scope Appreciation.

Section-II: Role of NSS in social aspect

Today's Youths are challenge or opportunity India has the youngest population in the world. While India's young population is India's most valuable asset, at as same time it is the most challenging for India [1,3]. It is

imperative that we, as Indians, must take hones efforts to transfer this youth as a human capital [1,2].

In this case, we realize that the Internet (balance invention of science, management, and technologies) provide various way of progress in front of us. The mind-blowing mobility of internet access extends the opportunities to learning and doors to earning due to the rise of networking start-ups and companies.

Influence of Internet's glimmer is producing 'double-edged' influence. Its proper utilization gives very good result but its misuse produces uncontrolled effect. There are lot of chances that our youth power may easily fall prey to frustration, depression, and boredom [3,5]. It is very big constrain exactly which manner we avoid the consequences. So, there is need to think over such policy that will assist to our youth power to transfer such double-edged tools challenge in opportunity for creation good human capital.

In today's 'Covid -19' pandemic era we abstract benefits of fruitful utilization of Internet. Moreover, we must accept that world is transfer form highway to i-Way. Furthermore, it is proven with various incident that, "It is very difficult to find our balance, or swim against the tide, or, recover and regain stability". In this situation, 'Resilience' is very effective concept because 'Resilience' is such strategies that assist us to maintain balance in our lives during difficult or stressful periods and can also protect us from the development

of some mental health difficulties and issues. There are different of resilience, but it can be summarized in Inherent resilience, Adapted and Learnt resilience [4].

Constrain

It is very difficult to cater 'Resilience' concept for our Youth in themes learning era. Unfortunately, with our education system we make awareness about it but can't provide practical experience about it. So it is very big constrain how we make such policy that fostering human resilience in our youth to gain stable youth profile for uphold positively impact of Management, Technology and Science.

Opportunity

Since 1969, the National Service Scheme (NSS) has been successfully implemented at the college level with the motto "not me but you". The primary objective of this scheme is developing the personality and character of the youth by understanding the problems of the society, serving the society and their knowledge. It concerts to promote social welfare among the students, by the two activity ('Regular program activity' and 'Winter Special Workforce Rites Camp'). These two initiatives help students to build and enable patriotism, national unity, all religions, tolerance and social commitment through volunteer services [6,7].

Under the National Service Scheme, 'Winter Special Workforce Rites Camp' are organized for 7 days. Through this, the youth have to live as a volunteer in the adopted village rather than home place. So naturally life experiences the opposite of daily life. Forward these volunteers comes contact with different communities, have an opportunity understand different social problem, different social lifestyle. In this 7-day volunteer contribute to activities are being developed to address the needs of the society. These include education and literacy, health, family welfare and nutrition, hygiene and sanitation, environmental conservation, social service programs, programs to improve the status of women, product-oriented programs, disaster relief and rehabilitation, campaigns against

social evils, public awareness digital India, Skill India. Dissemination of yoga about major government programs etc.

So, this study, seeks "opportunity fostering human resilience in our youth to gain stable youth profile for uphold positively impact of Management, Technology and Science with National service Scheme".

Based on it here we set the hypothesis "N.S.S. fostering human resilience: Catalyst for Management, Science and Technology"

Section –III

To systematically evaluate the hypothesis, research methodology is important way. Research method mainly classified in two type Quantitative and Qualitative. Quantitative research study carried out with number and statistics and Qualitative research deal with case study. In this study to evaluate the hypothesis both methods are utilized separately.

Our hypothesis is "N.S.S. fostering human resilience as a Catalyst for Management, Science and Technology."

Ho: "N.S.S. fostering human resilience: Catalyst for Management, Science and Technology."

Ha: "N.S.S. is not fostering human resilience: Catalyst for Management, Science and Technology."

a) Quantitative research study

Data Collection : Data is collected from the Volunteer, Campier and villagers as source.

Data collection tools : A Survey was carried out in the format of standardized Questionnaire (Feedback from) on the basis of Likert scale. (By using "Survey Heart" Mobile App free ware)

Analytical Tools : Descriptive statistics by Grouping and Visualizing by graph.

b) Quantitative research study

Case study research: The case study method has used at number of areas like education, social sciences and similar. This simplest ways of conducting research by using event as case happen in past. Study the case in depth rather than extent.

Observation and Discussion

A) Quantitative research study

Question : Winter Special Workforce Rites Camp Beneficed

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Respondent give more than 50 % positive response in the favour of Winter Special Workforce Rites Camp Beneficed

Question: Respondents Opinion about Winter Special Workforce Rites Camp

Result in Percentage	Graphical Representation																		
<div>शिबीरा बाबत आपले मत</div> <div>Results</div> <table><thead><tr><th>Options</th><th>%</th><th>Count</th></tr></thead><tbody><tr><td>उत्तम दर्जाचे</td><td>76.72</td><td>89</td></tr><tr><td>समाधानकारक</td><td>21.55</td><td>25</td></tr><tr><td>विशेष काही नाही</td><td>1.72</td><td>2</td></tr><tr><td>असमाधान कारक</td><td>0.00</td><td>0</td></tr><tr><td>निकट दर्जाचे</td><td>0.00</td><td>0</td></tr></tbody></table>	Options	%	Count	उत्तम दर्जाचे	76.72	89	समाधानकारक	21.55	25	विशेष काही नाही	1.72	2	असमाधान कारक	0.00	0	निकट दर्जाचे	0.00	0	<div>शिबीरा बाबत आपले मत</div> <div>PIE CHART</div> <div><div>■ उत्तम दर्जाचे - 89</div><div>■ समाधानकारक - 25</div><div>■ विशेष काही नाही - 2</div><div>■ असमाधान कारक - 0</div><div>■ निकट दर्जाचे - 0</div></div>
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Respondent give more than 76 % positive response in the favour of Winter Special Workforce Rites Camp Superiority

Question: Winter Special Workforce Rites Camp useful in future

Result in Percentage	
	<p>Respondents give more than 89 % positive response in the favour of Winter Special Workforce Rites Camp Superiority</p>

B)

Quantitative research study

Case Study: There are lot of incident and case are available with us in that NSS volunteer are cope with any disaster's situation from 1972 drought to Covid -19 Pandemic. Apart from that here mention Our College's NSS volunteer's perspective story. Our NSS student (name is not given as privacy Ethics) is lives at the bank of Nira River. On 7 July 2019, society located at the bank of Nira River

is suffered from flood. In such situation, With Covid -19 pandemic phobia, our three-student come in front rather than depress. In the cooperation of villagers our student makes the living and food arrangement for the people who suffered from Nira river flood. These students submitted themes handwritten report of this incident. The report in in following table.

Table 2: Report and photograph of Nira river Bank at flood

Hand written Report	Flood Situation	
		
Making Temporary Shelter for Flooded people		
		

Observation and discussion

The above two methods outcome indicates our NSS volunteers are capable to adapt and bounce back when something difficult happens in our lives. With case study our NSS volunteer show the ability to once again preference mankind in trauma or painful experience. In such digital eras of science, management technology's one click respond's environment Our NSS volunteer develop mechanisms for protection against practices

that could be over powering as per resilience aspect.

Since '1970's drought' to 'Covid -19' Pandemic situation, there are various incident are available with us that proves NSS is a pronounced practical oriented schema of the Government of India' in the field of youth work in the world. 'It provides opportunity to student to build-up ideologically inspired profile. That is very important to avoid fusional influence Science, Management and Technology. It provides the opportunity for

youth understand the human resilience for enjoy the horizon of Science, Management and Technology. The prominence of NSS's role in

youth profile is also abstracted by Tata Institute of Social Sciences (TISS) [8].



Figure 1: Indian 'Youth profile' existence

This directly indicates that hypothesis is proven positively "N.S.S. fostering human resilience: Catalyst for Management, Science and Technology"

Section –V

Conclusion and further work

In concluding, this study accepts the role N.S.S. fostering human resilience as a Catalyst for Management, Science and Technology. Based on that, it has arrived that our youth profile must be enhanced by "Making development and deployment step efficient by

eliminating inefficiencies for tries to reduce confusion and increase appreciation level by adding values of human resilience.". This will happen when forerunner focus on 'Youth' and its need and grip it with technological friend hood management on the basis of human resilience philosophy established on science to accomplish the progressive path. This study appreciates that it is very initial effort in this direction. There is need complete exclusive effort that will explore each and every aspect and its influence clearly.

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A STUDY OF NON PERFORMING ASSETS AT RAJARSHI SHAHU SAHAKRI BANK LTD, KATRAJ BRANCH, PUNE

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ABSTRACT

The Co-operative banking sector is one of the principle accomplices of Indian Banking structure the co-operative banks have more rich to the ruler India., through their huge network of credit societies in the institutional credit structure. The co-operative structure have played key role in the economy of the country and always recognized as an integral part of our national economic-operative have ideological base, economy object with social outlook and approach. The co-operative covers almost cent percent village in India. The co-operative form of organization is the Ideal organization for economic weaker session in the country according to the recent study by World Bank and National Council for applied Economic Research.

Keywords: Co-operative Bank, Rural Development, Indian Banking, Credit Societies.

Introduction

The subject of research study is Non-Performing Assets (NPA) in Rajarshi Shahu Sahakri Bank Ltd. Katraj Branch, Pune. Today the foundation of the country financial turn of events and exchange is relying on banking and credit construction of economy.

The monetary construction is the establishment of credit and capital market of the economy. This is exclusively relying on the financial business in the country. The fundamental establishment at any bank is its store examples and Advances come from the stores which the public keeps in the bank consistently in a specific proportion and extent, no bank can allow credit more than its store structure.

Non-Performing Assets (NPAs)

Today NPAs are the matter of utmost concern in the banking sector or other financial institutions in India. Whenever a loan amount which doesn't meet the laid payment criteria of interest amount of EMI (Equated Monthly) payments are known as non-performing assets. NPAs can be further seen as commercial and consumer loans. Commercial loans become NPA when they are overdue for more than 90 days, whereas consumer loans become NPA when they are due for more than 180 days. Recently, there have been various cases by big corporate houses which are pending with the Indian Banks. Bhushan Steel is one such

example who defaulted on an amount of Rs. 56,022 crore, out of which only 63.5% (= Rs. 35,571 crore) has been realised so far.

Meaning of Non-Performing Assets (NPA)

Meaning of Non-Performing Assets (NPAs) has been well defined by RBI. RBI (Reserve Bank of India) is the central bank of India. Now, as per RBI, a non-performing asset is:

- An asset, that also includes leased asset when it stops accumulating income for the banks or financial institutions.
- A NPA is a loan or advance where:
 - Any interest or portion of the principal sum stays past due for a period longer than 90 days if there should arise an occurrence of a term advance.
 - The instalment of principal or interest thereon remains overdue for two crop seasons for short duration crops, the instalment of principal or interest thereon remains overdue for one crop season for long duration crops.
 - The portion of head or interest consequently stays late for two yield seasons for brief length crops, the portion of head or interest subsequently stays past due for one harvest season for long span crops.
 - The portion of head or interest consequently stays late for one yield season for long length crops.

- The measure of liquidity office stays extraordinary for over 90 days, in regard of a securitisation exchange embraced as far as rules on securitisation dated February 1, 2006.
- In regard of subsidiary exchanges, the late receivables addressing positive imprint to-showcase worth of subordinate agreement, if these stay neglected for a time of 90 days from the predefined due date for instalment.

Types of NPA

Gross NPA

Gross NPA is the overall quantitative amount of all those loans that have gone bad debts. It is an advance which is written off, for which bank has made provisions, and is still in bank's book of accounts.

Gross NPAs Ratio = $\text{Gross NPAs} / \text{Gross Advances}$

Net NPA

Those NPAs in which, the banks have deducted the provisions regarding NPAs from the Gross NPAs are known as Net NPAs.

Net NPA = Gross NPA – Provisions

Assets Classification

Assets can be classified into 3 types:

Standard Assets

Those assets which are not facing any problem and are not pf more risk towards the customer are known as standard assets. These standard assets are measured as performing assets. A 0.25 percentage general provision is must to be providing on basis of global loan portfolio.

Sub-Standard Assets

Any asset which is remained NPA for a period less than or equal to 12 months is classified as sub-standard asset. A general provision of 10% on outstanding has to be provided on sub-standard assets.

Doubtful Assets

Those assets which have remained NPAs for a period outperforming a year and which are not adversity advance. As indicated by RBI, it is must for banks to work with 100% of unsound proportion of approaching development.

Reasons behind NPAs

There are several reasons for a loan asset account becoming a NPA asset. It is very important for a banking sector to flourish; otherwise it directly impacts the economy and the financial power of the country. The increasing non-performance assets are nothing but failure of the banking sector which also indirectly affects the other sectors. Earlier, the Indian banking sector was being operated in a closed economy but since when it has been open to the economy, it has faced various challenges.

The increasing NPAs is the net result of this situation and which costs the banks so much and finally it leads to the higher cost of the banking services. One of the main reasons behind the increasing NPAs is the prescribed percentage of credit of the banking sector to the priority sectors. And this percentage is too high, i.e., 40 percent. Indian banking sector doesn't faces lack of stringent norms but rather they face various legal impediments and time consuming asset disposal process.

This NPA problem is not new, and has been existing for more than decades. It was year 1989-1990, when the Prime Minister VP Singh at that time, had given a huge waiver of Rs. 15,000 crore for the rural loan accounts, this didn't help much, but this left a very negative impact in the payer and the borrower, as after that the payer didn't use to feel obliged to pay their debts, and this negatively affected the Indian Banking Sector.

There are two factors for a loan account becoming a non-performing assets, internal factor and external factor. Internal factors are related to the funds and the borrower like when the funds borrowed for any particular purpose is not used for that purpose or when that purpose or project is not completed within the stipulated time. This creates the situation of non-payment of loan assets. Apart from this, business failures and diversions of funds for doing other things also cause the situation of NPAs. Well, all these situations occur because of the borrower and their projects. Also, willful defaults, siphoning of the borrowed funds, frauds, loan disputes and misappropriation are the additional reasons.

On the other hand, internal factors also include the deficiency on the side of the banks, when the banks fail to monitor the loan assets, and delay in follow-ups with the borrower for settlement of the loan accounts.

External factors are other factors that are due to policies, environmental, legal and social factors. Sluggish legal system is one of the major external factors as there are never ending disputes and lack in sincere efforts by the legal system to settle the disputes. And the government policies like excise and import duties affect the banking sector. Also, the industrial recession and shortage of raw materials, power and other resources are the major reasons for the increasing NPAs.

Impact of NPA

The increasing NPA in the banking sector of India, not only minimizes the profitability of the banks but also impacts the credibility of the banks. This massive amount of increasing NPA in the commercial banks is eroding the maximum of the capital base of the public sector banks. If the banks start making losses, it starts destabilizing the confidence of the customers (depositors) of the banks. And if the depositors lose confidence in their banks, they will start withdrawing their money from the banks, which would lead to the collapse of the banking system. This is why it is very important that non-performing assets must always remain within the minimum limit so that the sustainability and stability of the banks doesn't get disturbed

This is not the only impact NPAs causes. Also when NPAs increase, it forces banks to decrease the interest rates on the saving deposit accounts to increase the margin of profitability of the banks. NPAs cause long term threats to the banking sectors with respect to its stability. Recently after demonetization, it was noted that the profitability of the manufacturing sector reduced, which prompted the banks to stop the credit growth of the industrial sector. The shortage of funds due to NPAs affected the growth of the industrial sector. This continuous reduction of availability of credit is not only harmful for the industrial sector, but also for overall economy.

Increasing NPAs lead to the shrinking of availability of credit to the public, and hence the funds are not available to the public at large and mainly for priority sectors, which in turn halts the economic growth and industrial sector. Only when credit is available to the public in excess through banks, then only new entrepreneurs could establish new companies, which in turn would generate employment and will lead to a better and robust economy. Hence, it is very important that banking sectors be stabilized and NPAs should be controlled through its effective management.

Review of Literature

Neelam S. Pandya (2019) this is the time of change exceptionally directed to progression, public sector to private sector and shut economy to globalized economy. This is the new beginning time of new private sector banks and unfamiliar banks. The review is centered on gross NPA to net advances and net NPA to net advances. Its covers the exploration time of 20 years in the wake of banking sector changes began..

Ms. Arshiya Mubeen Non-performing assets (2019) (NPAs) are bad debts for banks and they have become headache while declaring net profit. In this study the growth of NPAs among public sector banks had been described. Syndicate Banks NPA for a period of five years have been analyzed in this paper. Some suggestions were given for banking professionals which should be considered before sanctioning loans.

Pallavi Singh Yadav (2019) A well-developed and financially strong banking sector is the backbone of the economic development of any nation. Banks mobilize the savings of the public by accepting deposits and disburse credit according to socio-economic priorities of the country. The public and private sector banks and most of the financial institutions are provided financial assistance in the form of advances to agricultural and industrial units, MSMEs and service sector, to run their businesses efficiently and to contribute in the economic development. It took almost 3-4 years for banks to come out of the 2008 financial crisis that happened in the world economy and still, banks are facing issues like

NPA, which not only decreased the profitability of banks but also affect their smooth operations and goodwill. A drastic increase in NPAs is happening in public sector banks of India. Public sector banks are ruling the banking sector in concern of net worth, which is 70 percent of the banking system of India. In the mid of September 2018 gross NPAs of SCBs crosses the limit of nine lakh crores out of which 90% NPAs were in the public sector banks. State Bank of India and Punjab National Bank are leading in that. Although, Reserve Bank of India and banks themselves have taken numerous steps to solve the NPAs problem but it is still alarming in the Indian economy.

Banerjee et al. (2018) have inspected the situation with gross NPAs and net NPAs in private sector banks and public sector banks to concentrate on their impact on the resource nature of the banks. Purposeful advance defaults, helpless credit the executives strategies, endorsing of advances without dissecting the danger bearing limit of the borrowers are the fundamental explanations behind stacking up of NPAs. The banks should weight on better system definition and its legitimate execution also. Severe arrangements by the public authority could help in diminishing the degree of NPAs.

Mukhopadhyay (2018), in his paper, has examined about discovering answers for India's NPA hardships. He has proposed that to determine the issues of NPAs the RBI ought not maintain a solitary model; all things being equal, an imaginative and adaptable methodology is required for each influenced bank, which ought to contrast on made to order premise.

Kumar (2018), in her investigation has discovered that NPAs contrarily affect the productivity and liquidity of the financial area. As indicated by her assuming the issue of NPAs is overseen productively, numerous microeconomic issues like destitution, joblessness, and uneven characters of equilibrium of installments can be diminished, the currency market can be reinforced, and in this manner, the picture of Indian financial framework can be worked on in the global market.

Sharma (2018) emphasizes the job of the financial area as an instrument of monetary development and advancement. The paper talks about how banks are troubled because of increasing NPAs particularly in the event of public sector banks. The creator expresses various preventive estimates that would diminish the degree of NPAs. Reasonable administrative norms and opportune execution of them could prepare for a solid monetary area in India.

Dey (2018) in an extremely late exploration paper takes a gander at the recuperation part of recuperation of helpless advances of the Indian business banks. The creator views the job of DRTs to be vastly improved contrasted with the recuperation through LokAdalats and SARFAESI Act.

Kumar et al. (2018) make a fascinating review to discover the primary explanations for amassing NPAs. They observe the principle motivations to be modern infection, change in government arrangements, helpless credit examination framework, adamant defaults and deformity in the loaning system.

Mishra and Pawaskar (2017) have suggested that banks ought to have a decent acknowledge examination framework to stay away from NPAs. They call attention to that the issue of NPAs can be tackled in case there is an appropriate lawful design to help the banks in recuperation of obligation.

Research Methodology

Objective of the Study:

Major objective of the research is to study the NPA and its types, different level of NPA in commercial bank and its remedies measures taken by the bank to decrease the NPA of the selected bank.

Sources of Data

The data collected for the preparation of this research is secondary data. The sources of data used for this research paper include the annual reports and literatures published by Indian Banks and Reserve Bank of India, various articles, magazines and journals. The data used

in this analysis is restricted to the past one decade, i.e., 2016-2019.

Research Design

For this research paper, Analytical Research method of research was used. Researcher has reviewed the NPA in selected commercial bank that include cooperative bank listed in the Second Schedule of the Reserve Bank of India Act, 1934. The data has been collected from the Annual Reports of various public and private sector banks, RBI press release, RBI notifications and RBI occasional papers. The

secondary data has been collected from various articles, magazines and research papers on NPAs.

Techniques of Data Collection and Analysis:

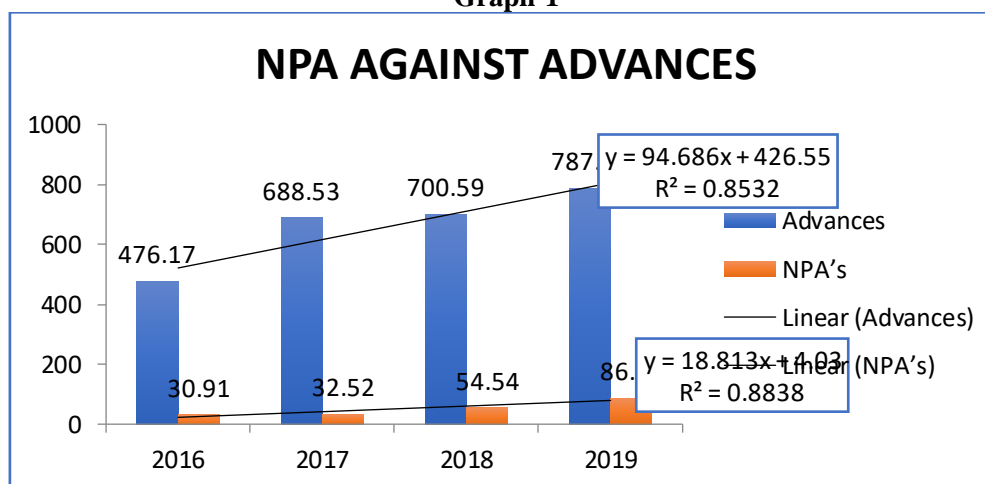
Simple technique of data collection has been used for this research paper. Data for this research paper has been extracted from various documents and records. The data obtained for this research paper has been analyzed using appropriate statistical techniques like averages, financial ratios, trend analysis and percentages.

Data Analysis and Interpretation

Table 1 NPA AGAINST ADVANCES (Rs. In.lakhs)

Year	Advances	NPA's
2016	476.17	30.91
2017	688.53	32.52
2018	700.59	54.54
2019	787.77	86.28

Graph 1



Interpretation

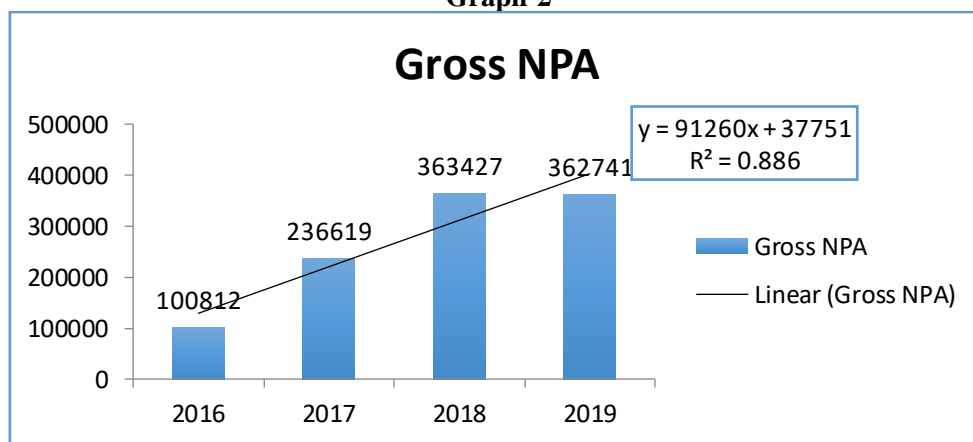
Checking out the development of the NPA to propel proportion the bank can have a thought regarding the amount of its loaning is paid off and what extent isn't so the bank can then intently screen the loaning design if it is stretching out advance to hazard project reasonable tasks whether it needs to build post observing etc& settle on the reception of legitimate danger the executives method and such measure so this apportion is more imperative to the bank then the NPA to resource proportion during the year 2016-17 The gross NPA to net advances of the bank is as on March 16. the net NPA to net

development has additionally improved from 32.52 as on 31st March 2017 to 86.28 as on March 2019 during the had been decrease of NPA to the sum recuperate 26.00

Here researcher use trend analytical to forecast NPA against advance for the future 2 to 3 yrs. Here researcher observe that linear trend line is fitted to the advance & NPA R^2 of advances is 0.8532 is greater than 0.8. So, it is best fitted trend line for advance also R^2 value for NPA is 0.8838 is greater than 0.8. So, it is best fitted trend line for NPA. By using linear equation researcher can forecast the NPA & Advance for the future few year.

Table 2 Gross NPA'S (Rs. In Lakhs)

Year	Gross NPA
2016	100812
2017	236619
2018	363427
2019	362741

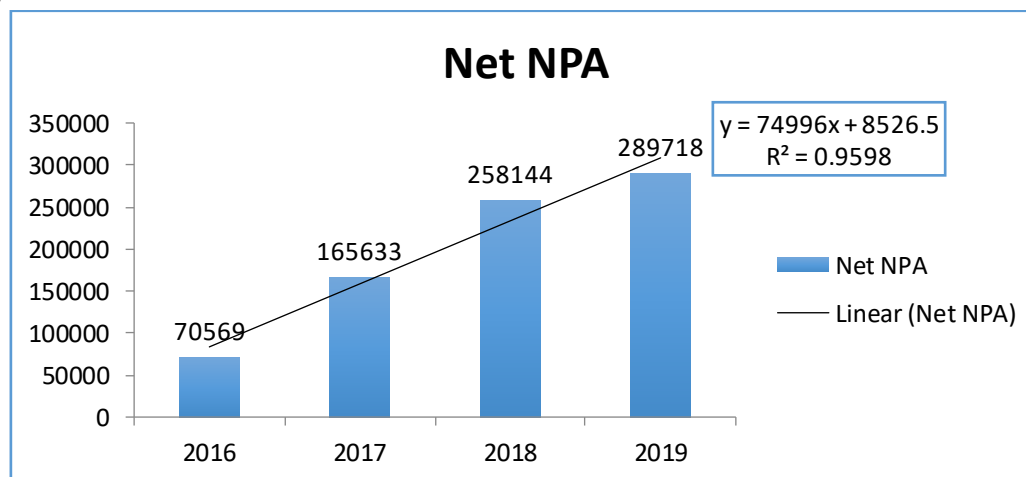
Graph 2**Interpretation**

Here researcher has observed that Gross NPA is increasing. It was 100812 in 2016 and reached till 362741 in 2019. The highest

Gross NPA in 2018 i.e 363427. The trend of gross NPA is increasing linearly. The bank needs to control the gross NPA by implementing some guidelines to control it.

Table 3 Net NPA'S (Rs. In Lakhs)

Year	Net NPA
2016	70569
2017	165633
2018	258144
2019	289718

Graph 3

Interpretation

Here research can observe that Net NPA is increasing linearly. It was 70569 in 2016 till 2019 it became 289718. The highest NPA is 289718 in 2019. The r-square value of Net

NPA is 0.9598 shows that the given linear trend line is best fitted to the above data and researcher can forecast the future Net NPA trend by using the trend equation.

Table 4 Amount Recovered Through Various Legal Measures

Total NPA	7,84,064
Recovered NPA	4,57,000
Balance NPA	3,27,064

Interpretation

Total NPA is 7, 84,064 out of which 4, 57,000 is recover by One time settlement and SURFAESI Act. But still 40% of NPA recovery is balance due to some reasons.

- Loss of occupation or job after the advance or loan is approved
- Market condition; request and supply position additionally influenced the paying limit of the borrower.
- Demotion which bring about the bringing down of salary, at last influencing the installment of portion or principal sum.

Findings of the study

1. NPA against advance are increased from 2016 to 2019.
2. Gross NPA are increasing year by year & highest NPA i.e 3, 62,741 in 2019.
3. Gross NPA is increasing year by year because borrowers are not repaying their instalments on time.
4. Net NPA is increasing from 2016 to 2019.
5. 20% of comparison of Net NPA in the year 2016 & 2017.
6. The 60% amount of NPA recovers through One Time Settlement and Lok-Adalat.

Conclusion

The NPA have been a very big problem for the banking sector in India. This doesn't only affect the banking sector in India but also affects the Indian economy. The percentage of the NPAs to the loans has been increasing rapidly in both the private and public sector banks. Private Banks are also unable to decrease this ratio, but they are still better at managing their NPAs when compared to the public sector banks. Here researcher concluded that NPA is increasing of Rajarshi Shahu Sahakari Bank Ltd from 2016 to 2019. They have taken good remedial measures to recover the NPA like One Time Settlement, Lok-Adalat, Compromise Settlement, Recovery Camp etc. but the performance is not consistent.

Recommendations

1. Knowing a customer profile completely and setting up a credit report by paying successive visits to the customer and his specialty unit.
2. Appreciation list of borrower should be displayed in the banks premises which will motivate others to pay the amount on time.
3. Reminder Calls, Emails should be done to the borrower before the instalments date of his amount.

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BEST PRACTICES BLUEPRINT FOR INSTITUTIONAL DEVELOPMENT

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ABSTRACT

Master of Business Administration (MBA) programs influence the business and administrative sectors of modern organizations in important ways. Students are at the center of growth at all levels. MBA institutional approaches play an important role in exploiting student talents and preparing them for global competence. The annual reports of the Higher Education Institute (HEI), the National Assessment and Accreditation Council (NAAC) and the National Board of Accreditation (NBA), contradict further research into the best practices of private / privately funded MBA institutions in rural areas. Blueprint is a useful tool for keeping institutional development on track. The MBA Institute's work plan and best practices serve as a self-assessment tool for timely development. The plan is designed to help you achieve your goals. This paper focuses on the best practices. Private MBA-funded institutions are included in the research sample. The information is collected from secondary sources of websites approved by the NAAC. The NAAC compiled a list of best practices based on published research. Secondary data meta-analysis was used to determine best practices. The top ten practices have been established as a result. The ID is made using the concept of the parameter power. For each practice, five-year programs are recommended as programs. As a result, a total of ten plans have been developed and proposed for the healthy expansion of the MBA Institute. The purpose of this chapter is to highlight the many ways and means to achieve academic success. Its purpose is to suppress the thinking process of everyone involved in the growth of the institution. The guidelines can be a guide for private MBA institutions in rural areas of the country to implement the program.

Keywords: Blueprint, Academic excellence, Best practice, MBA Institute.

Introduction to Study

Innovation, disruptive business research, and product development, all of which, based on higher education institutions, have accelerated growth in the world's most active economy. Such institutions are a national asset, contributing to national prosperity and rural development at the grassroots level.

Successful institutions have strong links with local communities and industries, and contribute to the development and growth of the city, region, and country. It is well-known that business education has a profound effect on people's lives. For modern MBA institutions, creating an environment conducive to innovation and entrepreneurship is an important endeavor. In this setting, institutions should develop a strategic plan.

Review of Literature

IIT Bombay has developed a five-year strategic plan [1]. Based on the literature review of the program, the following objectives have been identified as priorities for the program, in addition to the broad range of activities undertaken by IIT-B to support its objective:

1. Increase public and business participation.
2. Increase educational opportunities
3. Improve internal support systems
4. Develop the learner's knowledge
5. Expand the financial base
6. Attract international students and professors
7. Extend information boundaries
8. Promoting diversity
9. Increase student involvement
10. Develop a clean and environmentally friendly compass.

The researcher takes this strategy and incorporates a purpose-focused approach to its research design. A large number of new MBA colleges have failed to provide quality education at a lower cost. The following are two important reasons:

1. They could not repeat the good habits of the high schools.
2. Because they have failed to meet the expectations of the participants, their seats are not fully seated. [2]

Systematic search for best practices, new ideas, and more effective work processes is known as recording plans. The purpose of this study is to identify and summarize the best practices used by privately funded MBA colleges.

Objectives

1. Determining areas that are critical to institutional growth where best practices are available.
2. Assess and evaluate the best practices of selected MBA institutions in accordance with their NAAC standards.
3. Propose a plan for best practices for institutional development over the next five years.

Research Method

MBA programs that want to know where they are regarding accreditation and testing should contact the NAAC. On its website, the NAAC also provides a list of best practices for MBA institutions, as well as their rating.

In this study, a three-part research strategy was used:

1. MBA programs offered by Higher Educational Institutes (HEIs) are being investigated.
2. Human-managed HEIs are being investigated.
3. Investigate NAAC-accredited tertiary institutions with grades A ++, A +, B ++, and B.

These MBA programs have made their Self Study Reports (SSR) available on their websites. SSR refers to the sample of literature selected for this study. Depending on the availability and availability of data on the respondent's website, a sample sample of 10 MBA institutions from each grade above was sent. As a result, a second set of 40 SSR data was tested.

In addition, the "best institutional practices provided under NAAC Criteria 7" are evaluated in six categories.

1. Institutional Management and Administration
2. Teacher Education and Research
3. Student Learning Guidelines
4. Campus Infrastructure and Resources
5. Learner reading and response rates
6. Access and consultation
7. Institutional Collaboration

Scope

The paper focuses on the MBA Institute Best Practices. Curriculum planning and design, teaching, learning, and assessment, research, innovation, and expansion, infrastructure and resources for learning, institutional and administrative management, and institutional separation practices are all intertwined with best practices.

Limitations

The analysis is based on secondary data available on HEIs websites in the form of SSR. In the sample, only complete SSRs are performed. Only slightly issued SSRs are not considered. NAAC SSR investigated. Although AICTE promotes NBA accreditation for MBA programs, NBA reports are not readily available on websites. In addition, a large percentage of MBA institutions are accredited by the NAAC rather than accredited by the NBA.

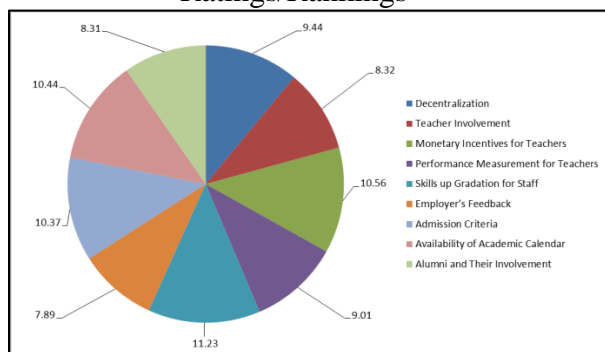
After a thorough review, NAAC publishes Best Practices on its website. The second detail refers to these topics..

Data Analysis and Interpretation

A] The following are the main areas where evidence and footprints of best practises can be found:

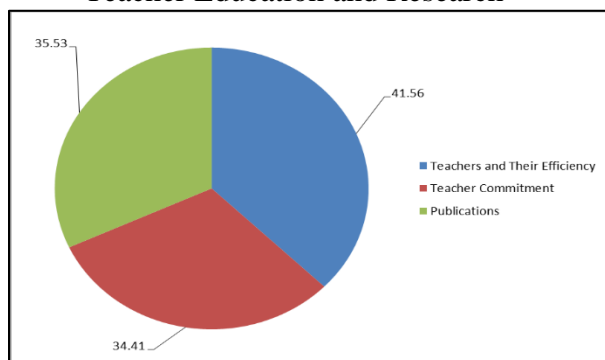
Institutional Governance and Management:

Graph No. 1: Practices with the Best Ratings/Rankings



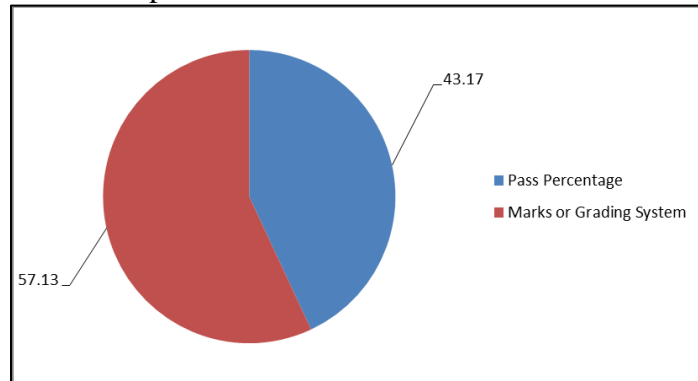
Source: Meta-Data Secondary Data

Graph No. 2: Top Rated/Ranked Practices in Teacher Education and Research



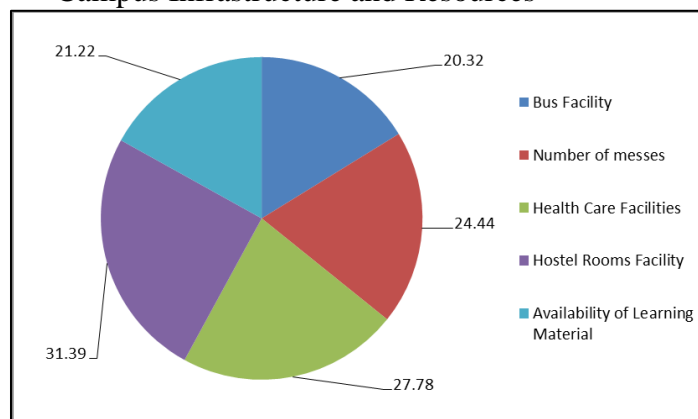
Source: Meta-Data Secondary Data

Graph No 3: Student Academic Indicators: Top Rated/Ranked Practices



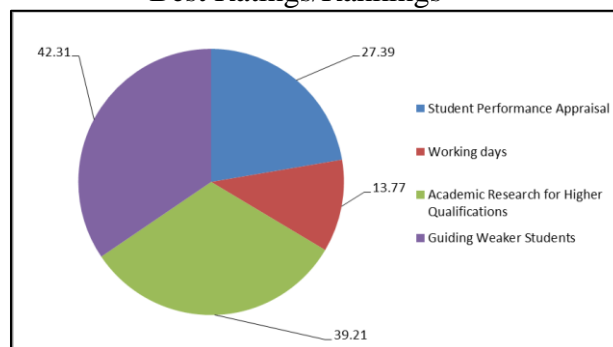
Source: Meta-Data Secondary Data

Graph No. 4: Top Rated/Ranked Practices in Campus Infrastructure and Resources



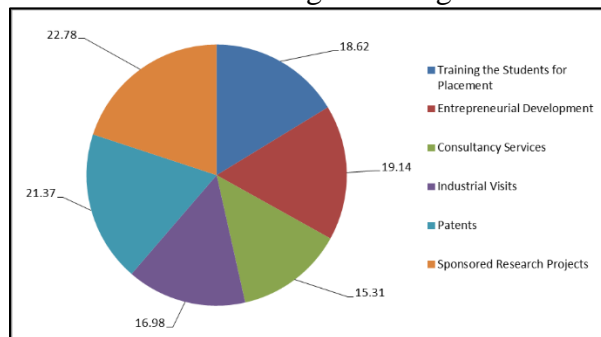
Source: Meta-Data Secondary Data

Graph No. 5: Student learning levels and feedback (Graph No. 5): Practices with the Best Ratings/Rankings



Source: Meta-Data Secondary Data

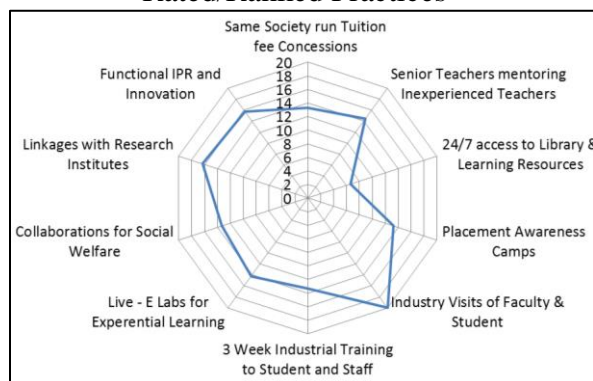
Graph No 6: Institutional Collaborations: Outreach and Consultancy: Practices with the Best Ratings/Rankings



Source: Meta-Data Secondary Data

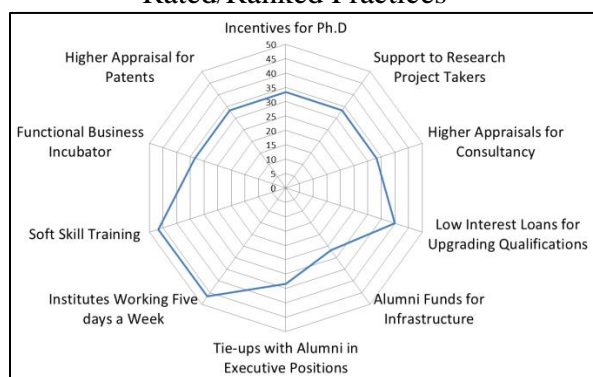
B] A Review of NAAC Accredited Institutes' Best Practices (Grade Specific Categorization)

Graph No 7: NAAC Grade: A++: Top Rated/Ranked Practices



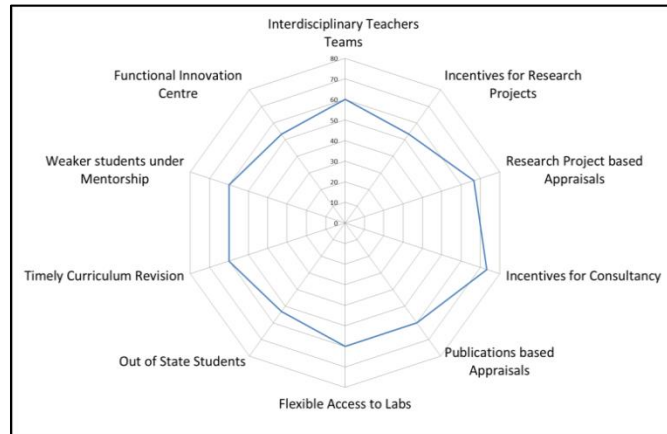
Source: Meta-Data Secondary Data

Graph No. 8: NAAC Grade A: Top Rated/Ranked Practices



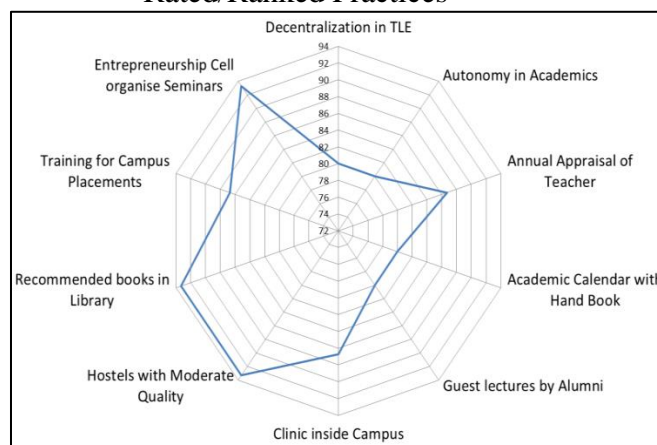
Source: Meta-Data Secondary Data

Graph No 9: NAAC Grade B++: Top Rated/Ranked Practices



Source: Meta-Data Secondary Data

Graph No 10: NAAC Grade B & B+: Top Rated/Ranked Practices



Source: Meta-Data Secondary Data

Findings

From the data collected and analysed in sections A and B of Data Analysis and Interpretation, four main theme indicators have been identified as significant benchmarks.

1. Student Achievement Core: Through its commitments to open access learning, offering a portfolio of appropriate and well-chosen educational programs, services, and activities, and its ongoing attention to student persistence and educational attainment, Theme Institute supports all students' success in meeting

- their educational goals. Access, persistence, completions, success efforts, and demographics are all important concepts.
2. **Priority Initiatives for Student Success:** Create and implement a strategic enrollment management plan that supports all student populations' achievement. Provide academic support and other services to help students set and achieve their objectives. Provide equal opportunities: affordability, initiatives that promote all student populations' success and retention, and efforts to reduce the gap. Ensure that services are egalitarian by using universal design, accessible facilities, and multilingual communication. To boost persistence and completion, use data-driven techniques. Support the whole pre-graduate continuum by promoting efficient transitions into and through the MBA programme.
 3. **Excellence in Teaching and Learning:** Core Theme Institute prepares and enables excellence in teaching and learning through its commitments to ensure curriculum relevance, responsiveness, and inclusiveness; to maintain an effective teaching environment by supporting all faculties' teaching and professional achievement; to provide access to high-quality learning support services; and to monitor academic and professional performance. Curriculum, programme design, faculty professional development, and assessment of learning outcomes are all important themes.
 4. **Priority Initiatives for Teaching and Learning Excellence:** Create and promote new projects, certificates, credentialing methods, and degrees that match the region's needs, such as expanded baccalaureate programs. Involve faculty, staff, and students in regional, state-wide, national, and international discussions on higher education's future. Develop a programme that includes undergraduate research and experiential learning. Incorporate personal effectiveness abilities such as communication, teamwork, and leadership into the curriculum. Through interdisciplinary learning focusing on economic, social, and environmental sustainability, prepare students to prosper in an interconnected and interdependent world. Encourage faculty professional development to promote disciplinary and pedagogical currency and creativity.
 5. **College Culture and Life:** Through its commitments to support a campus environment that is diverse, inclusive, open, safe, and accessible; to model a college community that affirms and embodies pluralism and values collaboration and shared decision making; and to honor and practise sustainability, creativity, and innovation, Core Theme Institute values learning and working environment. Equitable procedures, decision-making, efficiency, work-life quality, and safety are key ideas.
 6. **Priority Initiatives in College Life and Culture:** Integrate social justice into day-to-day college operations, ensuring a nondiscriminatory, universally designed, and accessible environment. Improve operational decision-making structures and support the college's governance system. Establish consistent and efficient processes based on best practises in higher education, such as long-term planning and change management, onboarding and continuous training, disaster readiness, and succession planning. Improve the information-sharing systems. Become the region's employer of choice by

providing an engaging environment, competitive wages, and a shared value system for employees. Encourage all employees to pursue professional development, progress, work-life balance, and wellbeing. Address disparities that part-time faculty and staff face.

7. Participation in and enrichment of the community: Through its commitments to collaborate with businesses, industries, local school districts, primary transfer institutions, alumni, donors, and governmental and social service organisations to develop and refine educational programs that prepare individuals for academic success, employment, and lifelong learning, Core Theme Institute aspires to be a leader and partner in building a strong and vibrant region. Continuing education, funding, community connections, alumni participation, and college identity are all important issues.
8. Priority Initiatives for Community Engagement and Enrichment: Create an educational environment that fosters lifelong learning opportunities for informed and active citizenship. Establish strong relationships with community partners—employers, postsecondary institutions, community organisations, service groups, companies, and neighbors—in order to develop and sustain relevant programs. Make our identity known. Create and implement a system for carefully listening to and responding to community and regional needs. Create a large network of active alumni. Look for financial opportunities to help offset the loss of societal support.

Recommendation

Program for Best Institutional Development Practices through Quality Improvement Over the Next Five Years: Excellent performance efforts over the next five years are planned for the four major Institute topics in the Strategic Plan 2019-20. It identifies several of the most appropriate methods of the MBA Institute, privately funded and in rural or urban areas. The program promises to provide higher educational opportunities, to educate students to become global citizens, to promote social justice in all its activities, to engage with society, to fix its foundations, and to improve human capacity.

Table No. 1: Improved involvement with society and industry is the first best practise (See Appendix)

Table No. 2: Best Practices 2, 3, and 4: Expanding the Educational Field, Improving the Internal Support System, and Improving the Student Experience (See Appendix)

Table No. 3 shows the best practises. 5, 6, and 7: Increase funds, recruit out-of-state students and professors, and push knowledge forward (See Appendix)

Table No. 4: Enhance Diversity, Enhance Alumni Engagement, and Develop a Cleaner and Greener Campus (Best Practices 8, 9, and 10) (See Appendix)

Conclusion

Blueprint is a useful tool for keeping institutional development on track. The MBA Institute's work plan and best practices serve as a self-assessment tool for timely development. The plan is designed to help you achieve your goals. The focus of this chapter is on the good deeds. Private MBA-funded institutions are included in the

research sample. The information is collected from secondary sources of websites approved by the NAAC. The NAAC compiled a list of best practices based on published research. Secondary data meta-analysis was used to determine best practices. The top ten practices have been established as a result. The ID is made using

the concept of the parameter power. For each practice, five-year programs are recommended as programs. As a result, a total of ten plans have been developed and proposed for the healthy expansion of the MBA Institute.

Reference

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2. <http://www.naac.gov.in/resources>
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5. <http://dx.doi.org/10.5539/ies.v8n11p169>
6. <http://www.iitb.ac.in>

Appendix

Table No. 1: Improved involvement with society and industry is the first best practise

Sr. No.	Best Practice	2018-19	2019-20	2020-21	2021-22	2022-23	Target
1	Enhance Engagement with Society and Industry	Create an Office for Inreach and Outreach with schools, under graduate colleges and local community	Create a Business Development and Industry Interface Office in to enhance Intellectual Property (IP) commercialization, and promote industry interactions.	Develop an ecosystem in the campus to enable and support faculty involvement in the Research Cell.	Set up a business accelerator in the campus and strengthen incubation and Entrepreneurship ecosystem in the campus. Enhance networking and support the Development of Baramati as a startup hub.	Enhance engagement with educational and research institutions in the region with joint workshops and joint research by providing seed funding.	Number of open days: one per year Number of visitors for open days: 200 per year Number of external visitors to public lectures/colloquia: 20 per year Target IP commercialization/licensing: 1 per year New industries engaged to the Institute: 2 per year Total number of faculty with industry engagement to: 10 per year Joint publications/patents with companies associated with Research Cell: 2 per year New startup companies: 1 per year Number of city and state problems taken up as research projects: 2 per year Number of personnel trained from the city and state employees: 10 per year Number of TEQIP training offerings to people trained: 5 per year; 10 people trained per year Number of joint research projects with regional institutions: 1 per year

Source: Meta-Analysis of Secondary Data

Table No. 2: Best Practices 2, 3, and 4: Expanding the Educational Field, Improving the Internal Support System, and Improving the Student Experience

Sr. No.	Best Practice	2018-19	2019-20	2020-21	2021-22	2022-23	Target
2	Broaden Educational Areas	Create Academic Support Program for identification of new program/ areas and realignment of existing program based on special needs of the city (possibly finance, commerce, entertainment), regional challenges, and faculty Expertise	Initiate new MBA Executive program in existing academic entities.	Initiate Joint Academic program in collaboration with Skill based institutions.	Initiate major curricular revision to broaden education and enhance skill based courses and the liberal arts foundations.	Strengthen ASP to promote Institute engagement with the city and the local government for capacity building and Skill based societal problem	New programs introduced: 3 EMBA, ASP, Up-Skill Periodic review of ASP curriculum: once in every 2 year period New courses introduced: 10 by 2023 New Skill based programs introduced: 5 by 2023
3	Improve Internal Support Systems	Simplify systems and processes with a modern ERP system	Appoint and empower departmental managers to support and co-ordinate purchase, Maintenance and administration.	Service orientation and training for staff, service response and new recruitment rules to attract qualified staff at various levels.	Conduct annual satisfaction survey	Implement Pay Commission based Compensation for all staff	Reduction in average processing times Financial Support through Competitive Salary and Sponsorship for Development/Research/Consultancy Continuous improvement on satisfaction survey scores Improved faculty Development and mentorship: 5 FDPs In-house and 2 MOOCs/faculty/Year
4	Enhance Student Experience	Enhance and revamp faculty advising system to improve interactions Supervised internships for students in industry for longer duration.	Conduct annual student satisfaction survey and setup a complaint redressal system with an Ombudsman.	Enhanced student facilities including cafeterias, food courts and interaction spaces.	PhD Research Centre of SPPU with Infrastructure support for Teaching and Learning	Support student for participation in international technical competitions, Including academic credit for learning by doing.	Seminar Hall with Increase number of additional seats/ rooms: 500 by 2023 Number of PhD students mentored for Teaching/ Entrepreneurship: 20 per year Number of interaction spaces: 2 by 2022

Source: Meta-Analysis of Secondary Data

Table No. 3 shows the best practises. 5, 6, and 7: Increase funds, recruit out-of-state students and professors, and push knowledge forward

Sr. No.	Best Practice	2018-19	2019-20	2020-21	2021-22	2022-23	Target
5	Broaden Funding Base	Create Institute Development & Relations Foundation (IDRF) as a systematic Approach to donations and for enhanced engagement with stake holders.	Increase internal revenue through EMBA course, ASP and Skill based courses.	Improve financial management using ERP and establish methods for costing space, facilities, utilities and managing costs.	Increase research projects from industry (Research Cell, Uchchar Avishkar Yojana)	Establish Centers of Excellence in Continuing Online Education	Increase Donation receipts: Rs.10 Lakhs per year by 2023 Increase internal revenues: Rs.15 Lakhs per year by 2023 Increase consultancy and industry R&D receipts: 10 Lakhs per year by 2023
6	Attract Out of State Students and Faculty	Create International Relations Office with dedicated staff.	Enhance information availability and publicity in target states to attract students. Enhanced link with partner out of state universities by providing dedicated budgets.	Facilitate student exchange and joint-MBA programs	Attract Out of State faculty on long term appointments.	Attract Training and Placement Officers on long term appointments.	Increase percentage of out of state students (exchange students and regular students): 5% of new admissions in 2023 Increase percentage of out of International students (exchange students and regular students): 1% of new admissions in 2023 Increase number of long term out of state faculty: 5 by 2023
7	Advance Frontiers of Knowledge	Establish mechanism to support high impact research through an annual call for proposals and a process for identification of thrust areas and publish it in Institute ISSN Journal	Enable access to data required for research and specify a data use and access policy. This refers to Plagiarism Software Licenses.	Encourage formation of multi-disciplinary research centers in high potential areas and enable cluster SIP hiring.	Proactive and flexible mechanisms to attract high quality PhD student researchers. Encourage and support advanced research conferences at the Institute.	Departments to set up awards committees to help identify and nominate faculty and researchers for national and international awards.	Research output and impact should continue to increase. This would be reflected by increased publications per faculty, citations per faculty, citations per paper (this would not be specifically targeted, but would emerge as an outcome of enhanced research) Increase in annual research funding: Rs 5Lakh per year by 2023 Establish new multi-disciplinary centers: 2 by 2023 Increase licensing: 1 per year; and patenting:1 per year by 2022

Source: Meta-Analysis of Secondary Data

Table No. 4: Enhance Diversity, Enhance Alumni Engagement, and Develop a Cleaner and Greener Campus (Best Practices 8, 9, and 10)

Sr. No.	Best Practice	2018-19	2019-20	2020-21	2021-22	2022-23	Target
8	Enhance Diversity	Recruit Women Faculty and bring ratio 1:1	Increase the size of day care facility so that more staff members and students can use it.	Focused outreach to present women students, alumni, faculty members as role models to school students	Enhance percentage of women students in new admissions	Convey the exciting career opportunities provided by an MBA education to girl students in Baramati	Increased percentage of women entrants in students (20% by 2023), staff and faculty Number of outreach programs to attract female students: 1 per year
9	Enhance Alumni Engagement	Create an Alumni Centre at the Institute to support alumni visits, activities and engagement.	Initiatives for supporting alumni needs for continued learning and career improvement. Lifelong Learning Modules targeted for Alumni	Multiple interaction modes such as, interaction between alumni and students, mentoring interaction between alumni and faculty, alumni inputs for curriculum development, alumni support for student placements and internships, alumni involvement in Department Advisory Committees and in enhancing the innovation ecosystem at Institute.	Enhance effectiveness of the Alumni Cell to pro-actively identify potential SIP recruiters and prospective faculty and Staff	Engage alumni as adjunct faculty.	Number of alumni visitors to Alumni Centre and the Institute: 100 per year Number of courses/workshops/networking events for alumni: 5 per year
10	Develop a Cleaner and Greener Campus	Annual Green Audit	Community Service through Village Adoption	Annual Energy Audit	Environment Protection Award	Involve students in campus planning including green campus initiatives.	Setup a cell which will monitor, implement and enable policies and initiatives of the Green Campus Committee Annual Audits: 5 per year Establish Green Campus metrics and work towards reducing carbon footprint water footprint, energy footprint Improvement on green metrics: 5 per year

Source: Meta-Analysis of Secondary Data

TRAINING NEEDS FOR TEACHERS IN INDIAN HIGHER EDUCATION: TEACHERS' PERSPECTIVE

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ABSTRACT

Team performance is important to achieve organizational goals. Training Needs Analysis should be undertaken at team level to enhance team performances. Reviewing individual competency and skill sets as well as team skills and competencies are essential to achieve desired Organizational objectives. An individual's skills sets are mapped and utilized in the team for better performance. Thus, enhancing the team performance by adding individual's skills and competencies in the group. Through TNA one experiences personal and professional development. Employees are given in-house as well as outdoor trainings as per need. The leader/manager plays an important role in identifying training needs of the employees. It sometimes is a part of appraisal.

Keywords: *Training Needs, Competency, Performances, Development, Appraisal.*

Training Needs Analysis: Introduction

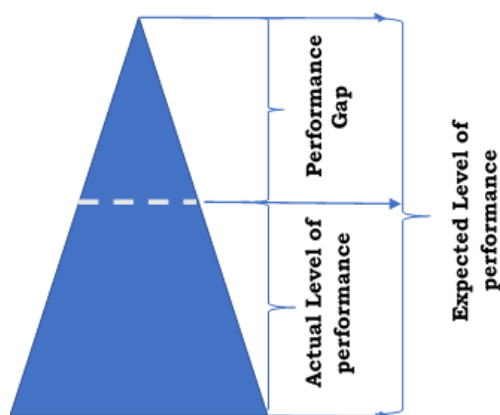
In the technology driven and ever-changing competitive world TNA has become a part and parcel of any profession. It not only helps the organization to have trained and proficient individuals but also to retain efficient and effective human resources. Individually, it helps employees to understand their strengths and weaknesses and provides an opportunity to work on it, in order to achieve individual goals. TNA makes manifold changes in the productivity of the employees.

Through TNA one experiences personal and professional development. Employees are given in-house as well as outdoor trainings as per need. The leader/manager plays an important role in identifying training needs of the employees. It sometimes is a part of appraisal.

First of all, leaders need to identify what skill sets are required to achieve the particular task or the process. Next is to assess existing skill

levels of the team members and finally determine the training gap.

Training Need Analysis (TNA) is a process of recognizing performance gaps (Diagram 1) and accordingly identify the individual and related training needs (Diagram 2). It helps in understanding how to design trainings for particular group and in what way. TNA is done to assess training needs of an organization or an educational institution. Especially it is done to find out gap between the already possessed knowledge, skills and attitude of individuals working in the organization and the need/requirement of essential and additional skills to support their qualities to achieve the organizational goals. It is key to success for an individual and for the organization.



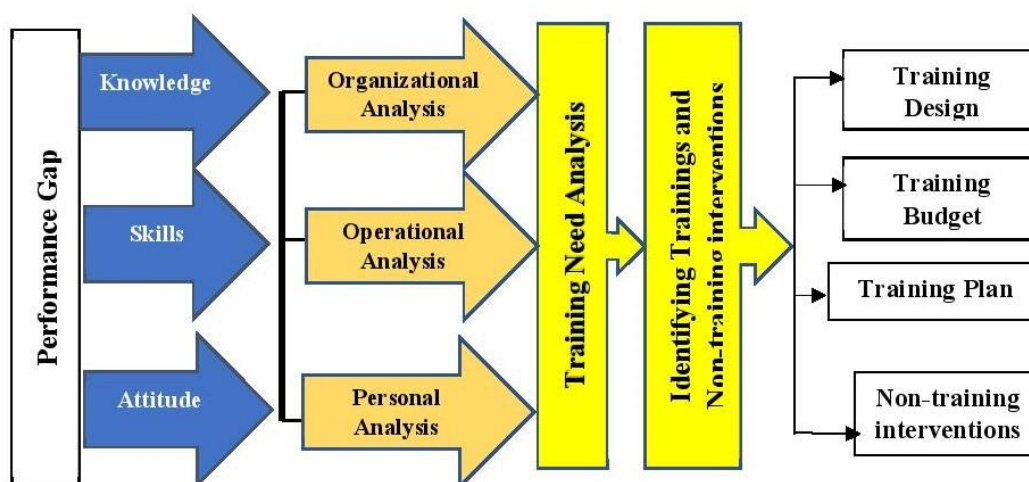
(Diagram 1: Identification of Performance Gap)

TNA is done specifically to get the answer of who, what, why, when, where and how. It answers the questions like:

- ☞ Why one needs training?
- ☞ Which skills are required?
- ☞ Who needs the training?
- ☞ When do they need training?
- ☞ Where will the training be conducted?
- ☞ How will the new skills be implemented?

TNA is basically done to identify needs of employment and make them well equipped with the courses and skills required to produce desired results. It improves their efficiency and productivity. In every organization, TNA is carried out for constructive outcome.

There are mainly three types of training needs. They are organizational, team and individual.



(Diagram 2: Process of TNA)

TNA considers key skills like knowledge, emotional intelligence, behavior etc. and how to develop them effectively. TNA is generally done in 3 levels: Organizational, team and individual. These three levels are interconnected and interdependent. It gives clear idea about the areas to be improved and the Skill gaps where training is required. The outcome of TNA is linked to creation of

organizational and individual development plan and objective.

Organizational Level

TNA helps to review organization with its strengths and helps to build strategic and operational plans in terms of Human Resources. Once the picture of organizational goals, future plans is clear then the leaders can address the weakness and build on the

strengths with knowledge, skills and behavior of the employees.

Team Level

Team performance is important to achieve organizational goals. TNA should be undertaken at team level to enhance team performances. Reviewing individual competency and skill sets as well as team skills and competencies are essential to achieve desired Organizational objectives. An individual's skills sets are mapped and utilized in the team for better performance. Thus, enhancing the team performance by adding individual's skills and competencies in the group.

Individual Level

TNA helps individuals to understand about the training needs of an individual to achieve individual goals in accordance with the organizational goals. TNA helps to identify weaknesses and strengths and decides upon the particular training program for the professional development of an individual. In this study the researcher is focusing on individual training needs .

There are various methods and **Techniques of TNA:**

- Observation
- Questionnaires
- Consulting a person on key position.
- Review of literature
- Interview
- Focus groups
- Surveys and samples
- Records & report

When we think about **Training Needs for Teachers in Indian Higher Education, we need to overview in-service training programs. Its development and its current status.**

In-service training programs:

In service training can be stated as the forms of education and training given to the individual who is on duty. In service training can be seen as a staff development process. A staff development process is a deliberate process which involves anticipating the future needs off the staff and providing necessary resources in order to further their job satisfaction and career prospects.

Professional Development initiatives of teachers in Indian higher education:

India is one of the countries to attract the most intelligent teachers in the Higher Education with the positive and strong system . The main aim is to create good human resource.

The Higher Education system plays an important role in nurturing human resources. The system focuses on making good leaders with scientific temper, with vision and critical thinking. Post independence Era witnessed a massive expansion of the educational system. From 22 Universities, 500 colleges, 15000 teachers and 1,00,000 students in 1951, the number has increased to 1043 universities and university level institutions, 54,122 colleges, 1503156 teachers and 3,85,36,359 by the end of 21st century.

While dealing with professional development of teachers in higher education, the Kothari Commission Report (1964-1966) pointed out that a lecturer neither receives orientation to his profession nor is given time for adaptation to his job. He is satisfied or perhaps, perforce satisfied to copy the methods adopted by his own teachers or senior colleagues.

The college/university teacher has always been an inspired lecture, which sways the students-audience and motivates them to acquire more knowledge on their own. This system has lasted for long due to lack of teacher evaluation seriously by the university/college authorities and lack of accountability on part of the teacher as individual.

Today the condition is totally different. The teachers are not dedicated. They are practical. This has led to incalculable losses, eroding the academic standards both amongst the teaching community and the students at large. A need for a suitable form of training and orientation to professionalize a lecture, thus, became evident.

Various staff development programmers are mainly intended to improve the professional knowledge of the staff, their skills and attitudes to enable them to accomplish their assignments more efficiently and effectively. It is a continuous process, which should take place in an organized manner to help the individuals to acquire deep knowledge, develop skills and improve value- judgment. A comprehensive approach should aim at viewing academic, managerial, administrative and technical support staff development as a whole within a facilitating infrastructure. Staff development allows teachers to develop their own faculties so that they can participate in formalization of the andragogic, technical and resource issues related to Higher Education. They should do their SWOT analysis and overcome their drawbacks. This is possible only through a proper induction program at the entry level of the teaching profession.

The National Policy on education (NEP) 1986 in its **Program** of Action (POA) showed a significant link between motivation and quality education. For the effective implementation of roles and responsibilities of a teacher in the system, the NEP decided to Motivate teachers by enhancing knowledge through systematic orientation in specific subjects, techniques and methodology, thereby inculcating in them the right kind of values, which would, in turn encourage them to take initiative for innovation and creative work.

NEP has suggested some programs under various schemes::

☞ Organization of specially designed orientation programs focusing on teaching methodologies, andragogy and educational psychology for all new entrants in teaching profession.

☞ Organization of subject oriented refresher courses for in service teachers focusing on latest trends and developments in respective subjects.

☞ Encouraging teachers to participate in seminars, symposia etc.

For continuous and effective organization of these programs it was suggested to establish permanent structure in the higher education system to achieve these objectives.

Introduction of Academic Staff Orientation Scheme:

Keeping the above in view and realizing the lacunae in the professional development of college/university teachers, the University Grants Commission (UGC) thought of organizing Orientation Programs for the new entrants and Refresher Courses for the benefit of in-service teachers at various levels of their profession. The UGC rightly thought that both the orientation programs and refresher Courses should be organized with an entirely different philosophy. In the Seventh Five Year Plan, the UGC formulated a new scheme, which came to be known as the scheme of establishing Academic Staff Colleges (ASCs), which are now known as UGC-Human Resource Development Centre (HRDC).

Considering the financial and other resources involved in the in-service training programs organized by HRDCs, it is felt necessary to understand the training needs for individual teachers from teachers' perspective.

Here, the researcher has adopted the survey method through Questionnaire. The researcher had distributed questionnaire to Higher Education teachers. This survey was done by the researchers to understand the Training Needs of higher education teachers. The various areas pertaining to a teachers

personal and professional life, impacting her/his performance and professional development and which can be considered in

the in-service trainings, was majorly thought over in the survey, the areas identified were as below:

Questionnaire:

1.	Role of the teacher & expectations from him/her
2.	Innovative teaching-learning methods and skills
3.	Overall Personality Development of a teacher
4.	Use of Technology in teaching & Learning
5.	Social Awareness
6.	Communication, Presentation Skills and Language Proficiency
7.	Microteaching & Classroom management
8.	Curriculum development and evaluation methods
9.	Updated knowledge of Andragogy
10.	Higher education system
11.	Recent trends / updates in the respective subjects
12.	Governance & Leadership in higher education
13.	Employability / career opportunities & entrepreneurship for students
14.	Work-Life balance

The higher Education Teachers responded enthusiastically. Based on the responses

received from teachers across the country, the results for each statement is as follows:

1. Role of the teacher & expectations from him/her

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Neutral	5	2.6	2.6	2.6
	Agree	39	20.1	20.1	22.7
	Strongly Agree	150	77.3	77.3	100.0
	Total	194	100.0	100.0	

While responding about training on role of the teacher and expectations, 97 % teachers agreed upon the necessity of having training

on this, with almost 77% teachers strongly agreed to this statement.

2. Innovative teaching-learning methods and skills

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Neutral	5	2.6	2.6	2.6
	Agree	39	20.1	20.1	22.7

	Strongly Agree	150	77.3	77.3	100.0
	Total	194	100.0	100.0	

About the point of innovative teaching learning methods and skills 97% teachers agreed on the out of box teaching methods

and sharpening the skills to enhance attention span of the students.

3. Overall Personality Development of a teacher

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	1	.5	.5	.5
	Neutral	9	4.6	4.6	5.2
	Agree	51	26.3	26.3	31.4
	Strongly Agree	133	68.6	68.6	100.0
	Total	194	100.0	100.0	

For the overall personality development factor almost 94% of teachers agreed strongly. only 5% teachers disagree to this

factor as they think that 'high thinking' is the important factor than outer development.

4. Use of Technology in teaching learning

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Neutral	8	4.1	4.1	4.1
	Agree	50	25.8	25.8	29.9
	Strongly Agree	136	70.1	70.1	100.0
	Total	194	100.0	100.0	

This factor was inevitable part of any training as 95% of teachers backed up this point. The non technical as well as technical teachers have to adopt this technical part mandatorily

because of Pandemic. It is need of the hour. They have to willingly or unwillingly accept the technical part of learning.

5. Social Awareness

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Neutral	9	4.6	4.6	4.6
	Agree	56	28.9	28.9	33.5
	Strongly Agree	129	66.5	66.5	100.0
	Total	194	100.0	100.0	

As there is a great influence of social media, there is a great need of awareness. A teacher should be aware of various social issues to be

in pace with the students. Hence, 96% of teachers strongly agreed on this point.

6. Communication, Presentation Skills and language Proficiency

		Frequency	Percent	Valid Percent	Cumulative Percent
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Valid	Neutral	5	2.6	2.6	2.6
	Agree	45	23.2	23.2	25.8
	Strongly Agree	144	74.2	74.2	100.0
	Total	194	100.0	100.0	

Communication and presentation are inseparable parts of teaching. They can transfer the knowledge easy. The combination can be used in traditional as well as in modern way. Language proficiency is a

must if you want to reach the masses. If one needs global exposure, there is no way out but language proficiency. 74% teachers agreed to this point and 23% backed them up.

7. Microteaching & Classroom Management

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	1	.5	.5	.5
	Disagree	5	2.6	2.6	3.1
	Neutral	16	8.2	8.2	11.3
	Agree	53	27.3	27.3	38.7
	Strongly Agree	119	61.3	61.3	100.0
	Total	194	100.0	100.0	

Many a times a good teacher needs professional training in intervals for classroom management and regarding new trends in teaching. It helps them in conducting their classes effectively and with

efficiency. Therefore, 88% teachers agreed to this point. Approximately 8% teachers cling to traditional way of teaching and stubborn not to change themselves.

8. Curriculum development and evaluation methods

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	2	1.0	1.0	1.0
	Neutral	10	5.2	5.2	6.2
	Agree	60	30.9	30.9	37.1
	Strongly Agree	122	62.9	62.9	100.0
	Total	194	100.0	100.0	

With changing time, we need to change our curriculum and the method of evaluation. 92% teachers are open for this change. 5%

are neutral. In short most of the teachers are ready to welcome changes and inculcate them.

9. Andragogy:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Neutral	7	3.6	3.6	3.6
	Agree	54	27.8	27.8	31.4
	Strongly Agree	133	68.6	68.6	100.0
	Total	194	100.0	100.0	

For Higher Education andragogy is applicable. Dealing with students in a different level and using various methods of teaching, experiential learning, experimental

learning, field work are essential. Adopting these methods will help in overall development of the students. 95% of the teachers agreed on this point.

10. Higher Education System

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	1	.5	.5	.5
	Neutral	14	7.2	7.2	7.7
	Agree	64	33.0	33.0	40.7
	Strongly Agree	115	59.3	59.3	100.0
	Total	194	100.0	100.0	

There is a particular structure and a separate system in Higher Education. To be well versed with all these systems is a part of learning of a teacher in Higher Education.

Once a teacher knows about the system, the path towards gaining heights in system becomes very easy. 95% of the teachers agree to this point.

11. Recent trends / updates in the respective subjects

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Neutral	5	2.6	2.6	2.6
	Agree	58	29.9	29.9	32.5
	Strongly Agree	131	67.5	67.5	100.0
	Total	194	100.0	100.0	

A teacher must have knowledge of updated trends and technologies of their respective subjects. They should be aware of what techniques should be used to cater it to the

students. 98% of the teachers strongly agree with new andragogy and up-dation of their field.

12. Governance & Leadership in Higher Education

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	2	1.0	1.0	1.0
	Disagree	2	1.0	1.0	2.1
	Neutral	16	8.2	8.2	10.3
	Agree	81	41.8	41.8	52.1
	Strongly Agree	93	47.9	47.9	100.0
	Total	194	100.0	100.0	

Not only academic but also administrative part is important for being a teacher in higher education. Knowing the hierarchical structure of university authorities as well as governance and various policies to run

different departments is necessary. One can get acceptance and exposure to various schemes and can utilize his/her knowledge for the betterment of education sector. 93% teachers agreed to this point.

13. Employability / career opportunities and entrepreneurship for students:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	1	.5	.5	.5
	Neutral	9	4.6	4.6	5.2
	Agree	57	29.4	29.4	34.5
	Strongly Agree	127	65.5	65.5	100.0
	Total	194	100.0	100.0	

Every course curriculum should focus on employability of students. It should open various career opportunities for the students. They should be entrepreneurs and create employment for local and global citizens.

The objective of any course is to make all the students self sufficient and employable. A good human resource will help in the growth of national GDP. 96% teachers agreed to this point.

14. Work-Life Balance

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	2	1.0	1.0	1.0
	Neutral	15	7.7	7.7	8.8
	Agree	67	34.5	34.5	43.3
	Strongly Agree	110	56.7	56.7	100.0
	Total	194	100.0	100.0	

Modern age is the age of technology and competition. Especially due to Pandemic, there is paradigm shift in all levels of education. It is difficult to have work -life balance due to excess ambition, cut-throat competition and fast-growing globalization. To be in pace with all these facets of life, work life balance becomes a necessity. 90%

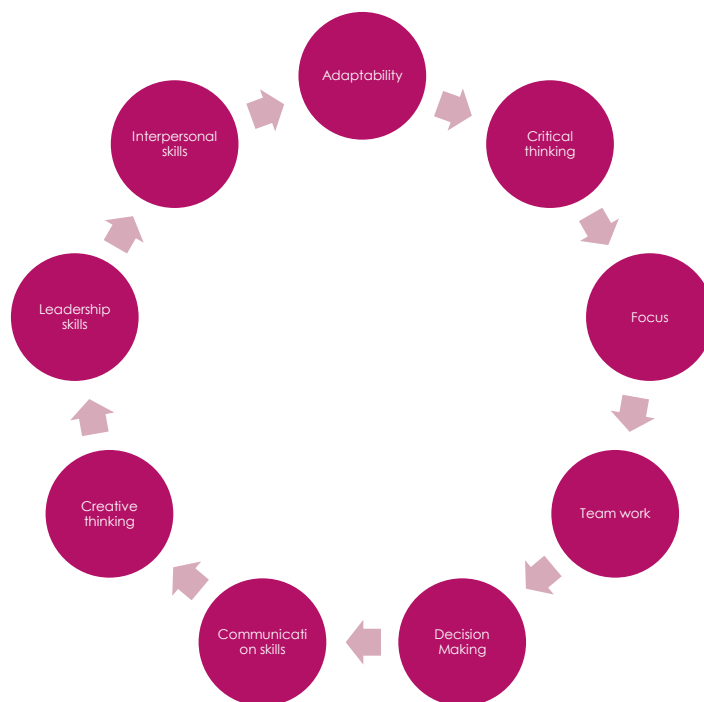
The high-tech world needs employees to be independent thinkers responsible for making good decisions based on limited information. TNA fulfills this need if someone is lagging

teachers agreed to this point whereas 7% teachers are neutral.

The above survey is self explanatory. TNA makes it easy to enter and smoothly succeed to higher steps of Higher education. With TNA, knowledge, skills and abilities play an important role in self development.

Knowledge, Skills, and Abilities

behind or short of skills and knowledge required for the job. There are few competencies required, they are as follows:



The above Survey explains in detail the training needs of the teachers in Higher Education. Trainings are needed to strengthen the weaker part of organization. It also strengthens the culture of any organization . It's an essential part of planning and development of any organization.

Based on the study, it can be said that majority of teachers in Indian higher education, agrees to the areas identified by the researcher and also expects the in-service training programs to cover contents related to these areas.

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ARTIFICIAL INTELLIGENCE APPLICATIONS IN THE LIFE INSURANCE SECTOR: A STUDY OF SELECT LIFE INSURANCE COMPANIES IN INDIA

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ABSTRACT

Indian Life insurance industry has witnessed a remarkable change in recent times. Insurance sector has included technology in various aspects of business - like consumer experience, underwriting, marketing and of course the constant competition. Digital interface, mobile and internet assistance and easy payment systems have transformed this sector in a considerable way. In recent times, Technology is being implemented in front as well as back-end insurance processes. This is possible mainly because of the use of Artificial Intelligence (AI) in various insurance operations like customer profiling, marketing, underwriting, claim processing, fraud detection etc.

This research is based on secondary data collected from various reliable sources like media reports, press releases and insurance company's websites etc. Several newspaper articles, reports, websites, research papers and expert comments have been reviewed to map the present state of use of AI in the insurance sector. The study offers an overview of AI technologies used in different insurance operations by the select six life insurance companies in India. The research focuses on AI enabled applications used in select insurance operations either customer-facing or employee-facing. The study also discusses how, where, and why AI applications are critical in the insurance operations.

Keywords: Artificial Intelligence, Life Insurance Companies, Insurance Processes, Customer experience, Operational efficiencies.

Introduction

Artificial intelligence (AI) is an extensive branch of computer science. AI powers computers and machines to imitate the problem-solving and decision-making talent of the human brain. AI focuses on developing the abilities of operation systems to solve issues complex skill set like learning, reasoning and self-correction. AI is applied in varied industries and services. Currently, it is applied in the field of healthcare, education, banking and financial services, automobiles and gaming to name a few. Artificial intelligence systems use several multifaceted algorithms that execute greater decision-making proficiencies with high communication speed.

Technological adaptations in the insurance sector were slow as compared to the other sectors. The main reason behind this is dependence of insurance industry on manual work. Insurance industry is adapting the AI efficiencies in day-to-day working to improve on performance speed and accuracy. Application of AI in insurance sector will bring

boon in the sector and help to make the processes more hassle free. Some of the areas in insurance sector, where artificial intelligence can be successfully applied are - distribution, underwriting, pricing, claims and product improvisation. AI applications are currently affecting the promotion, purchase and pricing of insurance product. The scope of AI in Indian insurance market is going beyond telematics and risk assessment.

Apart from insurance companies, the engineering and technology start-ups in India are slowly and steadily recognizing the importance of AI applications, opportunities and wide scope of operations in insurance sector. InsurTech companies in India are steadily approaching this comparatively new field of application and solving the critical insurance challenges. According to India Brand Equity Foundation Report (2021), currently, there are 110+ InsurTech start-ups operating in India.

Literature Review

Eling, M., Nuessle, D. and Staubli, J. (2021)

studied the effect of AI on the insurance sector using Porter's value chain (1985) and Berliner's insurability criteria (1982). The study based on a data set of papers and industry studies. The results demonstrated that the cost efficiencies, new revenue recognition and better risk management in the field of insurance is possible with the help of AI. The study identified two major advantages of AI execution. The first one is - AI will help the insurance companies in correct estimate of loss probabilities. The second advantage is it can transform few risks from high frequency to low frequency. This study leads to new thought process among insurance companies and they started thinking to design adequate insurance products.

Seema Rawat, Aakankshu Rawat, Deepak Kumar, A. Sai Sabitha. (2021) the research work focuses on identifying the factors for claim filing in insurance. The data set was analysed using machine learning algorithms on performance metrics. The study showed that InsurTech can help to know and classify the customers more precisely. A study of customer demographics, claim pattern and claim analysis can assist significantly in insurance product improvisation and suitable premiums calculations. The policies can be altered on the basis of profit/loss ratio by recognizing the policy acceptance practice of insurance company.

Sushant K Singh and Muralidhar Chivukula. (2020) highlighted the role of machine learning and deep learning, in addressing the varied issues in insurance sector. The study mentioned that the data produced and the challenges faced by the insurance companies are multifaceted. It concluded that the AI application in the insurance industry is still in the elementary stages and there is a long way to go. Traditional statistical and machine learning methods may lack in establishing precise prediction models in nearing future due to increasing complexities involved. The study urged the new generation data scientists and engineers to work together to discover innovative ways of handling unique data of insurance industry and developing sustainable solutions. The study also mentioned about the expected proficiencies of data scientists. The study predicted that the

insurance industry innovations and upcoming technologies such as Drone, the Internet of Things (IoT), and Fitbit would bring additional challenges to AI professionals while working in the field of insurance.

Naman Kumar, Jayant Dev Srivastava and Harshit Bisht. (2019) The aim of the study was to get new sights into the operational problems and customer dissatisfaction in insurance. Few international insurance companies and InsureTechs companies were studied to develop the model to understand the relationship between AI & its uses in the sector. The study found the scope and market penetration of AI in current sector. This research showed that these techniques can help to increase customer satisfaction, reducing frauds, and reduce operational complexities thus increasing profits. Riikinen, M., Saarijärvi, H., Sarlin, P. and Lähtenmäki, I. (2018) has discussed the role of AI in improving value in insurance sector. The purpose of the study was to understand the role of insurance chatbots which support customers' and creates value. Three major points – AI, use of customer data in reverse manner, and service logic were briefly discussed. The results were further shown through cases that studies different ways of customer support leading to value creation.

Research Objectives

- 1.To study the scope of AI technologies in life insurance sector.
- 2.To study AI applications of a select life insurance companies in India.

Methodology

This research is based on secondary data collected from various reliable sources like media reports, press releases and insurance company's websites etc. Several newspaper articles, websites, research papers and expert comments have been reviewed to map the present state of use of AI applications in select companies of insurance in India. The selection of companies are based on the performance criteria. Top six insurance companies have been selected for review purpose.

Analysis

Currently twenty four life insurance companies

are operating in India. LIC of India is public sector company rest all are from private sector. The researchers have selected top six insurance companies on the basis of media reports for this study.

1. Life Insurance Corporation of India (LIC)

It is one of the oldest insurance companies in India. LIC, being a government entity has always followed a traditional path of business making. The growing importance of technology in financial service sector and cut throat competition from private players has made LIC to shift to online connectivity and futuristic technology.

Being among the top service brands in India, LIC has a huge customer base of over 30 crores. The entire 30 crore policy records have been digitized by the year 2020. LIC has changed and upgraded its operations over a period of time. Now, LIC is set to improve its IT system in coming years applying blockchain and AI. During the lockdown it has started issuing electronic policies to its customers. According to Vipin Anand, Managing Director, LIC (2020) "LIC is committed to Aatmanirbhar Bharat agenda and for this we plan to deploy technology for better operations even from remote locations."

LIC has processed 6.5 Cr policies amounting to Rs 25,000 Cr online in the first quarter of 2020. It accounts to about 42% of insurance premium collected online between the period April-July 2020. Not only premium collection but the payment of claims and pension process has also been smoothened out with digitization. About 51 lakh claims were settled between April-July 2020 which was only 47 lakh during the same period previous year.

2. ICICI Prudential Life Insurance

It is the most recognized insurance companies in India in private sector on the basis of premium collected. For year 2019 the premium collected was more than 300 billion. It is well known for its process improvement efforts. Cutting-edge technology has become an integral part of company's business processes. ICICI has added layer of precision and convenience for its customers by introducing

digital technologies. It is pioneer in innovations like bots for auto servicing, facial recognition checks, Since long company is focusing on leveraging ecosystems, collaborating with internal stakeholders and partners for enhanced experience and productivity. In the year 2018, company has started focusing more on market leadership with the help of IT as an enabler for Business innovation.

The various stages of policy process like pre sales, onboarding and issuance, customer servicing and claims, marketing and lead generation and analytics are highly automated. Following are the little technological advancement applied by the company right from the pre sales to analytics stage-

- My Coach – AI Platform for video-based library creation for sales pitches.
- Robotic Enabled Issuance – Robotic processing for faster issuance of insurance policies.
- AI assisted Underwriting – Empowers underwriters with insights for speedy and comprehensive decision making.
- AI based Claim Processing – AI based pre claim assessment and claim processing with speed, efficiency and convenience has been implemented successfully.
- Bot Orchestration Layer – Universal bot with voice capability to cater to all touch points.
- Humanoid – AI based conversational tool positioned for reminder calling of renewal premium of insurance policies.
- Rank high on online searches – ML is used to rank the company higher when customers search.
- Selfie Quote – AI backed quote based on facial recognition.
- Google Big Query, Hadoop, Python – using best technology available to process the data.
- Data Lake Solution – Use of AI and ML to analyze structured and unstructured data.

3. SBI Life Insurance:

With 922 branches and offices, SBI Life operates throughout India. Digitisation is certainly helping SBI life to expand its reach. SBI Life has seen manyfold rise in e-sourced

policies. SBI YONO, was a great success because life cover is provided in just three clicks. SBI Life also provides video based KYC in addition to Optical Character Recognition to read and recognize the KYC document's data and validate the same with proposal form data. Further to reduce on staff dependency, the company has used AI enables facilities for tracking cases, status updates etc.

4. HDFC Life Insurance

It is a joint venture between HDFC and Abrdn, a global investment company. The company had insured over 20 million policies in both segments with highest margins in the business, with 25% in first half of 2019. HDFC Life's AI usage is divided into the following key areas:

- Text AI: Bots have enabled the company to automate processes to improve performance. Some of the bots are SPOK, Etty, Zoey and Neo, which extends service experience to customers 24x7. The company uses natural language processing to power the conversation engine.
- 'Etty' used to automate routine calls. 'Etty' supports more than 650 service queries. It has served 6.5 lakh users and has handled more than 35 lakh queries with a 94 per cent accuracy.
- Vision AI: These applications include - 'FaceSense', 'Bodmeter' and 'Age Tymer'. 'FaceSense' application, which is used for facial authentication of the customer, has processed over 40,000 cases year to date and processes almost 600 cases daily in the HDFC Life branches. It is used to mitigate risk of incorrect payouts at branches. Customers walking in for payouts are asked to take a simple picture then it is compared with the image at the policy inception, thus ensuring the same customer.
- Voice AI: These applications include - 'Ezra' (Google Assistant), 'Elsa' (Alexa) 'SVAR' and 'InstA'. 'Ezra' and 'Elsa' have seen over 1,000 inquiries so far. The voice bot 'SVAR' is available in 14 Indian languages. It reaches out to 4.5 lakh customers every month for payment collections. Approximately ₹3.5 crore of payment per month is attributed to this bot.

It has 14,500 active sales users. It is being used across all the branches and 17 call centres, addressing over 17 lakh queries.

- Machine learning: These applications include - Propensity, Risk and Customer Retention models. Cloud computing has helped company to increase scalability and enabled customisation. It currently has 25 cloud-native products with most of the applications migrated to the cloud platform. AI has aided the company in many areas such as underwriting engine, risk mitigation, sentiment analysis, hyper-personalisation of sales incentives.

5. Max Life Insurance:

It is a joint venture between Max Financial Services and Mitsui Sumitomo Insurance Company. Its current claim settlement ratio is 98.74%. Max Life Insurance's AI usage can be divided into the following key areas:

- Machine Learning & NLP for Sales Team Support: The company is implementing machine learning models to help the sales team focus on promising leads with high probability of conversation into sales. The company has also built the NLP-based conversational virtual sales assistant which supports the sales agents throughout the sales journey - right from product suggestions by sales person to the product interrogation and query handling on the go over WhatsApp.
- Smart Algorithms and Machine Learning for Customer Segmentation: The company makes use of CRMs of bank-assurance partners and the industry databases to know more about the customers. This saves on onboarding time and lengthy documentation procedure. The company uses smart algorithms and machine learning for customer segmentation. It uses AI models for the right risk selection and pricing.
- AI to Support Banking Partners: The company has built the AI-based campaign engine, Suraksha, with banking partners to offer customised PASA proposals depending upon customer need, risk return trade off and recommending the most suitable product for the customers.

- **AI in Underwriting:** Shield & Fincheck, the predictive underwriting engine of Max Life Insurance assesses the likelihood of an early claim, policy lapse and risk of fraud upfront. It also intimates if any additional verification is required by an underwriter for any policies. This helps the company in fast policy issuance, identification of risky and fraudulent policies at the issuance stage rather than rejecting them at the claims stage. Deep learning-based face-matching algorithms is used at the application stage to verify customer's photographs with the proof of identity to further assess risk. The application can also accurately read KYC document scans, validate and digitise the details automatically.
- **AI in Policy Servicing:** The company uses a combination of machine learning and NLP-based techniques and has developed the AI-based automated IVR and email intent prediction engines to identify customer calls and email contents to provide quick solutions. The voice call data from renewals and customer servicing teams, is accessed by the speech engine – VOX. Linguistic speech models are used to infer the script and customer sentiment across these calls and thereby managing the unstructured data.

6. Kotak Life Insurance:

It is founded in 2001 which caters 15 million customers and has 232 branches in India. Kotak life insurance's digital journey can be divided into key areas such as New Business Opportunities, Customer Experience and Distribution Ecosystem. Building a good support system for its employees is one more dimension of company's digitalization. Kotak Life Insurance claims that their, 98% of its data center workload is virtualized. Kotak Life Insurance uses AI in the following key areas:

- **Text AI:** Limited customer interaction is one of the challenges faced by insurance industry. Kotak has deployed an assistive bot that could help customers even if they don't remember their login Id and password. The bot is designed with artificial intelligence and machine learning

algorithms with an aim to solve customer's doubts and queries in a most efficient manner. Kotak chat bot has served as a solution to call center time bound limitations and served 53% more customers in a user friendly and adaptive way.

- **Voice AI:** KAYA is developed to enable the customer experience with instant solutions. It can handle multiple queries related to payment, policy statements, policy information and policy renewals.
- **Vision AI:** Vision AI system is started by the company to check the annuitant's liveliness. Automation of submission of certificate of existence using AI is done by uploading latest photograph through application and AI verifies whether the person is alive or not.

The company is working on AI based fraud analysis and has already working on open-source software and datafication of business interactions, private life and public life.

Discussion

The insurance sector in India is prospering at an enormous growth rate. With growing middle-class population, people recognizing importance of risk transfer and retirement planning, the expansion of insurance sector is enviable. The secondary data related to six select insurance companies clearly indicates that the insurance companies in India have recognized the increasing importance of technology implications in customer-facing as well as employee-facing operations.

The leading insurance companies in India are establishing and using the automated underwriting, taking support of machine and deep learning methods, experiences more insurance purchase with AI enable distribution network. Automation in claim processing with AI handling initial claims is leading to improved efficiency and high accuracy. Still there is a scope for enabling more complex AI and ML applications in insurance operations and thereby facilitating the customer and employee convenience.

Conclusion

AI is not new in India and we know the engineering and research professionals have

been experimenting with various AI enabled technologies for social revolution. AI enabling technologies in insurance sector are becoming more accessible and inexpensive for insurance companies plus there is an easy access to internet facilities to the end users, making it desirable to all the stakeholders. It is estimated

that AI will help Indian economy to add approximately \$1 trillion in next twenty years. AI adoption is still in its budding stages and it has got tremendous potential to grow in nearing future. There is huge scope for AI in insurance operations which can be explored with time.

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REINVENTING HR WITH AI

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ABSTRACT

Artificial intelligence is going to take over a large part of the organizations and with these quickly changing technologies we must develop certain skillsets to adapt artificial intelligence. No doubt artificial intelligence is going to make everything easier, but we must make sure that we must use AI efficiently. As strategic HRM is gaining recognition in upcoming HR world, artificial intelligence will help reduce the repetitive tasks of HR and help them be more strategic. The study is aimed at analysing the perception of HR professionals towards adapting artificial intelligence and which branch of human resource do professionals think artificial intelligence will be adapted the most. To do so, a pilot study was conducted, and the data was collected from the human resource professionals to understand their perception on artificial intelligence. The findings of this study will help to know that employees are ready to adapt AI and believe that they have the skills to work with AI efficiently, but the employees are not yet ready to fully depend on machines for some tasks and employees are not sure if they will be comfortable of having robots as their co-workers. Human resource professionals think that recruitment will be the branch where artificial intelligence will be adopted the most.

Keywords: Artificial intelligence, Human resource, Recruitment, Perception, Strategic HRM,

Introduction

Artificial intelligence is the ability of machines to act and think like human and work intelligently. Artificial intelligence is said to cause disruption in all sectors of industry and human resource is no exception. It is said that by 2022-2025 AI is going to take over a large part of the organizations and with this quickly changing technologies we must develop certain skillsets to adapt AI. No doubt AI is going to make everything easier, but we have to make sure that we have to utilize AI efficiently. As strategic HRM is gaining recognition in upcoming HR world, artificial intelligence will help reduce the repetitive tasks of HR and help them be more strategic. Everyone has accepted the fact that artificial intelligence is going to change human resource drastically but there is an unclear picture of how we are going to adapt these changes efficiently. This study will try to know the perception of professionals towards adapting AI in HR. It will help us to find whether the employees are ready to accept robots as their co-workers, if HR ready to depend on machines, moreover it will help to us to know that will HR be more innovative and

effective with the emergence of AI and if this pandemic will help us in adapting AI more quickly as we are now becoming more and more familiar to the virtual world and becoming more efficient in using machines. Hence this study is an effort to know the perception of HR professionals towards adapting artificial intelligence.

Literature Review

Artificial intelligence is a machine which can perform tasks intelligently like any other human while adapting to changes in the world. AI can be applied in sectors of industry, for financial sector to detect fraud, and enhance customer service by understanding customer requirement. It is also be used in manufacturing sector to detect faults prior to production process and reduce maintenance. In an article what Artificial Intelligence will look after covid-19 by Kenrick Kai says that many founders are trying to imagine workplace post covid which will accelerate the spread of AI. AI is safe and AI would be synonymous with the word safety. A study conducted on employees and managers and HR leaders from many countries reflected that artificial intelligence

has increased the penetration of technology among people in the workplace and is transforming the role of HR. The challenge of recruitment process where more time an HR have to invest for approvals and also the screening can be overcome with the help of artificial intelligence as it will assist to find the right candidate at the right time by shortlisting the best candidate by matching the job requirement and skills of the candidate. In an article how artificial intelligence is transforming HR, *Laurie Carantit* states that AI can take over some tasks such as employee questions about policies and procedures giving the HR professional time to focus upon engaging and motivating employees, formulating different strategic tasks than can help in the success of organization. *Annette White-Klososky* wrote in her article about innovation in technology is happening at a fast speed and the emergence of AI is beneficial for Human resources. But he also warns that adapting AI could be a quite staggering task and HR people are not sure where to start from. Nowadays employees change jobs frequently and it becomes a challenge for a HR to retain great talents hence the HR must modify the experience of employee. AI will allow and help a HR professional to deliver a more customized experience to their employee. *Maja Nowak* in an article wrote about how AI is transforming human resources. She mentions some AI based applications that enable you to use AI in HR. Textrecruit is a chatbot that can be used in recruitment. Gohire is another AI based recruiting application that enables you to text recruit, Ascendify aspire is an intelligent career assistant that can help in employee growth, Everwise is also a talent development app that helps employee to improve and build employee skills.

Objectives Of The Research

- 1) To understand the perception of HR professionals towards adapting AI
- 2) To explore the impact of AI on human resource

- 3) To identify in which branch of HR, AI will be used the most.

Limitations Of The Study

- 1) The study is based on responses received by those who have access to smart phones/internet. A total of 275 responses were received from various cities.
- 2) This study is conducted in current scenario. The perceptions, opinions and behaviour of the respondents might change with time.

Research Methodology

This is a descriptive type of research. This research includes primary as well as secondary data. The sampling method used is stratified random sampling.

Methods of data collection

Primary data: The primary data collection tool used is a questionnaire. Responses on questionnaire were collected by an online method which was through Google forms. The questionnaire prepared consists of questions which were close ended. The respondents were HR professionals of service sector of Pune city. The sample size used for this study is 300; these samples were chosen through stratified random sampling method.

Secondary data: Secondary data was collected through websites, journals, and articles published online through various sources.

Data Analysis

1. Employee's comfort working with robots and machines

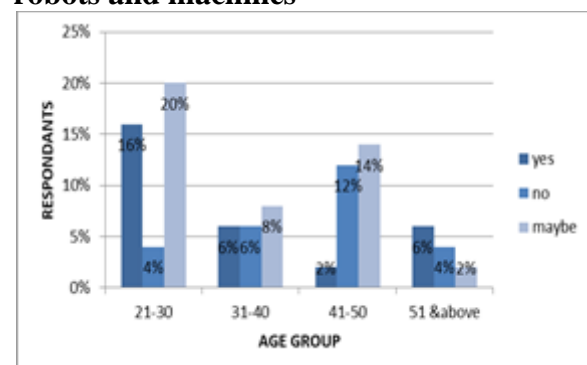


Figure 1: Employee's comfort working with robots and machines

42% of respondents from the 21-50 are uncertain about working with machine and robots to such a greater extent and people from age 51 and above say they will be comfortable working with robots and machines to a greater extent. Majority of the respondents from age 21-40 say that artificial intelligence would be largely adapted for recruitment while people from age 41-50 think it would be largely used for administrative work and people of age 50 and above say that it would be mostly used in administrative type of work as well as in on boarding and employee training.

2. Whether AI will be equally beneficial to large organizations where there are hundreds of CV's coming in and as well as small organizations including startups

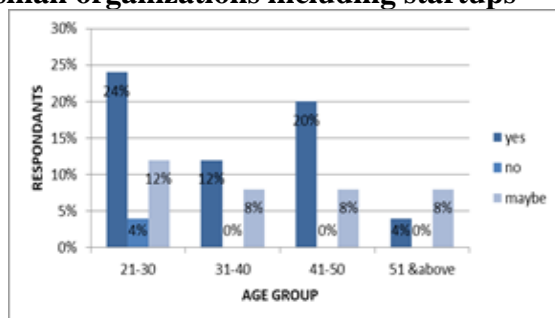


Figure 2: AI beneficial to large organizations

56% of the respondents from age 21-50 say that adapting AI will be equally beneficial to small as well as large organizations and people in the age 51 and above are not sure whether it will be equally beneficial for small as well as large organizations.

3. Whether respondent has the skill-sets required to work with AI in HR

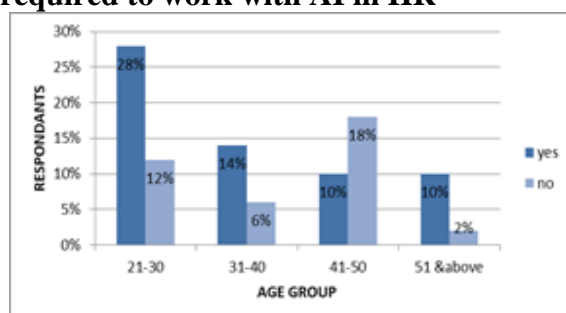


Figure 3: Skill-sets required to work with AI in HR

Majority of the respondents from age 21-40 and 51 and above are confident that they

have the skillsets required to work with artificial intelligence and people from age 41-50 say that they do not have the skillsets required to work with AI.

4. Whether the organization is ready to adopt AI

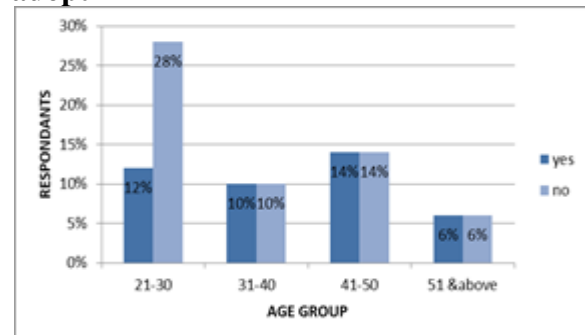


Figure 4: Organization is ready to adopt AI

Most of the people of age 21-30 say that their organization is ready to adapt AI whereas equal people from the age 31 and above say that their organization is not ready and ready to adapt to AI.

5. Whether AI will help eliminate biasness completely

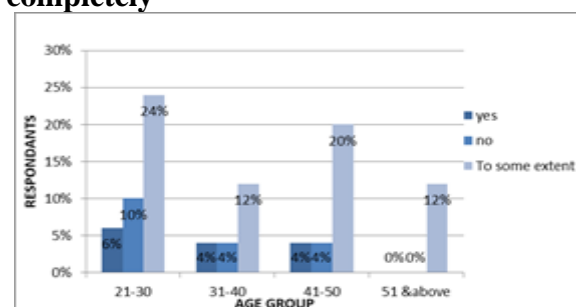


Figure 5: AI will help eliminate biasness

68% of the respondents say that adapting AI will help in eliminating biasness to some extent.

6. AI can also help managers to know about any external achievements of the employees

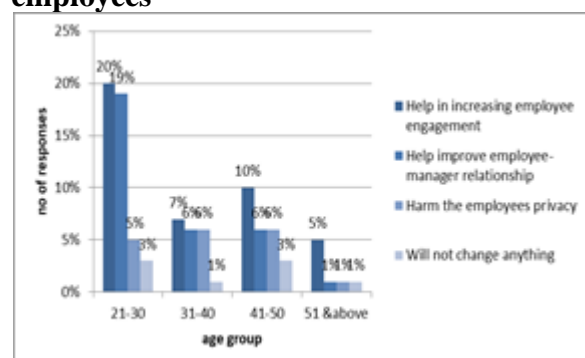


Figure 6: Effects of AI

Majority of the respondents believe that AI will help in increasing employee engagement as it can also help managers know the external achievements of the employee.

7. As a HR, whether to rely on machines/robots for screening and sourcing candidates

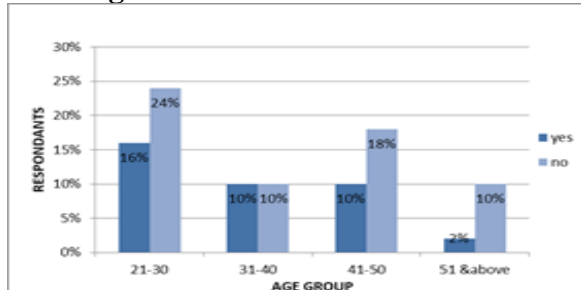


Figure 7: HR rely on machines/robots for screening and sourcing candidates

Many HR's are not comfortable with the idea of relying on machines and robots for screening and sourcing of candidates.

8. With the automation of AI as there will be less human connection, whether it will be reduced

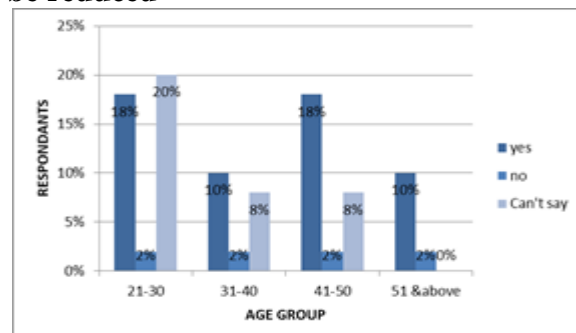


Figure 8: AI will reduce human aspect

Many respondents from the age 21-50 say that they cannot say if adapting AI in HR will take human aspect out of human resource and most of the people of age 51 and above equally agree and disagree with the statement. People from age 31 and above feel that as with adaption of AI there will be less human connection this will affect the loyalty of the employees towards the company and people of age 21-30 are not sure if adapting AI will affect the loyalty of the company.

9. Whether employees will be optimistic about having robots as their co-workers

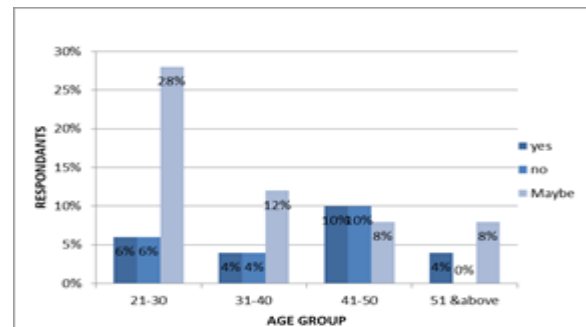


Figure 9: Employees will be optimistic about having robots as their co-workers

Most people from age 21-40 and 51 and above are not sure if employees will be optimistic about having robots as their co-workers and people from age 41-50 think that employees will be optimistic about having robots as their co-workers.

10. Whether employees are ready to adapt AI

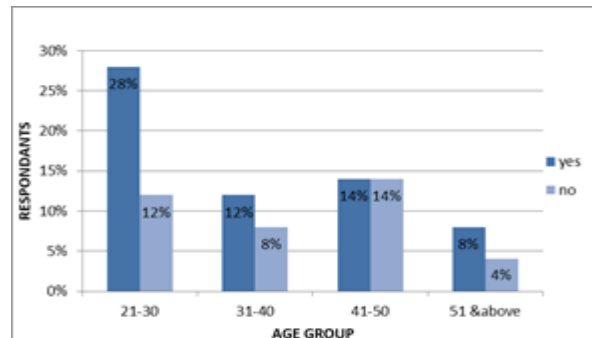


Figure 10: Employees ready to adapt AI

Most of the people think they have the skillsets and are ready to adapt artificial intelligence.

11. Whether adapting AI in HR will make HR more innovative and effective

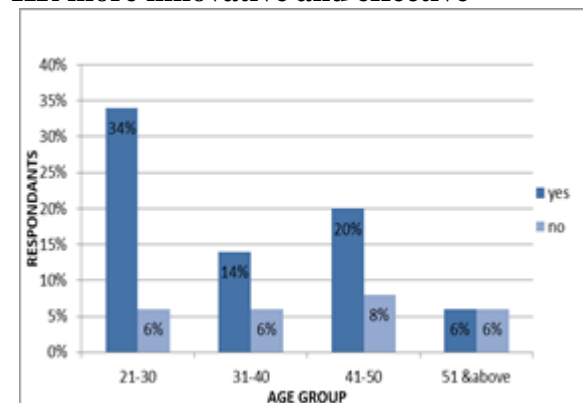


Figure 11: AI will make HR more innovative and effective

Many people think that adapting AI in HR will make human resources more innovative and effective.

12. Whether this pandemic will help speed up the process of adapting AI as we are now becoming more and more familiar and dependent to virtual world

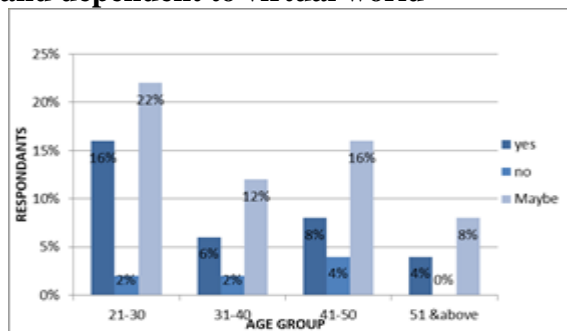


Figure 12: Pandemic will help speed up the process of adapting AI

Most of the people are not sure if the pandemic will speed up the process of adapting AI as we are becoming more familiar to the virtual world.

SUGGESTIONS

1. Organizations must develop culture so that even after adapting AI, the human connection must not be lost and in turn will not affect the loyalty of the employee towards the company.
2. HR professionals still vary on opinion about depending on chatbots, robots etc. for screening and sourcing candidates this could be because of the lack of knowledge or because of lack of trust on the efficiency on the machines, or because of insecurity of their job hence organizations should take

adequate measures to develop trust and knowledge regarding the new revolution in the employees.

3. Organizations should also update employees of how new technologies can be adapted in different sectors and that artificial intelligence is not just limited to recruitment but also can reduce the monotonous work of a HR and can also help in training employees.

4. Organizations should also investigate how their employees will not feel insecure about their job and work efficiently and effectively with artificial intelligence.

Conclusion

Artificial intelligence has taken over a large part of the organizations and with quickly changing technologies; organizations must develop certain skillsets to adapt artificial intelligence. Artificial intelligence will help reduce the repetitive tasks of HR and help them be more strategic in today's era. This research will certainly help to know that employees are ready to adapt AI and also believe that they have the skills to work with AI efficiently. Employees are not fully prepared to work on machines for some tasks. AI is going to make everything easier, but we must make sure that we have to utilize AI efficiently.

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REVIEW OF DRIVING FACTORS OF ONLINE BUYING- FUTURE RESEARCH AGENDA IN LIGHT OF INDIAN YOUNG ONLINE CONSUMERS

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ABSTRACT

There have been attempts of understanding the factors of online buying, which always created interest, challenge and focus of studies since the time online buying has taken rise. Past studies in this endeavour understood these factors in the direction understanding the factors of driving online buying of Young Indian buyers/Consumers. But these studies were found to be fragmented, done in silos and needed consolidated approach for further research studies. This paper attempts to fill this gap of being the first paper to propose the future agenda on understanding the factors driving the online buying of Young Indian Consumers. In this paper we propose eight futuristic propositions to set the agenda of future study in this direction.

Keywords: Online buying, Online Trust, Factors of online buying, Young Indian Online Consumers, e-retailing

1. Introduction

Understanding the factors of online buying has been always a challenge and focus of studies since the time Online buying has taken rise (D. Bhalerao,2021). The studies in this direction, have attempted to understand these factors, but Studies in the direction understanding the factors of driving online buying of Young Indian buyers/Consumers are fragmented and need consolidated research studies. This paper attempts to fill this gap of being the first paper to propose the future agenda on understanding the factors driving the online buying of Young Indian Consumers. In the next section, we present the glimpse of past studies to understand the scope of past studies. In analysis section we have presented the analysis in the tabular form to understand the deep connect between factors. In discussion section we present eight propositions followed by the conclusion section.

2. Theoretical Literature Review background

Past studies were focused on many aspects of factors of online buying, including Factors of Online Buying Risk, Factors of online trust-Service Experience, Factors of online trust-Website Experience, perceived technology, and online purchase intention Online Trust, Factors of e- retailing and Factors of E- WOM (E-Word of Mouth) to be mentioned prominently. In this section we explore them briefly and also mention them in

tabular manner to understand them one by one.

2.1. Factors of Online Buying Risk

Past Studies have been done on the mentioned areas namely- Damaged/Wrong Delivery, Stress, Financial Risk by Dr. Suresh A. M. and Shashikala R. (2011). Another key study by Qing et al (2015) Focused on Systematic Risk, Transactional Risk.

2.2. Factors of online trust and Security

Many Studies were done to inspect multiple dimensions of online trust related factors such as Online service Experience (Sandip&Mital 2012), Website Experience, Online Experience(Tyagi and Agarwal 2012), Online Privacy (Adeline et al 2006), Promotion Intention (Subhashini et al 2010), Perceived Integrity, Perceived Competence(Subhashini et al 2010), Brand Trust Safety, Information Quality, Brand Image, WOM Online service Experience (Hong Lee 2004), Service Quality(Mohammad and Samar 2012), Motivation, Attitude (Sangeeta et al 2013),Privacy Non-deception, Perceived Value, (Gizem and Gungor 2010) and issues such as Trust-Distrust(Gregory et al 2014). These studies were not done mostly on the young Indian consumer context.

2.3. Factors of Perceived Technology

Few Select studies were found to focus on technology related issues Online Trust, Purchase Intention (KwekChoon et al 2011)

2.4. Factors of Anxiety

In an Interesting study, it was found that anxiety related issues of emotions, perceived Risk, Online Satisfaction drive the online buying decisions (Chengwen and Shuling 2011).

2.5. Factors of Online Loyalty

Factors related to Online loyalty also were studied in studies mentioned ahead which focused on parameters prominently as Online Experience, Online Information Content, Website entertainment content Online, Brand Trust, Online Ease of Use (Treiblemaier et al 2011), (Talal and Charles 2011), Web experience, Tech Acceptance, e-satisfaction, Web Service quality, Specific holdup cost (Grace and Chia-Chi, 2009) and Online Credibility (V.Srikanth, Dr. R. Dhanpal, 2012).

2.6. Factors of Demographics

Demographics was also found to be an area driving the online buying decisions, as the deviation varied from element to element of demographics depending upon the factors of Technology Factors, Internet Platforms, Internet Media (Muthumizh 2010), Cultures, Nationalities (Jiyoung et al 2013), Age wise demographics (Juxt Consult's 'India Online' 2008), Education categories- student and non-student (Siohong et al 2008) and Nationalities, Geographies (Jiyoung et al 2013)

2.7. Factors of E-retailing

Not only the issues related to the consumer, but the parameters or factors related to the company side i.e. of the e-retailing also played an important role in driving the online buying. Past studies found that Effectiveness of e-retailing, Data Analysis of Consumer Behaviour, Consumer buying pattern (Ellis et al 2007), Online buying stages, Prebuying, Buying, post buying phases, 3 C's- Core offers, Complementary, Benefits, Cost of Operations (SitaMisra 2009), E-service quality, 2 Dimensions of E-Service quality, Incubative and Active (Jessica 2003), Three perspectives – Retailer, consumer, technological perspectives (Doherty et al 2006), Insecurity of Internet payment in internet transaction (Ajeet et al 2012, Agwu 2012), Marketing and customer relations activities, Marketing targeting activities,

Marketing performance and Marketing efficiency (Riyad and Yasser 2012). It was found that The two categories of success factors - online and offline, Online factors-Trust, Word of mouth, Technology and design, emotional connection, offline factors-name, equity, advertising, loyalty and satisfaction, drive the online buying. (Riyad E. et al 2011). These are driven across Three Stakeholders, Consumer, manufacturer, retailer (Robert et al 1997). Depending on these parameters e-retailers have Online and offline retail strategy Going offline from online (Mohammed and Heather 2005), where KM- Knowledge management and Behavioral Business Intelligence plays a Major role (Archana and Ujwal 2012). These studies were reflections of many past theories such as - Theories used in understanding online retailing factors predominantly - TAM, TRA, TPB Theories (Rajesh and Biranchi 2013)

2.8. Factors of E- WOM

While talking about the studies on growing the e-retailing, E-Word of mouth has always played a key role. Past studies have reflected that through parameters of e-WOM namely related to intention to visit, attitude towards hotel and buying intention (Manel and Rym 2013), Reviewer's characteristic, Reviewer Details, Reliability of the website, Significance of the reviews, Type of review suggestions, Price of the products (Ali and Murat 2012).

3. Literature Review Analysis

In the table- I, it is mentioned that how each factor is associated with/ driven by these key sub factors and a systematic representation of the past studies is given for better and clear understanding of the past studies. These studies reflect two major issues –

1. The study is mainly fragmented and needs a consolidation.
2. The future agenda of research should be based on some futuristic propositions in the context of Indian young online consumers.

Table 1- Key Studies done on Factors of Online buying-

Factors of Online buying	Sub factors	Author
Online Buying Risk	Damaged/Wrong Delivery, Stress, Financial Risk	Dr. Suresh A. M. and Shashikala R.2011
	Systematic Risk, Transactional Risk	Qing et al 2015
Online Trust	Online service Experience	Sandip&Mital 2012
	Website Experience, Online Experience	Tyagi and Agarwal 2012
	Online Privacy	Adeline et al 2006
	Promotion Intention	Subhashini et al 2010
	Perceived Integrity, Perceived Competence	Subhashini et al 2010
	Brand Trust Safety, Information Quality, Brand Image, WOM Online service Experience	Hong Lee 2004
	Service Quality	Mohammad and Samar 2012
Online Security	Motivation, Attitude	Sangeeta et al 2013
	Trust-Distrust	Gregory et al 2014
	Privacy Non-deception, Perceived Value,	Gizem and Gungor 2010
	Online Trust, Purchase Intention	KwekChoon et al 2011
Perceived Technology Anxiety	Emotions, perceived Risk, Online Satisfaction	Chengwen and Shuling 2011
Online Loyalty	Online Experience , Online Information Content, Website entertainment content Online, Brand Trust, Online Ease of Use	Treiblemaier et al 2011, Talal and Charles 2011
	Web experience, Tech Acceptance, e-satisfaction, Web Service quality, Specific holdup cost	Grace and Chia-Chi2009
	Online Credibility	V.Srikanth, Dr. R. Dhanpal, 2012
Demographic Factors	Technology Factors, Internet Platforms, Internet Media	Muthumizh 2010
	Cultures, Nationalities	Jiyoung et al 2013
	Age wise demographics	Juxt Consult's 'India Online' 2008
	Education categories- student and non-student	Siohong et al 2008
	Nationalities, Geographies	Jiyoung et al 2013
Factors of e-retailing	Effectiveness of e-retailing, Data Analysis of Consumer Behaviour, Consumer buying pattern	Ellis et al 2007
	Online buying stages, Prebuying, Buying, post buying phases, 3 C's- Core offers, Complementary, Benefits, Cost of Operations	SitaMisra 2009
	E-service quality, 2 Dimensions of E-Service quality, Incubative and Active	Jessica 2003
	Three perspectives – Retailer, consumer, technological perspectives	Doherty et al 2006
	Insecurity of Internet payment in internet transaction	Ajeet et al 2012, Agwu 2012
	Marketing and customer relations activities,	Riyad and Yasser 2012

	Marketing targeting activities, Marketing performance and Marketing efficiency	
	. The two categories of success factors - online and offline, Online factors- Trust, Word of mouth, Technology and design, emotional connection, offline factors- name, equity, advertising, loyalty and satisfaction	Riyad E. et al 2011
	Three Stakeholders, Consumer, manufacturer, retailer	Robert et al 1997
	Online and offline retail strategy Going offline from online,	Mohammed and Heather 2005
	KM- Knowledge management as Major tool, Behavioural business intelligence	Archana and Ujwal 2012
	Theories used in understanding online retailing factors, , TAM, TRA, TPB Theories	Rajesh and Biranchi 2013
Factors of E-WOM	Intention to visit, attitude towards hotel and buying intention	Manel and Rym 2013
	Reviewer's characteristic, Reviewer Details, Reliability of the website, Significance of the reviews, Type of review suggestions, Price of the products	Ali and Murat 2012

3. Research Methodology

This study was done through the review and critical analysis of the past literature and based on the select papers and the tabular representation of the study is prepared to know that how the study progressed.

4. Discussion

Based on the above literature review analysis, we propose following important futuristic propositions to be studied in the future course of time and research to be conducted on these propositions. Hence, we put forth following research agenda propositions-

P1- Online Risk has significant association with/Impact on Online buying Trust.

P2- Online Security has significant association with/Impact on Online buying Trust

P3- Online perceived Technology has significant association with/Impact on Online buying Trust

P4- Online Anxiety has significant association with/Impact on Online buying Trust

P5- Online Demographics has significant association with/Impact on Online buying Trust

P6- Factors of e- retailing has significant association with/Impact on Online buying Trust

P7- E-WOM has significant association with/Impact on Online buying Trust

The past studies have separately studied in the silos to focus on the factors of online buying. These studies show that the online trust is a function of many other variables mentioned in above analysis of literature review. Hence, we have proposed these seven propositions of online trust.

P8- Online Trust has significant association with/Impact on Online buying Loyalty

This 8th Proposition plays the role of bridging the connecting dots between the parameters of this study. Hence, we propose that the online loyalty and online trust has significant associations and impact driven relationship. We strongly advocate that these propositions should be tested with the empirical approach of research in future.

5. Findings

The findings of this paper are for the first time being proposed in such consolidated manner on this topic of factors of online buying in the context of Young Indian Online consumers. The futuristic agenda in terms of the 8 propositions, will contribute

significantly to drive the future research in this context. Adding to the work done by past studies for development of this research, this paper has achieved the success in weaving the entire research into a very structured futuristic agenda. The major findings of this paper are the eight propositions.

6. Conclusion, Limitations and Future Scope

This is the first paper to unfold the factors of online buying on this comprehensive level. in the context of young Indian online consumers. Our eight research propositions

pave the way for strong future research with significant contribution to the new knowledge creation on this area of research. The limitation of this research is that this study was done in only secondary sources of data. This study can be conducted in future in the empirical manner in both quantitative and qualitative manner. In the current context of changing buying behavior of the young Indian online consumer, this study will be very critical to all the stakeholders of online buying phenomenon in offline, online and omnichannel scenario.

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COMPREHENSIVE INDIAN AND INTERNATIONAL REVIEW OF LITERATURE ON BEHAVIOURAL FINANCE

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ABSTRACT

The study is divided into two categories; research contributed by Indian researchers and research contributed by international researchers have been studies and analysed. It has been observed that nine predominant features such as Herding, Regret, Representativeness, Overconfidence, Anchoring and Ability, Gambler's Fallacy, Hindsight, Cognitive Conflict, Mental Accounting are prevailing biases in behavioural finance. Gender, age, marital status, annual income, and work experience are all important demographic aspects to consider when analysing the impact on investment decision making. The study of traditional finance and neo classical economics are being discussed from several decades. John Stuart Mill introduced the thought of rational economics man or also known as homo economicus in 1844. He defined an individual as a homo economicus who tries to optimise financial benefits in the given constrained. He described basic three assumptions for the thought of cogent economic man or homo economicus.

Keywords: Behavioural Finance, Investment Decision, Economicus, Cognitive Conflict, Mental Accounting

I. Introduction

Human psychological behaviour plays an importance role in investment decision making process in capital market. It is imperative to study the factors affecting investment decision in today's scenario. The research and study of behaviour finance proved that behavioural biases are relevant at the time of investment decision making process. In this research paper; attempt has been made to review relevant existing literature and it was concluded that there are number of biases which are present among investors that impacts their investment decision.

The research has been classified into two categories: research produced by Indian researchers and research contributed by international researchers. It has been discovered that nine prominent biases in behavioural finance include Herding, Regret, Representativeness, Overconfidence, Anchoring and Ability, Gambler's Fallacy, Hindsight, Cognitive Conflict, and Mental Accounting. Gender, age, marital status, annual income, and work experience are all important demographic aspects to consider when analysing the impact on investment decision making.

1. Perfect Rationality
2. Possess extreme self-interest
3. Has complete information of the market conditions

Eventually these assumptions became the base of financial economics (M. Pampian, 2011)

Investor follows rational and logical attitude to take realistic financial decisions (Nozick, 1993) Efficient Market Hypothesis (EMH) is a theory from traditional finance which states that a market where large number of investors are trading securities and wherever the significant info is easily accessible to entirely the participants. The EMH assumption is that the security market is efficient in processing all the available information.

The theory of moral sentiment was introduced in 1759 by Adam Smith. He developed theory of invisible hands where he explained the role of sentiment in decision making process.

Cognitive biases of investors have high influence on stock market. There are several psychological factors which challenges rational thinking.

During 1960s and 1970s psychologist Daniel Kahneman and Amos Tversky studies new concept in the field of finance that is behavioural finance. The study of economics, finance, and psychology is the emerging area of behavioural finance.

Definitions of behavioural Finance

Selected of the important explanations of behavioural finance are deliberated here:

1. Linter (1998) defines BF as 'the investigation of how humans understand and act on information in order to make sound investment decisions'.
2. De Bondt (2004) defines BF as 'a theory that investigates financial challenges using principles derived from cognitive psychology'.
3. Weber (1999) observes that, 'Individual behaviour and market phenomena are strongly intertwined in behavioural finance, which employs information from both the psychology and financial fields.'
4. Fromlet (2001) defines BF as 'It is a blend of the psychology field and finance theory that closely combines individual behaviour and market events and employs knowledge.'
5. Sewell (2001) state that behavioural finance has been defined as "the study of the influence of psychology on the behaviour of financial practitioners and the resultant effect on markets."

II Objectives Of The Study

1. To understand the concept of behavioural finance
2. To analyse the assessment of the prose on behavioural finance within India and foreign countries
3. Find out the research gap

Scope of the study

This study includes an introduction to behavioural finance as well as important concepts. The study focuses on the different behavioural Finance biases and analyse the review of the literature within India and other countries.

III Research Methodology

The systematic Literature Review method was used to analyse various research papers. The systematic literature review on behavioural finance allows to map and access existing literature. The second step is to conduct a thorough and unbiased literature search, selecting terms that best fit with the study's objectives. Literature has been classified in

two parts; first is contribution to the body of knowledge from Indian researchers and second is contribution from international researchers. The study also focuses on difference behavioural biases which impacts the investment decision process.

Limitation of the study

1. Research is connected to conceptual and theoretical hence there is no experiential study conducted for this research paper.
2. Discussed few literature reviews and behavioural finance biases.

IV Review Of Literature

A review of the literature entrusts a research study carried out by Indian and international researchers related to area of study that is Behavioural Finance. The objective of the review is to determine the outcomes of several research commenced in the field of behavioural finance and to find out the current research gap. Most of the researchers have undertaken study on features affecting individual investor's investment decision from different perspectives. The study is categorized in to two features, first is the assessment of studies by Indian researchers and second is a assessment of studies by international researchers.

Indian Studies

(Rajarajan, 2002) identified the connotation amid the demographic factors and the risk bearing capacity of individual investor on 405 respondents from Chennai city using research tools such as Chi-square test and other analysis. The study found that there is a positive association between risk bearing capacity& demographic factors.

(Rajarajan, 2003) studied the determinant choice of portfolio individual investor. The analysis done using multiple regression analysis. The study analysed that that there is a positive relation among risk bearing capacity, rate of return on investment and loss avoidance.

(Kiran, 2004) analysed the group of investors and categorised them in different segment based on various demographic factors and

psychological characteristics of the investors. The study has been conducted using Multinomial logistic regression and other correspondent analysis. The study is based on 96 respondents.

(Ranganathan, 2006) analysed the financial behaviour and general awareness of investor regarding mutual fund. The study is based on 100 respondents from Mumbai using multinomial logistic regression & other correspondent analysis. The conclusion of the study is that factors related to quality of fund and portfolio, quality of fund managing company and customer services to investors affects the investment decision process.

(Jain, 2008) identified that the performance of the investors between the several kinds of financial assets classes and the problem related to capital market. The study has been considered 1463 individual investor respondents. The conclusion of the study is that the investors give preference to invest in stock market as than mutual funds due to higher possibility of return on investment in stock market.

(Parashar, 2010) examined the outcome of behaviour characters on special of investment. The study is conducted on 100 investors respondent using cluster Kruskal Wallies test and other correspondent analysis. The study concluded that personality traits and demographic characteristics affects the investment behaviour.

(NCAER, 2011) analysed the behaviour of individual investors in dealing with capital market trading. The study is conducted on 38,000 households in different 44 conurbations and 40 towns. The study identified that the risk repugnance factor is extremely high in Indian households.

(Subash, 2012) investigated the influence of particular behavioural finance prejudices on investment choice procedure of retails depositors in Indian capital market by main data of 92 individual investors respondents. The study identified that the hindsight biases, fastening and gambler fallacy are the dominant

biases among younger investors than experienced investors.

(Rushdi, 2014) described the effect of numerous psychographic biases on investment pattern behaviour of salaried pros in India. The study is conducted on 1627 respondent's primary data. The study identified that demographic factors such as gender plays important role in all aspect of investment behaviour.

(Maheshwari, 2014) identified the association between age and financial planning using Chi-Square and ANOVA test. The study shows that there is statistically positive association between the process of financial planning and age of investor. The results of ANOVA test analysed that there is difference in perspective regarding process of financial planning by different age group segment.

(Sasirekha, 2015) analysed the factors of investment behaviour of retails investors who are working professionals in Information Technology in Coimbatore city. The study is conducted on 482 respondents which identified that the investment strategy is largely depend on the socio-economic characteristics. The study analysed that the behaviour biases plays major role in the process of investment decision making process.

(Shinde C.M., 2015) examined the influence of demographic profile on depositor's scale of risk lenience concerning choice of investment using Mann Whiteny 'U' test and other correspondent test on 670 investors from Pune city. The study determined that the demographic profile of individual depositors such as gender, level of education, income segment, age the investor's scale of risk tolerance.

(Kandpal V., 2018) examined the individual investors of the Dehradun city on 358 respondents. The study concluded that the Investment decision in India is taken into consideration by perception, by word of mouth, Investment decision in India is not taking seriously, and rather it is done quickly and no proper detail study take place. Behavioural

Finance is considered to be the important element in the investment decision making in Indian Capital Market.

International Studies

(Thaler, 1985) states that several depositors face delinquent to determine investment choice making under uncertain circumstances because traditionally investor's decisions are based on rule of probability. But in reality, most of the people overreact to unexpected news and it impacts the buying and selling decisions of the stocks. The sentiments play important role in decision making process.

(Warren, 1990) identified various segment depend on the lifestyle and demographic factors of the investors. The study is based on 152 respondents. The study showed the segmentation based on their investment behaviour. The investor behaviour is classified in to two categories, active traders and inactive investors as well as heavy transaction volume and light transaction volume depositors.

(Massa, 2002) identified two different parts of investment behaviour, first is risk captivating characteristic which includes loss aversion, and mental accounting and second is stock choosing with information-based knowledge and pure fundamental knowledge. The researcher examined the influence of behavioural biases on risk appetite and stock selection pattern, the study attentive on behaviour with regards to long term holdings of investors with a yearly prospect. The study shows that there was an influence of losses and gains on investor risk taking ability but not on mental accounting.

(Thaler B. a., 2003) examined behavioural finance biases, scenarios of market competence, investor psychographic factors, limitations to level of arbitrage, and behaviour & beliefs of individual investors in detail. The study focuses on application of behavioural finance to various segments like individual investors and capital market and corporate finance that is fund manager's behaviour.

(Wood, 2004) described the characteristics of various investors into multiple segment based

on their investment pattern and attitude as well as behaviour using main data of 90 respondents. The study identified that the retails investors can be classified into level of tolerance, confidence level of traders, loss aversion traders and traders who are very conservative and looking for long-term investment.

(Pompian, 2006) identified that biases are mainly classified into two types, Emotional biases and cognitive biases. The study identified seven different emotional biases, those are Status Quo Bias, Regret Aversion Bias, Loss Aversion Bias, Confirmation Bias, Optimism Bias, Self-control bias and Endowment Bias. Cognitive biases are categorised in thirteen different biases, Availability bias, framing bias, Self-Attribution bias, Overconfident bias, Cognitive Dissonance bias, Hindsight Bias, Mental Accounting, Anchoring and Adjustment bias, Ambiguity bias, Representative Bias, Conservatism Bias, Illusion of control bias, Recency bias.

(Al-Ajmi, 2008) examined the level of risk lenience of retails investors in Bahrain. The study considered 1484 respondents. It has been observed that the individual investors who has more financial responsibility and other liabilities has less level of risk tolerance.

(Matoussi, 2009) examined the psychographic characteristics that impacts the investor's behaviour in Tunisia considering 92 stock brokers as respondents. The study identified that under confidence, conservatism, precaution, and information inferiority complex are the factors impacting behaviour of investors.

(Joost, 2011) identified how investor's behaviour change and their impact during 2007-2009 financial crises primary data of the clients. The study concluded that investors who has high risk appetite have more turnover of investment transactions as compare to those who have lower risk tolerance level.

(Bikas E., 2012) analysed the influence of behavioural biases like cognitive and

emotional biases, psychographic impact on the financial decisions making process of amateur retail investors. The researcher used historical data to determine perception of investors through comparison of different types of investor and descriptive method to analyse the influence.

(Athur, 2014) examined behavioural characteristics that impact the retail investors' investment decision in Kenya. The study conducted on sample of 30 retail investors. It analysed that cognitive biases such as representative biases, deception of control, herd mentality, hindsight biases contributed positive correlation with individual investor's decision whereas over-optimism, regret aversion, loss aversion and self-attribution were not positively related with individual investment decision.

(Roberta, 2017) studied factors such as cultural difference, stability, investment and cultural transmission in 38 countries. The study concluded that the impact of such factors influence the decision making process of retail investors.

It is concluded from the analyses of above literature that all the contribution of study in the body of knowledge are mainly on behavioural aspect, psychographic characteristics, different traits of personality, perspectives and biases. Most of the literature is based on primary data in different geographies, however in Indian context, not much research contribution in the area of financial behavioural biases and their influence on retail individual investor's investment decision making process. There is no recent study which shows comprehensive study related to analysing influence of behavioural finance biases on investment decision making process of individual retail investor.

V Problem Identification & Research Gap

After undertaking detailed study of research done in the field behavioural finance, one important part of research gap in India is that most of the researchers considered consumer behavioural perspective. However International study is more focused to understand behavioural finance and its impact on investment decision. Hence there is a need of study detailed financial behavioural biases and it has influence on investment decision making process, their perception. It is important to study the different biases that exist among investors. This is a completely new approach in the fundamental study of theory of behavioural finance for economic decision and behaviour of individual investor in Indian stock market. The study will help immensely to the stake holders of Indian capital market.

VI Conclusion

In concluding, the recent financial and investment scenario in capital market shows significant influence of individual investor behaviour. It is imperative to study the behavioural biases and its impact on investment decision making process. The study will immensely help to stakeholders in capital market such as regulators, brokers, financial institutions and retail investors. We can say from above literature review that behavioural finance has a vital role in financial decision process of retail investor. In India, the participation of retail investors witnessed 40% rise post pandemic hence this is the right time to consider and evaluate behavioural biases and their influence on individual retail investor's investment decision process and overall impact on financial market.

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STUDY OF MACHINE LEARNING ALGORITHMS FOR STOCK PRICE PREDICTION**S. S. Zalte¹, P. N. Patil², S. N. Deshmukh³**¹ Department of Computer Science, Shivaji University, Kolhapur.^{2,3} Department of Computer Science, Vishwakarma College of Arts, Commerce and Science, Pune.¹sheetal.zaltegaikwad@gmail.com, ²pnpatil@vcacs.ac.in, ³sndeshmukh@vcacs.ac.in**ABSTRACT**

Stock market investigation empowers financial investors to distinguish the inherent worth of a security even prior to putting resources into it. All securities exchange tips are formed after intensive examination by specialists. Stock experts attempt to discover action of an instrument/area/market in future. By utilizing prediction analysis of stock, financial investors and brokers show up at value purchasing and selling choices. Prediction research analysis of stock prior to making a speculation is an unquestionable requirement. It is exclusively after a careful exploration that you can make a few suppositions into the worth and future exhibition of a stock price. Regardless of whether you are following stock exchanging tips, it is ideal to do some examination, just to guarantee that you are making a trade that is relied upon to get you the most extreme returns. In this paper, we introduce various techniques used to predict share price in the stock market.

Keywords: Machine Learning, Linear Regression, K-Nearest Neighbors, Naïve Bays, Decision Tree, Support Vector Machine.

Introduction

Prediction available market is a potential and a helpful space of analysis for business call makers. The stock trading is an organic process, advanced and volatile method. Stock prediction is characterized by information intensity, noise, uncertainty and hidden relationships. Prediction of stock techniques obtainable is incredibly complicated and important analysis topic. It's difficult once the data available is noisy and not stationary. It's vital as a result of it yield important results for decision markers. Stock trading may be a location where corporations invest high capital and do their shares trading. The predicting cost is crucial issue for investors for creating cash. Researchers have tried that it's attainable to predict stock costs. It put together helps investors to from commercialism or buying choices to induce higher profits.[1]

There are various algorithms used in datascience for stock market value used in datascience for stock market value prediction as shown in Figure 1.

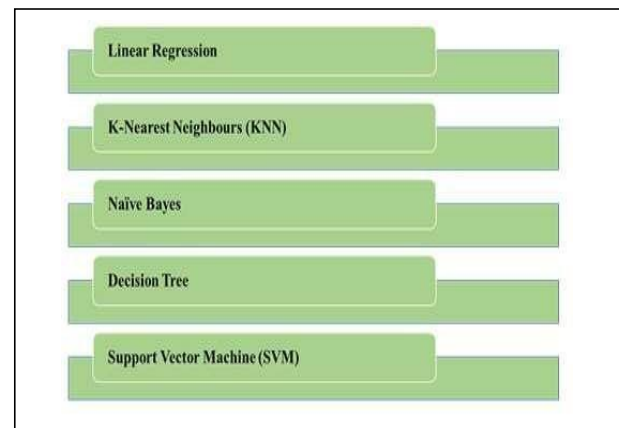


Figure1. Machine Learning Algorithms

A. Linear Regression

One of the simplest and most well-liked supervised Machine Learning algorithms is linear regression. It is an applied math approach that's used for prophetic analysis. Linear regression shows the linear relationship between dependent and independent variables as shown in figure 2. which implies however, the worth of the variable quantity is varied in keeping with the worth of the experimental variable. Linear regression could be an easy technique and quite straightforward to interpret, however downside is that regression algorithms model over fits to the date and month worth rather than taking under consideration the previous values from the purpose of prediction, the model

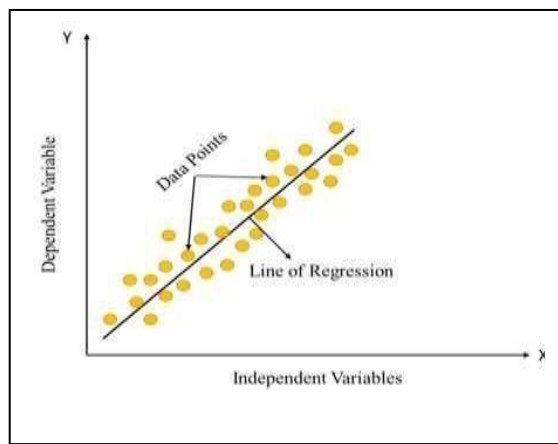


Figure 2. Linear Regression
can contemplate the worth from a similar
Figure2. Linear Regression

date a month past, or a similar date/month a year or past, is the assumption of linear relationship between dependent and independent variables. [2]

B. K-Nearest Neighbors (K-NN)

KNN is that the simplest machine learning algorithm that is predicated on supervised learning techniques as shown in figure [3], [4]. Assumption for KNN is that the similarity between the new data/cases and offered cases and keep the new case into the class that is analogous to the accessible classes. The K-NN formula is used for each Regression and Classification however primarily it's used for the Classification issues. It's a non-parametric formula. It's a lazy learner formula because it doesn't acquire from the coaching set at once. For big coaching information it's simpler. To see the worth of K is also complicated your time. It's advantageous if we have a tendency to choose the options properly then it offers superb results. Second is that the K-Nearest neighbor Classifier works well on basic recognition. The most vital drawback is that the existence of immaterial parameters is incredibly sensitive to them [3]. In stock prediction analysis there is no definite variable to predict future cost of stock. People opinion or emotion about particular stock also affects the price of stock. To categorize tweet to calculate sentiment worth relating to specific stock, Naive Bayes and Random Forest algorithm area unit used. The results of sentiment analysis area unit want to predict

the corporate stock value. The linear regression technique used to build the prediction model. [4]

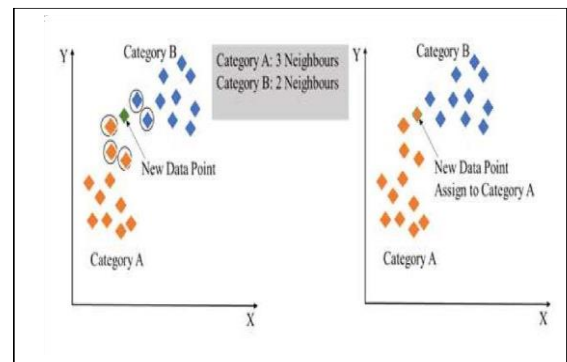


Figure 3. Before KNN Figure 4. After KNN

C. Naïve Bayes

It is a supervised learning algorithm that is predicated on mathematician theorem. This algorithm is employed for solving classification issues. It's in the main used for text classification that consists of high dimension training information sets. It's a {quick} machine learning algorithm which may offer quick predictions. It is a probabilistic classifier. It's used for binary furthermore as multiclass classification. It handles each continuous and distinct information. It's wont to create period of time predictions. It needs a tiny low quantity of training information. The main disadvantage of Naive mathematician is that the assumption of freelance predictor options. Naïve Bayes assumes that each one prognosticators area unit freelance. In world it's seldom happening. [3]

D. Decision Tree

Decision Tree algorithm is supervised learning algorithm. This algorithm accustomed solve each regression and classification issues. Chiefly it's accustomed solve classification issues. It is a tree structured classifier, during which internal nodes represent the options of a dataset, branches represent the choice rules and every leaf node represents the end result. There are a unit 2 nodes within the call tree, Decision node and also the leaf node as shown in figure 5. Decision nodes area unit used for creating a choice and it's multiple branches. Leaf nodes don't contain from now on

branches and area unit the output of these choices. the choices area unit taken on the premise of options of the given dataset. It's a graphical illustration for all potential solutions to a tangle based on given conditions. To create a tree Classification and Regression Tree (CART) algorithm is used. It is straightforward to grasp. information cleansing demand is a smaller amount as compared to different algorithms. The decision tree could contain many layers, which can build it advanced. [5],[6].

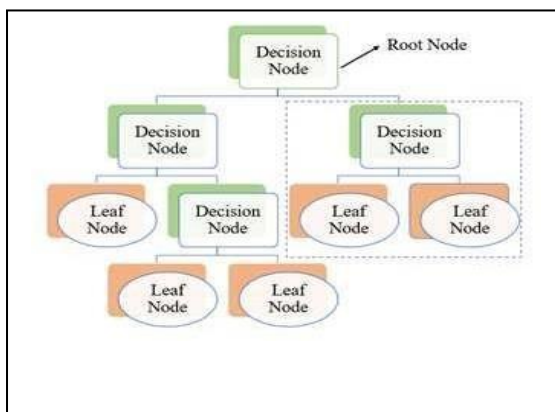


Figure 5. Decision Tree

E. Support Vector Machine (SVM)

Support Vector Machines area unit the foremost standard supervised Learning algorithms. it's used for Classification still as Regression complications. SVM algorithm is to form the simplest line or call boundary which will segregate n-dimensional area into categories so we will simply place the new datum within the correct class. Hyperplane is that the best decision boundary. It works well in generalization. It conjointly reduces process burden. SVM selects the acute points/vectors that facilitate in forming the hyper plane as shown in figure 6. These extreme points area unit referred to as support vectors, and thence the formula is termed as Support Vector Machine. it's simple to tackle the problem of call rules and error frequency. For nonlinearly separable training data, it is not easy to decide optimal parameters. It does not provide good transparency. It is difficult to understand. [2]

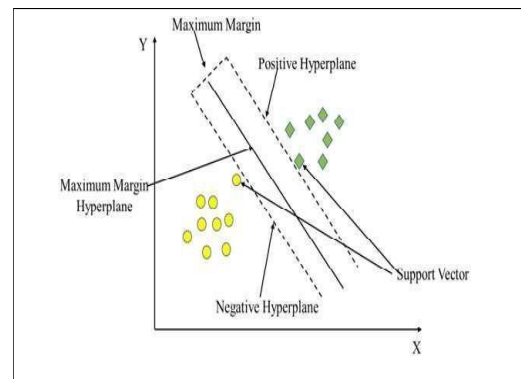


Figure 6. Support Vector Machine

Literature review

One of the most daunting areas of computer science is study of stock market movements and emotions. The author proposed a method in [7] for automatically predicting the stock price using the neural network in this paper. The author demonstrates that the forecast of stock prices from historical prices and sentiments is substantially linked to the real stock price of a specific stock price. In [8] article, the author suggested a new methodology that incorporates the qualitative method and the quantitative method. Data from social media, including text mining and sentiment analysis, was obtained in qualitative analysis. Historical data of individual stock was used in quantitative analysis to forecast market movement. For the latest news headlines, the author also measures sentiment value. The stock prediction value, which supports the opening price and closing price, was calculated by the author using the machine learning module. Fuzzy rules are set to forecast specific market movement on the basis of sentiment value and stock prediction value. This model has suggested the beneficial stock for investment successfully. There are two common methods in this strategy to forecast stock market prices. Technical theories are one of these, and fundamental or intrinsic value analysis is the second. The method proposed in [9] is based on the concept of technological theory. The forecast model can be useful for historical data to obtain potential patterns when and when new data varies in the valuation of the business stock market. Technical analysis and a semi-strong type of

successful study In the proposed work, the market hypothesis is followed to construct the prediction model. This approach uses historical data and social media data to construct a model that forecasts the movement of stock patterns. Two models are constructed, using both models administered by the algorithm of machine learning. The first model is a regular prediction model and the second model is predetermined weekly. The future pattern for the next day is projected by the Regular Forecast model. The monthly forecast model reflects historical data only and forecasts the pattern for the next month. It is very common among investors to forecast the stock market value. Investors want to know what the return on their investment. Stock values are historically forecast by technical analysts and brokers who use historical prices, trends and fundamental trends the stock price forecast for a day is now becoming more complicated as stock prices depend on the political climate, the country's economic situation and natural disasters, etc. The author uses the linear regression method in this approach to estimate the stock value. The technique of linear regression is used because it is very straightforward and is usually appropriate. If we try to estimate the value of a variable based on the value of another variable, linear regression is a statistical model. The Moore and Penrose technique are used by the author in [10] to estimate the regression equation coefficients. By using Java, the author

implements this method. The author collected stock details from the New York Stock Exchange. In [11] two algorithms were used by the author: Least-squares support-vector machines (LS—SVM) are the least-square variants of support vector (SVM) machines and particle swarm machines Optimization (PSO). LS-SVM is an algorithm supervised by machine learning that can be used for the problems of classification or regression.

Conclusion

Technical research identifies with the investigation of past stock costs to foresee the pattern of costs in future. It shows you the bearing of development of the offer costs. With the assistance of specialized exploration, you can recognize whether there will be sharp ascent or fall in the cost of offer. It is not reliant on ongoing information or occasions which have just been joined in the price of the stock. As the stock costs are reliant on financial backer sentiment which continues changing as indicated by news and occasions, technical research underlines the utilization of Stop-misfortunes. It will save financial investors from enduring a major misfortune in future Specialized exploration gives significant outcomes just for stocks which are high popular and exchanged enormous volumes. In this paper, we summarized various machine learning algorithms which are relevant to stock prediction.

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SAMPLING DISTRIBUTION OF SAMPLE MEAN AND SAMPLE MAXIMUM UNDER SIMPLE RANDOM SAMPLING AND STRATIFIED SAMPLING: A COMPARATIVE STUDY

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ABSTRACT

Traditional sampling designs provide an estimator of the population mean through the sample mean. The sample maximum receives very little attention. This paper gives the comparison of statistical properties of the sample mean and sample maximum under simple random sampling and stratified sampling. In particular, the sampling distribution of sample maximum is derived under simple random sampling and stratified sampling. The sampling distribution is then used to derive the expected value and sampling variance of sample maximum under these sampling designs.

Keywords: Sampling design, simple random sampling, sample mean, sample maximum, sampling distribution, sampling variance, stratified sampling.

Introduction

One of the most common statistical procedures for collecting data that will be evaluated for inferential purposes is sampling. The population mean or population total has been emphasized as the most important population characteristic in the majority of the literature on finite population samples. As a result, the majority of statistical literature focuses on estimating the population mean or population total. In real life, the interest may not always be confined to the population mean or population. There are various scenarios in which the interest is in the population maximum. For example, the maximum temperature indicates the intensity of summer, and the severity of pollution is determined by the maximum level of pollutants present. In such instances, it is obvious to use the sample maximum as an estimate of the population maximum. The sampling behavior of the sample mean and sample maximum is investigated in this work using various simple random sampling and stratified sampling. It is interesting to note that the sampling variability of the sample maximum as the sample size changes in comparison to the population size.

Estimation of Population Mean Under Simple Random Sampling

Simple random sampling (SRS) is a method used to draw a sample of n number of sampling units from a population which contains N sampling units, in such a way that every sampling unit of the population has an equal chance to include in the sample. There are two methods for drawing the samples.

Simple Random Sampling without Replacement (SRSWOR): In SRSWOR the units are randomly drawn one by one in such a way that, the unit selected will be again replaced, in the population before the next draw.

Simple Random Sampling with Replacement (SRSWR): In SRSWR the units are drawn one by one in such a way that the unit selected will not be replaced back in the population before the next draw.

Notations

Let the population contains the N sampling units U_1, U_2, \dots, U_N and sample contains the n sampling units u_1, u_2, \dots, u_n .

Y is the characteristic under consideration

Y_i ($i = 1, 2, \dots, N$) is value of the characteristic for the i^{th} unit of the population and y_i ($i = 1, 2, \dots, n$) is value of

the characteristic for the i^{th} unit of the sample. Then we define

$$\text{Population mean} = \bar{Y}_N = \frac{1}{N} \sum_{i=1}^N Y_i$$

$$\text{Sample mean} = \bar{y}_n = \frac{1}{n} \sum_{i=1}^n y_i$$

S^2 = Mean square for the population

$$= \frac{1}{N-1} \sum_{i=1}^N (Y_i - \bar{Y}_N)^2$$

s^2 = Mean square for the sample

$$= \frac{1}{n-1} \sum_{i=1}^n (y_i - \bar{y}_n)^2$$

σ^2 = population variance

$$= \frac{1}{N} \sum_{i=1}^N (Y_i - \bar{Y}_N)^2$$

Probability of drawing a Sample and a Specified Unit

SRSWOR: If n sampling units are selected from population of size N by SRSWOR then

the total possible samples are $\binom{N}{n}$.

Therefore the probability of selecting any one of these samples is $\frac{1}{\binom{N}{n}}$.

The probability of drawing any unit at the 1st draw is $1/N$, the probability of drawing any unit at 2nd draw from among the available $(N-1)$ units, is $1/(N-1)$, and so on.

Let A_k be the event that any specified unit is selected at the k^{th} draw then

$$P(A_k) = \frac{1}{N}; k = 1, 2, \dots, n$$

The probability of a specified unit including in the sample is

$$\sum_{k=1}^n \frac{1}{N} = \frac{n}{N}$$

SRSWR: If n sampling units are selected from population of size N by SRSWR then

the total possible samples are N^n . Therefore the probability of selecting any one of these samples is $\frac{1}{N^n}$.

In SRSWR population size remains the same at every draw, therefore the probability of selecting any element at any draw is $1/N$. In simple random sampling with replacement and without replacement, the sample mean is an unbiased estimator of the population mean.

$$\text{i.e. } E(\bar{y}_n) = \bar{Y}_N$$

The variance of the sample mean under SRSWOR is

$$\begin{aligned} \text{Var}(\bar{y}_n) &= \left(\frac{1}{n} - \frac{1}{N} \right) S^2 \\ &= \frac{N-n}{nN} S^2 \end{aligned}$$

And the variance of the sample mean under SRSWR is

$$\text{Var}(\bar{y}_n) = \frac{N-1}{nN} S^2$$

Estimation of population mean Stratified Sampling

When the population is not homogeneous, simple random sampling is ineffective because some portions of the population may be overrepresented while others may be underrepresented. In these circumstances, the population is sub-divided into k strata in such a way that strata are internally homogeneous. This procedure of dividing the population into k strata is called as stratification. Stratification is done based on a characteristic that is closely related to the characteristics of the units being studied. After this process, a random sample is drawn from each stratum by using SRSWOR. All these units from different strata constitute a random sample from the population. Such a sample is called as a stratified random sample.

Between stratum, there is the maximal heterogeneity. This is why, when our aim is to estimate the population mean, sampling units are chosen from all strata, because each stratum contributes to the mean estimation.

Notations

Let k be the number of strata.

N : Total number of sampling units in the population, N_i : Number of sampling units of i^{th} stratum, n_i : The number of sampling units selected by using SRSWOR from i^{th} stratum, Y : characteristic under study, y_{ij} ($j = 1, 2, \dots, N_i$, $i = 1, 2, \dots, k$): value of j^{th} unit in the i^{th} stratum. $\bar{Y}_{Ni} = \frac{1}{N_i} \sum_{j=1}^{N_i} y_{ij}$: population

mean of i^{th} stratum, $\bar{y}_{ni} = \frac{1}{n_i} \sum_{j=1}^{n_i} y_{ij}$: sample

mean of i^{th} stratum, $w_i = \frac{N_i}{N}$, $n = \sum_{i=1}^k n_i$ and

$$N = \sum_{i=1}^k N_i$$

In stratified sampling population mean is weighted arithmetic mean of stratum means, weights being equal to size of strata and is given by $\bar{Y}_N = \frac{1}{N} \sum_{i=1}^k N_i \bar{Y}_{Ni}$. Sample mean is

$$\bar{y}_n = \frac{1}{n} \sum_{i=1}^k n_i \bar{y}_{ni} \text{ and } E(\bar{y}_{ni}) = \bar{Y}_{Ni}$$

Now,

$$\begin{aligned} E(\bar{y}_n) &= \frac{1}{n} \sum_{i=1}^k n_i E(\bar{y}_{ni}) \\ &= \frac{1}{n} \sum_{i=1}^k n_i \bar{Y}_{Ni} \\ &\neq \bar{Y}_N \end{aligned}$$

Here \bar{y}_n is biased estimator of \bar{Y}_N . Now to obtain unbiased estimator of \bar{Y}_N consider the

stratum mean which is the weighted mean of strata sample means, weights being equal to size of strata given by $\bar{y}_{st} = \frac{1}{N} \sum_{i=1}^k N_i \bar{y}_{ni}$.

Now,

$$\begin{aligned} E(\bar{y}_{st}) &= \frac{1}{N} \sum_{i=1}^k N_i E(\bar{y}_{ni}) \\ &= \frac{1}{N} \sum_{i=1}^k N_i \bar{Y}_{Ni} \\ &= \bar{Y}_N \end{aligned}$$

Thus \bar{y}_{st} is an unbiased estimator of \bar{Y}_N .

$$\text{Var}(\bar{y}_{st}) = \sum_{i=1}^k w_i^2 \frac{N_i - n_i}{n_i N_i} S_i^2$$

Estimation of Population Maximum under Simple Random Sampling

Simple Random Sampling (SRS) provides an unbiased estimate of the population mean. This is the consequence of the fact that simple random sampling imposes a discrete uniform distribution on the finite population that is being sampled. The sample maximum is the most natural choice when the purpose is to estimate the population maximum. Statistical properties of the sample maximum are investigated here.

Let the population contains N sampling units u_1, u_2, \dots, u_N . Let the variable of interest X , have values. x_1, x_2, \dots, x_N on these sampling units, respectively in that order. If the values x_1, x_2, \dots, x_N are organized in an ascending order of magnitude and written as $x_{(1)}, x_{(2)}, \dots, x_{(N)}$, then the corresponding sampling units in the population also get reorganized and are recorded as $u_{(1)}, u_{(2)}, \dots, u_{(N)}$. When a random sample of size n is selected by using SRSWOR from this population the sampling units in the sample are denoted by U_1, U_2, \dots, U_n and the corresponding values

of the variable of interest by X_1, X_2, \dots, X_n . When sample values are sorted and organized in an ascending order of magnitude, the resulting values are written as $X_{(1)}, X_{(2)}, \dots, X_{(n)}$ and the corresponding sampling units as $U_{(1)}, U_{(2)}, \dots, U_{(n)}$. Since the n sample values are different (because SRSWOR), the sample maximum cannot take any of the $n - 1$ smallest values in the population, namely $x_{(1)}, x_{(2)}, \dots, x_{(n-1)}$. It is then clear that the sample maximum $X_{(n)}$ can take any one of the $N - n + 1$ possible values $x_{(n)}, x_{(n+1)}, \dots, x_{(N)}$. If $X_{(n)} = x_{(r)}$, for some r such that $n \leq r \leq N$, then no sample value can exceed $x_{(r)}$. In other words, if $X_{(n)} = x_{(r)}$, then the other $n - 1$ sample values must be from among the $r - 1$ possible values $x_{(1)}, x_{(2)}, \dots, x_{(r-1)}$. The number of ways in which such selection can be made is given

by $\binom{r-1}{n-1}$ since the number of ways of selecting a sample of size n by using SRSWOR from a population of size N is $\binom{N}{n}$

The probability that the sample maximum is $x_{(r)}$ is given by

$$P[X_{(n)} = x_{(r)}] = \frac{\binom{r-1}{n-1}}{\binom{N}{n}} \text{ for } r = n, n+1, \dots, N.$$

In other words, it is assumed that $x_{(r)} = r$ for $r = 1, 2, \dots, N$. (1)

This simplification leads to the simplified expression

$$P[X_{(n)} = r] = \frac{\binom{r-1}{n-1}}{\binom{N}{n}} \text{ for } r = n, n+1, \dots, N.$$

Probability Distribution of the Sample Maximum

The largest sample value, that is the sample maximum, denoted by $X_{(n)}$, can take any one of the $N - n + 1$ possible values $n, n+1, n+2, \dots, N$. When $X_{(n)} = r$ for some $r = n, n+1, n+2, \dots, N$, then one of the n sample values is exactly equal to r and the remaining $n - 1$ sample values are chosen from the $r-1$ possible values $1, 2, \dots, r-1$. The number of ways in which this can happen is $\binom{r-1}{n-1}$.

This leads to the expression

$$P[X_{(n)} = x_{(r)}] = \frac{\binom{r-1}{n-1}}{\binom{N}{n}}, r = n, n+1, \dots, N. \quad (2)$$

Since it is assumed that $x_{(r)} = r$ for $r = 1, 2, \dots, N$.

It is also easy to write

$$P[X_{(n)} = r] = \frac{\binom{r-1}{n-1}}{\binom{N}{n}}, r = n, n+1, \dots, N. \quad (3)$$

Expected Value and Sampling Variance of the Sample Maximum

We use the probability distribution of the sample maximum given in Equation (3) to get the first two moments of the sample maximum. The expected value of sample maximum is given by

$$\begin{aligned}
 E[X_{(n)}] &= \sum_{r=n}^N r \cdot P[X_{(n)} = r] \\
 &= \sum_{r=n}^N r \cdot \frac{\binom{r-1}{n-1}}{\binom{N}{n}} \\
 &= \frac{1}{\binom{N}{n}} \sum_{r=n}^N r \cdot \binom{r-1}{n-1} \\
 &= \frac{1}{\binom{N}{n}} \sum_{r=n}^N r \cdot \frac{(r-1)!}{(n-1)!(r-n)!} \\
 &= \frac{1}{\binom{N}{n}} \sum_{r=n}^N \frac{r!}{(n-1)!(r-n)!} \\
 &= \frac{n}{\binom{N}{n}} \sum_{r=n}^N \frac{r!}{n!(r-n)!} \\
 &= \frac{n}{\binom{N}{n}} \sum_{r=n}^N \binom{r}{n} \\
 &= \frac{n}{\binom{N}{n}} \binom{N+1}{n+1} \\
 &= n \cdot \frac{n!(N-n)!}{N!} \cdot \frac{(N+1)!}{(n+1)!(N-n)!} \\
 &= \frac{N+1}{n+1} \cdot n. \tag{4}
 \end{aligned}$$

The sample maximum is clearly not an unbiased estimator of the population maximum, as shown by Equation (4). The bias in the sample maximum $X_{(n)}$ is given by

$$\begin{aligned}
 \text{bias}[X_{(n)}] &= N - E[X_{(n)}] \\
 &= \frac{N-n}{n+1} \tag{5}
 \end{aligned}$$

Now, the sampling variance of the sample maximum is obtained by obtaining the second raw moment of the sample maximum. For this, consider the factorial moment

$$\begin{aligned}
 E[X_{(n)}(X_{(n)} + 1)] &= \sum_{r=n}^N r(r+1)P[X_{(n)} = r] \\
 &= \sum_{r=n}^N r(r+1) \cdot \frac{\binom{r-1}{n-1}}{\binom{N}{n}} \\
 &= \frac{1}{\binom{N}{n}} \sum_{r=n}^N r(r+1) \cdot \binom{r-1}{n-1} \\
 &= \frac{1}{\binom{N}{n}} \sum_{r=n}^N \frac{(r+1)!}{(n-1)!(r-n)!} \\
 &= \frac{n(n+1)}{\binom{N}{n}} \sum_{r=n}^N \frac{(r+1)!}{(n+1)!(r-n)!} \\
 &= \frac{n(n+1)}{\binom{N}{n}} \binom{N+2}{n+2} \\
 &= n(n+1) \cdot \frac{n!(N-n)!}{N!} \cdot \frac{(N+2)!}{(n+2)!(N-n)!} \\
 &= n(n+1) \cdot \frac{(N+1)(N+2)}{(n+1)(n+2)} \\
 &= \frac{(N+1)(N+2)}{(n+2)} \cdot n \tag{6}
 \end{aligned}$$

The second raw moment of the sample maximum is then obtained by using the following relationship

$$E[X_{(n)}^2] = E[X_{(n)}(X_{(n)} + 1)] - E[X_{(n)}] \quad (7)$$

From Equation (4) and (6)

$$\begin{aligned} E[X_{(n)}^2] &= \frac{(N+1)(N+2)}{n+2} \cdot n - \frac{N+1}{n+1} \cdot n \\ &= \frac{(N+1)(nN+N+n)}{(n+1)(n+2)} \cdot n \end{aligned} \quad (8)$$

Finally, we obtain the sampling variance of the sample maximum as

$$\begin{aligned} \text{Var}[X_{(n)}] &= E[X_{(n)}^2] - \{E[X_{(n)}]\}^2 \\ &= \frac{(N+1)(nN+N+n)}{(n+1)(n+2)} \cdot n - \left(\frac{N+1}{n+1}\right)^2 \cdot n^2 \\ &= \frac{(N+1)(N-n)}{(n+1)^2(n+2)} \cdot n \end{aligned} \quad (9)$$

Since $X_{(n)}$ is not unbiased for the population maximum its mean squared error is obtained as

$$\begin{aligned} \text{MSE}[X_{(n)}] &= \text{Var}[X_{(n)}] + \{\text{bias}[X_{(n)}]\}^2 \\ &= \frac{(N+1)(N-n)}{(n+1)^2(n+2)} \cdot n + \frac{(N-n)^2}{(n+1)^2} \\ &= \frac{(N-n)(2N-n)}{(n+1)(n+2)} \end{aligned} \quad (10)$$

Estimation of Population Maximum under Stratified Random Sampling

When the goal of sampling is to estimate the population maximum, stratified random sampling may not be the best option because, in its most frequent form, it aims to acquire comprehensive data on a heterogeneous population without increasing the sample size unnecessarily. When the goal is to estimate the population maximum, however, only one stratum can give the

essential information. As a result, only one stratum should be sampled, with all other strata and sampling units in those strata being ignored.

Suppose size of population is N , k is the number of strata and N_1, N_2, \dots, N_k are stratum sizes. For $h = 1, 2, \dots, k$, the stratum boundaries are denoted by x_{h_l} (l for lower boundary) and x_{h_u} (u for upper boundary).

Without loss of generality suppose further that strata are numbered in such a way that $x_{h_u} = x_{(h+1)_l}$ for $h = 1, 2, \dots, k-1$. It is then obvious that the first $k-1$ strata cannot contain the population maximum, and that the sample must therefore be drawn only from stratum number k . Let us denote its size by S , so that the largest value among the N_k sampling units in the stratum by selecting a sample using SRSWOR of size n_k from the stratum.

It may be easy to understand the situation if it is described as follows. The sampling units in the population are arranged in an ascending order, so that strata are non-overlapping. The k strata can be represented as follows.

If the problem is described as follows, it may be easier to comprehend. The population's sampling units are grouped in ascending order to prevent strata from overlapping. The k strata are represented in the following way.

$$\text{Stratum 1} = \{x_{(1)}, x_{(2)}, x_{(3)}, \dots, x_{(N_1)}\},$$

$$\text{Stratum 2} = \{x_{(N_1+1)}, x_{(N_1+2)}, \dots, x_{(N_1+N_2)}\},$$

⋮

$$\text{Stratum } k = \{x_{(N-N_k+1)}, x_{(N-N_k+2)}, \dots, x_{(N)}\}.$$

However, none of these values are unknown in practice. The above representation can be simplified even more using Equation (4.1), resulting in the following representation.

$$\text{Stratum 1} = \{1, 2, \dots, N_1\},$$

$$\text{Stratum 2} = \{N_1 + 1, N_1 + 2, \dots, N_1 + N_2\},$$

⋮

$$\text{Stratum K} = \{N - N_k + 1, N - N_k + 2, \dots, N\}.$$

Probability Distribution of the Sample Maximum

The population values in the stratum are denoted by

$$N - N_k + 1, N - N_k + 2, \dots, N - N_k + N_k = N$$

Whereas the sample values are ordered in an ascending order and written as $X_{(1)}, X_{(2)}, \dots, X_{(n_k)}$ so that $N_{(nk)}$ is the sample maximum. Using Equation (4.3), we can write

$$P[X_{(n_k)} = N - N_k + j] = \frac{\binom{j-1}{n_k-1}}{\binom{N_k}{n_k}}, j = n_k, n_k + 1, \dots, N_k \quad (11)$$

Alternatively, but equally as effectively,

$$P[X_{(n_k)} - N + N_k = j] = \frac{\binom{j-1}{n_k-1}}{\binom{N_k}{n_k}}, j = n_k, n_k + 1, \dots, N_k \quad (12)$$

Expected Value and Sampling Variance of the Sample Maximum

The expected value of the sample maximum is obtained as follows using the probability distribution of the sample maximum given in Equation (12) and the result in Equation (4).

$$E[X_{(n_k)} - N + N_k] = \frac{N_k + 1}{n_k + 1} \cdot n_k \quad (13)$$

so that

$$E[X_{(n_k)}] = N - N_k + \frac{N_k + 1}{n_k + 1} \cdot n_k \quad (14)$$

The last expression simplifies to

$$E[X_{(n_k)}] = N - \frac{N_k - n_k}{n_k + 1} \quad (15)$$

The sample maximum is not unbiased for the population maximum, as Equation (15) shows. As a matter of fact, Equation (15) shows that the bias of sample maximum is given by

$$\text{bias}[X_{(n_k)}] = \frac{N_k - n_k}{n_k + 1} \quad (16)$$

Using Equation (9), the sampling variance of the sample maximum is given by

$$\text{Var}[X_{(n_k)}] = \frac{(N_k + 1)(N_k - n_k)}{(n_k + 1)^2 (n_k + 2)} \cdot n_k \quad (17)$$

The mean squared error of the sample maximum is calculated using Equations (16) and (17) as follows

$$\text{MSE}[X_{(n_k)}] = \frac{(N_k - n_k)(2N_k - n_k)}{(n_k + 1)(n_k + 2)}$$

Conclusion

Sample mean is an unbiased estimator of population mean under simple random sampling and the stratum mean which is the weighted mean of strata sample means, weights being equal to size of strata is an

unbiased estimator of population mean under stratified sampling whereas the sample maximum is not an unbiased estimator of population maximum under simple random sampling and stratified sampling. When the goal of sampling is to estimate the population maximum, stratified random sampling may not be the best option because, in its most frequent form, it aims to acquire comprehensive data on a heterogeneous population without increasing the sample size unnecessarily. When the

goal is to estimate the population maximum, however, only one stratum can give the essential information. As a result, only one stratum should be sampled, with all other strata and sampling units in those strata being ignored. But when the goal is to estimate the population mean, all strata gives the essential information. As a result, all strata should be sampled to estimate population mean.

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ACADEMIC RESILIENCE OF PROSPECTIVE TEACHERS IN CHENNAI

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ABSTRACT

Academic Resilience is the ability of Prospective teachers to overcome their academic pressure. This study was aimed at finding out differences in academic resilience of Prospective teachers with respect to gender, age, medium of study, discipline, year of study, domicile and type of management. Survey method was adopted for this study. Purposive sampling was taken for this study. This study was administered upon 155 student teachers. Academic resilience scale (Cassidy, 2016) was used. Findings revealed academic resilience differed significantly with age, medium of study, discipline, year of study and type of management of the institution.

Keywords: Academic Resilience, Prospective teachers, Counseling therapy, Achievement motivation, Teaching–Learning Practices.

1. Introduction

Over the past decades, Prospective teachers are experienced by stress and anxiety. In the aspect of practicum, Prospective teachers faces difficult situation. It showed how student teachers encountered with academic problems and difficulties. Resilience can be knowledge of as skill to face challenges to success or progress (Masten & Coatsworth, 1995; Driscoll, A. K. 2006).

Academic resilience defined as “a capacity to overcome acute and/or chronic adversity that is seen as a major threat to a student’s educational development” (Martin, 2013, p. 488).

In the aspect of scholastic perspective, Academic Resilience is the student teacher’s capacity to deal efficiently with scholastic complications, stress and strain to learn.

2. Review Of Related Literature

Yavuz, H. C., & Kutlu, O. (2016). investigated factors affecting the academic resilience of economically disadvantaged high school students. 304 senior students were selected. Results revealed that cognitive flexibility and perceived social support predicted the level of academic resilience of economically disadvantaged high school students.

Rao, P. S., & Krishnamurthy, A. R. (2018). analyzed impact of academic resilience on the scholastic performance of high school students. High schools students studying in Public school and came from low socio-economic background were selected. The study revealed that girls and boys were not differed significantly with their scholastic abilities as well as their resilience attributes.

Buslig, S. M. C. A. (2019). investigated the academic resilience of college students in Kalinga. The sample of the study was 100 college students who generally came from indigent families. Stratified random sampling was taken by investigator. Relationship between academic resilience and academic performance was not differed significantly.

Karabiyik, C. (2020). conducted a study on interaction between Academic Resilience and Academic Achievement of Teacher Trainees. 198 pre-service English language teachers were selected. Participants’ reflecting and adaptive help-seeking was highly scored. It was followed by perseverance, negative affect and emotional response dimensions.

3. Methodology

STATEMENT OF THE PROBLEM:

The study was entitled as “Academic resilience of Prospective teachers in Chennai”.

DEPENDENT VARIABLE: Academic Resilience

INDEPENDENT VARIABLE: Gender, Age, medium of study, discipline, Year of study, Domicile and Type of management of the institution.

OBJECTIVES

1. To find gender – wise significant difference in academic resilience of Prospective teachers.
2. To find academic resilience of Prospective teachers is significantly differing with respect to age.
3. To find academic resilience of Prospective teachers is significantly differing with respect to medium of study.

4. To find stream - wise significant difference in of academic resilience of Prospective teachers.

5. To find academic resilience of Prospective teachers is significantly differing with respect to Year of study.

Hypotheses

1. Gender – wise no significant difference in academic resilience of Prospective teachers.

2. Academic resilience of Prospective teachers is not significantly differed with respect to age.

3. Academic resilience of Prospective teachers is not significantly differed with respect to medium of study.

4. Stream – wise no significant difference in academic resilience of Prospective teachers.

5. Academic resilience of Prospective teachers is not significantly differed with respect to year of study.

6. Academic resilience of Prospective teachers is not significantly differed with respect to domicile.

7. Academic resilience of Prospective teachers is not significantly differed with respect to type of management of the institution.

6. To find academic resilience of Prospective teachers is significantly differing with respect to domicile.

7. To find academic resilience of Prospective teachers is significantly differing with respect to type of management of the institution.

Method Of The Research:

“Descriptive survey” method of research was used.

SAMPLE: The researcher was collected the data from 155 Prospective teachers using the purposive sampling technique for this study.

INSTRUMENT: Academic Resilience Scale (Cassidy, S. 2016) was employed. It consists of 30 items. The reliability was 0.90 and its criterion validity was 0.49.

DATA COLLECTION PROCEDURE:

Researcher created a Google Form link to collect data from sample.

4. Data Analysis

Researcher used SPSS to calculate Mean, S.D and t-value for analyzing the collected data.

Hypothesis 1: Gender – wise no significant difference in academic resilience of Prospective teachers.

Table I: Academic resilience of male and female Prospective teachers.

Gender Composition	No. of Prospective teachers	Academic Resilience- Avg. in % & Std. Dev.	Cal. 't'	p
MALE	127	38.46 & 9.751	1.346	0.180
FEMALE	28	41.79 & 18.759		

Since probability value $0.180 > 0.05$, and it is an evidence to accept the framed hypothesis1.Hence, Gender – wise academic resilience of Prospective teachers were not significantly differed.

Hypothesis 2: Academic resilience of Prospective teachers is not significantly differed with respect to age.

Table II: Academic resilience of Prospective teachers and age.

AGE	No. of Prospective teachers	Academic Resilience- Avg. in % & Std. Dev.	Cal. 't'	p
BELOW 25	87	37.34 & 12.940	2.056	0.041
ABOVE 25	68	41.25 & 10.039		

Since probability value $0.041 < 0.05$, and it is an evidence to reject the framed hypothesis². Hence, academic resilience of Prospective teachers is statistically differed with respect to age.

Hypothesis 3: Academic resilience of Prospective teachers is not significantly differed with respect to medium of study.

Table III: Academic resilience of Prospective teachers and language of study.

MEDIUM OF STUDY	No. of Prospective teachers	Academic Resilience- Avg. in % & Std. Dev.	Cal. 't'	p
TAMIL	69	36.30 & 10.837	2.639	0.009
ENGLISH	86	41.27 & 12.274		

Since probability value $0.009 < 0.05$, and it is evidence to reject the framed hypothesis³. Hence, academic resilience of Prospective teachers is differed statistically with respect to medium of study.

Hypothesis 4: Stream - wise academic resilience of Prospective teachers is not significantly differed.

Table IV: Academic resilience of Prospective teachers and different stream.

STREAM	No. of Prospective teachers	Academic Resilience- Avg. in % & Std. Dev.	Cal. 't'	p
ARTS	81	41.00 & 12.763	2.159	0.032
SCIENCE	74	36.93 & 10.510		

Since probability value $0.032 < 0.05$, and it is evidence to reject the framed hypothesis4. Hence, stream - wise academic resilience of Prospective teachers is significantly differed.

Hypothesis 5: Academic resilience of Prospective teachers is not significantly differed with respect to year of study.

Table V: Academic resilience of Prospective teachers and year of study.

YEAR OF STUDY	No. of Prospective teachers	Academic Resilience- Avg. in % & Std. Dev.	Cal. 't'	p
FIRST YEAR	88	41.36 & 12.148	2.822	0.005
SECOND YEAR	67	36.04 & 10.887		

Since probability value $0.005 = 0.05$, and it is evidence to reject the framed hypothesis5. Hence, Academic resilience of Prospective teachers is significantly differed with respect to year of study.

Hypothesis 6: Academic resilience of Prospective teachers is not significantly differed with respect to domicile.

Table VI: Academic resilience of Prospective teachers and domicile.

DOMICILE	No. of Prospective teachers	Academic Resilience- Avg. in % & Std. Dev.	Cal. 't'	p
RURAL	74	35.90 & 11.414	3.260	0.001
URBAN	81	41.94 & 11.627		

Since probability value $0.001 < 0.05$, and it is evidence to reject the framed hypothesis6. Hence, Academic resilience of Prospective teachers is significantly differed with respect to domicile.

Hypothesis 7: Academic resilience of Prospective teachers is not significantly differed with respect to type of management of the institution.

Table VII: Academic resilience of Prospective teachers and type of management of the institution.

Type of management of the institution	No. of Prospective teachers	Academic Resilience- Avg. in % & Std. Dev.	Cal. 't'	p
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GOVERNMENT AIDED	86	41.36 & 12.148		
			2.822	0.020
PRIVATE	69	36.04 & 10.887		

Since probability value $0.020 < 0.05$, and it is evidence to reject the framed hypothesis⁷. Hence, Academic resilience of Prospective teachers is significantly differed with respect to type of management of the institution.

5. Major Findings And Discussion

1. Gender – wise academic resilience of Prospective teachers were not significantly differed.
2. Academic resilience of Prospective teachers is statistically differed with respect to age. Above 25 aged Prospective teachers have higher academic resilience than that of below 25 aged Prospective teachers. This result is clashing with the studies (Munro & Pooley, 2009; McLafferty et al., 2012; Cassidy, 2015). The reason may be below 25 aged B.Ed. have higher rates of psychological distress.
3. Academic resilience of Prospective teachers is significantly differed with respect to language of study. English medium Prospective teachers have higher academic resilience than that of Tamil medium Prospective teachers.
4. Stream - wise academic resilience of Prospective teachers is significantly differed (Sharma, R. 2017). Arts stream Prospective teachers have higher academic resilience than that of Science stream Prospective teachers. The reason may be science teachers' have greater achievement motivation.
5. Academic resilience of Prospective teachers is not significantly differed with respect to Year

of study. First year Prospective teachers have higher

academic resilience than that of second year Prospective teachers. The reason may be second year student teachers faces difficulties during their practicum.

6. Academic resilience of Prospective teachers is not significantly differed with respect to domicile. Urban Prospective teachers have higher resilience than that of rural Prospective teachers. The reason may be colleges of urban domicile have better learning environment.

7. Academic resilience of Prospective teachers is not significantly differed with respect to type of management of the institution Government aided college Prospective teachers have higher academic resilience than that of private college Prospective teachers. The reason may be the unaided colleges are conducting extra coaching classes, and counseling therapy classes.

Conclusion

This study provides the information regarding academic resilience of Prospective teachers. This study will help the administrators, policy makers and teacher educators for fostering academic resilience to Prospective teachers. Family, peer groups, community, and college support were considered most relevant variables to foster academic resilience for Prospective teachers. Healthy college and healthy interaction with family and peers is required to make the Prospective teachers academically resilient.

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A STUDY ON ABSENTEEISM IN COLLEGE STUDENTS OF MAHARASHTRA

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ABSTRACT

Policymakers, corporate leaders, and educators have been focusing on boosting student achievement over the past decade. Hundreds of crores of rupees have been invested in raising standards, strengthening curricula, and improving classroom teaching and learning. All of these reform attempts are important, but they aren't enough. We will never be able to ensure that future generations receive the education they require unless we engage children and their families directly. And this is especially true when it comes to college attendance. In India, absenteeism affects practically every type of student group. It's not just a problem for low-income students in cities; it's also a problem for students and families in the middle class who want to go to college but aren't spending enough time in college to ensure they'll be equipped and ready to succeed once they get there. Why do so many students miss so much of their college experience? As a researcher who engages and motivates students, I chose to ask that topic directly to teenagers. I conducted a poll of Indian undergrad and postgrad students who were skipping classes and asked them why they did so and what they thought the consequences would be. The findings shed light on the human aspect of the 7-crore figure, reminding us that the most essential thing teachers can do is notice when students are absent and ensure that pupils are aware of the implications of missed days on their future plans. Students must participate in the discussion. We must establish a relationship with them and encourage them to become active participants in their education. They are adamant about it. If we, as parents, instructors, and even celebrities, demonstrate that we genuinely care about them, their dreams, and their frustrations, they will be more motivated to attend college.

Keywords: Absence, undergrad and postgrad students, college, engage, motivate and policy.

Introduction

7 crores of rupees. That's the number of students who miss 180 days or more of college each year, according to estimates [1]. Undergraduate (UG) and postgraduate (PG) colleges are the epicenter of the absenteeism epidemic. On any given day, one out of every three UG students in various states and districts is missing [2].

That's a remarkable amount, but even more astounding is the fact that few teachers seem to notice, and few children seem to suffer any consequences for skipping school [3]. However, even if a student misses only five days of college, his or her academic performance can suffer [4]. Students who miss more than 100 days of college are more than 20% less likely to graduate than their peers, and are 25% less likely to enroll in any sort of college. Individuals who do go to academic institutions stay not as much probable to be ready, are further expected to register in corrective programs, and are more probable to drop out earlier to graduating [5].

As our country's leaders continue to set lofty educational goals for our children, one thing is certain: we will never achieve these objectives unless we lower the number of students who drop out of college.

The face of absence in everyday life

What are the names of these young people? The students that were interviewed for this paper come from all walks of life in India today. They are open category, reserved category, specially abled, and equally gendered people who reside in rural, urban, and suburban locations. A third of the children have college-educated parents, and over 60% grew up in joint families. Two-thirds of pupils polled say their family's income is "average or above average." These students have the same expressions as any other young individual. They simply aren't noticed.

When and why do young people skip college?

By the end of the third year, skipping college has become a habit [6]. Nearly three-quarters of current sophomores, juniors, and seniors who skip began doing so in UG College or

their first year in PG College [7]. What's the source of all these college dropouts? There's not much that can keep them in college – 61% of college skippers find it boring and uninteresting, and the most persistent skippers exhibit a strong distaste for the academic environment. They see no link between what they learn and who many aspire to be, and they feel isolated from the college environment.

When they're not in college, what do they do? When it comes to skipping college, the most popular activity (65 percent) is "hanging out with pals." Another 27% say they spend time on the Internet, watching TV, or playing video games. Only approximately 6% of those polled skip because they are working or caring for a child or other family member.

Getting along without being detected

Parents don't seem to notice how much students miss them [8]. It didn't matter if they skipped frequently or infrequently. It didn't matter if you missed one lesson or a whole day, or if you missed it once a month or once a week. The majority of teenagers claimed that their parents did not notice their absence from college most of the time: When it comes to skipping school, 42% of adolescents say their parents "never" or "rarely" know. Despite the fact that 66% of these students reported their professors, principals, and others had discussed their skipping behaviours with them.

What makes you think I'm worried?

Students also stated that skipping college has few or no direct effects for them. This is especially true for pupils who just miss a few classes. Only a minority believe their college work is affected, and the majority believes they would have to skip college a few times a week before their grades suffered or their chances of attending Sr. college were jeopardized. Nearly two-thirds (64 percent) of skippers intend to attend PG college after completing UG college, despite the fact that the same number (67 percent) are concerned

that they would not be prepared for PG college if they continue to skip classes.

Understanding the consequences of skipping classes

The gap between the true effects of missing college (worse achievement, lower rates of UG and PG College) and both parents' (ignorant) and kids' optimistic outlooks on the future is striking [9]. Students requested that this disparity be bridged, and many even provided solutions to the problem.

1. Emphasize the importance of attendance: Students said they would be less likely to miss class if they were aware of the implications of their absences. As a technique of raising attendance rates, school officials refer to the success of making attendance a visible priority for both children and their parents in both big and minor ways.
2. Encourage students to participate: Students desire to be actively involved in their studies. Students seek for a link between what they study in college and their "actual life." Too often, their life outside of college, their aspirations and expectations for the future, and how they spend each day are completely disconnected.
3. Deliver the correct message to the right people: Often, it's the school principal or administrator that reminds pupils of the importance of going to college every day. Parents, a trusted teacher, and a well-known artist, athlete, or celebrity can all have a far greater influence on a student's decision-making than an authority figure who is not involved in the student's life.

Review of Literature

The Best Predictor of Student Success is Attendance.

According to studies, there is a clear link between student attendance and academic achievement and, eventually, graduation rates [10]. In fact, student attendance has been identified as the top predictor of UG

graduation rates in numerous researches [11]. Simply said, if you do not attend college, you will not be able to graduate. Students who miss 50 days of college per year (or just two days per month) have a one in five probability of graduating [12]. According to a study conducted by the NAAC in 2021, student test scores begin to decline after just twenty-five days away from college [17]. According to another studies, attendance is eight times more indicative of failure than a previous test result [13].

CBSE published “The Importance of Being in School” in the first part of 2021. Few states assess and report chronic absenteeism, which researchers define as missing at least 10% of school days each year, or roughly 18 days, according to the report. According to the report, 10% to 15% of students in the India are chronically absent, implying that 5 million to 7.5 million students are at risk of dropping out or failing to graduate [18]. To put that in perspective, the number of chronically missing pupils in India is almost equal to the number of K-12 students in Maharashtra [15].

Research Method

From June 14 to June 29, 2021, the researcher performed 516 online interviews in 25 cities or small towns across Maharashtra, India. Students in UG and PG colleges who report skipping college a few times a month or more are included in the survey. The survey was available in both Marathi and English for students to complete. The margin of error for all respondents is 4.3 percentage points, although it is larger for subgroups. The students who were interviewed attended either public or private universities. Although reserved category (24 percent), minority community (16 percent), and physically challenged (2 percent) children were substantially represented in the sample, they were predominantly open category (55 percent).

The goal of the researcher is to engage and inspire students to take charge of their education and future. He understands that

going to college “all day, every day” is the most important thing students can do. The need of engaging students across the college to focus on attendance is recognised by the researcher. By incorporating pop culture into everything he does, the researcher hopes to encourage pupils to feel connected to their community and to motivate them. Researchers conducted a study of self-identified “college skippers” from the renowned UG and PG College in Maharashtra to better understand why so many students are so quick to skip school. At least once a week, these pupils said they skipped college.

- Who knows they aren't in college, according to the researcher?
- What are the repercussions, in their opinion, of missing so much college?
- What might motivate them to attend college more frequently?
- Who could possibly motivate them to attend college more?
- What is it that they miss about college?
- What do they do while they're not in school?

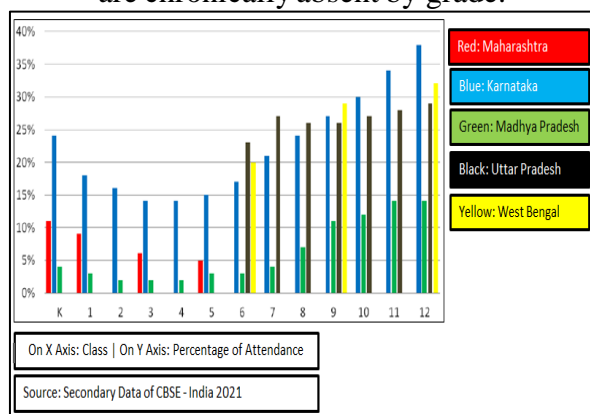
Findings and Interpretation

It all begins in middle school (Based on Secondary Data)

Chronic absence does not affect all students equally. While chronic absenteeism does not differ much by student, gender, or caste, grade level does. In primary schools, Indian kids have unusually high absenteeism rates, although attendance levels out until senior school.

Many parents, according to the researcher, encourage their children's attendance in school once they reach fifth grade. When children reach middle school, everything changes. The number of chronically absent children rises each year of school beginning in sixth grade, with 11th and 12th graders having the highest absence rates.

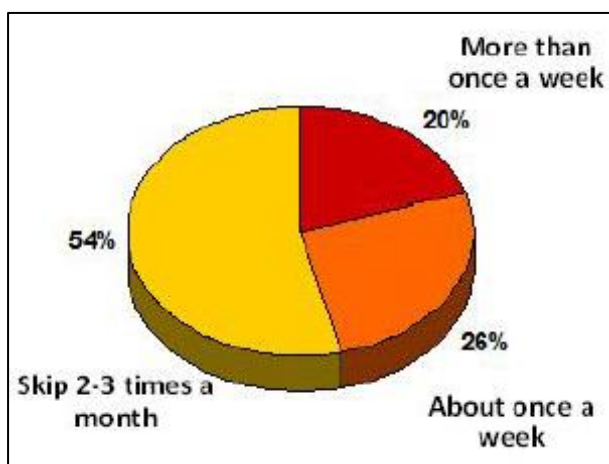
Chart 1 shows the percentage of pupils who are chronically absent by grade.



Student Skippers: A Profile (Based on Primary Data)

According to the interviews, skipping college is a well-established habit by the conclusion of high school. Nearly three-quarters of current sophomores, juniors, and seniors who skip began doing so in UG College or their first year in PG college. They also skip a lot: nearly half of skippers (46 percent) are gone once a week or more.

Chart 2: How frequently do you miss classes or college?



Source: Primary Data

The following are characteristics of the college skippers' households:

1. 57 percent were reared in a nuclear family, while 33 percent were raised in a joint family.

2. In the past year, 39 percent of people have relocated; 19 percent have moved at least twice.
3. 34% have at least one parent who has completed college.
4. 33% have a parent who dropped out of PG College; 14% have neither parent graduate from high school, and 19% have only one parent graduate from PG College.
5. 23% of respondents say their household has a lower-than-average income; 24% say their household has a higher-than-average income; and 44% say their household has an average income.

There are two types of skippers.

Students' future objectives, reasons for skipping college, and what they do when they are not in college are similar across age and gender. However, the data reveals two distinct categories of college skippers: habitual skippers and occasional class cutters. Skippers miss at least three days of college every week on a regular basis. These students are more likely to come from a nuclear household and are more likely to have gotten into legal problems. This group of pupils is more likely to live in cities. Only approximately a third of Habitual Skippers intend to continue their education after high school. Another third intends to work or enter the government service immediately after graduating from UG College. These pupils recognise that they are on the verge of leaving UG College.

A few times a month, Class Cutters take a break. These students are more likely to live in joint family households and to have at least one parent with a college diploma. Occasional Class Cutters are more likely to live in the suburbs or in a small town. More than half of these students are confident that they will attend a four-Year University and those they will receive mostly A's and B's in college. Only roughly a quarter of these students say their parents are "always aware" of their lateness. Aside from receiving a detention or

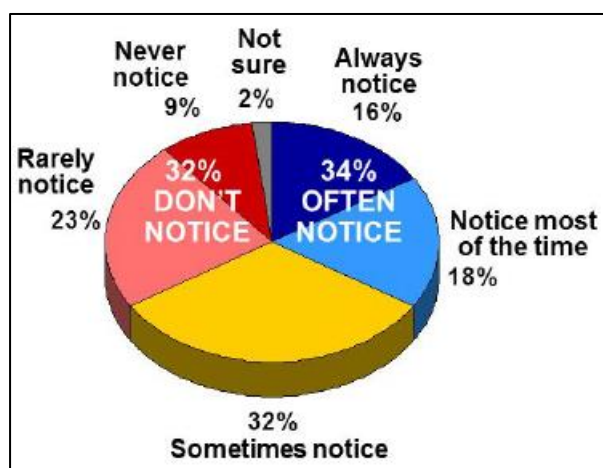
failing an exam, these kids have suffered few consequences for missing college.

Both groups of skippers are on the verge of extinction. Skippers who skip classes frequently are the most likely to drop out of UG college, a decision that more than a fifth of Indian UG students will make. They are gradually disengaging from college and, as a result, falling behind academically. Occasional Class Cutters are more likely to graduate, but many are unaware that skipping college has a direct impact on their professional readiness. When students enroll in PG Colleges, they will be faced with a series of remedial programs, and many will become disillusioned and quit out before earning a PG degree.

No one notices you when you're young.

Students who Skip College and/or a class feel that their absence will be noticed by few people at college or at home. While institutions are likely to keep track of all absences, students think there is only a 50-50 probability (or less) that officials will notice. Their parents, they feel, are even less likely to notice. Every week, these children make decisions that will have long-term ramifications for their future, and they assume no one knows.

Chart 3: How often do adults at your college, such as instructors, administrators, and attendance officers, notice when you skip college or class?



Source: Primary Data

Chart 4: How often do your parents or guardians know when you miss college or a class?

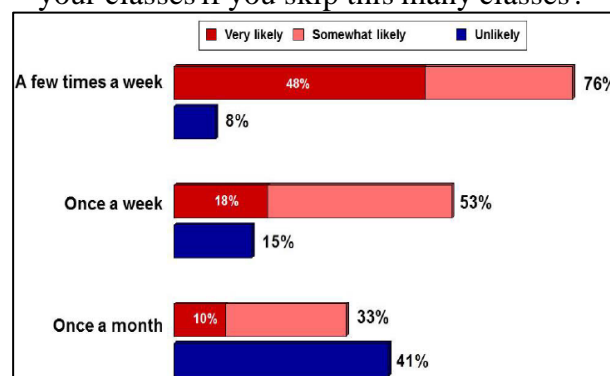


Source: Primary Data

There are no real consequences.

While the majority of kids who skip classes incur minor consequences such as detention, failing a test, or being grounded, few students regard college as having real-life consequences. Students who skip college 2-3 times a week feel that their academic success will not suffer as a result. They incorrectly feel that skipping one or more classes per week will jeopardize their marks and ability to graduate. Few teenagers regard missing college 2-3 times each week as a serious problem. Despite this, the majority of kids who do not attend college intend to attend PG College: 46 percent said they intend to attend a two-year PG institution, whereas 18 percent said they intend to attend a two-year PG college.

Chart 5: How likely are you to fall behind in your classes if you skip this many classes?



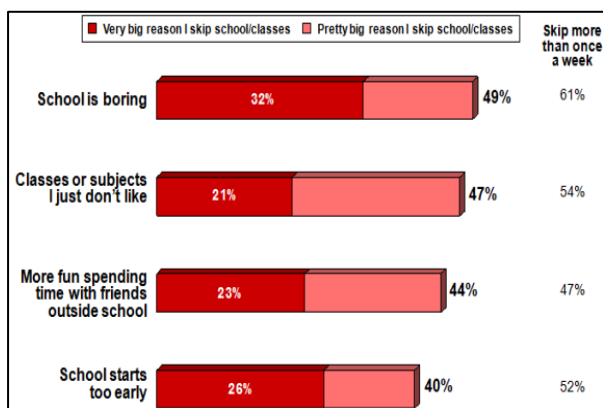
Source: Primary Data

"College is a chore."

We asked students to explain why they miss all or part of a college day in their own words. The most prevalent justification for skipping college is that it is "boring." Nearly half of those who skip say it's because they're bored in college or uninterested in their studies and three-quarters say these factors influenced their decision in some manner. For many teenagers, college begins far too soon. Early start hours were cited by two-fifths of young people (40 percent) as a major factor for missing college or class.

In the end, many students would rather spend time with their buddies than attend college. A big reason for skipping college, according to over 45 percent of all students, is that it is "more fun spending time with friends" than attending to college. Avoiding a test/homework (23 percent), having other work/family duties (18 percent), bullying (11 percent), and transportation concerns are among the other reasons students cited as very significant or somewhat big reasons for missing college (9 percent).

Chart 6: What are the reasons you don't go to college?



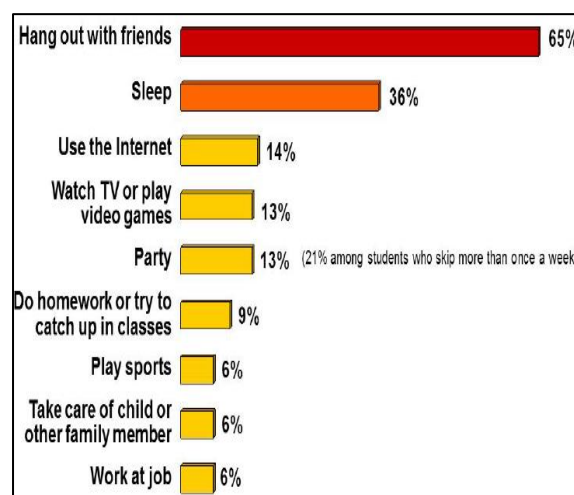
Source: Primary Data

"Hanging Out" is a casual decision.

When students miss class, they frequently return for a portion of the day. Only approximately 28% of pupils said they

skipped an entire day of school. Many people say they've dropped one or two classes. What do they do and where do they go when they skip class? Nearly two-thirds of students said they spend the majority of their time with their pals. When they are not at college, other students say they spend their time sleeping, watching television, and/or surfing the Internet at home.

Chart 7: When you miss college or classes, what are the top one or two things you do?

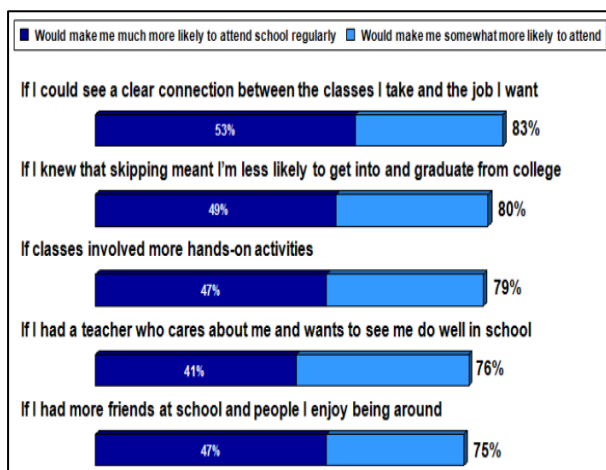


Source: Primary Data

It's All About the Messenger

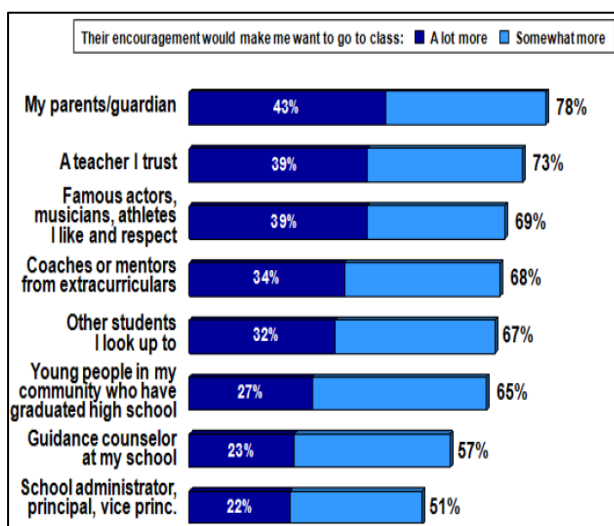
When we asked students what would motivate them to attend college more frequently, they said they wanted to be more involved in their studies. Students believe that if their classes were more relevant to their life and goals, they would attend college more frequently. Students also believe that chronic absenteeism may be reduced if we simply communicate the negative consequences of skipping college in a way that they understand. While students claim that college authorities have advised them to attend classes more frequently, the message appears to be ineffective. As a result, the messenger is important. Students want to be encouraged to attend school by someone with whom they have a personal relationship, whether it's a parent, a trusted teacher or coach, or a celebrity they like.

Chart 8: What would motivate you to go to college on a more regular basis?



Source: Primary Data

Chart 9: Who would motivate you to stay in college and attend more classes?



Source: Primary Data

Recommendations and Suggestions

This section provides a framework for collaborating to achieve the long-term objective of ensuring that all students in the India are enrolled in college and prepared to learn. In the medium term, the researcher proposes a framework for action that will provide colleges and their stakeholder groups with the tools and resources they need to map and manage chronic absence. This framework is broken into four parts, each of which should be bolstered by what happens at universities as

well as collaborations with other community players.

1. Actionable Data: Invest in Early Warning Systems Development
2. Changing the Narrative through Positive Messaging
3. Developing and Implementing Early Interventions: Capacity Building
4. Establishing Performance Standards through Shared Accountability

While all of these elements must eventually be in place to maintain progress over time, actionable data is listed first since it is the most important starting point for action. It's what enables schools and institutions to figure out where they should focus their positive messaging and capacity-building activities. To make the concept of shared accountability work, actionable data must be available.

1. Actionable Data: Invest in Early Warning Systems Development

Supporting the collection of actionable data that can be used to develop early warning systems that identify at-risk kids and schools, as well as a better overall understanding of chronic absence patterns in order to determine when and where poor attendance is an issue.

Actions that could be taken

1. Invest in the development of more effective student data systems that incorporate attendance and can quickly create information about which and how many children are chronically missing by grade, division, mentor allotment, and student sub-population while maintaining confidentiality.
2. Assist employees, faculty, and mentors in their learning and development of data reports that are simple to use and understand.
3. Provide information and resources to encourage data exchange while maintaining privacy.

2. Changing the Narrative Rationale: Positive Messaging

The mainstream narrative on student absence blames parents and punishes pupils. Neither of these approaches is useful in assisting families and students in attending college and being prepared to learn. As a result, the narrative surrounding student attendance should be modified to one that engages and empowers families, students, and communities. Making the case for action to address chronic absenteeism and engaging diverse sectors around this issue requires a shift in the narrative.

Actions that could be taken:

1. Develop new messages that raise awareness about chronic absenteeism without blaming students or families; promote a commitment to unpacking the underlying reasons for students missing college; assist families in understanding the negative consequences of multiple absences; and ensure that communications are culturally and linguistically meaningful and relevant.
2. Form an institutional coalition of important stakeholders to communicate the new messages through their institutional channels, including school superintendents, management decision makers, principals, teachers, health experts, parent leaders, and others.
3. Identify and mobilize significant public figures to support the new public narrative.

3. Developing and Implementing Early Interventions: Capacity Building

Rationale: Colleges and stakeholder groups must have access to model practises, technical help, financial sustainability choices, and additional resources in order to feel confident that they have the knowledge and support they need to map early chronic absence and implement effective interventions. The linked university, as well as the alumina association and others, can help ensure that these

resources are available. To guarantee that a coherent plan addressing chronic absenteeism incorporates many sectors in a community, a collective impact model should be implemented.

Actions that could be taken:

1. Provide key professors and staff members at the university and linked colleges with a comprehensive set of tools and a diverse range of behavioural and counseling training opportunities.
2. Develop model solutions for unpacking and dealing with chronic early absence that can be used to lead efforts throughout the state.
3. Present case studies of successful initiatives and explain the tactics and best practises that can be gained from them.
4. Encourage linked colleges to participate in peer learning events to exchange ways for collaborating with health providers and other local stakeholders.

4. Establishing Performance Standards through Shared Accountability

The need for systems that promote and give incentives for college departments and class divisions to boost student attendance is critical. Chronic absence, for example, might be incorporated into department and class division accountability systems, such as report cards, to track progress and indicate areas where further support is needed to improve student performance.

Actions that could be taken:

1. Encourage the institution to develop a standardised definition of chronic absence, including what constitutes a day of absence, so that statistics can be compared across departments and class divisions.
2. Encourage the use of data on chronic absenteeism in college turnaround efforts.
3. Advocate for chronic absenteeism metrics to be included in college report cards and other accountability mechanisms.
4. Provide linked universities with examples for collaborating with colleges to

incorporate chronic absenteeism into their college improvement programs.

Conclusion

As another college year begins, we have the opportunity to make tremendous progress in decreasing achievement gaps by reducing early attendance gaps. We can ensure that children, particularly our most vulnerable youth, do not miss so much college that they fall behind before even having a chance to learn and experience the rewards of doing well in the classroom by investing early. Colleges alone will not be able to accomplish this. A

wide range of community stakeholders, particularly health care providers, can have a significant impact. It takes a determined effort at the college level, with the correct policies and professional development in place, to map and solve the early attendance gap. It necessitates creative thinking at the college level, as well as data for sites and family support. If done correctly, these local examples can educate the institution's approach and create a circle of innovation and growth that ensures that every young person has an equal chance to succeed in college. Incorporate chronic absenteeism with assessments of community health needs.

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INDUSTRY 4.0: EMERGING CONCEPT: OPPORTUNITIES AND RISK FOR INDIA**¹Dr. Shilpa Kulkarni, ²Deepali Anpat**¹Matrix School of Business Management, Ambegaon, Pune.²BBA Department, TC College Baramati.

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ABSTRACT

Industry 4.0 terms is referred to fourth Industrial Revolution. The revolution according to this era was characterized by use of digitization, Computational power, IoT, Business Analytics, Artificial Intelligence, advanced robotics and specially use of all these technologies in manufacturing process. If we consider Indian economic structure, it is seen that India depends heavily on its service sectors for growth. Manufacturing sector is a cutting edge today and hence heavily needs high level of skills to boost growth. By considering this some countries already stated adopting Industry 4.0 techniques to improve the manufacturing techniques. By considering all issues related to global warming and its impact on environment it is recommended to follow the technology in manufacturing which will lead to minimize the waste, maximizing the production capacity, full utilization of resources, product modifications as per green code, and even modifications in supply chain activities is the basic concept behind technology used in manufacturing according to the concept of Industry 4.0. With the help of this research paper we will try to focus on the concept of Industry 4.0, what will be the possible model to follow Industry 4.0 and opportunity and Risk for India to adopt Industry 4.0 concept.

Keywords: Industrial Revolution, Business Analytics, Artificial Intelligence, robotics, Service sectors.

Introduction:

The term "Industry 4.0" mean implementation of smart industry in which smart devices are used to established network in the activities related to raw materials, processed materials, final products, machines, new tools, robots and human resource. This smart industry is characterized by flexible production process, optimum use of resources and integration of customers and business partners in all business process.

Common picture that can be observed in smart factory is that men, and machines or robots will act as equal partners. According to the concept of I 4.0 is there will be combination of new technologies like big data, processing speed, Internet of Things (IoT), Business analytics, AI, robotics, and man machine systems and so on. I 4.0 would mean the use of all recent and updated technologies in production process. This will result in the "Smart Factory", which is characterized by advanced process, resource efficiency, and ergonomic design.

Digital technology is responsible to brings major changes in the business models.

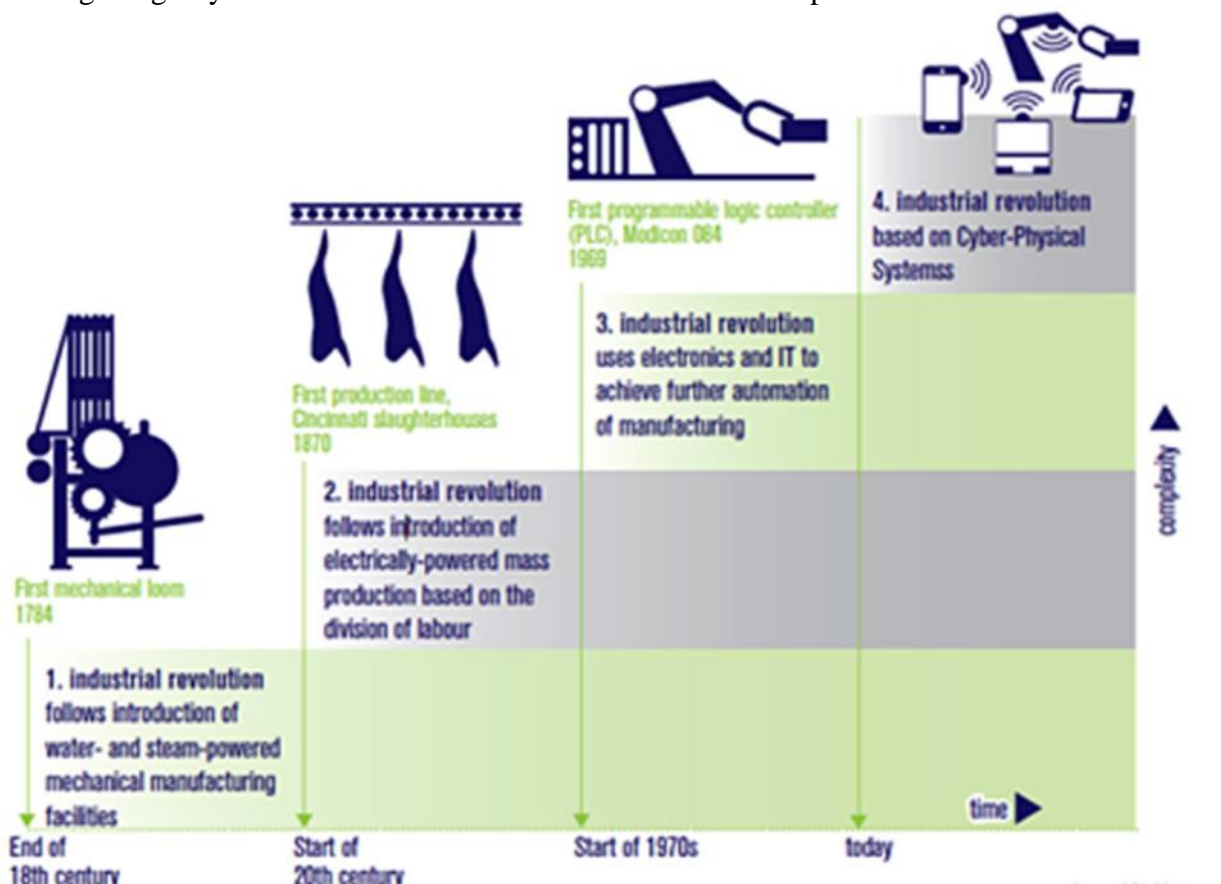
Production system must be more flexible to adopt a lot of technology innovations into reality as quickly as possible. This can be achieved with the help of two main factors that are hardware and software system. Innovation and advanced technology can be applied to the smart production in a way to influence the entire product life cycle right from product design till the product recycling.

The objectives of all these activities is to increase productivity in minimizing time period between the development of a new product and its delivery to customers in the market for 50%, efficiency and energy savings to ensure competitiveness in the world market.

Objectives of Study:

1. To understand the concept of Industry 4.0.
2. To analyses the structure of Business organizations according to Industry 4.0.
3. To study opportunities and threats in implementation of Industry 4.0.
4. To analyze position of India to follow the industry 4.0 concepts.

Following image try to elaborate the First Three Industrial Development in India.



Initially India was participated in various economic activities which contributed to the growth of the economy. During this era textile industry established in India and it was the major contributor to the national income. Before industrial revolution, India had a very well-established cotton industry and its products were exported to various parts of the world including Europe and America. The textile industry in India achieved this by access to low waged labor and skill that resulted in high quality but low-priced products during late 17th century

Second industrial revolution was characterized by use of electric power for increasing or large production.

In this era jute textile mills were established in Bengal and textile mills in Bombay and Ahmadabad. During 1911, J.R.D. Tata established the first steel mill in Jamshedpur. Up to two world wars industrial development in India is very slow and poor.

Industrial Revolution industry development plan mainly focus on development of heavy

industries, R&D teams in organizations, higher education universities, and improvement in agriculture activities.

1980 is the beginning of third Industrial Revolution. This revolution introduces new economic thinking in India. Economic freedom started during this phase of Industrial development. Many organizations enter into technical collaboration with foreign firms. Local and domestic organizations undertook various initiatives like implementation of research and Development activities, updating in productivity, and innovative management techniques for better allocation and utilization of resources.

What is Industry 4.0?

The term "Industry 4.0" indicates the smart factory having digital devices that are networked and these devices communicate with raw materials, semi-finished products, products, machines, tools, robots, and humans which all are involved in different activities of the organizations. Smart industry is characterized by flexible production system,

optimum use of resources and integration of customers and business partners in the business process.

In such type of advanced type of factory, machines and men will be equal working partners; Artificial intelligence is implemented in the terms of robots and other devices as compared to the previous generation of robots. Like this the use of digital technology in production industries brings prominent changes in the business models. In order to implement this changed model in organization digital innovation is required to adopt by the organizations. Smart industry mainly focuses on flexible production process with the help of hardware and software system for the real-time evaluation of data.

The objectives of development of this smart industry include:

1. To increase productivity.
2. To increase the efficiency of production.
3. To save energy.
4. To identify competitiveness of India in the global market.

Readiness of India towards Industry 4.0

World Economic Forum (WEF) has performed holistic research indicating readiness for adoption to this new network model by various countries.

Key indicators for identifying how countries are performing in the digital world is a Network readiness index. And this readiness index is based on some of the following criteria:

- Increasing pressure to implement innovative and new technology in productions system.
- Competition with rapidly growing digital business and companies.
- Legal and political approaches to adopt digital technologies and

According to above mentioned network readiness index criteria, India ranks 91 out of 139

Countries.

As per German Engineering Federation (VDMA) there are six-dimensional model to assess

The readiness of enterprises, these includes following six dimensions:

1. Strategy and organization
2. Smart factory
3. Smart operations
4. Smart products
5. Data services
6. Employees

Current Status of Industry 4.0 in India:

India ranks sixth as a largest manufacturing country and so India focus on the manufacturing sector forms an Integral part of the country's long-term vision. Government is initiating various activities like 'Make in India' campaign. And also, Government is encouraging various entrepreneurship development activities to promote the manufacturing sectors in India. The expected share of manufacturing that government wants to rise from 17 to 25 per cent. Government of India have taken the number of initiatives and policy reforms like

Introduction of the GST (Goods and Services Tax)

FDI policies are made easy.

A major part of the Indian manufacturing sector is still in the post-electrification phase as it uses technology limited to systems that function independently of each other. According to requirement of Industry 4.0 concepts integration of physical systems on cyber platforms and this basic premise is still not sufficient in India. It has been observed that Individual, Small & Medium Enterprises in India cannot adopt full automation technology due to high cost involved in Automation. So if try to summaries the current position of India to accept or adopt Industry 4.0 concept, we find that:

1. Ignorance of the technology in India.
2. Lack of Systematic approach towards modernization in Indian organization.
3. It seems that even organizations are not willing to adopt the new technologies.
4. India has availability of low waged labor and due to this organizations are not ready to adopt automation
5. Each industry does not produce large volume of

products so not ready to adopt the automation.
6. Skill sets required to adopt the automation in industries is absent in India.

7. Government plays a vital role in taking decisions regarding automation and industrial Development.

Government Initiatives:

Indian government, its policies and strategies play an important role in Development of manufacturing industries and adoption of Industry 4.0 concepts.

We can summarize the initiatives of Indian Government as follows:

2015 ---Launched an IoT Policy.

2015 - National Policy for Advanced Manufacturing to enhance India's global manufacturing competitiveness.

Mission on Cyber Physical Systems (CPS) and allotted an initial corpus of INR100 crore for commencement of the mission.

2017 -- National Manufacturing Policy, 2017: which focus on adoption of digital platforms for I4.0

Centre of Excellence (CoE) on IT for Industry 4.0.

2018-19 -National Program on Artificial Intelligence.

2018-19 - Mission on Cyber-Physical Systems

Role of Organizations: The industry, particularly the large and multinational manufacturing companies, will adopt 4.0 if they see returns on investment.

It is essential to prepare the roadmap for adoption at various levels of technology appropriate for different scales of operations especially for MSMEs.

Opportunities and Risk involved in industry 4.0 concepts for India:

There are several risks associated with the adoption of Industry 4.0.

India still lagging in adequate physical and digital infrastructure. Indian government is taking continuous efforts of to enrich the industry sectors with required infrastructure such as roads and electricity.

India's telecommunication network still suffers from slow data speed and unstable connections.

As per the study report proposed by KPMG India Cybercrime Survey Report 2017, 79 % of corporations in India have acknowledged cyber security as one of the top five business risks.

Apart from cyber security, the regulatory environment pertaining to data privacy would also need to be strengthened.

High cost of digital technology is yet another factor. Building the factory of the future with an entirely connected system could require significant capital outlay.

Getting access to digital technologies remains a challenge due to the high cost of these ~~technologies~~ ^{technologies}.

There is still a leadership gap. India lacks business leaders ready for Industry 4.0.

Although Indian companies have strong traditional leadership, there is a deficiency of digital experts with a strong vision for Industry 4.0 adoption.

India's present workforce lacks skill and expertise in new age technologies such as data analytics, additive manufacturing, and IoT.

The government, industry, and academia need to collaborate to enable an Industry 4.0 ready workforce.

The availability of adequate talent in both terms i.e. Strategic leadership level and factory floor can prove to be a significant challenge for Indian companies on their way to Industry 4.0 maturity.

The traditional organizational structure incorporating human-human hierarchy is needed to replace by functions where humans and machines would interact at

strategic and operational levels.

Most importantly, there is a need to change traditional mindsets and skillfully manage that change across organization.

With Industry 4.0 automating most of the technical tasks, the focus could turn to soft skills for employees to be successful.

The current workforce would need to be re-engineered to fill new roles.

The next generation workers need to be digitally strong.

At present, India is struggling with low vocational training capacity. It is only 0.8 per cent of the total workforce as compared to 6.7 per cent in the US and 11.5 per cent in China.

The skilled workforce is only 4.7 % in India as compared to 24 % in China and 96 % in South Korea (PWC and FICCI, 2019).

Repetitive jobs may disappear. This is likely to leave a deep impression on employment landscape.

There may be new role for the labour force in the form of supervisory, managerial and cross-functional, demanding diverse skill sets.

Industry 4.0 is likely to create widespread disruption in the labour market.

The key stakeholders—the government, industry and training institutions—have to come together to re-engineer the education system to make employees competitive.

Conclusions

After the analysis of the industry 4.0 concepts, Requirements, initiatives and current position of India in adaptation phase of this Industry 4.0 concepts, following conclusion can be drawn:

1. Concept of Industry 4.0 is completely technology oriented and it requires tremendous changes in manufacturing technologies to adopt this 4.0 strategy. For

large scale production these concepts are very important.

2. According to industry 4.0 concepts industry models will have drastic changes. Industry will be a Smart Industry with smart products, Smart process, Smart operations and prominent use of Information Technology in all sense of manufacturing.
3. As far as opportunities and threats are considered for India it can be concluded that threats are more due some prominent factors like non-awareness of the technology in India, availability of Cheap labor and due to this organizations are not ready to adopt automation, Each industry is not large scale where volume of products is very high so as to adopt the automation, India has non availability of skill set to adopt the Automation.

But if Indian Government along with Industries and Higher education Institutes follows the adaptation policies for Industry 4.0 then India and Indians will have very high growth opportunities.

4. We can conclude that India is not completely ready for adaptation of Industry 4.0 model but for future growth and development we need to start adopting these concepts.

India should adopt digital technologies to become a global manufacturing powerhouse.

Since the launch of “Make in India,” some progress has been made. The global manufacturing process is transformed by digital technologies such as IoT and robotics. But adoption of digital technologies in Indian industry is still in its infancy. There are many advantages for India. It has a number of factors in its favor that are mainly huge and growing domestic market, a large number of workers with diverse skills, demographic dividend, English-speaking scientists and engineers, research and development institutions, and a large startup technology base.

Along with being a catalyst for growth, digital technologies may be disruptive with far reaching effects on productivity and employment.

Following are the implications for India:

1. India's low labor cost advantage may lose.

2. With the right ecosystem, India could gain a significant share of embedded software services, data management, and supply chain restructuring.
3. Along with physical infrastructure, large-scale investments in requisite digital ecosystem are needed.

Advanced technologies such as 5G mobile network, wireless sensor network, 3D printing, industrial e-commerce, cloud computing, AI, and big data will determine industrial competitiveness.

Global industry is at the brink of the next technological revolution. The combination

of intelligent machines, modern communication, big data, and cloud computing is causing disruptive changes in industrial production. "Smart Manufacturing," "Industry 4.0," and "Industrial Internet" are labels that will characterize the upcoming transformation. The new technology paradigm will reshape the dynamics and the rules of global competition. The race for advanced industrial production may decide the fate of large corporations, and also determine the overall development of the economies.

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E-PHARMACY- CURRENT OUTLOOK & FUTURE TREND**S. Ramdas¹ and S. Dandekar²**¹HirabenNanavati Institute, Pune.²Research Scholar.²sheetaldandekar1@gmail.com**ABSTRACT**

Online buying journey in India started since 2007 with books, smart phones and groceries by FlipKart and subsequently Amazon in 2013. Year on year, online buying gained attention with the introduction of more E-Commerce stores which reinforced customer's trust. In 2015 Indian internet Pharmacy Association (IIPA) was formed by 11 start-up E-Pharmacies. Because the Traditional Pharmacies are highly fragmented and they buy medicine in small quantities resulting in reduced margins, competition and price increase, hence sustaining capacity is at risk. Therefore, with the advent of technology, E- Pharmacy has taken birth to bridge this gap. E-Pharmacies are online platforms where consumers can purchase medicines without visiting conventional retail medical shop. Today, acceptance of online buying medicines has increased during COVID-19, and the current market size is expected to grow by 20% by 2024¹. This review article examines to understand the consumer behavior towards online buying and future of E- Pharmacy potential to grow.

Key words: E -Commerce, Online Pharmacy, Consumer Behavior.

Current market scenario of E-pharmacy in India

Indian e-Pharmacies started around 2015, gained acceptance rapidly over years. Currently, approximately 50 E-Pharmacy players are in India -Pharmeasy, Medlife, 1mg and Netmeds are some of the leading players in market.² Estimated market size of India E-pharmacy is \$0.5B which is approximately 2-3 % of total Indian pharmacy sale. During Lock down, the Union Govt. and State governments identified E-pharmacies as essential services and went one step ahead to encourage customer through their ArogyaSetu portal and app to promote online buying of medicines.³ With increasing acceptance of E-pharmacy, it has potential to gain a market share of 5-15% and expected to grow at a compounded annual growth rate over 20% reaching to approximately US\$3 Billion by 2024.³

Objective

- To study current consumer outlook towards online buying medicines
- To review Govt. policies & regulations for E-pharmacies
- To understand factors contributing future trends of E-Pharmacy

Research Methodology

The data collected is descriptive. Data used in this article is collected through secondary sources like published articles, journals, newspapers, reports and website. This data was verified for relevance, authenticity before its inclusion in this paper.

Discussion

1. Current benefits & limitations of E pharmacy

Benefits of E pharmacy⁴

- Price discount

E-pharmacy platforms offer price discounts up to 20-30%, hence online buying of medicine helps consumer to save money

- Comfort & Convenience

E-Pharmacy offers greater convenience & access of wide range of medicines. It takes less time to order medicine on E-pharmacy than buying from conventional retail store with doorstep delivery. Specially contact less medicine delivery has helped consumers during covid-19 scenario.

- Available for 24X7

Consumer can order at their ease; E-pharmacy portals are functional 24X7.

- Medicine information

Majority E-pharmacies provide useful information on medicines & diseases which

can create consumer awareness for medicine usage

- **Quality of medicine**

E-Pharmacies ensure genuine drug supply, sourcing it directly from manufacturers and licensed resellers.

Limitations of E pharmacy⁴

- **Consumer reach**

Currently E Pharmacies are able to deliver medicines till tier III cities, so catering medicines to remote cities & rural areas is still a concern

- **Emergency medicines**

Delivery of emergency medicines is currently not possible with E Pharmacy

- **Lack of physical supervision**

E-pharmacies do not have any processes of medical supervision or physical evaluation in place.

- **Speed of delivery**

E-Pharmacies need to work hard on fastest delivery of medicines currently, Medlife has started express delivery of medicines in 2 hours after the order and Myra promises of medicine delivery within 1 hour of order.

- **Security and confidentiality of information**

Today, consumers have major concern about prescription privacy hence E pharmacies must ensure confidentiality of consumer data.

2. Consumer outlook towards online buying

E-pharmacies gaining acceptance day by day in India, factors influencing buying online have been evaluated well in earlier studies. The major key factors influence consumer behavior for buying medicine online are low price of medicines, wide range of medicines, convenience of buying, doorstep delivery & quality of medicines.

As per the study done by the FICCI, the overall consumer perception regarding online buying of medicine is positive. Almost 90% of the respondents showed inclination to buy online medicines. Convenience of ordering medicine & doorstep delivery of medicines are key contributing factors for attracting more & more consumers.⁶

As per FICCI white paper approximately, 76% respondents agreed that E-Pharmacy would be convenient as compared to the existing mode of purchase.⁶

India being a price-sensitive country, price of medicine is important factor for making medicine accessible.⁵ Lower prices of medicine are perceived as one of the major influencing factors for buying online medicines. Around 84% of the respondents prefer low prices, discounts key feature for consumer buying medicine on e-Pharmacy⁶

Changing lifestyle of the masses is leading to a rise in chronic and lifestyle diseases amongst the Indian population. Among respondents, 94% have responded positively for buying chronic disease medicines on E-pharmacy. Currently-Pharmacies primarily cater to the medical requirements of chronic patients.⁶

Apart from offering attractive discounts by E - Pharmacies such as Doctor consultation, Health information like disease awareness and reminders to buy medicines regularly and Diagnostic facilities at consumer door step. Mr. Prashant Tandon who is co-founder and CEO of 1mg (E Pharmacy player) quoted, "People are apprehensive about exposure while venturing outside for medicines and lab results and prefer online options and the need at present is unbounded. The company is actively investing to cater to demand".²

3. Current Government policies for E-pharmacy-

There are no specific rules for E -Pharmacy in India. However, in 2015, IIPA – was formed and now changed to DHP – Digital Health Platform, and the president is Mr. Prasanth Tandon formed set of rules in which members like Tata 1mg, M-chemist, Netmeds, Pharm Easy, to name and other few online pharmacies are following. Government of India framed 'The drugs and Cosmetic Rules, 1945'. Prior to Independence, under the heading of 'The Drugs and Cosmetics Act 1940'. As the time changes with the birth of internet, the drugs are made available through online drug stores in advanced nations. However, in India it all started in 2015 with some individuals framing rules and formed

association to sell the drugs on line for consumer by uploading prescriptions. Government of India took initiative under Department of Health and Family Welfare under Ministry of Health. Drafted policy for online Pharmacies as "Draft – E Pharmacy Rules published on August 2018 and called for Objections and suggestions from the public on or before October 12, 2018 to make an act. Looking back in India, only the Drugs and Cosmetic Rules (the "Rules") were formulated in 1945 under the Drugs and Cosmetic Act, 1940 (the "Act") for regulating the import, manufacture, distribution, and sale of drugs and cosmetic in India. Given that the Act and the Rules were enacted prior to the advent of the internet. Government did not anticipate the revolution of the sale of drugs over the internet. As the e -Pharmacies are setup in India 2015, the Drugs Controller General – India the current act does not show the difference of selling drugs either on online or offline. However, in 2015, Indian Internet Pharmacies Association (IIPA).

4. Factors contributing future trends of E-Pharmacy-

E-pharmacy is getting acceptance day by day & future looks bright. As mentioned by Prashant Tandon, co-founder and CEO of 1mg, "more than 45 per cent of the new users on boarded were based out of non-metros. The platforms continued to get a total 30-40 per cent increase in sales compared to pre-lockdown figures. In the recent second wave, e-pharmacies reported a 25-65 per cent increase in sales"². Increasing Internet penetration Internet penetration is increasing with use of affordable smart phone & high-speed internet. Due to this consumer from Rural & remote areas can be able to access E-

Pharmacy Growth of e-commerce adoption – increasing e-commerce acceptance is complimentary

1. Changing disease profile – E-pharmacies majorly cater to the medical requirements of chronic patients. Increase in prevalence of chronic & lifestyle disease will further encourage use of E-pharmacy.
2. Serve consumer best
 - a. Maintain Confidentiality of patient data- The e-Pharmacy would comply with rules regarding personal information of the patients.
 - b. Timely availability of medicines- especially in Tier 3 and rural areas
 - c. Price Discount-E-pharmacy should continue medicine availability at discounted rate

Conclusion

On brief review of the E-Pharmacy industry, the current status is promising for E - Pharmacies business prospects. For this, the government needs discuss current policy with stake holders & make it further transparent & efficient for E-pharmacy.

Moreover, Government needs to ensure affordable, faster, interruption free internet connectivity to semi-rural and rural areas. Secondly E-Pharmacy players need to integrate with local retailers to facilitate timely availability of wide range of medicines at most affordable rate for consumers at semi-rural and rural areas.

Currently, E-pharmacy players working on innovative strategies to reach Tier II and Tier III cities using advanced technology like AI, offering doctor consultations and diagnostic lab services for strengthening the trust of consumers.⁷ E-Pharmacies are also reaching out to consumer in regional languages for education on medicine & disease.

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IMPACT of “BE VOCAL for LOCAL” on TOYS MANUFACTURING INDUSTRY in INDIA

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ABSTRACT

The Hon. Prime Minister propounded mottos as “be vocal for local” and to a greater extent “be local for global” which have paved way for indigenous industries to have a world-wide presence. India is the ever growing and giant consumer for the majority of the product categories including toys. Undoubtedly, the proportion of young population in overall population, rising per capital income, and modernization in different segments of toys for the junior population base, the Motto “Vocal for Local” would witness a revolution in toys manufacturing industry in India. To analyze its impact, consumer perception must be observed while increasing awareness about boosting the Indian economy to make it self-reliant. The motto “Vocal for Local” would also urge the Movement “Made in India”. India accounts for less than 1% with respect to the global toy market which is worth US\$ 678.30-813.96 million. The IMARC report depicts that toy sector in India shall surpass the US\$ 3.3-billion by the end of 2024 while marking down a CAGR nearing 13.3% during the period of 2019 to 2024. With this, India is destined to be the global hub in the late 30th of this century. India’s local toy & games industry would demonstrate a crucial role in realizing the aspirations of “Atma Nirbhar Bharat” too. Towards the efforts to make India stand out for its rich and multifarious toy production, “Vocal for Local” would prove to be influential.

Keywords: Vocal for Local, Toys manufacturing, Made in India, Atma Nirbhar Bharat, Global presence

1. Introduction

The Hon. Prime Minister of India in his “Mann ki Baat” narrated the motto of “Be Vocal for Local” in December, 2020. Eventually, India’s First Virtual Toy Fair was organized and conducted in the month of February, 2021 where various Ministries of Government of India played pivotal role of participating, promoting and aiming to boost Indian toy manufacturing. This industry is capitalizing on the advantage of large young population between the ages 0-15, revolutionary changes brought in the consumption of toy due to COVID-19 global pandemic and Learning Management System (LMS) in education sector linked with utilization of toys for educative purposes. Toys manufacturing industry is pointing out the significant opportunities in every toy segment which can be considered as follows:

Different toys segments prevailing in India are as follows:

- Activity toys
 - Sport and outdoor plays
 - Ride-ons
 - Puzzles
 - Electronic toys
 - Building and constructing toys
 - Pre-school and infant toys
 - Specific need toys (age wise, toys for children with special needs, tradition-based toys)
 - Toys from waste material
- India is a native soil of variety of traditional as well as hi-tech toys. However, considering the global exposure the nation stands out for 1.5 billion US\$ only in terms of toy exports calculating to only 0.5% towards the global share. Undoubtedly, the United States of America, China, and Japan are considered to be the top three competitors in this industry whose contribution to toys manufacturing globally stand maximum. The Indian toy market has huge benefits in the form of huge population for

consumption, diverse range of toys, specialization in innovation and creativity, skilled workforce, Cultural diversity, festive demand for toys and importance on learning & education with toys. In addition to strong economic growth, market witnesses the changed spending patterns. Indian toys market has also roped in successfully into online retail sector which provide support to many other sectors in distinct ways.

1.1 Indian Toy Market Structure

India showcases as the most important consumer for toys considering the huge population exploiting the toys. In terms of population, India ranks second largest country in the world after China with a population of around 1.3 Billion out of which almost a half of the population is aged below 25.

The growing domestic demand for toys in India is accelerated by the country's strong economic growth and rising per capita income. On global fronts, with consistently strong GDP growth rates since last numerous years, India is representing amongst the world's largest economies. The biggest advantage which India accounts for is widely spread Consumers base with disposable income and open markets to cater to the needs of changed pattern of spending moneys. Considering toys market, such factors have resulted in major transformation from traditional toys to intelligent toy, soft toys backed by innovation, technology and also electronic toys.

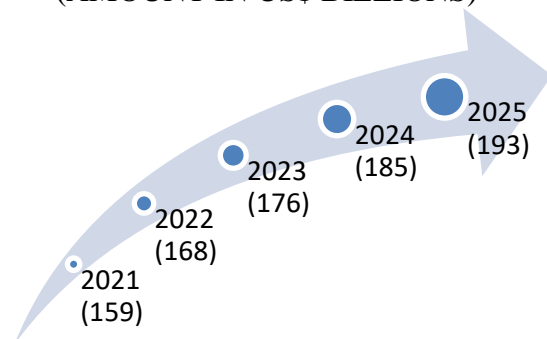
Toys market in India is majorly unorganized and large portion of toys manufacturing is being done by MSMEs as well as large scale manufactures. Almost 60% of toy manufacturers belong

to unorganized sector which consists of small units with maximum 5 employees working in such units. Such units at times are not equipped with technology, not having requisite capital for increasing production capacities and fostering the expansion plans. There also exists a category of manufacturers in India who manufactures toys belonging to well-known international brands. The demand for toys varies with gender. Considering that, Unisex toys have been manufactured and consumed in India on a greater extent. The below table considers the market share of toys by gender differentiation.

TABLE I : GENDERWISE TOYS MARKET IN INDIA

Market share by gender	Percentage
For Boys	
For Girls	

FIGURE I: INDIAN TOYS MARKET SIZE BY YEAR.
(AMOUNT IN US\$ BILLIONS)



1.2 Need For Transformation

In the last week of February, 2021, Hon. Prime Minister inaugurated the country's first ever virtual toy fair where more than 1000 virtual stalls participated and knowledge sessions by experts were conducted. Various Ministries of Government of India participated to

eventually boost the indigenous Toy manufacturing industry.

The toys market is filled with a wide collection of traditional as well as modern toys. Indian toys manufacturing industry mainly focused on the traditional sources of raw material and conventional methods for manufacturing toys which are made up of wood, cotton, wool, plastic, rubber and also into electronic forms. With growing technologies, there have been changes in consumer preferences. To name few, the plastic/ metal based “Lego” have widely replaced wooden/ Rubber building blocks while Kitty and Barbie dolls are more demanded than traditional cloth dolls. Thus, innovative electronic toys, intelligent toys, and up market plush toys are more demanded than traditional and manual- operated toys.

Towards innovative management, design thinking and learning linked to toys, STEM-based toys have become popular and most demanded. STEM accounts for science, technology, engineering, and math. These toys are relatable to the real world where the focus is not only to provide fun but also education to children. More than 65% parents consider that young children are benefitted from STEM- based toys which encourage mathematics and science studies.

Today’s connected world comprises the Internet of Things (IoT). Thus, technology driven hi-tech toys are more demanded and loved by children. Such toys serve the purpose of learning with fun for children and also cater to the needs of parents who intend to keep track of whereabouts of their children. Connected toys use technological

peripherals such as cameras, Bluetooth, microphones, Wi-Fi etc.

2. Literature Review

There are various studies on toys manufacturing in India covering the particulars including but not limited to present structure, Government initiatives, startup promotion, Innovations, developing the supply chain management.

The branded Indian toys have been replaced by the fairly cheap and easy available Chinese toys. It is projected that Chinese toys have captured almost 80% of the toy market in India. The expected productivity growth for labour and capital indicates that technology played a vital role in the overall productivity growth of Toy manufacturing sector in India. (2014)

Smart toys are popular toys among the age of 8 to 15. Smart toy is a blend of technological intelligence mixed with traditional toy which enhances the toys functionalities. To a highly developed technological savvy generation, smart toys seem to be the perfect option. (2019).

3. Need For Study

On the onset of a proclamation “Atma Nirbhar Bharat” and “Vocal for Local” by Hon. Prime Minister, the steps taken forward towards the upliftment of toy manufacturing industry must be projected to cater to the needs of unorganized sector as such where handicraft, artisans and rural industries which are largely engaged in toys manufacturing. The impact shall be analyzed and pervasive study be undertaken for achieving new milestone by toy manufacturing industry in India. Export promotions, import substitutions, quality improvement, technology advancement, innovation management are

certainly the driving forces when “Vocal for Local” be practiced.

4. Objectives

The objective of this research paper shall be to:

- analyze the impact of Vocal for Local
- evolve methods for fostering the strategies for toys manufacturing industry.
- Create awareness about government policies for encouraging exports of toys manufactured by unorganized sector.

5. Research Methodology

Several secondary sources including online data sources such as Google, Google Scholar, Toys association, IMARC, IBEF, the India Toy Fair and reputed newspapers are referred to extract the data for the study. The publications referred include research papers, Scholarly articles, concerned announcements by various ministries of Governments and articles from online newspapers and journals, etc. This information is mainly used to support the discussion and to conclude the study.

6. Result And Discussion

The objectives of the research paper are thoroughly discussed hereunder:

6.1 Analyzing The Impact Of Vocal For Local

Hon. Prime Minister made an announcement of flamboyant package worth more than Rs 20 lakh Crores while addressing to the nation in the midst of the COVID-19 Global pandemic lockdown. He focused on making India “Atma Nirbhar Bharat”- a ‘self-reliant’ nation. Consequent to that, he urged Indians to widely promote “be vocal for local” campaign. Such campaign was considered as an addition to

the ‘Swadeshi Movement’, a statement which is having highly respected legacy in the history of India.

In order to achieve the aim of ‘Atma Nirbhar Bharat,’ the Indian government not only wants products be made in India, but also want to promote local brands, manufacturing, and supply chains, etc. Vocal for Local campaign is been targeted mainly for local brands to strengthen them to achieve global presence. The campaign would witness strong pillars to the foundation of small local businesses on the backdrop of global pandemic facing the atmosphere of uncertainty. The mindset of free India should be 'vocal for local' while appreciating and encouraging our local products. Indians need to move forward with the mantra of Make for the world along with Make in India. To match and trail the same to toy manufacturing industry in India, it can be interpreted that the local toy manufactures must be provided with necessary infrastructure, facilities, training for increased production, fostering innovations, and widening the supply chain management for large market reach out.

To analyze the impact, following factors will be determinants:

- Scope for innovation and improvement in the existing toys segments
- Large foreign direct investment in toys sector
- Upliftment of rural areas where artisans, handicraft businesses are mainly situated.

6.2 Evolving Methods For Fostering The Strategies For Toys Manufacturing Industry

The toys market is filled with ample of innovative toys which are produced by

MSMEs, and large indigenous manufactures and also imported toys of various international brands. Methods for fostering the strategic for toys manufacturing industry are discussed below:

- **E-Commerce:**

With the evolution of smartphones and other digital media platforms, online sales channels in short e-commerce have facilitated heavy boom in India. Since the quality and features of products, prices, discounts, warranties, customer reviews and grievances can be checked and compared on various digital platforms, these e-commerce channels have proven the ever-growing speedy distribution channels for toys manufactured in India.

- **COVID-19 Pandemic effects:**

On the backdrop of COVID 19 pandemic, innovative engagement with child for learning at home must be considered. When children have been savvy with the smart phones and all digital platforms, toys with electronic features, easy learning apps, audio-video features online games, offline games must be developed for innovative learning experience.

- **Strong supply chain systems:**

FIGURE II: SUPPLY CHAIN
DIAGRAM



Supply chain channel plays a very important role in the distribution function. The customer demand for particular products is being generated by the

marketing channels and thus such supply chain channels play a vital role in fostering the competitive advantages to the firm. Earlier, Consumers used to buy toys from traditional outlets such as departmental stores, supermarkets, and exclusive toys stores. Sales from e-commerce platforms, hypermarkets, toys franchisee stores have increased tremendously in last 5 years. Maximum efforts be made to propagate domestic toys in pre-schools, schools, day care centers and crèches.

- **Start ups in toys manufacturing industry:**

Hon. Prime Minister urged the start-up entrepreneurs to explore the toys manufacturing sector. He insisted wide consumption of local toys and be self reliance with support of big industry players in India thereby reducing dependence on foreign goods.

Hon. Prime Minister's call of 'be vocal for local' aims to expand the country's start-up environment. The plans consist of creating more and more local brands and elevate them at a global level. Technological developments will be in place to achieve global outreach of indigenous businesses. Digital marketing will also prove as fundamental for the maximum consumer base to cover.

- **Promotional activities:**

The India Toy Fair 2021 proved to be fruitful to analyze the strengths, capacities and prospects of toy manufacturing industry in India. The geographical diversity, customs- tradition based toys, skills based toys and specialty toys were given much focus. Hon. Prime Minister in his speech during the India Toy Fair sensitized educational institutions for organizing "hackathons" for students. Such efforts would bring innovations in online games, apps, toys design and

technology. He expected that such toys would also reflect Indian ethos and values.

The creation of Toy Labs was an initiative of Indian government to promote traditional toys manufacturers in the India for making an innovative Indian-theme based toys. Such labs would assist specialized toy marking with quality certifications keeping original designs where such toys would be catering to the needs of children to learn, play and innovate.

- **Growth story:**

- The domestic demand for toys in India accounts for more than 1 billion US\$. However, 80% of demand is satisfied with imports mainly from China, US and Japan. Only 20% of such demand is served by the Indian toy manufacturers. On an average, the toys worth more than 600 million US\$ are imported from China only because of cheap prices and plenty availability. The worldwide demand of toys is worth more than 100 billion US\$ and since several decades, the United States of America, China and Japan have driven the worldwide toys market in terms of exponential sales. In 2019-2020, India exported toys worth 130 million US\$ where the United States of America and United Kingdom remained the hot destinations of exported toys. Considering this export, India's share to the global market stood at nearly 0.5% which is worth 1.5 billion US\$.

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Notably, Indian presence at global market share has been growing with a strapping pace touching 15% per annum which certainly indicates a huge potential of growth of toy manufacturing industry on the global fronts. With such affirmation, the exports are anticipated to reach 2-3 billion US\$ by end of 2024.

“Be Vocal for Local” campaign has brought confidence among Indian toys manufacturers for proving their presence and brand power at the global stage. SO far as the existing big bands in India, they changed their strategies of business and decided to focus on ‘Indian and indigenous’ as big motto and layout. MSMEs would earn significant benefits because of such campaign backed by the financial stimulus package of worth Rs 20 Lakh Crores announced by Hon. Prime Minister.

6.3 Creating Awareness About Government Policies For Encouraging Exports Of Toys Manufactured By Unorganized Sector

It is anticipated that the Indian Companies dealing with the imported toys would concentrate more rather on exploring Indian brands due to increase in existing custom duty in India. The existing custom duty of 20% would be increasing to 60% which ultimately would put a damper on importing the toys from abroad. The Department for Promotion of Industry and Internal Trade (DPIIT) invites not only the large-scale manufacturers of India to pump in investments in toy manufacturing industry but also top global toys making brands to invest and plan to discuss Indian-themed toys.

7. Conclusion

In this Review Paper, I have acknowledged current works of various researchers from the diverse range of Public Administration and attempted to find out the Impact of Vocal for Local on toys manufacturing industry. I have tried to concentrate on the impact, strategies and driving forces for evolution in toys manufacturing in India.

The expensive imported toys destroyed the concept of collective gaming and

demonstrated that the child would be engaged standalone. The working class parents usually like the idea of letting their child sit alone and play with such toys peacefully. However, the psychological factors are ignored where the basic needs of child would be to engage with like-minded, same aged children and needed motivation and appreciation at every stage of progress.

Finally, I conclude while expecting transformations in toys manufacturing and consumption patterns with rigorous efforts to turnaround a situation in toys markets. The government policies, subsidies, technological advancement, training for Upliftment of existing unorganized sector, media and promotions, strong distribution network etc. are the driving forces along with the mantra of Vocal for Local.

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A COMPARATIVE STUDY OF MARKETING STRATEGIES OF SELECTED PHARMACEUTICAL COMPANIES.” – A LITERATURE REVIEW

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ABSTRACT

A study was undertaken with the objectives of studying the concept of marketing strategy of pharmaceutical companies, understanding the differences in marketing strategy of Pharmaceutical companies, investigating impact of marketing strategies on sales of Pharmaceutical companies, analyzing the impact of marketing strategy and Branding of Pharmaceutical companies on consumer Perception, and, evaluating challenges and opportunities for Pharmaceutical companies. Before the full-fledged study was undertaken a literature review was carried. This paper presents the same and leads to the research gap that prompted the study.

Keywords: Marketing Strategy, Pharmaceutical Companies, Literature Review, Consumer Perception,, Evaluating Challenges

Introduction

Marketing strategies must empower a company to develop responsiveness to the present challenges and to anticipate the future requirements of the market, for which the company need to prepare in terms of its commitments and offers. Pharmaceutical industry has been changing in a fast speed due to globalization of the markets, combination of the world pharmaceutical industry and expanded competitiveness of the industry due to innovations and expanded alliance through mergers and acquisitions of the firms are responsible for the high concern of marketing individuals in this field. Pharmaceutical markets have experienced unpredicted changes, being research oriented, knowledge based and capital intensive industry it calls for high attentiveness of the policy makers. For marketing products effectively companies need to engage themselves in understanding the most recent developments and strategic moves of the competitors, for which they are compelled to more concentrate on research and development for improving the offers and fortify the sales force to make the offer to arrive at the target market. In this manner, marketing of pharmaceutical products is challenging field of business, where the achievement relies upon the quality, the people, technology and strategies. Like in other industry, pharmaceutical companies have an extreme area of achieving

customer satisfaction and the resultant advantages in the form of brand loyalty, increased market share, increased sales, high revenue and profits. As stated by Bartlett and Ghosal (1989), attainment for companies of today and tomorrow will be those one who might be able at the same time to satiate local needs, expanded global usefulness and strive for constant innovation and pledge worldwide learning. In this way pharmaceutical companies and industry largely depends upon the market orientation of the companies and their capacity to comprehend the customers' expectations and means to match them with right type of products, message, delivery and pricing strategies.

A literature review was carried in this context with the following objectives:

1. To review literature on marketing strategies in general,
2. To review literature on marketing strategies of pharmaceutical companies,
3. To review literature on impact of marketing strategy on sales performance of pharmaceutical companies,
4. To review literature on impact of marketing strategy and branding of pharmaceutical industries on consumer perception and

To review literature on challenges and opportunities for pharmaceutical industries

This paper presents select reviews under related themes.

Review Of Literature

Marketing Strategies In General

According to Jain, A., et al. (2020), the notion of green manufacturing has gained traction among manufacturers as a result of government requirements and increased customer ecological concern. Firms are rethinking their marketing strategies in light of the fact that green manufacturing can yield long-term economic and environmental benefits when enormous efforts are directed toward green marketing. Despite the fact that many academics have researched the significance and conceptual evolution of green marketing, none have investigated the approaches in a multi-criteria environment and from a multi-stakeholder perspective, which is the study's curiosity. In this example, a real-life instance of a manufacturing corporation that needs to choose an appropriate green marketing plan from four available strategies for promoting its newly introduced green product, namely

- I. Defensive Green,
- II. Lean Green,
- III. Extreme Green, and
- IV. Shaded Green.

Marketing Strategies of Pharmaceutical Companies

1) According to Crick, J. M., et al. (2020), while competition (simultaneous collaboration and competition) should categorically effect firm efficiency, it is unclear how these business-to-business marketing tactics may be implemented during large-scale crises. As a result, this paper explores how corporations exploited rivalry to deal with the novel Coronavirus (COVID-19) pandemic, influenced by resource-based theory and the relational perspective. Key examples include retailers sharing stock-level data, pharmaceutical businesses working together to develop a vaccine, technological behemoths partnering for the greater good, and charities forming alliances for a common goal. This study adds to the current literature by emphasising the variety of cooperative approaches that businesses can use in the

midst of a global crisis. Cooperation practitioners must weigh the risks and benefits of their work. As a result, they must determine whether to continue assisting their competitors after the pandemic has ended, or to continue operating under original business principles. This paper concludes with some recommendations for future research.

2) The test drive approach, according to Adler, R. M. (2020), aids important decisions about minimal strategy. The image focuses on strategic marketing decisions in the pharmaceutical industry. Sections 10.1 and 10.2 describe the structure of the prescription medicine industry as well as how pharmaceutical companies market to this sector. Section 10.3 exhibits a test drive model for competitive drug marketing decisions, whereas Section 10.4 depicts the results of a test drive simulation and inspection for a realistic critical marketing decision. Section 10.5 discusses why the decision test drive solution outperforms alternative investigative approaches.

Impact Of Marketing Strategy on Sales Performance of Pharmaceutical Companies

1) Kumar, P., et al. (2020) stated that marketing strategies stimulate the firm to unearth areas that are being disturbed by several factors. This is embraced to decide the target market in order to accomplish prosperity in the organization. An effective marketing strategy would possibly help in captivating new customers as well as sustaining for the longer-term. Thus, this can bring about the accompanying advantages such as products and services can be offered with exclusive components, viable department coordination, concentration on scarce resources, subsequently building a better marketing plan, selection of target market for easy entry and accumulation of 4 marketing p's. Accordingly, the increase in sales can be accomplished. The strategy ought to be viably formulated to witness the performance results. This study focuses on the determinants of marketing strategy on performance results. The information captured from 119 marketing professionals in the field of the biomedical healthcare industry

by utilizing a questionnaire. The questionnaire incorporates variables to measure the demographic profile of the professionals and 3 constructs of marketing strategy creativity, marketing strategy improvisation, and performance result. Collected data were analyzed through analysis of frequency, variance, mean, and regression. Results show that marketing professionals have comparable perspectives on marketing strategies. The findings of the regression analysis contend that the improvisation determines performance results in the marketing strategy.

2) According to Arrawatia, M. D. M. A. (2019), the pharmaceutical sector in India is rapidly expanding in all areas, and it is therefore necessary to analyse marketing and sales insights. Regardless, the relationship between sales and marketing and its impact on corporate success remains an undiscovered territory in a variety of industries, particularly the pharmaceutical sector. Because of the aforementioned shortcomings, the primary purpose of the proposed study was to analyse the impact of sales and marketing on the business performance of chosen pharmaceutical enterprises in India. Small and medium-sized firms (SMEs) play a key role in the development of the Indian pharmaceutical sector, accounting for more than 40% of industry turnover and supporting 48% of the country's pharma. Because the pharmaceutical industry is one of India's emerging industries, sales and marketing tactics have had a considerable impact on its growth. The current study examined the marketing and sales tactics employed by pharmaceutical companies to boost their bottom line using a cross-sectional and explanatory methodology. The most often used research models in social science research are positivist realism and interpretive approaches, with specific research procedures being qualitative and quantitative methods. The nature of the subject under inquiry, as well as the researcher's personal experience, would influence the paradigm of choice. The study will employ a hybrid approach, combining interviews and structured questionnaires aimed to elicit information about the research aims.

Impact Of Marketing Strategy And Branding Of Pharmaceutical Companies On Consumer Perception

1) Malaysia is ranked sixth in the Asia Pacific region for obesity and diabetes, and first among Southeast Asian countries, according to Tajuddin, U. N. R. A. et al. (2020). Obesity and diabetes can lead to life-threatening noncommunicable diseases such as hypertension and heart disease. Buying and eating habits are intricately intertwined, and e-word-of-mouth has a tremendous influence on these behaviours (e-WOM). However, a scarcity of study in this field makes reaching an agreement on the relationships between the variables involved difficult. The purpose of this study was to investigate the association between e-WOM and customer purchase intent among Malaysians who utilise dietary supplement products. The brand image was established as a moderator between e-WOM (quantity, quality, and sender expertise) and customer purchase intent. To analyse 213 survey usable sets, the Partial Least Squares Structural Equation Modelling (PLS-SEM) approach was utilised.

According to the data, e-WOM quality, e-WOM quantity, and sender skill all have a strong relationship with consumer purchase intention. In any case, there was no moderating influence of brand image on the connection between e-WOM quantity, e-WOM quality, sender skill, and customer purchase intention. This study contributes to the body of information on e-WOM, which influences client purchase intentions.

2) According to Srivastava, R. K., et al. (2018), the study's goal is to investigate customers' attitudes regarding over-the-counter (OTC) items as well as the factors that impact (OTC) products in India. It also intends to investigate the impact of demographic factors on customers' purchasing behaviour for (OTC) items. The inquiry is intended to be exploratory in nature. It is based on first-hand information. A questionnaire is used to collect primary data. Thirty respondents took part as a test case to help understand and evaluate the questionnaire. The information gathered is used to identify consumers' attitudes toward

over-the-counter (OTC) products. It was completed between the 1st and 30th of October, 2015. The responders are from Mumbai, a metropolis, and Nasik, a populous class city. A total of 180 people were chosen at random to take part in the survey. There were ninety responders from Nasik and ninety from Mumbai. Respondents were contacted at random. The perception of OTC among consumers is taken into account. Demographic considerations are also taken into account when comparing impressions between two cities. According to the findings of the study, there is a substantial variance in perception of OTC based on age and gender. Doctors' recommendation, pharmacists' advice, brand name, previous experience, prior awareness, safe to use, friends' advice, and user testimonials are all factors that influence OTC product buying behaviour. This is the first time an evaluation of emerging markets such as India has been conducted in comparison to western nations with well-developed marketplaces.

Challenges And Opportunities For Pharmaceutical Companies.

According to Procopio, A., et al. (2020), this part includes the source material qualities commonly established in polymers to 3D printing technologies and drug delivery applications. A few published examples are used to show the benefits of various technology as well as the drawbacks of

others. Furthermore, due to the novelty of this technology, a short examination of the regulatory impact and implementation of 3D printing in a clinical and commercial scenario is presented.

CONCLUSION AND RESEARCH GAP

Most of the studies have a generalized approach towards studying the marketing strategies of organizations in general and also for the pharmaceutical companies. Comparative analytical studies based on company specific characteristics are not found much. If a pharmaceutical company is dealing in main product line while other is research and development oriented, does this factor affect the marketing strategy? This question has not been answered by researchers. And if the strategies are different what are its implications on sales, consumer perception etc. have not been studied.

In the backdrop of the gap, following questions were formulated for investigation:

RQ1 – How do marketing strategies of pharmaceutical companies compare?

RQ2 – What is the impact of marketing strategies on sales of pharmaceutical companies?

RQ3 – What is the impact of marketing strategy and branding of pharmaceutical companies on consumer perception?

RQ4 – What are the challenges and opportunities for pharmaceutical companies?

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A Study on Consumer Attitude towards Branded Smartphones in Rural Area

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ABSTRACT

Consumer durable goods are lifestyle and status improving goods. With amplified advertisement efforts made by all companies, these products are becoming familiar with rural market. Unbranded durable products are attracting consumers on the basis of lower price positioning. But in long-term these products tend to be costlier as their quality is poor so they lead to more maintenance. Also, the user's safety is under question mark with the use of these products. Present research will assist the branded Smartphone companies to know the attitude of consumers from rural market. This in turn will increase their market share and also invisibly help to improve the lifestyle of customers from rural market by offering them more value satisfaction.

Introduction:

As the world's second-fastest-growing economy, India's consumer class is rapidly expanding, resulting in tremendous expansion in the consumer durables sector. The demand for consumer durables has remained consistent and is anticipated to remain so in the next years, thanks to rising income levels, simple access to credit, and improved awareness of new goods and models. According to a McKinsey analysis, India's overall consumption is expected to double in the next decade. In the worldwide consumer confidence survey, India ranks top with 131 index points (Nielsen 2011).

Revenue from the consumer durables sector reached USD 9.7 billion in 2015 and is predicted to reach USD 12.5 billion in 2016. (IFBI, January, 2016). India's electronics sector is predicted to grow to USD400 billion by 2020, up from USD94.2 billion in 2015. By 2020, production is estimated to exceed USD104 billion. Up to the financial year 2020, the consumer durable industry is predicted to increase at a CAGR of 13%. (IFBI, January, 2016).

India's handset market, which is one of the world's largest, continues to expand year after year. Due to the limited number of

models on the market, high handset pricing, expensive tariffs, and restricted network coverage in the early 2000s, mobile phones were often only found in significant urban centers and primary cities. With the advent of more global brands and the growth of homegrown manufacturers in the handset industry in recent years, the situation has altered. From 2 million in 2000 to 1009.32 million in 2015, the number of mobile subscribers has increased dramatically (Telecommunication Statistic). In May 2016, India has a total of 1033.20 million cell phone subscribers.

Research Problem:

The fact that a large chunk of India's population (about 69 percent) lives in rural areas highlights the need for a better understanding of the rural market and rural marketing phenomenon. Rural market consumers differ from their urban counterparts in a number of ways (A. Sarangpani, 2009). In the case of consumer durables, just 35 percent of sales come from the rural market, while 65 percent come from the urban sector (ASA & Associates LLP, July 2016). Despite this, the penetration of branded products in the rural market is lower than in the urban market. Furthermore, branded products account for only 10% of the consumer durable market, which is lower in rural markets than in

urban markets (IBEF, 2015). Given the price sensitivity of the Indian rural consumer, low-cost, feature-rich, and locally customized chip designs, as well as a strong distribution network, are all important concerns in the rural market. According to a study, the prices of non-branded smartphones have dropped by 50% in the last year. That suggests a mid-range smartphone cost around Rs. 20,000 in 2014. In 2015, the same configuration costs around ten thousand dollars or less. It is very complex for branded companies to attract and retain the price sensitive customer's base in rural market. Hence to understand value expectations, perceptions and attitude towards branded Smartphone's have become crucial for these companies. This research is aimed to search answers for the following questions:

1. Do consumers in rural market possess unfavorable attitude towards branded Smartphones?
2. How consumers perceive or evaluate various features of Smartphones?
3. Is the price only factor which influences consumers' attitude and intern their purchase decision of Smartphones in rural market?
4. Does consumers' attitude towards branded Smartphones influence their purchase intention?

Literature Review:

Attitude is defined as a "knowledgeable predisposition to respond in a good or negative manner to a situation" (Huang, Lee, & Ho, 2004). According to (Bagozzi & Dholakia, 2002), the most widely accepted definition of attitude is that it is a judgment, such as a spiritual predisposition, that is transmitted by rating a certain object as good or negative. According to (Cole & Woolger, 1989; Emler & Reicher, 1987; Wee et al., 1995), sentiments about counterfeit branded products are inextricably connected to fake merchandise purchase intent. People are willing to acquire non-genuine products because of the low pricing and ease of availability in comparison

to their liable counterparts. Gentry, Rizza, and Gable (M. Gentry, Rizza, & Gable, 2001) Customers who cannot afford genuine branded products but wish to obtain the image and enjoyment associated with owning such products can find a realistic fantasy among counterfeit branded product manufacturers.

Research Gap:

Consumer attitude is one of the significant psychological factors that influence consumer purchase intention. Attitude towards product is widely studied in many research projects but attitude of rural consumers towards smartphones is yet not covered in any previous research, also the relationship between attitude and purchase intention for smartphones in rural market is not yet studied.

Objectives of Study:

Present research strives to explore the attitude of rural consumers towards Branded Smartphones. The objectives of this study are:

1. To study the Attitude of rural consumers towards various features of Branded Smartphones.
2. To examine the relationship between consumer attitude towards branded consumer durable products with their purchase intention.
3. To investigate the impact of various factors on the preference of rural consumers towards branded Smartphones.

Research Methodology:

The research design adopted for study is preliminary descriptive in nature. Exploratory kind of research will also be undertaken to collect secondary data from various sources for formulation of hypotheses, objectives and to gain an insight in to the variables required for this study.

Data Collection:

Both Primary and Secondary data will be required in this study. Primary data will be collected through direct contact method with the help of structured schedule. Secondary data

will be collected from government publications, Consumer Durable Industry statistics, Information about rural area will be collected from census reports.

Sampling

The study will be undertaken in rural area of Pune district. The rural area will be identified based on the definition of rural area given by RBI and NABARD (National Bank for Agriculture and Rural Development). There are 14 Tehsils in Pune district out of them two tehsils viz. Baramati and Indapur are conveniently selected for this study. Baramati tehsil has 116 villages and Indapur tehsil has 114 villages. 20 villages from Baramati and 20 from Indapur are selected based on cross tabulation of population and proximity.

Sample Frame: 40 Villages from Baramati & Indapur Tehsil.

Sample Unit: Users of Smartphones in selected villages.

Sampling Universe: The total population of 400 villages (1, 07,513)

Sampling Technique: Simple Random Sampling

Sample Size: The sample size of 400 is calculated using statistical formula

$$\text{Sample size } n = \frac{N}{1 + N(e^2)}$$

Research Instrument: Primary data is collected using structured schedule. The schedule is to be specifically designed keeping in view the objectives of the study.

Findings:

Table No 1 Attitude of Rural Customers towards Branded Smartphones

Feature/Benefits	Mean	SD	Rank
Durability	4.35	1.92	1
Processing Speed	4.22	1.05	2
Display Quality	3.98	2.01	4
Battery Backup	4.12	1.85	3
Camera Quality	3.93	1.97	5

Price/Value for money	3.65	1.65	6
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(Source: Primary Data)

Above table depicts that, rural consumers have favorable attitude towards features of Branded Smartphones. All features are rated favorably by maximum customers. Durability of branded smartphone has more favorable response (with mean value 4.35) compared to other feature. Price/ Value for money is ranked lowest at 6th position with mean 3.65 which indicates that the prices of branded smartphones are perceived higher and consumers have less favorable attitude towards value for money.

Table No 2. Relationship Between Consumer Attitude and Purchase Intention Descriptive Statistics

	Mean	Std. Deviation	N
Consumer Attitude.	4.40	.725	400
Consumer Purchase Intention..	4.38	.753	400

Pearson Correlations

	Consumer Attitude	Consumer Purchase Intention
Consumer Attitude.	1	.676
Consumer Purchase Intention.	.676	1
N		400

(Source: Primary Data)

Pearson correlation coefficient was calculated for 400 respondents. The correlation value of 0.676 represent high positive association between Consumer Attitude

towards Branded Smartphones and their purchase intention.

Table No. 3. Impact of Various factors on Preference of Rural Consumers towards Branded Smartphones

Coefficients					
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.088	.210		5.179	.000
Social Influence.	.040	.090	.042	.442	.659
Product Scarified	.052	.041	.073	1.274	.204
Product Attributes	.213	.073	.221	2.924	.004
Brand Name	.210	.054	.274	3.908	.000

(Source: Primary Data)

Conclusion

The regression analysis is performed for factors influencing the consumer purchase preference of Branded Smartphones. Beta values of all factor are calculated using multiple linear regression. Product Attribute and Brand Name are the two most influential factors with positive coefficients. The Social Influence and Product scarified has less favourable impact on purchase preference of Branded smartphones.

It can be concluded from analysis of primary data collected from consumers that, consumers under study possess favorable attitude towards branded smartphones. All features/ benefits have more favorable ranking except value for money which has low rank. It is evident that there is high positive association between consumer attitude and their purchase intension. The Product attributes and Brand Image are the two important factors influencing the preference of consumers for purchase of branded smartphones.

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IMPACT OF TECHNOLOGY ON AGRICULTURAL BUSINESS AND ITS PRODUCTIVITY MANAGEMENT.

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ABSTRACT

Technology is one of the successful key for the business development. The agricultural technology is crucial role in the business development. The advantages of new innovative technology are applicable and its output will be very fast in the business system. The farmers and Agri entrepreneurs has developed it growth of business. The Indian and other country in which technology has beneficial for productivity management. The technology is Green house management, precision technology, block chain, Nano technology, Data analytics, and Genetic modification etc. Indian in which technology play important role, in the Economy development.

Key words: Technology, Agriculture, Economy, Business Development, Nano Technology

Introduction

Technology play important role in the Agribusiness management system. The technology has tremendous impact on the agri business development. Indian economy is depends upon the agriculture sector. Agricultural business growth development is successful due the technology adaptation In various business. The changes are done in the agriculture business like that agricultural base industry, Food process industry, Farming management, marketing of agricultural commodity, machinery development, organic fertilizer production, Flower business, Poultry farming Mushroom farming greenhouse hydroponics production etc. In new era modern agricultural drone, satellite photography and sensor, weather forecasting automated irrigation, soil management is applicable in agribusiness system. The utilization of the technology it will impact on increasing productivity, increasing yield, reduce the maintenance cost, and save time for business output.

Objective

- 1) To known the technological impact on Agri business development
- 2) To understand the technological factor which help for productivity management

- 3) To improve product service and agri business model.
- 4) To develop decision making activity in the business system.
- 5) To know the new innovative agricultural technology for business development

Theoretical Background

Technology play important role in the business process system. Technological innovation is more important in modern agri business system, now a day's business industry face the many challenges in production, market the major innovation technology in agricultural business such as vertical farming, automation robotics livestock technology, modern green house, practices, precision agricultural and Artificial technology and block chain. The traditional process business development is not capable for the more quantity of production, so the new desirable technological changes are essential for business development. The utilization of the new innovative technique is lot of change in agri business system. The production and maximum output of agri business is done it has great impact on the economy development. The India gross domestic product, employment sources Green revolution are occurred if the changes

are done due to the technology. One of the important thing that the new innovation technology applicable in the agri business. Foreign direct investment investing agri sector so FDI play vital role in the agribusiness sector Development and economy development. The agri entrepreneur face the problems in agri business start up and it policy it can be overcome by advance agri technology in the field. The technological great impact on agricultural business

- 1) To increase the productivity
- 2) Better management of cost and efficiency
- 3) It can save the time.

Research Methodology

A) Production In The Agricultural Sector Using The New Technology

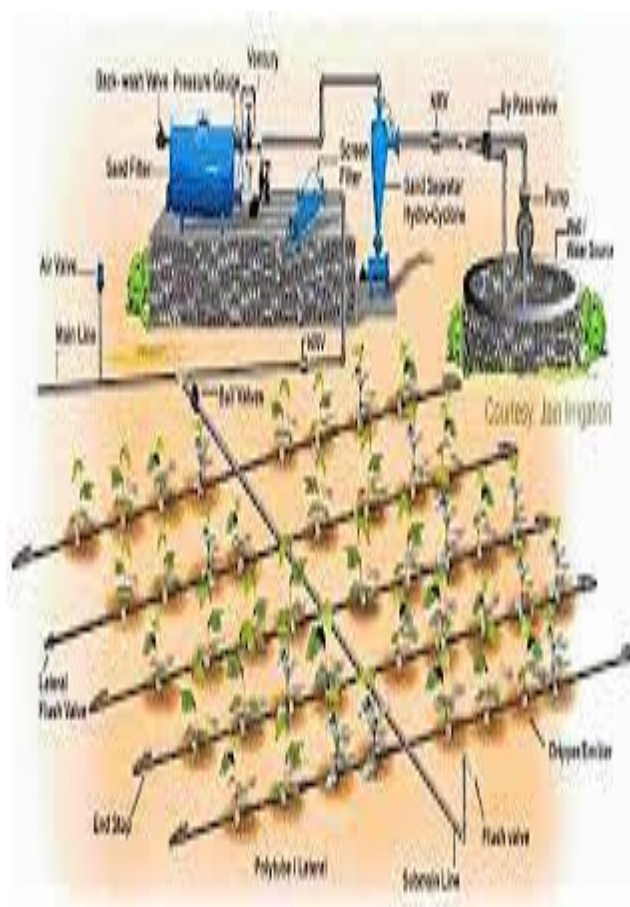


Figure.1 Drip Irrigation Technology

In the Research Methodology Primary and Secondary data is collected from the different sources. Questionnaire were filled from the respondent and collected. The research method data is collect through different sources various books, Journals, Website etc.

Analysis And Discussion:

The technological change is observed in the Agricultural sector old technology and new innovative method is change the agricultural business. This new researching agri innovative technology overcome on the different challenges which can be face the Indian farmer, Agribusiness entrepreneur and researchers.

Bioplastic Technology



Figure.2 Bioplastic Technology

Hydroponic Technology



Figure.3 Hydroponics Technology

B) Use New Technology To Bring Food Production- Vertical Farming-



Figure.4 Vertical Farming Technology

3 D PRINTING-



Figure.5 3 D Printing Technology

Genetic Modification-



Figure.6 Genetic Modification Technology

C) New Innovative Industrial Technologies In Business Industry – Drone Technology-



Figure.7 Drone Technology

Data Analytics



Figure.8 Data Analytics

Precision Agriculture

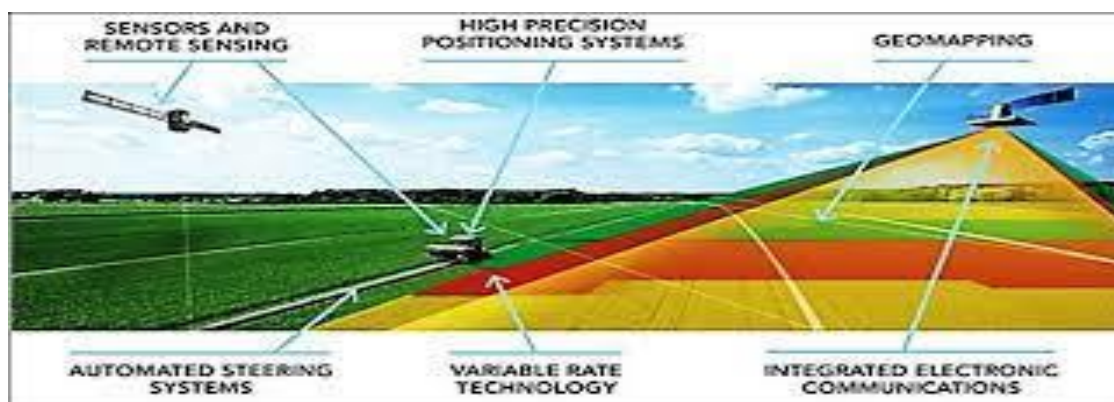


Figure.9 Precision Agriculture Technology

Nano Technology



Figure.10 Nano Technology

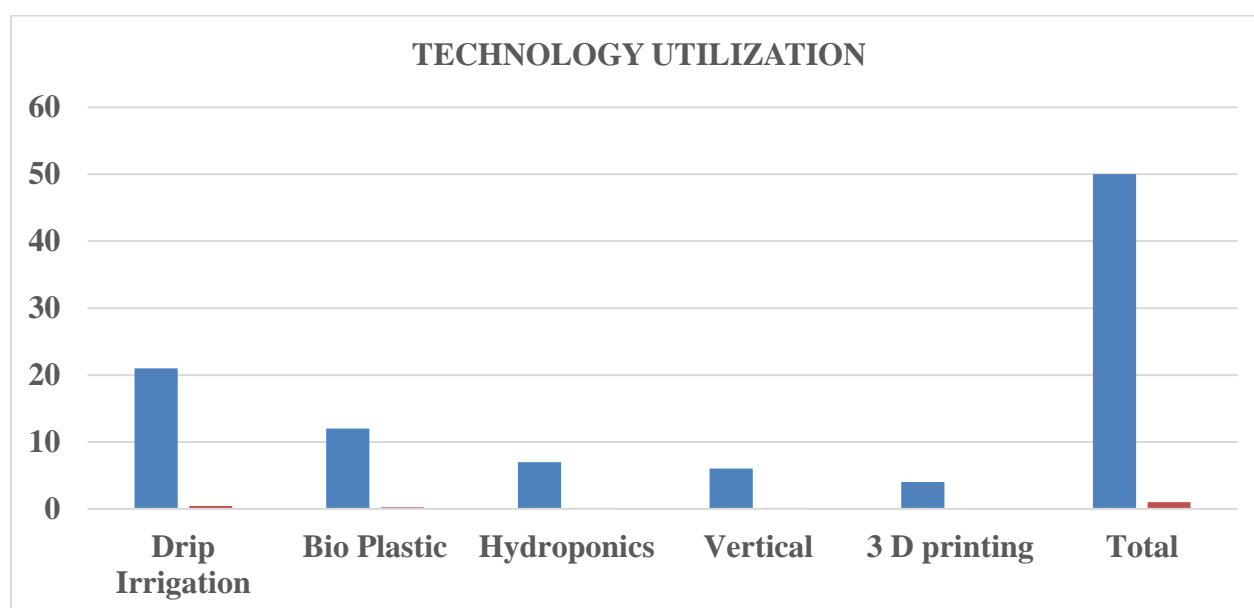
Analysis # Technology Utilization

The data collected from the respondent and tabulated as follows.

Technology	Number Respondents	of	Percentage Respondents	of
Drip Irrigation	21		42%	
Bio Plastic	12		24%	
Hydroponics	07		14%	
Vertical	06		12 %	
3 D Printing	04		08 %	
Total	50		100%	

Table: Analysis of Technology Utilization by the Respondents.

The graphical representation of data is as follows.



Interpretation

From the above analysis it can be interpreted that 42% respondents agreed for the Drip Irrigation, 24% respondents agreed for the Bio Plastic, 14% respondents agreed for the Hydroponics, 12% respondents agreed for the Vertical, 08% respondents agreed for the 3 D Printing technology.

Findings

1) The new innovation technology in the agribusiness is necessary for the growth of business.

2) The cost of business and time for more profit it require the innovation.

3) Indian farmers and entrepreneur are overcome on the challenges, which will generate in the farming and it business process management system.

4) The adaptation of technology in agricultural business it will automatically boost up the growth of Agricultural engineering and other agri input industry.

Conclusion

1. The maximum output from the business and farming innovative technology play an important role.
2. Increase the business output or production due to the technology it will be helpful for economical growth development.
3. Lot of post harvest technological changes in farming and business system are development due to the utilization technology resources.
4. The future scenario of agricultural business is depends on the new Agri technology because it has solve the difficulties in the business system.
5. The Agri entrepreneur has developed abilities to shape own business and significant stock in the business venture.

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AWARENESS REGARDING FOOD SAFETY TRAINING PROGRAMME AMONGST FACULTY MEMBERS OF HOSPITALITY STUDIES

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ABSTRACT

Food Safety Standards Authority of India (fssai) has laid down standards regarding food safety. Faculty members of Hospitality Studies should be aware about all food safety standards and they are supposed to undergo training about it, so they can pass on this knowledge to their students. This study pointed out that 30% faculty members have completed the 'FOSTAC' (Food Safety Training and Certification) by FSSAI (Food Safety Standards Authority of India), HACCAP food safety training or hazard. Within which 68% faculty members found the library collection and services partially useful, 22% found it fully useful to complete the FOSTAC & HACCAP courses. Researcher has also tried to find out the purpose of their visit to library, wherein the faculty members have given fifth rank 'to get information on Hotel related trainings like FOSTAC, HACCAP etc'.

Keywords: Food Safety Training; FSSAI; FOSTAC; HACCAP; Hospitality Studies; Hotel Management; Faculty Members.

Introduction

Training of food safety is essential for the faculty of Hospitality Studies. Hospitality Studies is the base from where students get excellence and knowledge about the food production, food & Beverage Service, Accommodation etc. Hospitality Studies build in the students towards 'Entrepreneurship'. It develops train and build in the skills in them to become an entrepreneur who can find the opportunities from the available assets and also contributes towards the growth and development of the society. This course also build in various skills in students from where they can get an opportunity with Hotel Industry, Spas, Resorts, Restaurants, Bars, Clubs, Fast Food Chains. They can also get an opportunity in Airline, Kitchens / In Flight Operations, Cruise Liners, Indian Navy, Indian Army, Hospitality & Catering Services. Wherever the students will grab the opportunity or start his/her own business food safety is the base. They must know all about the preparation of food, its handling, and its proper storage to prevent foodborne, illness & injury. So first of all faculty members should get into the food safety training programme then they can pass on the knowledge to students.

Problem Statement

Researcher has revealed the awareness regarding food safety training programme amongst faculty members of Hospitality Studies, usefulness of library collection and services to complete the courses and purpose of their visit to library.

Scope of the Study

Researcher has covered the hotel management colleges affiliated to Savitribai Phule Pune University, Pune.

Objectives of the Study

1. To know about the awareness regarding food safety training programme amongst faculty members.
2. To identify usefulness of library collection and services to complete the courses.
3. To find out the purpose of the visit to library by the faculty members.

Research Methodology

Researcher has collected the data by using the questionnaire prepared through 'Google forms'. It helped to collect the data easily from the faculty members of Hospitality Studies.

Population of the Study

Researcher has considered the full time faculty members of the Hospitality Studies institutions affiliated to Savitribai Phule Pune University, Pune. There are total thirteen number of hospitality studies colleges affiliated to SPPU.

Sample for the Study

Researcher has decided the sample size as per Krejcie and Morgan table. Accordingly, the sample size of respondents for the faculty population is 108 out of 143 size of population.

Literature Review

Khandke and Mayes (1998) guided about the systematic implementation of HACCP plan, wherein they focused on transfer of ownership of the HACCP plan, training for implementing it and about its maintenance. Taylor (2001) identified the slow uptake of HACCP in small companies in regards to the production of safe food. He discussed about barriers in implementing HACCP which talks about the need of training in implementing it, requirement of technical expertise and the constraints of time and money. Kumari and Kapur (2018) evaluated the compliance to food safety and hygiene standards in catering establishments of Delhi, wherein they found the need to improvise the sanitary conditions. Lake (2018) noticed underperformance in terms of trade and food safety while studying the South Asian free trade agreement. Kumari and Kapur (2019) discovered the need of continuous training to be given to the food handlers to produce safe and hygienic food.

1. **FOSTAC**: “Food Safety Training & Certification is a large scale training programme for the food business operators”.

2. **HACCP**: As defined by the Food and Drug Administration, “HACCP is a management system in which food safety is addressed through the analysis and control of biological, chemical and physical hazards from raw material production, procurement and handling to manufacturing, distribution and consumption of the finished product”.

HACCP is a tool which assesses the hazards and found control systems which focuses on preventive measures instead of testing of end products.

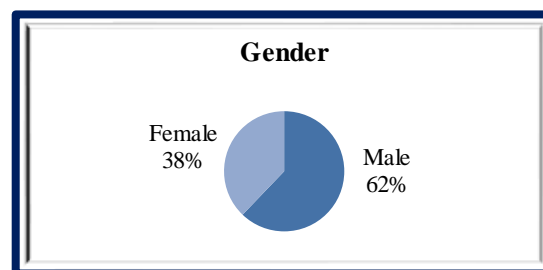
“HACCP is a system which identifies, evaluates, and controls hazards which are significant for safety”.

Data Analysis and Interpretation

Researcher has collected the data from the respondents through questionnaire. Researcher has received 74 responses i.e. 68% response received from the sample population.

From the received data, it seems that 62% maximum numbers of faculty members are male.

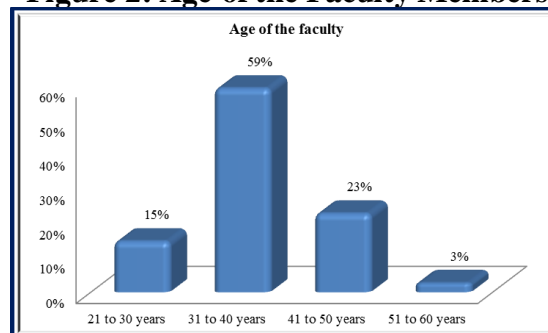
Figure 1: Gender of the Faculty Members



Source: Primary Data

Figure no. 1 demonstrates that the Hospitality study is male dominant field, as 62% [46] faculty members are male and only 38% [28] faculty members are female.

Figure 2: Age of the Faculty Members

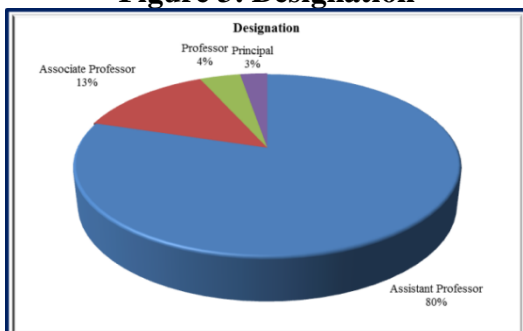


Source: Primary Data

Figure no. 2 clearly indicate that, most of the faculty members i.e. 59% [44] in hospitality studies are young between 31 to 40 years, followed by 21 to 30 years 15% [11], then between 41 to 50 years 23% [17]

and only 3% [2] faculty members are from the age group of 51 to 60 years.

Figure 3: Designation



Source: Primary Data

As shown in figure no. 3 most of the respondents i.e. 80% [59] are Assistant Professor, 13% [10] are Associate Professor, 4% [3] are Professor and 4% [2] respondents are Principals.

Figure 4: Teaching Experience

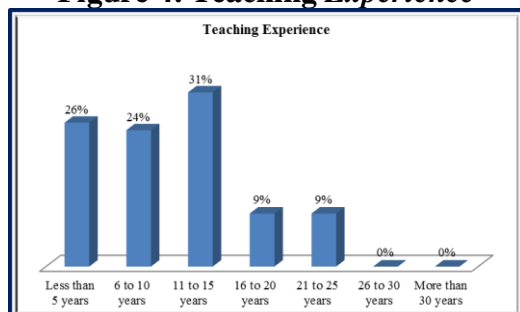
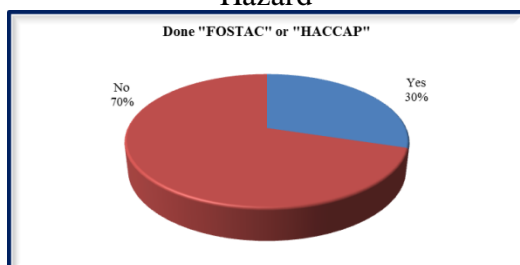


Figure no. 4 indicates that Most of the faculty members i.e. 31% [23] have 11 to 15 years' experience. 26% [19] of them have less than 5 years' experience, 24% [18] of them have 6 to 10 years' experience, 9% [7] faculty members have 16 to 20 years' and 21 to 25 years' experience.

Figure 5: Completed the "FOSTAC" [Food Safety Training and Certification] by FSSAI [Food Safety Standards Authority of India], HACCAP Food Safety Training or Hazard



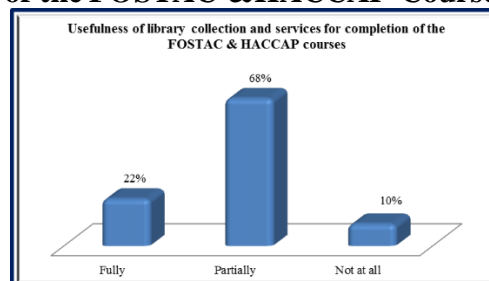
Source: Primary Data

Figure no. 5 explains that only 30% [22] faculty members has completed their FOSTAC [Food Safety Training and Certification] by FSSAI [Food Safety Standards Authority of India], HACCAP food safety training or hazard analysis and risk based preventive controls.

Usefulness of library collection and services for completing the courses:

The aim of this question to know whether the collection and services of the library is useful to the faculty members for completion of the FOSTAC, HACCAP or hazard analysis and risk based preventive controls training & certification.

Figure 6: Usefulness of Library Collection and Services for Completion of the FOSTAC & HACCAP Courses



According to the figure no. 6, 68% [47] faculty members, library collection and services was partially useful for completion the courses, 22% [15] said that it was fully useful, 10% [7] find it not at all useful.

Table No. 1: Purpose of Visit to Library (See Appendix)

Researcher has tried to find out the purpose of the visit to library by the faculty members.

The question was asked to know the purpose of faculty member's visit to library.

The question was analyzed by using a Likert scale. A Likert scale of Always – 5 to Never – 1. (Always=5, Frequently = 4; Sometimes = 3; Rarely = 2 and Never = 1)

Thus scores were obtained and used to rank to know the purpose of faculty members' visit to library such as for availing library services like issue, return,

reservation, to avail library facilities like Inter Library Loan, Photocopy, to refer the information sources like books, journals, project reports, newspapers, to access e-resources, browsing the internet, browsing the YouTube videos, to prepare lecture notes, to get information on hotel related trainings like FOSTAC, HACCAP etc.

The data presented in Table No. 1 displays that 'To refer the information sources like books, journals, project reports, newspapers' scored at top i. e. 333 securing first rank. **'To get information on Hotel related trainings like FOSTAC, HACCAP etc.'** scored **271 securing fifth rank** and 'To avail library facilities like

Inter library loan, photocopy' was the least mentioned purpose of visit to library.

Conclusion

Faculty members of Hospitality Studies should be aware about all food safety standards and should take training of it, so that they can able to provide the essential knowledge to their students. Librarian can also develop the library collection, Food Safety Training Manual and provide essential services to the faculty members which can assist the faculty members to gain more knowledge.

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VIRTUAL COMMUNICATION - A TREND IN THE NEW NORMAL: COMPREHENSIVE BIBLIOMETRIC SURVEY

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ABSTRACT

This paper is an attempt to evaluate the knowledge composition in the field of Virtual Communication which is a must to go for in the new normal with the support of an in-depth bibliometric and network analysis. Findings are drawn from a total of 590 research articles on virtual communication published in research journals and conference proceedings listed in Scopus, spanning over last 38 years from 1983 to 2021. Articles written in English were considered for the current study. This bibliometric assessment provides a diverse perspective by depicting the landscape and developmental path of the research carried out in the field of virtual communication over the time. Analysis is done basis multiple bibliometric parameters with the use of various network analyses and data analysis techniques. Findings of the study reveals the rising number of publications in the virtual communication research domain, where 2021 has witnessed highest amount of publication till date. United States is surfaced as the leading nation followed by United Kingdom and Japan in terms of number of publications in the said field. Further bibliometric findings lay a strong foundation for the in-depth review of literature and empirical study. This marks the scope for future research.

Keywords: Virtual communication, electronic communication, Bibliometric analysis, Network analysis.

1. Introduction & Review of Literature -

1.1 Introduction to Virtual Communication

The Internet has introduced previously unknown modes of communication and new languages into our lives. One of such modes of communication is the virtual communication (Morozova & Rozhnenko, 2021). Man has communicated since the first signs of human life. From simple exchange processes to speaking through the use of symbols and written communication (Colin, 1966). Communication is now a fundamental process for companies and a very important Dimension of virtual team work (Purdy et al., 2000). Considering the business scenario during and post COVID-19, it has laid compulsion on many businesses to operate on virtual platform. This has increased reliance on virtual communication for the smooth functioning of virtual teams (Morrison Smith & Ruiz, 2020).

1.2 Literature Review

As correctly stated by (Mitchell & Zigurs, 2009), virtual communication is a mode of communication that includes the use of technology- audio and video to communicate with people who aren't physically present in front of us. Even though virtual communication started way back with the discovery of telephone, the arrival of

webcams, video conferencing and instant messaging, made virtual communication a big success (Shukla, 2012).

With the outbreak of the corona virus curse, face-to-face business communication has been wiped out for the time being. In-person meetings were fast replaced with virtual communication tools (Anderson et al., 2007). Empirical study conducted by Weigand et al., (2003) highlighted the advantages of virtual communication over traditional mode of communication. Apart from been quickly, virtual communication is also cost effective. Organizations can save on, spending on travelling expenses merely by initiating a video call (Kresimir et al., 2006). In a proficient environment, virtual communication saves a lot of time and funds. By using any instant messaging apps or web conferencing tool, we can exchange any information across the globe in seconds. It's a rescuer in case of a disaster (Shawn et al., 2015). Most of the texts we exchange with the aid of instant messaging application or internet conferencing device are encrypted, hence there is no fear of our messages being misused (Yi et al., 2006).

The largest challenge related to the use of virtual verbal exchange is that people's interpersonal abilities are diminishing (Ya-

Chun, 2014). To overcome the challenges of virtual communication, organizations have geared up by imparting required training to its manpower.

2. Research Methodology & Data Collection-

This research attempts to use bibliometrics to observe the research trends in the field of virtual communication in last 38 years (1983 - 2021). The rationale behind taking 1983 as a base year is, the first ever article on the study of virtual communication was published in 1983. (Broadus, 1987) defines it as "a quantitative study of physical publishing units or bibliographic units or their substitutes". The Scopus database retrieved 756 research articles, as; it is the largest peer-reviewed citation database in the fields of natural sciences, engineering, technology, medicine, social sciences, arts, and humanities, with more than 20,000 peer-reviewed academic journals (Chaudhari et al., 2019). The data was collected in September 2021 for bibliometric analysis. The data is collected by searching for "titles, abstracts, keywords" in the Scopus database by defining the corresponding search terms as Virtual communication, communication. Criteria for refining the search results were Articles and Conference papers published in English language only were considered.

3. Bibliometric Analysis

(Pritchard, 1969), invented the term bibliometrics. "Application of mathematics and statistical methodologies to literature and other forms of communication," he explained. "The application of statistical analyses to investigate patterns of authorship, publication, and literature use" is another definition of

bibliometrics (Lee et al., 2020). The cross-science of quantitative analysis of all knowledge bearers using mathematical and statistical methodologies is referred to as bibliometric analysis (Iftikhar et al., 2019). Bibliometrics is a comprehensive knowledge system that combines mathematics, statistics, and philology, with a focus on quantification (Garfield, 1987). The amount of literature (different publications, especially journal papers and citations) is the primary focus of bibliometrics (Moya-Anegón & Chinchill, 2007).

The Scopus database was used to find 590 research articles and conference papers, which were then analyzed. The data was analyzed in two sections: "bibliometric analysis" and "network analysis."

In bibliometric and network analysis, bibliometric indicators such as geographical analysis, citation counts, subject areas, most cited papers, most influential authors and co-occurrence of keywords are analyzed and presented in the form of graphs, charts, tables and network diagrams with the help of vosviewer and imapbuilder.

3.1 Analysis of yearly publication

590 Journal articles and conference papers were retrieved for the duration of 38 years (1983-2021). Trends for yearly publication for virtual communication are listed in fig 1 and fig 2. It can be seen that the first article on virtual communication was published in the year 1983. Between 1984 to 1989 there were no articles published on the said subject. From 1990 onwards there has been at least 1 research article published every year. From the year 2007, there has been a consistent rise in the number of articles amounting to 74 articles in the current year i.e. 2021.

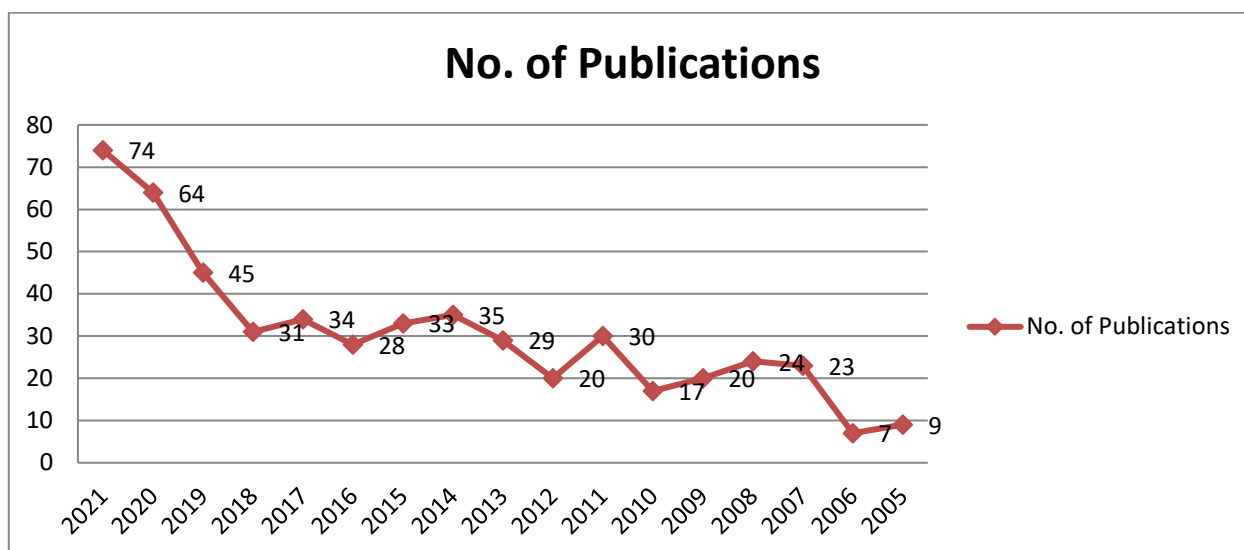


Figure 1: Annual publishing trend from 2005-2021 in virtual communication research

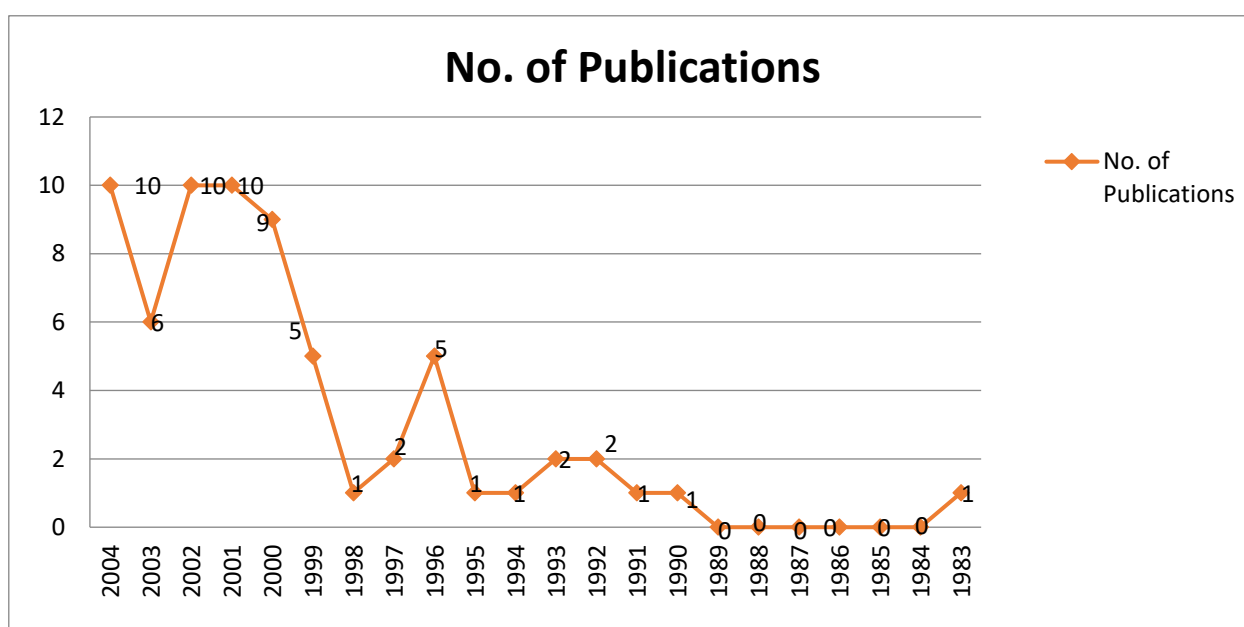
Source: <http://www.scopus.com> (fetched on 21st September 2021)

Figure 2: Annual publishing trend from 1983-2004 in virtual communication research

Source: <http://www.scopus.com> (fetched on 21st September 2021)

3.2 Analysis based on subject areas

Table 1 and fig 3 show a subject-by-subject examination of retrieved papers in the virtual communication study domain. It is clear that the most study is done in the fields computer

science having 269 articles constituting 25.5% of the total publications followed by social sciences with 196 articles capturing 18.6% of the share and other fields sprawling behind.

Table 1: Distributions of documents published by top 10 subject areas

Subject Area	Documents (Articles & Reviews)
Computer Science	269
Social Sciences	196
Engineering	137
Business, Management and Accounting	73
Medicine	59
Mathematics	57

Arts and Humanities	54
Decision Sciences	42
Psychology	41
Environmental Science	27

Documents by subject area

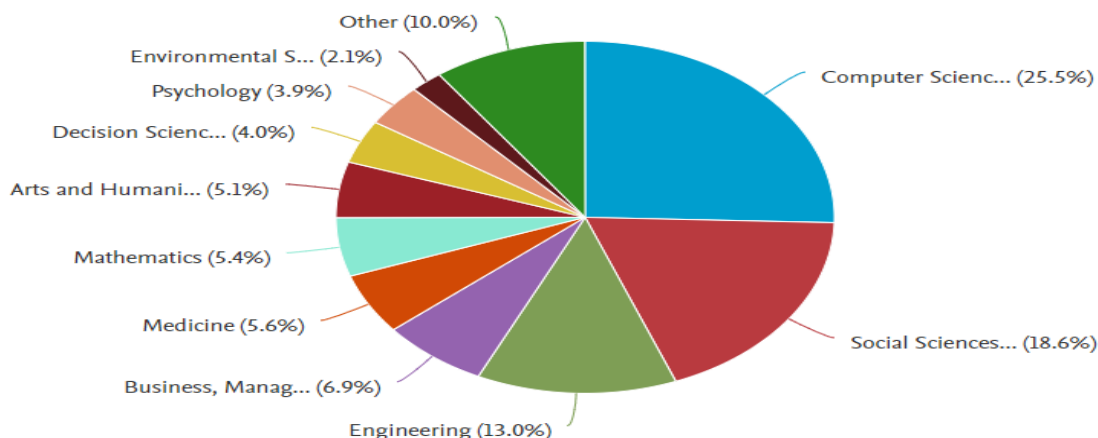


Figure 3: Subject area wise distribution of extracted literature

Source: <http://www.scopus.com> (fetched on 21st September 2021)

3.4 Analysis based on the author of documents (Author Influence)-

Fig 5 and Table 3 highlights the top ten authors who are contributing in related research. As outlined in the table, out of 590 articles and conference papers retrieved from Scopus, 54

articles and conference papers are written by these top 10 authors. Watanabe, T. dominates the research area with highest number of publications 16 articles altogether followed by Ishii, Y. having 6 articles published in the related field.

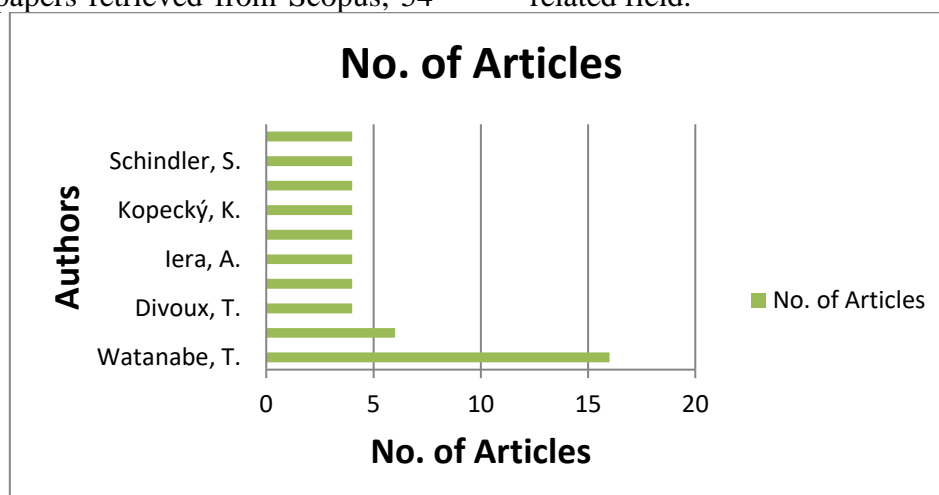


Figure 5: Key contributing authors in virtual communication related researches

Source: <http://www.scopus.com> (fetched on 21st September 2021)

Table 3: Top 10 highly contributing authors along with their number of publications

Name of Author	No of Articles
Watanabe, T.	16

Ishii, Y.	6
Divoux, T.	4
Farris, I.	4
Iera, A.	4
Kissler, J.	4
Kopecký, K.	4
Ohya, J.	4
Schindler, S.	4
Schwan, K.	4
Total Articles	54

3.5 Geographical regional analysis-

Fig 6 shows the distribution of published articles and conference papers based on geographical location. United States and

United Kingdom are emerged as the most prolific countries in the virtual communication research.

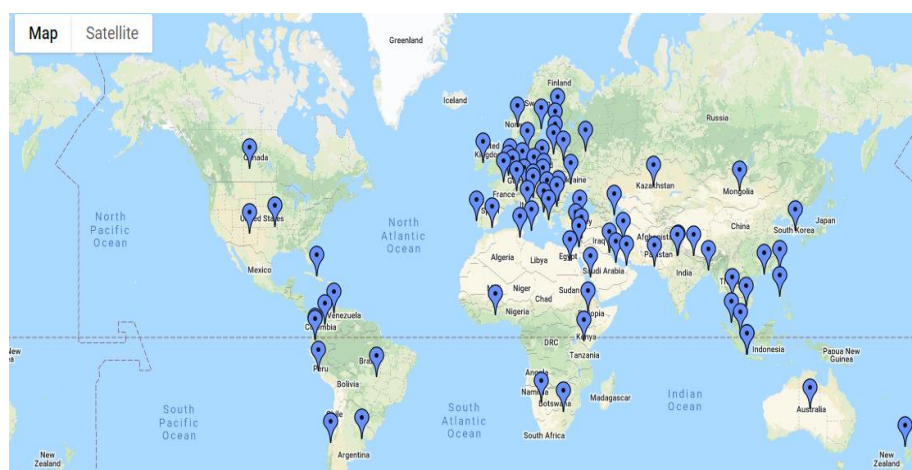


Figure 6: Geographical location of countries involved in the virtual communication research (data fetched from Scopus & map prepared with the help of Source-imapbuilder.com on 22nd September 2021)

Table 4: Top 10 countries contributing in virtual communication research domain

Country	No. of Documents
United States	145
United Kingdom	44
Japan	42
Germany	40
Russian Federation	34
China	31
Spain	26
Canada	21
Italy	19
India	18

Table 4 illustrates the top ten productive countries in virtual communication research publications. United States tops the list

contributing 145 documents followed by United Kingdom and Japan contributing 44 and 42 documents respectively. India occupies

10th place with 18 documents contributed till date.

Citation Analysis

According to (Garfield E. , 1972), the academic worth of articles is determined by

the number of citations they receive. "Citation establishes a connection between authors that is proportional to the degree to which they communicate indirectly through the literature," (Shaw, 1979).

Table 5: 10 Most cited articles

Year	Publication	Document Title	Authors	Total Citation
1991		An Adaptive and Fault Tolerant Wormhole Routing Strategy for k-ary n-cubes	Linder D.H., Harden J.C.	306
2013		Nomophobia: Dependency on virtual environments or social phobia?	King A.L.S., Valenca A.M., Silva A.C.O., Baczynski T., Carvalho M.R., Nardi A.E.	149
2013		When global virtual teams share knowledge: Media richness, cultural difference and language commonality	Klitmoller A., Luring J.	121
2005		Geographies of knowledge formation in firms	Amin A., Cohendet P.	114
2003		Clarifying the instructor's role in online distance learning	Easton S.S.	111
2012		Framing the telephone interview as a participant-centred tool for qualitative research: A methodological discussion	Trier-Bieniek A.	99
2020		Impact of COVID-19 on routine care for chronic diseases: A global survey of views from healthcare professionals	Chudasama Y.V., Gillies C.L., Zaccardi F., Coles B., Davies M.J., Seidu S., Khunti K.	97
2001		SmartKom: Multimodal communication with a life-like character	Wahlster W., Reithinger N., Blocker A.	95
2008		Autistic culture online: Virtual communication and cultural expression on the spectrum	Davidson J.	92
2010		The spatial dimension of social capital	Rutten R., Westlund H., Boekema F.	84

Table 5 shows 10 most cited articles in virtual communication domain. Article titled "An Adaptive and Fault Tolerant Wormhole Routing Strategy for k-ary n-cubes" authored by Linder D.H., and Harden J.C. published in the year 1991 has got 306 citations which is the highest number. As per the data accessed in Scopus on 21st September 2021, the total number of citations of 590 publications is 4895 to date.

Network Analysis

The network analysis method is used to show the graphical relationship between the study's numerous statistical parameters. For network analysis, there are a variety of software packages available, each with its own set of advantages and disadvantages (Fahiminia et al., 2015). Bibexcel, Gephi, Graphmaker, VOSviewer and Pajek are the most popular tools. VOSviewer is a tool for statistical analysis of text data and for creating and displaying visual analytics with its user-friendly environment (Van Eck & Waltman,

2010). In network analysis, author keyword co-occurrence map is constructed using the bibliographic database file retrieved from Scopus data base as an input.

4.1. Author keyword co-occurrence map-

The primary areas of research focus are identified by the author's keywords. The authors and author keywords were analyzed using VOSviewer software to create a co-occurrence network for keywords. The minimum number of co-occurrence of

keywords was limited to 20, and full counting citation algorithm was followed for analysis purpose. It showed total of 1027 keywords for all 590 journal articles and conference papers. However, 84 keywords met the set threshold and further grouped in 6 clusters.

It is clear from Fig 7 that the most commonly used keywords are virtual communication, communication, virtual reality, communication systems, e-learning, interpersonal communication, internet, male, female, adult, humans, covid-19, education, teaching, students, social media, social networking (online), knowledge, and virtual communication.

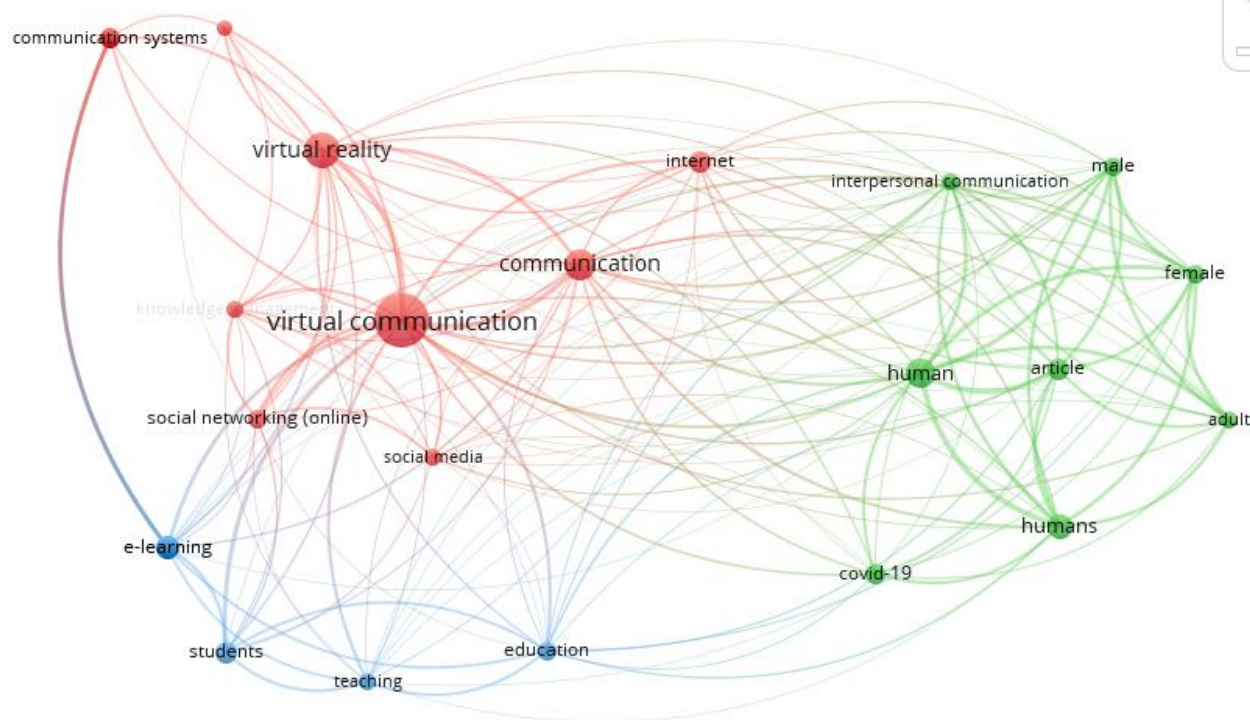


Figure 7: Visualization map for co-occurring keywords used in virtual communication related research.

Limitations of the Study

1. Present study used only Scopus repository for fetching relevant data on virtual communication. However, there are many other authentic data sources like Web of Science, Google scholar, and PubMed. Thus, future investigation needs to sufficiently cover these data sources to congregate more wide-ranging information and elude predisposition.
2. This study considers research articles and conference papers that have only been published in journals, and excludes other related literature in the form of books, book series, editorials, reviews and trade journals that might have been important.

Conclusion & Further Research Recommendations

This study is intended to analyse and report the bibliometric trends of virtual communication related research with the help of comprehensive set of journal articles conference papers retrieved from Scopus database spanning over 38 years from 1983 to 2021. It is concluded that 2021 has witnessed highest amount of publications till date (74 publications out of 590 publications). Countries like United States and United Kingdom followed by Japan are the leading countries in virtual communication related research. Computer science subject area has maximum articles (269 articles constituting 25.5% of the total publications) followed by

social sciences with 196 articles capturing 18.6% of the share. Research article titled “An Adaptive and Fault Tolerant Wormhole Routing Strategy for k-ary n-cubes” authored by Linder D.H., and Harden J.C. published in the year 1991 has got maximum citation (306 citations). Three most used keywords are virtual communication, communication, virtual reality, communication systems. The endlessly growing number of publications explains the steadfast interest of researchers in the field of virtual communication but most of

the research are concentrated in western countries like United States and United Kingdom. India holds 10th place. This shows there is a great need of more research to be carried out by Indian authors. Considering the dynamic business environment in new normal, further empirical research can be recommended to validate the applicability and effectiveness of virtual communication in global economy.

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WHY DO THEY (USERS) PREFER E-BOOKS?

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ABSTRACT

E-books are growing in academic world. The present study aims to find out the factors which motivated the users to prefer e-books and to find out the frequency of e-book reading among the respondents. Due to some features and advantages of e-books, the respondents preferred e-books such dictionary facility, bookmarking and highlighting features, facility of download, 24x7 accessibility etc. However, the frequency of reading e-books is not commendable.

Keywords: E-books, Academic library, e-book use, preference for e-books.

Introduction

Electronic books are the need of the time. Academic libraries have responsibility to grow e-book culture in academic community. Clay (2012) defined e-book as "a simple definition of an e-book is an electronic book. A book that is in a digital format that is read on an e-book reader or application" (p. 6). The e-books came into light in 1971 with Project Gutenberg. Academic libraries face various concerns while dealing with the different aspects of e-books. User's preference for e-books or print books is one of the major issues. The users prefer e-books as e-books have various features and advantages. E-books can be read on laptop, PC, E-reader and Mobile etc. Also there are different formats of e-books. However, PDF is the most popular. Awareness plays an important role in e-book access and usage. Young generation with tech savvy skill prefers e-books. Many times, the users aware about the e-books; however, they prefer print collection.

E-book provides the convenience and fastest updates to the users. The most of the users access e-books for their research and study. E-books are available to larger audience compare to print books. E-books are having features which are 24x7 accessibility, taking notes, saving and downloading, search ability, help the academic people to access it smoothly. E-book access may hamper due to digital right management and copyright laws. DRM restricts saving, printing, copying, pasting or downloading.

Objectives

The main two objectives of this study are:

1. To find out that how frequently users read e-books
2. To find out the motivating factors to prefer e-books

Review of Literature

Wilkin and Underwood (2015) highlighted e-books usage as a wicked problem. Whereas, Bhattacharjya (2017) remarked that "Users value the e-books because of its convenience and ease of access and so researchers are getting engaged in new forms of book content usage to take advantage of their library collection". Cumaoglu, Sacici, & Torun, (2013) found that the users had awareness about the e-books availability in their libraries. Bierman, Ortega, & Rupp-Serrano (2010) highlighted that the faculty members were low in use and awareness about the e-book. Cumaoglu, Sacici, & Torun, (2013) found that the users used e-books for their research assignments and self-study. The earlier studies showed the students are happy with e-books as they experienced the enhancement in learning (Kissinger, 2013). Ebied and Rahman (2015) highlighted motivating factor that "E-books provide freedom and flexibility to learners in learning according to their own abilities, time and learning pace." On the other hand, the 53% of the users preferred the printed books (Pledger, 2010) and the users have preferred printed books over the e-books (Woody et al., 2010). Ongozi and Baki, (2010) concluded that "It is becoming quite clear that, despite

the ubiquity of computers and interactive technology in their lives, students preferred textbooks over e-books for learning and this preference is not altered by familiarity with the medium". Due to easy to share facility motivated the students towards e-book use (Ongoz & Baki, 2010)

Methodology

1. Research design:

The researcher has considered the Mumbai region area for the present study. This study is a part of big research. The survey research method was used for the present study.

2. Population of the study:

The students of the MMS program affiliated to University of Mumbai, specifically who has taken Finance subject for their specialization are considered for the study.

3. Sampling:

The Convenient sampling technique was used.

4. Data Collection:

The researcher prepared questionnaire was distributed through Google form; however, the users were requested personally to fill Google form. The researcher tried to reach out and collected data. The proper 148 responses were recorded and taken for data analysis.

5. Method of Data Analysis:

The SPSS was used to analyze the collected data.

Data Analysis and Interpretation

The researcher analyzed the data with the help of SPSS.

Table No. 1: Age Wise Distribution of the Respondents

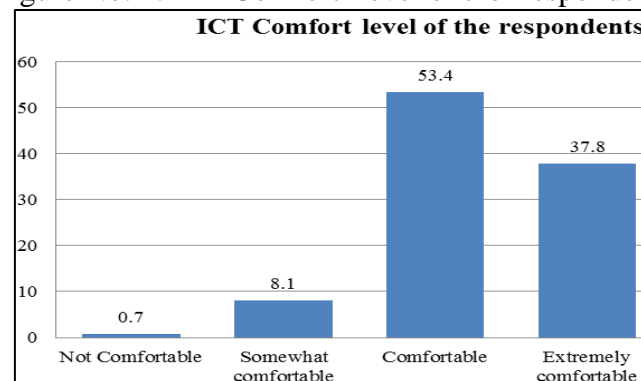
Age wise distribution of the respondents		
	Frequency	Percent (%)
18-22 years	106	71.6
23-27 years	42	28.4
Total	148	100

Source: Primary Data

The users who responded to the research tool were the students in which the majority of the students (71

.6%) were between the age range 18-22 years and 28.4% of the users were between the age range of 23-27 years.

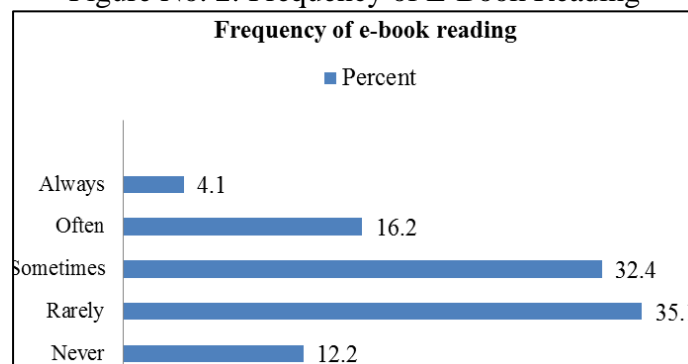
Figure No. 1: ICT Comfort Level of the Respondents



Source: Primary Data

The researcher found that the majority of the respondents (53.4%) were comfortable with the use of ICT equipment. About 37.8% of the respondents were extremely comfortable with the use of ICT equipment.

Figure No. 2: Frequency of E-Book Reading



Source: Primary Data

The researcher found that the most of the respondents (35.1%) read e-books rarely and about 32.4% of the respondents read e-books sometimes. About 4.1% of the respondents read e-books always and about 16.2% read e-books often.

Preference for e-books use: Motivating factors

There are various advantages and features which make e-book access very smooth and desirable. The researcher found the factors due to which the users preferred e-books.

Table No. 2: Online Availability - 24X7 Remote Accesses

Online availability - 24X7 remote access		
	Frequency	Percent (%)
Disagree	4	2.7
Neither Agree or Disagree	14	9.5
Agree	69	46.6
Strongly Agree	61	41.2
Total	148	100.0

Source: Primary Data

About 88% of the respondents preferred e-books as the e-books are available online 24x7.

Table No. 3: Faster and Easy Access to New Titles

Faster and easy access to new titles		
	Frequency	Percent (%)
Disagree	1	.7
Neither Agree or Disagree	12	8.1
Agree	78	52.7
Strongly Agree	57	38.5
Total	148	100.0

Source: Primary Data

The majority of the respondents (52%) agreed and about 38.5% of the respondents strongly agreed to the factor that the faster and easy access to new titles motivated them to prefer new e-books.

Table No. 4: Easy to search

Easy to search		
	Frequency	Percent (%)
Disagree	2	1.4
Neither Agree or Disagree	13	8.8
Agree	71	48.0
Strongly Agree	62	41.9
Total	148	100.0

Source: Primary Data

The majority of the respondents (48%) agreed and about 41.9% of the respondents strongly agreed to the factor that an easy to search facility motivated them to use new e-books.

Table No. 5: Offline E-Book Reader Facility

Offline e-book reader facility		
	Frequency	Percent (%)
Disagree	3	2.0
Neither Agree or Disagree	24	16.2
Agree	81	54.7
Strongly Agree	40	27.0
Total	148	100.0

Source: Primary Data

The researcher found that about 81.7% of the respondents preferred e-books as it provide the offline e-book reader facility.

Table No. 6: Convenience

Convenience		
	Frequency	Percent (%)
Strongly Disagree	1	.7
Disagree	3	2.0
Neither Agree or Disagree	15	10.1
Agree	76	51.4
Strongly Agree	53	35.8
Total	148	100.0

Source: Primary Data

The most of the respondents preferred e-books as e-books are convenient.

Table No. 7: User Friendly Features

User friendly features (Bookmark and Highlighting features of e-book)		
	Frequency	Percent (%)
Disagree	3	2.0
Neither Agree or Disagree	21	14.2
Agree	78	52.7
Strongly Agree	46	31.1
Total	148	100.0

Source: Primary Data

User friendly features such as bookmark and highlighting features of e-books motivated 84% of the respondents towards e-books, however, 16% of the respondents did not agree about it.

Table No. 8: Recommended By Faculty Members

Recommended by faculty members		
	Frequency	Percent (%)
Strongly Disagree	1	.7
Disagree	11	7.4
Neither Agree or Disagree	35	23.6
Agree	69	46.6
Strongly Agree	32	21.6
Total	148	100.0

Source: Primary Data

When the users were asked about their motivation from the faculty; the most of the respondents (46.6%) agreed and about 21.6% strongly agreed that they preferred e-book when faculty members recommended them. While about 23.6 % of the respondents were neutral about it.

Table No. 9: Recommended By Librarians

Recommended by librarians		
	Frequency	Percent (%)
Strongly Disagree	1	.7
Disagree	13	8.8
Neither Agree or Disagree	29	19.6
Agree	80	54.1
Strongly Agree	25	16.9
Total	148	100.0

Source: Primary Data

The researcher found that majority of the students (71%) preferred e-books when the librarians recommended them. About 19.6% of the respondents were neutral about it.

Table No. 10: Simultaneous Use

Simultaneous Use		
	Frequency	Percent (%)
Strongly Disagree	2	1.4
Disagree	4	2.7
Neither Agree or Disagree	34	23.0
Agree	77	52.0
Strongly Agree	31	20.9
Total	148	100.0

Source: Primary Data

The researcher found that the majority of the respondents preferred e-books because e-books provide the simultaneous use.

Table No.11: Updating and Accessing E-Books Faster Than Printed Books

Updating and accessing e-books faster than printed books		
	Frequency	Percent (%)
Strongly Disagree	3	2.0
Disagree	4	2.7
Neither Agree or Disagree	19	12.8
Agree	73	49.3
Strongly Agree	49	33.1
Total	148	100.0

Source: Primary Data

The e-books can update or reprint new editions faster than printed books. About 49.3% of the respondents agreed and 33.1 % strongly agreed that this feature of e-books motivated them towards the e-books as it provides fast access.

Table No.12: Dictionary Facility

Dictionary facility		
	Frequency	Percent (%)
Strongly Disagree	1	.7
Disagree	2	1.4
Neither Agree or Disagree	40	27.0
Agree	67	45.3
Strongly Agree	38	25.7
Total	148	100.0

Source: Primary Data

The dictionary helps the readers of e-books to use e-books smoothly. About 71% of the respondents preferred e-books as e-books have dictionary facility.

Table No. 13: Facility to Download

Facility to download		
	Frequency	Percent (%)
Disagree	6	4.1
Neither Agree or Disagree	25	16.9
Agree	75	50.7
Strongly Agree	42	28.4
Total	148	100.0

Source: Primary Data

About 28.4% of the respondents strongly agreed and 50.7% of the respondents agreed that e-books can be

downloaded on their device; whereas, about 17% of the respondents were unsure and about 4.1 %of the respondents disagreed.

Table No. 14: Good for Leisure Reading

Good for leisure reading		
	Frequency	Percent (%)
Strongly Disagree	2	1.4
Disagree	5	3.4
Neither Agree or Disagree	35	23.6
Agree	72	48.6
Strongly Agree	34	23.0
Total	148	100.0

Source: Primary Data

The most of the respondents (71.6%) preferred e-books for leisure reading, about 23.6% of the respondents were neutral about this.

Conclusions

The users preferred e-books due to various advantages of e-books such as online 24x7 accessibility, fast accessibility to new titles, dictionary facility, simultaneous access and use. Facility to download provides the freedom to save the e-books on their devices. The students also preferred e-books for leisure reading. However, the frequency of e-book reading is quite low. The libraries should take some measures to implement the e-book culture in academic community as the students are comfortable with the ICT and its equipment.

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NIEAS: NETWORK BASED APPROACH FOR IMAGE ENHANCEMENT USING AUTHORATIVE SEGMENTATION

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ABSTRACT

Network based approach for Image Enhancement using Authorative Segmentation i.e. NIEAS system is based on the concept of distributed image processing. In distributed environment, using the various image processing algorithm, important information or data from the image can be retrieved in parallel by enhancing the features of image object. Image contains various kinds of object and that object contains the information. Many times it is observed that using the image-processing algorithm experts are trying to find the information contained in the image. It is quite difficult to get the whole information at one instance. For that, by using the concept of Image segmentation first object of the image can be separated and then it will be analyzed. Our main concentration is on the concept of segmentation of image with respect to change in the space. Authorative Segmentation means the cropping of the image as per the requirement. After cropping the image part of the image will be saved as a single image object, it will be distributed through the existing network and then it will be analyzed.

Keyword: NIEAS.

1 Introduction

Many algorithms have been developed for paralleling different image operators on different parallel architectures. The objective of NIEAS system is to achieve parallel and distributed Image Processing. The goal is very simple:

“To segment an image into pieces and distribute these pieces to processing devices in networking, to increase the processing speed and to save the time.”

The principle of Authorative segmentation is shown in Figure 1. It says that Image segmentation can be made available through NIEAS system for any application in which the administrator or main authority has freedom to segment the image as per requirement without using the standard algorithm. This concept can be archived by using the manual segmentation. Authorative segmentation is the heart of the NIEAS system and by using which only network approach can be taken for distributed and parallel image processing.

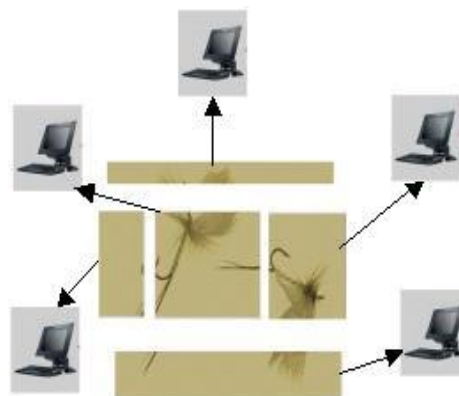


Figure 1: Concept of Authorative Segmentation

2 The NIEAS System:

The main idea behind this system is to **“Distribute the work and Save the Time”**

Basically in this system two major areas of the computer science and engineering are considered.

- i. Computer Networks & Distributed System and
- ii. Image Processing.

The basic purpose of first area is to provide the support for network approach used in NIEAS system through which the

parallel and distributed part can be achieved. While second area helps to achieve the image processing parts like image enhancement and image segmentation.

2.1 Definitions:

Some basic definitions relevant to NIEAS system are as follows:

I. Image processing:

The analysis, manipulation, storage, and display of graphical images from sources such as photographs, drawings, and video.

II. Distributed system:

It looks in multiple locations throughout an organization. It works in a cooperative fashion, with the system at every area and location. It serve the requirement of that location but also able to receive information from other systems, and supply information to other systems within the network.

III. Distributed processing:

In this, every machine in network does its task and processing and do manage the data while doing the communication between the machines as nodes.

IV. Distributed Image Processing:

Each machine as node in the network performs various operations on image and manages the information which is retrieved from manipulated image while the network facilitates communications between the nodes.

V. Image Enhancement:

The process by which an image is manipulated to increase the amount of information perceivable by the human eye.

VI. Image Segmentation:

In image analysis, segmentation is the partitioning of a digital image into multiple regions (sets of pixels), according to a given criterion.

2.2 Goals and Objective:

The Primary goal as stated above is to build parallel and distributed image-

processing platform. Simple as well as complex image processing functions related to the Image Enhancement can be utilized for extracting the information from image segments. The ultimate goal is to enable the distributed computing platform to cope with any type of SIMD (Single Instruction Stream, Multiple Data Stream) tasks.

2.3 Steps for NIEAS System:

The above goal can be achieved by using the NIEAS concept. It can be visualize as follows:

Step I: The image can be considered as one object and it can be divided into parts or pieces with respect to the change in the space.

Step II: Now the part of images can be considered as separate image object or image segment and these objects can be distributed using the existing network for analysis purpose.

Step III: The experts can analyze distributed image objects and information can be retrieved accordingly.

Step IV: The analyzed or processed image segments can be recollected along with the information retrieved from that segments.

Step V: Using the technique of merging, in which the entire image segments can be merged together with respect to the space can form a single processed Image Object.

The NIEAS system can be drawn as follows:

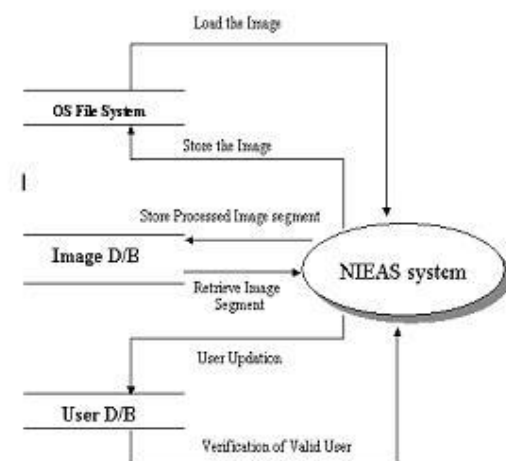


Figure 2 NIEAS System

3. Design Approach

As the name itself suggests, the system includes three main operations i.e. Image Enhancement, Authorative Segmentation and Distribution of Image Segment over the network. Image enhancement is the first step to design the NIEAS system.

- **Image enhancement**

Image enhancement refers to sharpening of image features such as edges, boundaries or contrast to make a graphic display more useful for display and analysis. The objective of image enhancement is dependent on the application context and criteria for enhancement is often subjective or too complex to be easily converted to useful objective measures. Also the image enhancement techniques used in this project form primitive operations used in image processing applications.

In image enhancement, the objective is to make the processed image better in some sense than the unprocessed image. The following are some of the operation that can be performed for enhancing the image. There are various Algorithm of Image Enhancement which are categorizes, with example of each which is used in the project for preprocessing purpose, as follows :

1. Gray Scale Transformation (Contrast Stretching, Brighten Effect, Invert, Gary Scale of Color Images, etc.)
2. Linear filtering (Edge Detection)
3. Low pass filtering (Smoothing, Blurring)
4. High pass filtering (Sharp)
5. Geometric Transformation (Rescaling, Zooming, Rotation, etc.)
6. Color Modeling (Red Invert, Red Remove)

Following are some of the example diagram of various Image Enhancement operations.

I. Negation or Invert



Figure 3 Negation Algorithm

II. Brightness Adjustment



Figure 4 Brightness Algorithm

III. Grayscale Operation



Figure 5 Grayscale Algorithms

IV. Edge Detection:



Figure 6 Edge Detection Algorithm

V. Scaling



Figure7 Scale Algorithm

- **Image Segmentation:**

Image segmentation refers to the decomposition of scene or image or picture into its component. That is it concerned with splitting an image up into segments that each holds some property distinct from their neighbor. It is the basic requirement for any identification and classification of objects in an image.

Techniques of Image Segmentation:

A central problem, called *segmentation* is to distinguish objects from background. For intensity images four popular approaches are:

- Threshold techniques,
- Edge-based methods,
- Region-based techniques, and
- Connectivity-preserving relaxation Methods.

Hybrid Technique:

By using the last two techniques, region based and connectivity-preserving relaxation-based segmentation method, mentioned above a hybrid technique is formed. Using this new technique the input image is segmented by the administrator in this application and distributed to the user. After processing by the user, again all segments will be recollected by administrator. Using region based method the area of interest can be selected by admin for segmentation and at last after processing to redraw the image, connectivity-preserving method is used for proper combination.

Authorative Image Segmentation

In this system it is considered that all the rights for segmenting any image is given to the administrator. Only administrator can define the region after selection and can assign that particular segment to the any user. User doesn't have facility to select the image from any of the machine connected in networking. He has to process the image segment, which is specified for it by the administrator. It means that this system is restricting to anyone, except administrator, to change any important image in any machine. Application doesn't give any facility of segmentation to user. That's why the word Authorative Image segmentation is used. The example of Authorative Image segmentation is given below:



Figure 8 Original Image for segmentation

In this paper we have considered that NIEAS system divides the Image Object into five parts or Image Segments.

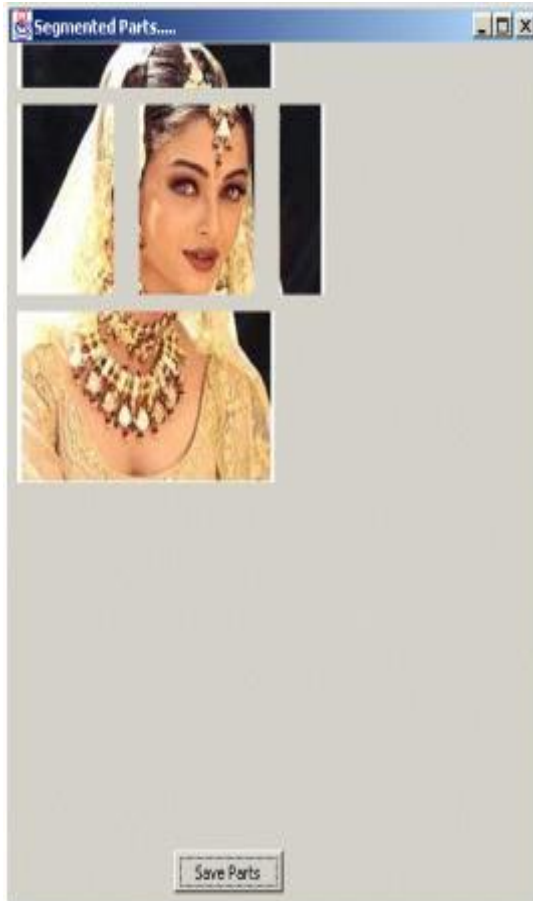


Figure 9 Authorative Segmentation

• Image Segments Distribution

After performing the basic Image processing operation, Image segments can be distributed over the network for next processing. Each connected node in distributed environment would be assigned the appropriate image segments as per the availability of functions and experts.

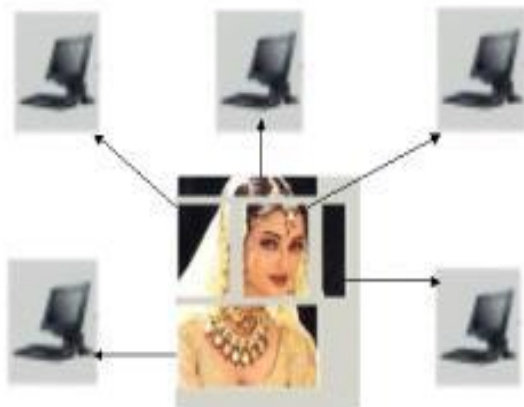


Figure 10 Image segment distribution

4 Example and Applications

• Example

Following is the example of NIEAS system with all the operation step by step. Figure 10 shows the function of NIEAS Administrator.

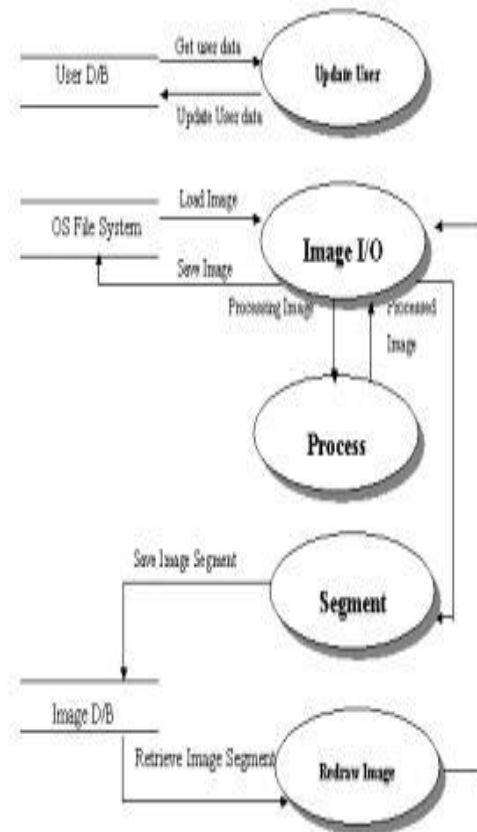


Figure 11 NIEAS administrator function

a. Original Image from any source can be considered for extracting the information.



Figure 12 Original Image

b. The original image can undergo the Image enhancement before the Authorative segmentation. Here the operation considered is Sharp Effect.



Figure 13 Application of sharpen effect

c. After applying the various image enhancement algorithms, administrator can divide the image by using the Authorative Segmentation principle with respect to the change of the space. The image can be segmented into the required number of parts, which can be decided by the administrator. The number of segments can be decided on the basis of available nodes for processing, requirement of the application, the information required from the image and how important is the image. In this example consider that the image is partitioned into five major parts and these parts are distributed to five expert users for the processing.

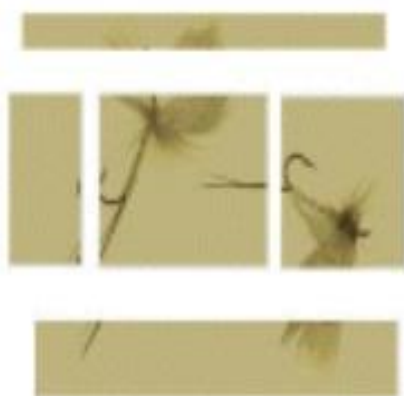


Figure 14 Authorative Segmentation

d. In next step, using NIEAS system functionality, expert user can process the image segment; try to retrieve the information as per the requirement of application and instruction of administrator. Also the user has to store the processed image and information retrieved at the same location from where it is taken.



Original Image



Brighten Image

Figure 15 Middle segment of Image 11

In above example, the operation performed by the expert user is brighten effect.

e. The last but not the least part of the NIEAS system is to redraw the processed image from all processed image segments. For example if we take image segments of Aishwarya Roy shown in Figure. 3.8 and some of image segments are processed by experts and return back to administrator. The administrator can recollect the processed image segments and using merging technique able to redraw the image.

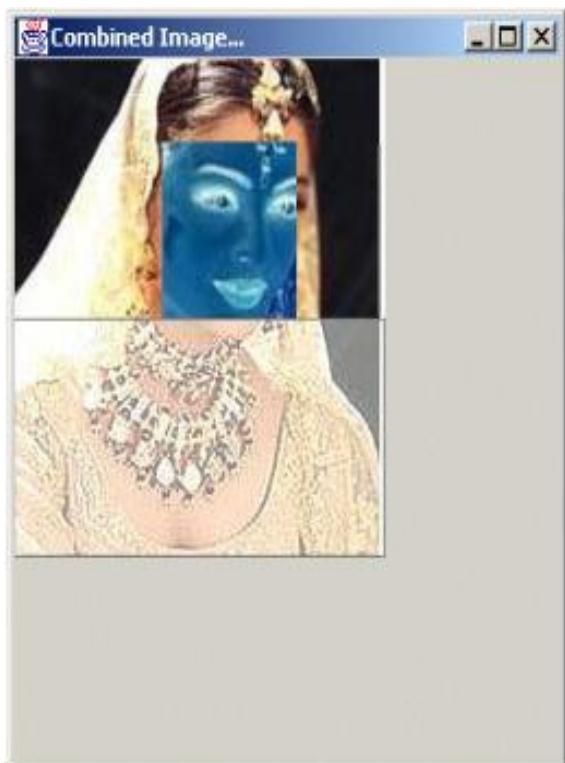


Figure 16 Image redrawn from processed image segments of Aishwarya Roy

The Figure 4.6 shows that applying the basic image enhancement algorithm experts has processed some of the image segments.

• Application

NIEAS system can be used where the application required processing of high-resolution images. Electronic Imaging, Medical Diagnosis, GIS system, Film Industry are some of the example where high-resolution images are processed in

day-to-day life. Recognition of the components mounted on the PCB.

Also this system finds the application in GIS system where recognition of the various objects of the photograph taken through satellite imaging is important.

5 Conclusion

Network based approach for Image Enhancement using Authorative Segmentation that is NIEAS system can be used in many application of Image Processing. The main aim behind this system is to achieve the Parallel and Distributed Image Processing. Number of users can login simultaneously and access the segments of the image, to work in parallel, which tremendously saves the processing time and efforts required. Instead of concentrating any image-processing algorithm in detail, this system is mainly focus on Distributed Image processing.

Acknowledgment:

We are very grateful to BCUD, University of Pune for providing Research Grant for the said system. Also we are very thankful to our Management and Principal for providing the required infrastructure for developing this system. We would like to give our sincere thanks to Prof. Mrs. Uma Nagaraj and Head of Computer Engineering for her constant source of inspiration and Encouragement

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A STUDY ON RELATIONSHIP BETWEEN FACTORS AFFECTING WORK PRESSURE AND THEIR INFLUENCE ON THE EMPLOYEE EFFICIENCY

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ABSTRACT

The work related pressure has critical mental and physiological impacts on employee performance. However, the work related pressure has some affliction impacts also. The work related pressure makes positive response that makes individual to accomplish and defeat a situation and motivates to perform best of his/her capacity. The large portion of the study conducted observed the impacts of work pressure on staff the scope of the study was restricted to IT industry. The aim of this paper is to illuminate the problem the "Stress" followed with its consequences for staff. A survey of 346 employees was done to analyse the work related, organization related and individual related pressure and its impact on employee efficiency. The relationship analysis was used to establish association of these factors and their impact on work efficiency. Reliability was established using cronbach's alpha. In the conclusion we mentioned that all three types of pressure affects the staff's exhibition of the efficiency.

Keywords: Job related pressure, work efficiency, organisational pressure, individual pressure.

Introduction

The term work related pressure mean difficulty, strain, misfortune or hardship. The work related pressure has been of extraordinary worry to workers and different stakeholders in organisation. Job related pressure is difficult area for the organisation (Ornelas and Kleiner 2003). Price of work related pressure is exceptionally more for most of the organization. Work related pressure, characterized impression for disparity among expectational personal abilities keep those (Ornelas and Kleiner, 2003). Christo and Pienaar (2006) said that the cause of work related stress of employment and difficult work, absence of comfort, intricacy, absence of independence for work. Also, work related pressure is brought about by absence of resources; work plans, for example, burning the midnight oil or extra time and hierarchical environment are considered as supporters of staff's stress. Work related pressure frequently shows high disappointment among the representatives, work portability, burnout, helpless work execution and less compelling work (Manshor, Rodrigue, and Chong, 2003). Mental stress impact the wellbeing through passionate, intellectual, social and mental

variables (Levi 1998). The job conflicts, job over-burden, job struggle have association and are normal reasons for the work related pressure (Sethi and Chand, 1997). Sort of job allotted for a representative is additionally work related pressure factor and those occupied with business ready to adapt work related pressure compared to the individuals who are appointed disconnected job (Tread G. 1999). Pressure associations is characterized as far as maverick between an individual's abilities and capacities and requests of his/her work and as a loner as far as an individual's requirements are not satisfied with work climate. Cooper et al said that job related pressure is implied variables, Cooper and Marshall (1976)

Review of Literature

Calpan et. al. (1975) viewed an individual, job space and job set with their association involves in assumptions for huge jobs, makes significant work related pressure dependent on the circumstances. Pareek (1983) worked on the work related pressure while distinguishing unique kinds with job stress. Hypotheses related to work related stress influence. (Osipow, 1998). Job load can bring about representative facing violence and disappointment

(Marini et al; 1995). Nervousness, widely recognized work pressure by which memorial specialists inspected recall implementation. Hussy (2003) showed employees contrastingly saw directors gives critical health impacts. Complete survey by harassing revealed critical associations of tormenting and emotional strain (e.g) depression, nervousness. A review of work related stress, showed that work related pressure is higher than individual related work related pressure (Karunanithy and Ponnampalam 2013).

Objectives

Based on the literature review following objectives were formed for the study;

- 1] To study the causes of work pressure and its influence on the work efficiency.
- 2] To study the relationship between the causes of work pressure.

Hypothesis

In view of the recognized issue, research question and the targets the following hypothesis were framed to test in the study.

Hyp1: Job related pressure has a relationship and also impact on staff's efficiency.

Hyp2: Organizational related pressure has association and also impact on staff's efficiency.

Hyp3: Individual related pressure has association and also impact on staff's efficiency.

Research methodology

In light of the previous study Seley (1993), the autonomous factor in this research additionally partitioned to job, organization and individual pressures.

Survey was conducted for 400 employees from different IT companies in and around Pune city. Out of which only 346 completed responses were used in this research. A structured instrument was developed for information collection.

Table 1: Demographic distribution of sample:

	Particulars	Number
1	Male	197
2	Female	149
	Total	346

Table 2: frequency distribution:

Sr. No.	Age group	Number of Respondents
1	25 to 34 years	85
2	35 to 45 years	99
3	46 to 55 years	94
4	Above 55 years	67

Data Analysis and hypothesis testing

The structured questionnaire was prepared based on the primary and secondary data used in the study. Likert type of rating scale was used for collection of information. Internal consistency was established using Cronbach's Alpha. The value was 0.87 which is within the acceptable limits. The barlett's test showed the significance level to 0.000, confirming the sampling adequacy for the study.

Karl Pearson's relationship coefficient was estimated to establish association between various causes of pressure and their impact on work efficiency.

Factors	Job related pressure	Organizational related pressure	Individual related pressure	Work efficiency
Job related pressure	1	0.28**	0.21*	-0.18*
Organizational related pressure		1	0.31*	0.21*
Individual			1	0.16*

related pressure				
Work efficiency				1

** significant at 0.05 level.

Table 2: Coefficients of relationships between various factors;

Coefficients ^a					
	Unstandardized coefficient		Unstandardized coefficient	T	Sig.
	B	StdErr	Beta		
Constant	9.16	1.72		5.42	0.001
Job related pressure	-0.11	0.04	-0.15	-1.3	0.021
Organizational related pressure	-0.06	0.05	-0.07	-0.23	0.043
Individual related pressure	0.09	0.05	0.11	0.53	0.031

From the above results it is clear that job related work pressure, organisational related pressure and individual related pressure have significant impact on the work efficiency. Thus from the correlation matrix and the significant values of beta coefficients the three hypothesis constructed for the study were proved. Therefore it is concluded that the three factors considered for the study share the relationship among themselves and has significant impact on the work efficiency of the employee.

Conclusion

From the study, it was seen that over all work related pressure which is referenced

through the three different factors i.e work pressure, organisational related pressure and individual related pressure affects the work efficiency. All above factors are the predominant reason for work related pressure. These issues should be inclined to by the administration of the organization by Ergonomics to comprehend the cooperation among people and different components of a system. We have additionally noticed that female staff will have more work related pressure in view of their double jobs and assuming liability of family. Appropriate procedures should be created thinking about dealing with adaptable hours.

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THE ROLE OF SERVICES MERCHANDISING STRATEGIES IN THE GROWTH OF THE INDIAN FINANCE SECTOR WITH SPECIAL REFERENCE TO PUBLIC SECTOR UNDERTAKINGS

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ABSTRACT

In this descriptive paper researcher found that service marketing is essential for growth of Indian PSU, because banking rates and products are mostly same across all the banks so that it was about effective bank advertisements which deal details of providing employment to fulfill patron commercial enterprise of necessity & requirement. The banks are the relied on locations of customers, and have come throughout many modifications in their operative. Financial institutions are strongly opposed to the proposal. In this regard, the role of technology has emerge as imperative as by no means before. Financial companies will need to implement a comprehensive publicity campaign. Consumer delight is critical for the future of any banking organization, in this paper we are limiting our discussions towards aspect of services mercantilism mix in maturation of finance aspect, research questions are identified for further study on this issue of marketing by PSU banks.

Keywords: PSU banks, marketing, Services, Indian banks, customer delight, RBI.

Introduction

There are additionally 12 public sector banks, 22 private sector banks, 46 foreign banks, 56 regional rural banks, 1485 urban cooperative banks, and 96,000 rural cooperative banks in the Indian financial system. the assets of public sector banks were Rs. 107.83 lakh crore (US \$1.52 trillion). Between FY16 and FY20, bank credit rose at a three.57 percent CAGR. In FY20, total credit granted climbed to \$1,698.97 billion. Deposits grew at a 13.93 percent CAGR from FY16 to FY20, reaching US \$1.93 trillion by FY20.

The banking business is a key component of the offerings sector in India. Prior to monetary liberalization, public sector banks enjoyed a market monopoly due to the government's protectionist policies. The liberalization initiative implemented by the Government of India in 1991 allowed foreign and private banks to enter the financial sector, resulting in increased competition. As a consequence of growing rivalry, banks are experimenting with marketing strategies to differentiate their goods from those of their competitors. Information about service advertising and marketing mix is essential for building efficient marketing strategies.

It implies that rate is no longer essential in Indian banking industry, survey on increase

and emergence of public and private area banks in India revealed that private sector banks are no longer favored for traditional items, such as loans, as their offers are difficult to apprehend and perceived fee of interest is high, whereas public sector banks are perceived greater dependable with lower prices of interest. In Indian banking industry where differentiation is now not plenty in terms of prices, it is required to be fair and transparent except hidden charges. To satisfy these dollars-and-cents conditions, accounts want specific services. All the approaches and approaches of marketing are used so that in the end they induce the accounts to do business with a particular bank. This requires satisfaction of accounts. Traditional advertising and marketing admixture can't be amenable to total marketing affection. It requires all the ABCs of service advertising admixture. Service marketing admixture plays an essential role in dollars-and-cents institution marketing. It consists of the chromatic ABC of an advertising program which needs to be considered in order to efficiently administer the advertising approach and positioning in the calls. It helps in distinguishing immolations of a particular bank from those of its challengers.

Research Methodology

It's paper based on secondary data regarding role of services marketing strategies in the banks, how marketing strategies could be implemented for growth of PSU banks in INDIA. This is conceptual paper written for the evaluation of available literature on PSU banks and role of services marketing in it. Marketing is way and process of identifying unfulfilled needs, and satisfying them with some profit to the organization. In case of PSU banks marketing shall play crucial role so that they can face tough competition from the private sector banks.

Research Questions:

1. What is role of service marketing in banking?
2. How service marketing can be implemented in banking sector?
3. What has to be done for employee engagement in PSU banks
4. How PSU marketing is different from marketing done by private banks?

Review of Literature

1. Kaura V., (2013)- This paper on services marketing mix, with special reference to banks, to deals with the bank marketing aspects of banks, like presenting various offerings to fulfill customers' monetary wishes and wants, to fulfill these monetary needs, clients prefer unique services. It was found that, service advertising and marketing combine performs an essential function in financial organization mercantilism. It's a number of factors an advertising announcement which necessity to be viewed in ordination efficiently put in force the advertising and mercantilism approach and emplacement in the chain store. This article examines pricing fairness and transparency, distributing banking services in a convenient manner, employee conduct, consumer education, tangibility, and procedure through technology applications as essential features in Indian banking.
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however also require the a good deal wanted seed capital to begin the business. Many MSME plants also want extra capital for technological know-how up gradation, potential expansion growth, and advertising and for imports and exports. Banks in India have been offering financial services to several organizations their department offices, regional offices in end-to-end the fundamental quantity and comprehensiveness of the territorial division.

Discussions and Conclusions

It was understood that, role of service marketing in banks is very crucial, However, in order to survive and expand, banks will need to embrace a full-fledged marketing strategy to keep their customers happy and pleasant. In this new method, the marketing scope prevalent in the banking sector is examined beneath the services marketing framework. Customers' expectations are now quite high, and banks in India will also have to implement service advertising standards in

their day-to-day operations in order to survive and flourish. All of the aforementioned consumer advertising and marketing aspects focus upon customers. Differentiating one's products from competitors is a fundamental necessity for every service company, including PSU banks. the customers' perceptions and expectations in detail.

Price and transparency in banking services, speed in distributing banking services, courteous personnel conduct, initiatives for customer education, and use of technology all play key roles in distinguishing offers from rivals. Banking sector its performance play a necessary function in an economy. The present day situation of Indian banking area is very dynamic and competitive. To preserve market share it is essential for PSU banks to gather large customer base. Customers today are very a great deal aware about quite a number economic offerings and institutions, in addition they are spoilt for choice. Therefore they can only be retained by means of providing fine services. Marketing done by private banks is about customer delight which is missing in case of PSU banks

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ACCOUNTING TECHNIQUES FOR ENVIRONMENTAL ISSUES

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ABSTRACT

This paper presents the research on how accounting techniques can be developed for environmental issues. Here I have tried to find out the solutions with the help of following questions:

What does an environment mean to us? How does it help us in our living? How do we disturb environment from doing so? What is its impact on environment? How does it effect on our living? How can we measure costs of these effects? What are the techniques to reduce these costs? How can environmental accounting be one of the techniques? How to define Assets and Liabilities in Environmental Accounting? How should be its reporting?

The analysis took as a starting point the standard accounting system followed by innovations in accounting system. As we all know traditional accounting system is responsible for only generation of profit out of the cost incurred for the same. Hence most of the industries try to earn more to show their healthy position to the investors. Here they neglect employee values and environmental values. This results in unhealthy society and environment at large. It results in the research in HR Accounting and Environmental Accounting.

In this paper I have started with the water vapour cycle while mentioning origin of the research problem. According to NASA Oceanography, human activities disrupt the water cycle, resulting in a warmer planet and a far higher surface temperature of 67°C. While thinking of profits we need to think of earning satisfactory profit. And we can not be satisfied without environmental satisfaction.

In last part of this paper a try is made to classify the environmental costs and to give them proper accounting treatment, following to which the reporting of the results of Environmental Accounting in financial statements is suggested. Lastly the requirements for serious implementation are mentioned in discussion part along with few examples of current scenario of EA in industries like Asian Paints (India) Ltd., Goodlass Nerolac Paints ltd., Maruti Udyog Ltd. and ITC Ltd.

Keywords: *Environmental Accounting, Carbon Credit, Environmental Liabilities, Environmental Assets.*

Introduction

“Vrukshavalli amha soyare vanachare, pakshi hi susware alavitee”

Saint Tukaram

“Interest is growing in modifying national income accounting systems to promote understanding of the links between economy and environment.” [1]

The quotes mentioned above very well define the subject of the research work. The first one is by Saint Tukaram, who told us the importance of nature conservation through his poems (Abhang) around 400 years back. We also can find the same from Dnyaneshwari written by Saint Dnyaneshwar. According to him, before constructing a town we need to build up forests so that we can live a healthy life.

In this changing era of global economy, it is very important for us to know the changing economic trends and its effect on the environment. As every organization, from accounting perspective, is aiming to earn more and more profit, actually from economic perspective they are trying to make satisfactory profit. The former has concern

with short term business activity whereas latter has concern with long term existence.

Now the question that every organization asks themselves is what all things they need to consider while planning for their business activities so as to make satisfactory profit. The expected answers may be keeping price low, quality control, employee satisfaction, after sales service etc. Here we think primarily about our responsibility towards customers and then our employees. But one important factor we normally forget which directly or indirectly help us in achieving our organizational goal. That is Environment. We can not achieve our goals without the help of nature and environment. So we need to identify our responsibility toward environment and also show their effect in our financial statements. Here the need comes for Environmental Accounting.

Before the discussion begins for environmental accounting, firstly we need to know the basic concepts of accounting.

A) Definition of Accounting: It is an art of recording, classifying and summarizing in a significant manner and in terms of money

transactions and events which are, in part at least, of a financial character and interpreting the results thereof.

B) Branches of Accounting:

- American Institute of Certified Public Accountant



Fig. 1: Classification of Accounting

1. Financial Accounting: It is historical in nature since it includes recording, classifying, and summarising past occurrences. It is historical accounting, often known as financial accounting, whose major goal is to create financial statements that reveal the business's income/loss and financial condition based on events that occurred during the accounting period.

2. Cost Accounting: It depicts cost classification and analysis based on functions, processes, products, and centres, among other things.

3. Management Accounting: Where financial and cost accounting finish, management accounting begins. It is concerned with the processing of financial and cost accounting data for managerial decision-making. It also looks at how managerial economic ideas can be used to make decisions.

C) Upcoming branches of accounting:

1. HR Accounting

2. Environmental Accounting

HR Accounting: It deals with the accounting of Human Resource that every organization has or need to perform the activities of an organization to achieve the desired goal.

Environmental accounting (EA):

It is a systematic study of the relation between organizational structure and the environmental costs and implementation of the strategies so as to bring equality in the costs of these two.

One may define EA, in simple words, as a process of assigning liability towards environment and suggesting/finding and implementing solutions to convert liability in to assets.

"Mechanism that enable enterprises to measure, analyze, and announce the cost for environmental conservation in business activities and the effects quantitatively (monetary units or physical quantity units) as much as possible - effects that were achieved by the activities - for promoting the tackling of environmental conservation efficiently and effectively while maintaining the friendly relationship with the society in order for sustainable development."

From the above definitions the important elements which are necessary in the accounting can be identified. Those may be environmental costs and its effective measurement in monetary terms. These costs and its measurement is discussed in section II (D) and Section III (A) respectively.

Now let us see how the need for accounting of environmental issues comes in the picture.

Origin of the research problem

Whenever we talk about environment the discussion begins with Water. Let us discuss water cycle/ water vapour cycle first.

A) Water cycle:

The water cycle, also known as the hydrologic cycle, depicts the continual movement of water on, above, and below the Earth's surface as shown in the figure 3 above. Since the water cycle is truly a "cycle," There isn't a beginning or an end to it. At various points in the water cycle, water can change phases from liquid to vapour to ice, with these changes occurring in the blink of an eye and over millions of years. Individual water molecules can come and go in a heartbeat, yet there is always the same amount of water on the surface of the globe,

despite the fact that the balance of water on Earth remains pretty consistent over time. [2]

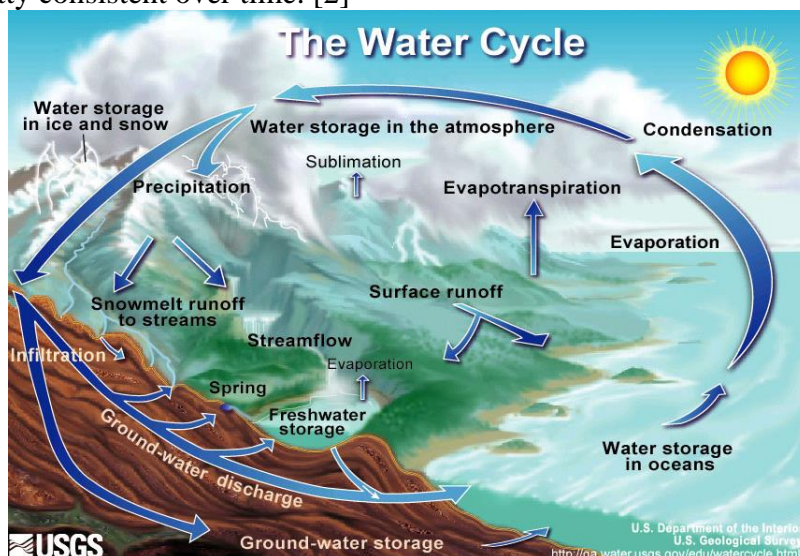


Fig 3. Water Vapour Cycle

B) Nature cycle: This cycle is related to the various seasons. In India there are three seasons- summer, monsoon, and winter each having four months duration one after another. Still these cycles are there but its duration has changed over the time. In India water vapour cycle takes around one year to complete. i.e. every year we expect Monsoon on 7th June and ends in October. But in recent years, picture has changed. We cannot assume the same period for Monsoon. Also, on one year we face heavy rain fall and on another no rain at all.

Why has this change occurred? Who is responsible for it? How can we cope up with this? Is there any solution to bring this cycle back? We need to be very serious to find out the answers of these questions.

B) Reasons for change in the cycle

Life on Earth existed in a natural environment with adequate water supplies from rain, unpolluted springs, streams, rivers, and wells throughout its early history. Water was

relatively pure, with only a few naturally occurring chemicals present. We have thrown all kinds of pollutants into the environment since the Industrial Revolution, and especially after World War II, almost universally poisoning our precious, life-sustaining water supplies. When hazardous chemicals are introduced into our system, the function of water is harmed. As our bodies degrade into toxic cesspools, our health suffers. If we think the water, we are drinking is just H₂O, there is need of thinking it again. According to some research, our water contains an incredible 75,000 chemical constituents, but the EPA has only developed enforceable safety guidelines for 87 of them. Many of these substances have the potential to be detrimental to human health. Each year, about one million people get sick from drinking contaminated water, according to the Atlanta-based Center for Disease Control, with approximately 1,000 cases tragically ending in death. [3]

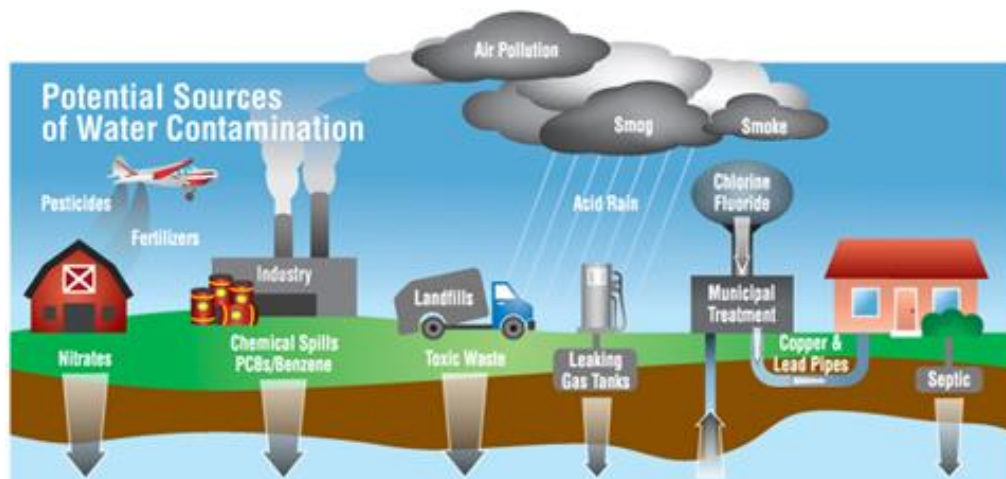


Fig 4. Environment Contamination Sources

The following are examples of human activities that influence the water cycle:

1. Agriculture
2. Changes in the atmosphere's chemical makeup
3. Dam construction
4. Deforestation and afforestation
5. Groundwater extraction from wells
6. Abstraction of water from rivers
7. Urbanization (industrialization, creating infrastructure and other comfort products)

C) Effects of change in the cycle on climate

Solar energy is used to power the water cycle. Evaporation from the oceans accounts for 86 percent of worldwide evaporation, lowering ocean temperatures through evaporative cooling. The greenhouse effect would result in a substantially higher surface temperature of 67°C and a warmer world without the cooling impact of evaporation.[4]

D) Price of pollution and Costs for human being due to these changes:

World Bank officials conducted research on the cost of pollution in India in 1992 (M. Balachandran 2002), which demonstrates the financial impact of the primary issues. They estimate that environmental damage costs India roughly Rs. 34,000 crore per year, or about 9.5 percent of GDP. [5]

Environmental Expenditures/Costs:
“Environmental costs are actual expenses incurred by industries, households and the government to avoid environmental degradation or to eliminate the effects after degradation has taken place. They include all

those goods and services that are, or are used as, an immediate response to environmental degradation caused by production units, government and households. They do not cover activities included to mitigate effects borne, in particular by households”. [6]

Environmental Expenditures/Costs are those costs which incurred to protect the environment or natural resources like water, air, land and atmosphere. It also includes the cost for physical as well as psychological destruction of living creatures.

These costs may incur after or before the effect (destruction) take place. We can classify these costs in to following categories as per their nature.

1. **Pre-costs:** It includes the costs which help in preventing us from all such destructions. Here we assume the costs well before its occurrence and we make the necessary arrangements to protect the environment. E.g. installing water purifier, plantation and equipment to reduce noise/vibration and air pollution etc.

2. **Post-costs:** It includes those costs which have incurred in anticipation of the incurred environmental losses due to the organizational/human activities e.g. government funds the farmers due to natural disasters, Social campaigning after knowing the environmental and psychological destructions etc..

Further we can classify these costs as per their useful life which, again, is going to help us in their accounting effects.

3. **Capital expenditure:** These are the expenses, the benefit of which is derived over

number of years. E.g. installing water purifier, plantation and equipments to reduce noise/vibration and air pollution etc.

4. Revenue expenditure: These are the expenses, the benefit of which is derived during an accounting period. E.g., depreciation on the capital assets, social campaigns etc.

5. Deferred revenue expenditure: These are the revenue expenses but the benefit of it is derived over few accounting years. E.g., Research and development expenses, huge social campaigning etc.

E) Who is responsible?

The answer to above question can better explained with the help of the following cycle.

1. We Try to earn more money to satisfy our needs
2. We Try to reduce cost
3. We use cheap and less costly inputs to reduce cost of production
4. We use shortcuts to get work done as quick as possible
5. Water waste, air pollution, noise pollution etc.
6. Unhealthy atmosphere (water, air, food etc.)
7. Increase in physical as well as psychological deceases
8. Increase in medical expenses
9. Increasing insurance and other health/risk related expenses
10. We need more money as our expenses increased

And cycle continues.....

Accounting for Environmental Issues

A) Defining liability toward environment....Process:

1. Study of external environment (nature): Every organization need to study the nature. As everyone thinks what they can get from the nature, we need to think what we are giving to the nature. We need to see whether sufficient greenery is available to absorb the air pollution as well as water waste. For such analysis study of environmental science is required.

2. Study of internal environment (process, layout etc.): Internal environment includes the employees, organizational structure, plant layout and the processes. Creating healthy work conditions is as important as earning profit. Making employees aware about their responsibility toward environment as well as

deciding proper layout to carry all processing efficiently will lead to reduce the wastes.

3. Study of kinds of harmful elements: Every organization should conduct the in-depth study to know the existing as well as possible harmful elements which are been used during the production process and which comes out with the finished product, may be as a part of it or as a waste. Here studying the amount of these elements is very important factor.

4. Comparing those with the environmental arrangements/assets: Once we come to know the harmful elements and the amount of their output, we need to compare those elements with the external as well as internal environment to know the discrepancy/ variance.

5. Computing variance: in environmental accounting variance means the discrepancy between the environmental arrangements/assets and the total output of harmful elements. If former is more than the later the difference will be known as favorable variance. This also may be treated as idle Asset. In opposite condition the result will be adverse variance which in turn will be treated as our Liability toward environment.

E.g., A manufacturing unit's output (harmful elements) is CO₂, and the amount of output is 1000 units per day. Now the environmental arrangements needed are plants that can absorb this much CO₂. The existing arrangement includes 700 trees which are expected to absorb 700 units @1unit of CO₂ per tree per day. Here the variance of 300 units is the net environmental liability (NEL) of that organization and to reduce it, they need to make arrangement of 300 trees.

In other case suppose for same level of output (harmful elements), arrangement of 500 trees is there which can absorb 1500 units @3 units of CO₂ per tree per day. Here the variance of 500 units is the net environmental Asset (NEA) which can be expressed in terms of trees as $500/3=167$ trees.

B) Selecting proper strategy/ies

We can adopt the following strategies to reduce the environmental liability.

1. Changing location: If existing location of an organization is not extendable to create sufficient environmental arrangements that organization may reduce its liability by

shifting the unit to the place where these arrangements exist or there is scope for its creation.

2. Changing Plant layout: If there is waste due to improper material handling or improper plant layout, organization needs to make certain changes in it.

3. Changing Product/ product-mix: Every organization produces multi-products. If any product is harmful to the living creatures in the long run, organization needs to stop the production of such product and try to find out better and healthy alternative.

4. Defining Input alternative: This is very important strategy among all. As discussed earlier, the main problem begins with human desire to earn more and to make more profit. To achieve it, we try to use cheap and less costly inputs to reduce the cost of production. As a result, output of harmful elements increases. This, in turn, increases our liability. So we need to select best alternative which will reduce such liability.

5. Training: It can reduce the waste and output of harmful elements due to improper material handling, casual working. So training at regular intervals is required.

6. Creating assets: It means to make environmental arrangements/assets.

This includes:

Water pollution- installing water purifier and wastewater treatment facilities for water waste, Air pollution- plantation, catalytic converters, Noise/vibration- equipments, Land- construction work for nature conservation, land reclamation, land improvement and erosion control.

Here plantation plays an important role in reducing pollution. Everyone should prefer this alternative because it is a natural source. Few trees like Banyan tree (Kalpvruksha) and Kagzi lime (Kadu-limb) and Tagitus erecta (Zhendu) for clean and healthy atmosphere as these trees have more capacity to absorb CO₂. Computation of assets will be as mentioned in computation of variances.

7. Social cause campaigning: For the organization who are in the production of habitual products e.g. cigarettes, tobacco, alcohol or even tea and soft drinks, it is necessary for them to do social campaigning to create awareness about the effects of their

product on our health. Social campaigning doesn't only mean to print warnings on the packing of the product but to create awareness among those who are not using these products.

Financial Reporting

Following things are important while reporting the results of environmental accounting

1. All equipments purchased to reduce environmental destruction should be shown as fixed asset at its book value less/add depreciation/appreciation. Its capacity to reduce environmental destruction, in monetary terms, should be shown in inner column. This means if an asset is purchased for Rs.10,00,000 less annual depreciation of Rs. 1,00,000 equals Rs.9,00,000 should be shown in outer column and the monetary value of its annual capacity in terms of protecting environment from destruction is Rs. 2,00,000 should be shown in inner column. The value of this capacity installed is shown in the table 1 with the '####' sign. Asset Appreciation is applicable only for trees (plantation) which have planted for the purpose of protecting environment.

2. All environmental costs can be measured in monetary terms based on the environmental destruction and that will be shown as liability. Here the calculation of net environmental liability (NEL) will be:

$$NEL = \text{Annual Environmental cost} - \text{Annual capacity installed}$$

Here annual capacity installed means the value of the assets which we are showing in inner column. If the answer is positive then one effect should be, showing it as liability and second effect should be at debit side of Profit and loss account. If it comes negative it should be shown as an indirect gain in Profit and loss account and second effect should be, showing it as additional asset in balance-sheet.

3. For revenue expenditures like social cause campaigning, advertisements etc. effects should be on debit side of Profit and loss account

4. For deferred revenue expenditures like R&D, heavy advertisement, expenses at primary stage (preliminary expenses) etc. the balance amount should be shown in the balance sheet asset side under the head Miscellaneous Expenses and the amount

written-off should be shown at debit side of Profit and loss account.

(Refer the appendix: Table 1. Financial Reporting)

Discussion

Though study is going on from last 20 years on the same issue, the implementation part is lacking. Following are few companies which are stepping toward a healthy way of making profits.

Asian Paints (India) Ltd, (1993-94):

Ecology and safety: Samples of treated effluents are tested for compliance with standards on a regular basis.

Goodlass Nerolac Paints Limited (1993-94):

Pollution: To safeguard the environment and ensure industrial safety, the Company monitors the measures in place in line with the Pollution Control Act on a regular basis. The organization makes adjustments on a regular basis to guarantee that all statutory requirements are met.

Maruti Udyog Limited (1993-94):

Environment: The current effluent treatment plant was modified to handle the increased effluents generated as a result of the capacity expansion. Non-methane hydrocarbons in the Paint Shop and Engine Testing Shop, as well as ambient air quality, stack emissions, and

effluents, are all monitored on a regular basis, and the parameters are kept well within prescribed limits. Green belt development around gas turbine and R&D areas was bolstered by the planting of 3000 extra saplings. [7]

ITC Limited: ITC has been 'Carbon Positive' for the past three years, sequestering/storing twice as much CO₂ as it emits. It has also been 'Water Positive' for the past six years (generating three times the potential for Rainwater Harvesting than ITC's net usage). Solid waste recycling is around 100 percent. All of ITC's environmental, health, and safety management systems meet or exceed worldwide best practices. [8]

Even while firms are taking steps, the fact remains that most companies report environmental data in a descriptive rather than a financial style, meaning that the degradation of natural capital is not taken into consideration when calculating corporate earnings. Here we may require government intervention to make environmental accounting compulsory to all organizations and further to the households as well. This is the only solution we may get to make our beloved Earth happy again.

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Appendix: Table 1. Financial Reporting

Liabilities	Rs.	Rs.	Assets	Rs.	Rs.
Owner's Equity			Fixed Assets		
Share capital		xxxx	Land and Building		xxxx
Reserves and surplus		xxxx	Machinery		xxxx
			Furniture		xxxx
Outsider's liability			Equipments for:		
			Water conservation	####	xxxx
			Chemical impact reduction	####	xxxx
			Pollution control	####	xxxx
Loan: Secured	xxxx		Investments		
Unsecured	xxxx	xxxx			
Net Environmental Liability					
Water waste	xxxx		Equity shares of xyz ltd.		xxxx
Chemical waste	xxxx				
Pollution	xxxx				
Psychological effects	xxxx	xxxx			
Current liabilities			Current Assets		
Accounts Payable	xxxx		Accounts Receivable		xxxx
Bills payable	xxxx		Bills receivable		xxxx
Bank overdraft	xxxx		Cash at Bank		xxxx
Outstanding Expenses	xxxx		Cash in hand		xxxx
Advance Income	xxxx	xxxx	Outstanding Income		xxxx
			Prepaid Expenses		xxxx
			Miscellaneous Expenses		
Total		xxxxxx x	Total		xxxxxx x

WORK LIFE BALANCE AND ITS IMPACT ON JOB SATISFACTION EVIDENCE FROM MSRTC DEPOT, PUNE

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ABSTRACT

Work life balance can be a major factor in job satisfaction, and we examine the impact of the issue on MSRTC depot and Job Satisfaction level. We find that employees who feel more satisfied with their work life balance show higher levels of job satisfaction. The study was implemented at the MSRTC depot in Pune. A sample of 50 employees with varying job profiles was chosen through stratified random sampling for this survey. The data for this study was collected using interview method. A high proportion of respondents felt that their work life balance was not satisfactory but had no plans to leave their jobs. More women were found to be dissatisfied with their work life balance than men. Employees working in the administration department, garage or garage sub-station, and mechanical department were found to be more satisfied than the other employees. Employees who are dissatisfied with their work life balance have a high intention to quit their jobs. Employees who are satisfied in this domain have a high intention to stay in the present job.

Keywords: Job Satisfaction, Work Life Balance, MSRTC Depot, Service Quality.

Introduction

The study aims to understand the relationship between work life balance and job satisfaction. The study was carried out at MSRTC depots, Pune. The data was collected in the form of self-reported questionnaire survey by means of interview method. A total 50 employees were interviewed for knowledge about their work experience. Data analysis has been done with chi-square test statistic to find out any association or difference in perceptions about job satisfaction with relation to work life balance at the depot level against other levels in MSRTC organizational hierarchy.

Work-life balance is a major issue for many people as they juggle responsibilities at work with those in the home. The phrase was coined to describe this sense that life can be overwhelming. The idea was that one's life is all-important, and, if it is not balanced equally with other areas of life, then one will be unhappy because of this lack of balance (Saleem, 2017).

The effects of work-life balance on job satisfaction were previously examined by Rosenfield (2001) who found evidence that work-life balance contributes to job satisfaction for men and women, but only among employees whose jobs are fairly balanced with respect to stressors. This study found that both men and women feel more satisfied in jobs where they have fairly equal amounts of personal time and work time.

Furthermore, the effect becomes larger for women than for men.

Also, a study by KUMARI (2017) showed that women who experience greater amounts of work-family interference exhibit lower levels of job satisfaction than those women who experience less interference. As such, having work-life balance is important for men and women as it contributes to their satisfaction with the job they have.

Preiss & Finanger (2011) conducted a study which found that individual differences in job satisfaction and life satisfaction were negatively correlated with work-family burden. In other words, people high in job satisfaction reported less work-family burden than those with low job satisfaction; likewise, those high in life-satisfaction reported less work-family burden than those low in life satisfaction. Furthermore, this finding was not explained by year of birth; thus, either individual or societal factors were at play.

Another study focused on the relationship between life satisfaction and job satisfaction: the idea is that the higher one's life satisfaction is (i.e., numbers of friends and family members), the more satisfied one will be with his/her job. The study found that those high in life satisfaction have a significantly better view of their jobs as compared to those low in life satisfaction, as well as a greater willingness to stay at their jobs even if they didn't enjoy the work they performed. In other

words, those high in life satisfaction have a better perspective on both their job and their lives overall.

Objectives of the study

1. The current study aims to explore the impact of work life balance on job satisfaction level of employees in MSRTC depot, Pune.
2. It also explore various factors influencing work life balance on job satisfaction level of employees in MSRTC depot, Pune

Research Methodology

The sample for this study was chosen through stratified random sampling and interviewed in order to understand the perceptions of employees on work life balance and its impact on job satisfaction in different job profiles. The data for this study was collected using an interview method. Employees were asked about their job characteristics, experiences, and expectations as well as how they feel about having such a diverse range of job profiles. A sample of 50 employees with varying job profiles was chosen this survey.

Literature Review

Work life balance is a concept that has been gaining traction within the workforce. This term refers to the idea of an individual's work-life experience, or how difficult balancing both work and family responsibilities are for an individual. In other words, work life balance is a term that refers to how well employees are able to balance the demands of their jobs and the demands of their personal lives. The concept was first coined in 1987 by sociologist James Sebenius from Cornell University who wrote about work participation and social participation (Preiss & Finanger, n.d.).

The year 1987 was not only one of significant change in the workplace, but also for Leisure Carriers (a Cornell student publication). James Sebenius, then a sociology professor at Cornell University, challenged all college students to participate in both their professional careers and student life schedules. Much of his work focused on measuring the link between work participation and leisure participation. He argued that the more time an individual spends working on their profession, the less time they

have to enjoy free time or vacation with family and friends. Sebenius was also interested in how this link would be different for college students who had not yet begun their careers. Sebenius adopted the term "work-life balance" to describe his interest in work participation and leisure participation. He claimed that "whatever its label, the notion of balance is intended to capture...theory's central focus on where one devotes one's energy (i.e., effort) over some period of time (e.g., a 24-hour day)." (Azeem & Akhtar, 2014)

The work-life balance concept has changed over the years. For example, in the 1960s, work life balance referred to how much time an individual spent working versus how much time they spent with their family. However, the meaning of this term has evolved to now refer to how well an employee can manage both their professional and personal lives (Haar et al., 2014).

Although the term "work-life balance" was not used until 1987 by Sebenius, other similar concepts have been discussed for decades. For instance, in 1970, Rensis Likert wrote that individuals are able to achieve a balanced life if they are happy in both their professional and personal lives. Likert also referred to the idea of "work-leisure balance" in his 1970 book, "The Human Side of Enterprise" (Jang et al., 2011).

Work-life balance is not only related to the amount of time an employee spends working versus how much time they spend with their family, but also to how well an employee can manage both work and life (Agha et al., 2017). Many factors have been identified that contribute to work-life balance. Work-life balance is affected by individual characteristics that are considered along with organizational variables. These characteristics include task dependency vs. autonomy, lifestyle and life stage, and gender (Maeran et al., 2013).

Task dependency versus autonomy is defined by employee's job classification. For example, in a highly task dependent role, feedback is required in order to complete work assignments. A highly task dependent individual will require constant communication with their supervisor or team members in order to do their job well. An

individual with high autonomy has the freedom to work independently or on a team without constant communication with supervisors or others. Work-life balance also relates to the level of autonomy individuals possess in their daily tasks. A high status and salary come with very little autonomy and long hours. An individual in a high autonomy role may have many responsibilities, but is able to shape their own professional life (Kanwar et al., 2009).

Lifestyle and life stage are defined by the time of day when work begins in relation to when work is completed. For example, individuals in their 20s have an opportunity for an unpredictable, frequent schedule that varies at each work location. With less time constraints on personal activities, these individuals are more likely to be able to balance professional and personal lives (Saleem, 2017).

Gender can create issues with time management for both men and women if they do not consider the gendered norms of their workplace culture. Although women and men may equally desire to balance work and family life, they differ in the strategies they use to achieve their goals (Malik et al., 2014).

Work-life balance is a state of equilibrium between an individual's personal and professional lives. Work-life balance is the topic of interest for many employees as it affects job satisfaction, stress levels, engagement levels, and turnover. In a study of 987 employees from 29 countries it was found that satisfaction with living arrangements had more influence over job satisfaction than work-effort intensity. Additionally, results from this study found that those who reported less work-life imbalance were more likely to stay at their job compared to those who reported a higher amount of imbalance (Bellmann & Hübler, 2020).

Many jobs can be very demanding and stressful, which differs from one individual to another. Whether a job has an inherent work-life imbalance or a particular employee's work-life balance is highly dependent on job characteristics. In addition, employees who have more autonomy in their work have greater potential for achieving a higher level of work-life balance (Azeem & Akhtar, 2014).

A multitude of factors contribute to the impact that work-life balance has on an employee's overall performance. In a study conducted by the University of Chicago Booth School of Business examining 987 employees from 29 countries it was found that satisfaction with living arrangements had more influence over job satisfaction than work-effort intensity (Haar et al., 2014).

Result and Discussion

Work-life balance is one of the most important factors in achieving happiness and job satisfaction in the modern world. And an MSRTC depot located in Pune reveals that when workers are able to balance work with their personal lives, they are less likely to experience burnout or depression caused by prolonged stress levels. The work-life balance in Pune is in a delicate balance and any issue which prevents it from being in harmony can lead to an unhealthy life, with mental and physical implications for both adults and children. People who adjust their lifestyles with the hectic pace of modern day working are less prone to depression, stress related ailments and other issues.

In this study MSRTC depot in Pune has been observed closely to check the impact of work-life balance on its employees. MSRTC is a government undertaking which provides transport services across India. The company has a large number of employees working at different depots throughout the country. A depot is a location where buses, trucks and/or other vehicles that are used by the company are repaired and cleaned. These depots also have drivers who operate the vehicles.

An employee of MSRTC Pune depot, who did not wish to be named, said that although they get 2 days off every week, they hardly get enough time to spend with their families. "We either have night shifts or operating hours stretch for 9 - 10 hours which is too much," she added. This is because of the fact that public transport is in high demand in Pune City which places a lot of work for MSRTC employees. With this high demand for public transport, there are long hours at the depot. "Most of us work 12 - 13 hours. If we are lucky, then we are given 14 hours. Some people come home after 11 PM but this is rare," she said about the

level of work at the Pune depot. The employee also mentioned that the number of staff working at any one time is 600 to 700 which means that no one can work steadily over a longer period of time.

This seems to be the reason why people often complain about being stressed at their workplace even though they have work-life balance issues at home. Stress manifests itself in many ways, including sleep deprivation and feeling tired or irritable. No one at the depot seems to have a healthy work-life balance as they work long hours and do not get much time to spend with their families. This is a common problem for MSRTC employees.

The MSRTC employee added that the company should improve their working conditions as it can be negatively impacting their lives. "I have seen a lot of people taking sick leaves. Even I take off because I do not feel like working for such long hours," she said, adding that it is very tough for MSRTC employees to endure such long shifts and tough schedules.

Another employee of MSRTC Pune depot, who wished to remain anonymous, said that he also has faced similar issues. "Our shifts are long and we hardly get time to spend with our family. I am able to see my family only once or twice a week," he said. This lack of time can be very negative for the mental health of the employees. It can lead to stress which is the root cause of several ailments. The stress levels at MSRTC Pune depot are so high that many employees suffer from depression and anxiety attacks regularly. A few weeks back, an employee fainted at the site after complaining of chest pain due to stress related issues. The employee was referred to a hospital for treatment and the company took it as a sign of stress.

The employees share this concern with each other as well as their doctors. "We talk to each other about our work-life balance issues because we are all in the same boat," said an employee who wished not to be named. Despite this, there are many employees who are not coping very well with the situation at their workplace. Once they get ill, they are unable to work for several days which means that they cannot help themselves financially or emotionally during that time. Many

employees live in the nearby area and travel to their workplace by train or bus. The commute can be a long process which adds to their stress levels. Some employees also come from Ranchi, a city in Jharkhand, to work in the Pune depot. They travel hundreds of kilometers every day by road which takes several hours when they have night shifts.

Because of this fear of being stressed from work, many people take time off when they are sick or injured. This means that they do not contribute financially towards their family until they recover fully. This also adds stress on them because of the fact that they cannot bring in an income for themselves and their families while taking off. Another reason is that people often land up in an emergency situation after they are actually treated. This means that they cannot work for several days which mean that they cannot help themselves financially or emotionally when they are sick. Another reason for this is the fact that when someone goes home on leave, there are no staff to take over their job at the depot. The standard of the depot falls when this happens. The MSRTC employees can do little about these instances but it only shows how many of them have problems with their work-life balance at present.

The MSRTC employees also mentioned that they were stressed by the nature of the job. The long hours that they put in on a daily basis seem to be taking their toll on them. "We are overworked and underpaid," said another employee who wished to remain anonymous. Distribution of work at MSRTC depot is very unbalanced with many people doing work which does not require experience or effort, while there are others who do more intensive work but still get paid less than others. "This is stressful because we do not get our calculative increases like everyone else," said another employee who wished not to be named.

The MSRTC employees also share this concern with each other as well as their doctors. "We talk to each other about our work-life balance issues because we are all in the same boat," said an employee who wished not to be named. Many people who work at the depot complain that they do not get enough breaks and that they can suffer from sleep deprivation and headaches after working for

very long hours. Some of the MSRTC employees also suffer from depression and anxiety due to stress and lack of time with family and friends at home. "We have always been working in a stressful environment," said another employee who wished not to be named.

Several employees who take part in the survey interview said that they would like to work at the depot but that there were very few opportunities for them. "There are many people who look forward to working here but then no one is given any employment," said an MSRTC employee. The other employees also said that they would like to take up jobs at the depot but could not because of other jobs or family responsibilities.

In order to deal with this issue, the MSRTC has considered giving jobs to senior citizens. Many senior citizens from cities such as Ranchi and Pune offer their services in the depot and do not get paid. "If we give them a job here, we will be able to get their service at a rate well above what we pay them," said another employee who wished not to be named.

There is lack of experience in the MSRTC Pune depot and many young people wish to acquire such experience before moving ahead in their careers. of communication between MSRTC and MSRTC employees. "We are facing many problems with the job but there is no communication with MSRTC so it is difficult to know what is happening," said one of the employees who wished to remain anonymous.

Another employee who wished not to be named said that there was no co-ordination between different departments of MSRTC and depot employees. Because of this, many issues go unresolved leading to lots of disrepair at the depot. For example, toilets are not cleaned regularly by workers. They cannot even comprehend why some toilets become unusable even after maintenance work which should have been done at least once in five months.

The employees also do not get paid for accidents at work. There is rarely any improvement in the working environment of the depot and this adds to their stress levels. According to one of the doctors, some people

who work here are afraid that they might lose their jobs if they fall sick or take any time off. They are also afraid that they will be labelled as "weak" by other employees if they cannot work on some shifts. This means that people who are ill prefer not to disclose it because of fear of rejection by others at work. This also means that the employees at the depot feel very isolated because they have nobody to turn to. Nobody from MSRTC or their superiors come to check on them although they have been working there for a long time.

In Pune, we had spoke to different employees who work at the depot and asked them what they wanted from MSRTC and what changes they would like to see in it. The majority of them said that they wanted their problems fixed by MSRTC and that there should not be any discrimination in pay and job opportunities for employees at the depot. Many of them also said that they wanted more money and better working conditions. "

"Our salaries need to be increased," said Vishal Sharma. Others also stated that their promotions had not taken place for quite some time. One employee even stated that he had been working at the depot for the last six years but he still did not have a promotion to a job with better pay or responsibility.

The employees also feel that there is a lack of communication among MSRTC and its employees. They wish to see co-ordination in the distribution of work, between different departments and departments within MSRTC such as finance, HR, maintenance etc.

The MSRTC depot is managed by a large number of staff but they do not always have enough opportunities for career progression or career growth to workers from various departments. However, MSRTC officers only come to the depot twice a year for a few hours. This lack of communication and co-ordination leads to a lot of problems, said some of the employees.

Many employees said that they wanted better working conditions but MSRTC did not take care of them on its own accord. They would have liked to see MSRTC take care of their work conditions on its own accord through some initiative such as giving money or providing free food or drinks, or giving them free training sessions. However, this never

took place even though they had many requests for it.

According to some employees, this lack of initiative on the part of MSRTC is because of the lack of communication between different departments of the organization. Some employees also requested MSRTC for better co-ordination with other departments within the organization and for more initiatives such as employer-sponsored health care and free food and drinks. Another request was for a day off once in a while so that they could go home and rest. They also wanted to be given training sessions so that they could learn new skills and increase their knowledge about their work. The MSRTC Pune depot is an example of how one organization runs things in India. Department of the organization is not able to communicate or co-ordinate with other departments or with other employees which leads to problems. However, the depot employees are very patient despite their issues and do not wish to leave MSRTC. "We should be given proper training and there should be no discrimination in pay and job opportunities for people at the depot," said one of the employees who wished not to be named.

We spoke to different employees who work at the Pune MSRTC depot about what they wanted from MSRTC and what changes they would like to see in it. The majority of them said that they wanted their problems fixed by MSRTC and that there should not be any discrimination in pay and job opportunities for employees at the depot.

Many of them also said that they wanted better working conditions but MSRTC did not take care of them on its own accord. They would have liked to see MSRTC take care of their work conditions on its own accord through some initiative such as giving money or providing free food or drinks, or giving them

free training sessions. However, this never took place even though they had many requests for it.

Conclusion

The conclusion is that the evidence from the MSRTC depot in Pune, India provides strong support for job satisfaction-as well as moderate to weak support for work life balance-to be tied to the outcome of performance. Work life balance and job satisfaction should be considered simultaneously and concurrently when predicting outcome of performance and outcome of happiness in an organization, because they go hand in hand with workplace effectiveness and workforce engagement respectively. The findings from the study have implications for workplace effectiveness and workforce engagement. The results of this study can serve as a basis for developing a work life balance strategy aimed at improving job satisfaction and performance at the same time.

The study also reveals that while working in a Pune depot of the Maharashtra State Road Transport Corporation (MSRTC), all staff members fear being transferred or being laid off. In addition, there is no promotion option in government jobs, which makes it difficult for employees to move up within one organization. The depot in Pune is one of the oldest in the State and has 30 buses. Over 12,000 employees work in the depot. The average age of workers is around 25 years.

The study suggested that based on employees responses MSRTC need to pay more attention towards providing an environment where employees can make decisions about their work/family balance in order to attract and retain high performing employees.

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A STATUS REPORT ON THE ICT INFRASTRUCTURE FACILITIES OF ACADEMIC LIBRARIES: SPECIAL REFERENCE TO MANAGEMENT INSTITUTES AFFILIATED TO SPPU

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ABSTRACT

The present study reviews the current state-of-the-art information and communication technology infrastructure in the libraries of management institutes affiliated to SPPU. This study analyses the hardware specification, software specification, library automation, accessibility of digital library, internet connectivity, tele communication facilities, audio visual equipment in these libraries.

Keywords: ICT Infrastructure, Library Management Software, Digital, Academic Institutions.

Introduction

Information communication technology (ICT) plays an important role in present day's higher academic system. As colleges are core sector of higher education system, development of ICT infrastructure facilities in libraries are demand of time to fulfill the information needs of users. ICT infrastructure facility can be described as electronic means of capturing, processing, storing and communicating information and its associated services. ICT infrastructure refers to the hardware or equipment, software applications, and services associated with ICTs, including telecom networks. Hardware, which comprises telephone, computer, LAN network, printer, scanner, fax, camera, projector, Video CD etc. and software that includes windows, Ms Office and others. The study investigates the current state-of-the-art information and communication technology infrastructure in Indian academic libraries.

Objectives

1. To investigate the status of hardware ICT infrastructure facilities available in the institutes under study.
2. To study the status of softwares available in the institutes under study.
3. To reveal internet facilities in the institutes under study.

Literature Review

Konwar and Sinha (2014) conducted a case study of nine colleges in the Barak valley to assess the state of ICT infrastructure and the growth of college library networks. They looked into the fundamentals of ICT infrastructure, such as hardware, internet connectivity, and backup systems. They also looked at operating systems, library automation software, and the areas that had been automated with the software. They also looked into the associations between these libraries and library networks, as well as their membership in consortiums. The findings of their investigation revealed that most college libraries lack adequate infrastructure. Colleges in urban areas have a higher level of ICT infrastructure development than colleges in rural areas. They also discovered that libraries are semi-automated. Their user research revealed that only a few colleges' librarians are constantly connected to the internet. The number of computers in libraries is insufficient, and as a result, students do not have access to the internet for searching; instead, they must rely on the OPAC. According to the researcher, a fund for the development of ICT infrastructure can be created by librarians and college authorities coming up with innovative ideas. With the proper support of college authorities, librarians can make short and long-term plans for the development of ICT. Reddy and Reddy

(2015) conducted research in Sri Venkateswara University's engineering college libraries. They evaluated the automation and hardware capabilities of the library. They research the library's system and application software. They looked at the digital library and internet access in the libraries that were being investigated. They also looked at the colleges' telecommunications and audio-visual equipment, as well as their websites. They identify the factors that have hampered the use of ICT services and infrastructure and propose solutions to improve ICT services and facilities. Choudhary and Sarmah (2017) have conducted similar research. They looked at the ICT infrastructure and how it was used in seven degree college libraries in Assam's Cachar district. They evaluated ICT equipment, internet connectivity, library automation status, consortia access to e resources, and ICT application barriers. They discovered that the majority of the college libraries under investigation are still in the early stages of ICT infrastructure and application. They also revealed that while the libraries have begun to automate, not all software modules have yet been covered. In addition, all college libraries have internet access, though only a few nodes are available. They recommended that users be given more bandwidth and nodes so that they can get the most out of ICT-based resources and services. The concerned college authority should help

librarians develop ICT in their libraries by allowing them to attend workshops and training programs to improve their ICT skills.

Research Methodology

A descriptive survey was used for this study. Librarians of Management Institutes libraries affiliated to SPPU are considered for the study. This study is a part of big research. Convenient sampling technique is used and questionnaire prepared in google forms was sent to the librarians. Researcher received 34 responses which were considered for data analysis.

Availability of server

The server is a computer hardware system that is dedicated to running one or more services (as a host) in order to serve the needs of other computers on a network. It was observed that almost all colleges i.e., 34 (100%) were maintaining servers.

Availability of computer workstations

Computers are required in the library to perform various library operations such as accessioning, circulation, fine calculation, and the preparation of various reports, among other things.

The majority of colleges have libraries with fewer than five computers. Only a few management colleges have libraries with more than 11 computers.

TableNo.1: Availability of client/computer workstations

Type of institute/college	Less than 10	More than 11	Total
Management (n=34)	24(70.58%)	10(29.41%)	34(100.0%)

Hardware facilities available in the library

It was observed that majority of institutes were having hardware like printer 34(100%), CCTV32(94.11%), laptop charging facility

cctv32(94.11%), pen drive 32(94.11%), photocopier 32(94.11%), telephone 32(94.11%), barcode reader/s 31(91.17%), paper scanner/flat-bed scanner 31(91.17%),

CD/DVD30(88.23%), Barcode printer 29(85.29%). 25(73.52%) institutes were having external hard disk/drive, 24(70.58%) were having headphones, 24(70.58%) were having video conferencing facility,

20(58.82%) were having SD Card, 20(58.82%) were having LCD projector. Very few i.e., 8(23.52%) libraries were having digital sound recorders and e book reader. No library was having RFID .

Table No.2: Hardware facilities available in the library

Type of hardware facility and technology (n=34)	Yes	No
Printer (Inkjet/Laser)	34(100%)	00(00.00%)
CCTV	32(94.11%)	2(5.89%)
Laptop charging facility	32(94.11%)	2(5.89%)
Pen drive	32(94.11%)	2(5.89%)
Photocopier	32(94.11%)	2(5.89%)
Telephone	32(81.97%)	2(18.03%)
Barcode reader/s	31(91.17%)	3(8.83%)
Paper scanner/flat bed scanner	31(91.17%)	3(8.83%)
CD/DVD	30(88.23%)	4(11.77%)
Barcode printer	29(85.29%)	5(14.11%)
External hard disk/drive	25(73.52%)	9(26.48%)
Headphones	24(70.58%)	10(29.42%)
Video conferencing facility	24(70.58%)	10(29.42%)
SD Card	20(58.82%)	14(41.18%)
LCD projector (multimedia projector)	20(58.82%)	14(41.18%)
Facilities for e-content development	14(41.18%)	20(58.82%)
Digital camera	10(29.42%)	24(50.82%)
Digital sound recorders	8(23.52%)	26(76.48%)
E book reader	8(23.52%)	26(76.48%)
Smart board	8(23.52%)	26(76.48%)
Kiosk	1(2.94%)	33 (97.0%)
RFID technology	0(00.00%)	34(100.00%)

Software in libraries

All the respondent libraries were having library management software and antivirus software in their library. Few libraries were

having Digital library software 10(29.42%), 8(23.52%) was having Learning management software, 8(23.52%) was having Content

management software. Only 4(11.76%) was having plagiarism detection software.

Table No.3: Software used by the library

Softwares used by the library(n=34)	Yes	No
Library management software	34(100.00%)	00(00.00%)
Antivirus software	34(100.00%)	00(00.00%)
Digital library software	10(29.42%)	24(50.82%)
Learning management software	8(23.52%)	26(76.48%)
Content management software	8(23.52%)	26(76.48%)
Plagiarism detection software	4(11.76%)	78(88.24%)

Internet access in the libraries

Campus LAN connected to internet

According to the data collected, all of the colleges have a LAN that is connected to the internet.

Internet connection speed

The internet's speed has a significant impact on the accessibility of web resources. Slow internet speeds make it difficult to access web content, so having enough internet speed is essential.

Majority of 22(60.7%) institutes were having internet speed in between 51 to 100 mbps. Only two institutes were having internet speed above 101 mbps

Table No4: Speed of Internet Connection in mbps.

Speed of internet	Below 50 mbps	51 to 100 mbps	Above 101 mbps	Total
N=34	10(29.41%)	22(60.7%)	2(5.88%)	34(100.0%)

Conclusion

The researcher of the present study analyzed hardware facilities, software used, internet connectivity and automation status of the libraries of management institutes and arrived at the conclusion that the ICT infrastructure in

these libraries at different state of development and this should be strengthened with the support of government, college authority and librarians. They further concluded that solid policy for the ICT infrastructure should be made for availability of digital platform for the users.

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ANALYSIS OF FACTORS INFLUENCING ONLINE BUYING INTENTIONS TOWARDS APPARELS

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ABSTRACT

The Indian e-commerce industry is growing substantially and is projected to reach ninety-nine billion USD in 2024 which was only 30 billion in 2019. The apparel industry is gaining more importance in E-commerce, Payoneer report indicates the growth of e-commerce is projected to be doubled from 2020 to 2025 that is 4.0 percent to 8.0 percent for food & grocery, Apparel and consumer electronics. Fashion and apparel is a key driver of incremental growth in ecommerce. The study enunciates important factors influencing buying intentions while online shopping of apparels. The study includes mixed demography to study the behavioral attributes, functional attributes and aesthetical attributes influencing buying intentions towards apparel. The vital factors are extracted applying factorial analysis, further filtered and confirmed through confirmatory factorial analysis in Amos.

Keywords: *Buying Intentions, Purchasing Intentions, Fashion and Apparels, Online Shopping, behavioral attributes, functional attributes, aesthetical attributes.*

Introduction

The fashion and lifestyle industry is witnessing a huge rush globally, with the ample opportunities for growth and a host of other factors resulting in the progress of this industry. Despite of the slowdown in the economy and uncertainty worldwide due to the pandemic, e-Commerce is expecting a huge growth in coming years. Consumers buy apparel the most from online channels in respect to fashion categories, followed by footwear and accessories. The online retail pioneers Amazon, eBay and Wal-Mart have set a benchmark in e-commerce business. E-commerce has shown tremendous growth during the pandemic, and retailers like Lifestyle, Shoppers Stop, Myntra, Flipkart have put much effort in improving their online stores. The brands or the retailers which were not active online, due to pandemic they have also improved online presence a lot. The present study focuses on the analysis of purchasing intentions of apparels in online segment. The research was carried out using apparel shopping lifestyle survey template by Question Pro to understand the factors that affect fashion behavior amongst buyers. This survey includes questions to understand behavior of consumers and their perception while purchasing apparels questionnaire

consists of how much preference customers give to fashion related clothes and what are the core buying intentions while buying apparels online. A set of behavioral attributes, functional and aesthetics attributes were clustered and studied with rigor analysis.

Literature Review

Madalena Periera, Rui Miguel (2009) in their research paper analyzed relationship between apparels attributes and advertising on consumer buying behavior. They analyzed whether advertising had an influence on people buying decision, they also tried to find out what are the attributes you look while going for shopping apparels.

(Syed Irfan Shafi, 2014) (Placeholder1) Deepali Saluja (2016) the study was conducted to analyze consumer buying behavior regarding fashion apparels in Delhi. The results showed that people prefer to shop with friends and family. Comfort, quality and brand are the attributes which have an impact on their buying decision. The results showed that age, occupation, education, gender had no influence on impact on their behavior decisions. It also showed that people of Delhi have positive attitude towards brands of apparels.

Y. Ramakrishna Prasad (2012) posit the drivers which influences the purchasing decision for buying apparels from the organized consumer market. The results showed that the attributes like referral groups, demand, diversity, value are the drivers which influences the buying decision of apparels from organized retail market.

Md. Mazedul Islam et al (2014) tries to find out what are the factors that influences consumer behavior towards buying local branded products, the attributes that the customer prefers are quality, value, aesthetics, price, and functional look. The results also showed few local brands which the consumers preferred.

(Vinith Kumar Nair) Dr. Pawan Kumar, Kanchan (2017) aims to study the consumer behavior while purchasing apparels in Ludhiana City. It also instructs to find out the psychological, demographic and socio-economic factors influence on buying apparels. The results show that people of Ludhiana are interested in buying branded products.

(Bello S. C., 2016) Namita Rajput et al (2012) aims to understand the consumer behavior in organized retail market. This paper also showcases the various attributes which act as the driving force of the dynamic organized market. The study also aims to understand the factors influencing consumer behavior and the importance of each in respect to their buying decision.

Padmakshi Sharma (2012) the study interprets the factors affecting the behavior of consumers in relation to branded apparels in Ahmedabad city. The various attributes related to consumers were explored in relation to their purchase behavior with reference to youth .

Raja Gopal (2011) the study examines the determinants and its impact on buying decision with reference to brand image, promotions, and external market knowledge. The results revealed that personality and socio-cultural attributes induces purchase intension among the consumers of Mexico. The results showed a positive impact of store and brand preferences on the purchase intension of the consumers.

Objectives of the Study

1. To classify the Factors Influencing Online Buying Intentions towards apparels
2. To refine the factors influencing online buying intensions towards apparels.

Methodology

The descriptive research design, a cross sectional study is carried out. The Sample of 78 respondents was collected using random sampling method. A survey consists of a set of 22 questions were used to study the functional attributes, behavioral attributes and aesthetics to analyze the purchase intensions of online shoppers of apparels. Data analysis was done through SPSS and AMOS. A KMO and Bartlett's Test is used to measure the adequacy of sampling and factor analysis and confirmatory factor analysis was carried out.

Data Analysis & Interpretations

KMO and Bartlett's Test			
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.			.666
Bartlett's Test of Sphericity	Approx. Chi-Square	661.185	
	df	231	
	Sig.	.000	

The KMO measure of sampling adequacy is 66.6 percent while Bartlett's test shows significant value to obtain factorial analysis

and reduce the insignificant dimensions of buying intentions towards apparels.

Rotated Component Matrix^a

	Component						
	1	2	3	4	5	6	7
"Clothes are one of the most important ways I have of expressing my individuality"	0.804	0.076	0.102	0.120	-0.160	0.075	-0.110
"I prefer the tailored look in my clothing"	0.796	0.145	-0.303	0.056	0.305	-0.025	-0.042
"My clothing selections are made with an eye toward the future"	0.792	0.044	0.014	0.101	0.104	-0.157	0.248
"I spend a lot of time on fashion-related activities"	0.671	0.043	0.346	-0.124	-0.004	0.180	0.105
"I try to buy "basics" in clothing"	0.595	-0.007	-0.091	0.413	0.124	0.012	-0.126
"I find that my size dictates what style of clothing I can buy"	0.461	0.142	0.185	-0.090	0.210	0.180	-0.353
"I never read fashion magazines or pay attention to fashion trends"	-0.048	0.757	-0.021	0.295	-0.108	0.025	-0.081
"I always buy at least one outfit of the latest fashion"	0.436	0.691	-0.158	0.212	-0.117	-0.067	0.180
"The quality of the merchandise I buy is more important than its fashion appeal"	0.268	0.655	0.368	-0.198	0.067	-0.170	-0.101
"If you have a few good clothes you can get by in most situations"	-0.198	0.577	0.229	0.064	0.033	0.137	-0.417
"I spend a lot of money on clothes and accessories"	0.421	0.452	0.145	-0.080	-0.381	0.284	-0.159

"I prefer to buy designer labels rather than store-branded merchandise"	-0.041	0.082	0.854	0.062	0.029	0.032	0.052
"I usually get bored with clothes if I keep them too long"	0.005	0.051	0.599	0.552	0.039	-0.006	-0.267
"It's just not worth the money to be well dressed all the time"	0.480	0.105	0.544	0.157	-0.119	-0.017	-0.159
"My apparel selections are strongly influenced by clothing worn by people I admire"	0.077	0.192	0.146	0.841	0.109	-0.008	0.041
"I avoid high fashion clothing because it goes out of style too quickly"	0.535	0.035	0.029	0.621	-0.113	0.111	-0.094
"It is important for me to be a fashion leader"	0.088	-0.010	0.149	0.034	0.863	0.166	-0.002
"I'd spend my money on clothes before I'd spend it on most other things"	-0.038	0.120	0.182	-0.059	-0.618	0.238	0.262
"I am confident in my ability to recognize fashion trends"	-0.172	-0.058	-0.181	0.096	-0.073	0.786	0.159
"I like my clothes to be practical"	0.313	0.033	0.249	-0.006	0.036	0.677	-0.215
"It's important to be well-dressed"	0.195	0.404	0.087	-0.150	0.275	0.415	0.298
"I am aware of fashion trends and want to be one of the first to try them"	-0.036	-0.083	-0.023	-0.074	-0.104	0.073	0.794
Extraction Method: Principal Component Analysis.							
Rotation Method: Varimax with Kaiser Normalization.							
a. Rotation converged in 10 iterations							

A factorial analysis- principal component matrix with Varimax rotation method and Kaiser Normalization was used to reduce the insignificant dimensions on purchasing intentions. The rotations converged in ten iterations and extracted seven components with several important factors with higher loadings of Eigen values. The Eigen values are

organized in Descending values on seven components.

The statements used are not purposely to exaggerate or understate the respondents, Further the important variables with higher Eigen values are grouped under the appropriate headings.

Behavioral Attributes

“Clothes are one of the most important ways I have of expressing my individuality”
“I prefer the tailored look in my clothing”
“My clothing selections are made with an eye toward the future”
“My apparel selections are strongly influenced by clothing worn by people I admire”
“I usually get bored with clothes if I keep them too long”
“I never read fashion magazines or pay attention to fashion trends”

Functional Attributes

“I try to buy “basics” in clothing”
“The quality of the merchandise I buy is more important than its fashion appeal”
“I like my clothes to be practical”

Aesthetic (Fashion) Attributes

“I always buy at least one outfit of the latest fashion”
“I prefer to buy designer labels rather than store-branded merchandise”
“I spend a lot of time on fashion-related activities”
“I avoid high fashion clothing because it goes out of style too quickly”
“It is important for me to be a fashion leader”
“I am confident in my ability to recognize fashion trends”
“I am aware of fashion trends and want to be one of the first to try them”

The purchasing intentions were categorized in three groups such as, Behavioral attributes,

Functional attributes, and Aesthetic attributes. The behavioral aspect explains the perception

and responding nature of the people towards apparel buying intentions. Since the sample consists of mixed population like Students, Housewives (dependents) and working-class category in high to middle income groups, the results clarify general perception. It is very clear that people consider clothing as a priority to demonstrate their personality. To exhibit their uniqueness, it's obvious that the apparel selection is influenced with the people they admire. However, comfort is a basic concern

A functional attribute describes practicality, sensibleness in online buying intentions of apparel. Most of the people try buying basics in clothing for day today use. It doesn't mean that occasional dressings are less preferred. The basics in apparel especially for women is a complex situation, however we can consider five basics in women clothing e.g., Sarees, Kurtis, Anarkalis, leggings/jeggings and tops while in men's clothing it can be casual shirts, T – shirts, Jeans and shorts. The frequent buying intentions are basic clothing this can be due to cyclic utilization and hence the quality is overtopped than a fashion appeal.

The Aesthetic attribute in clothing describes artistic, fashion, lucrative visuals. People are fond of looks and are basically attracted towards fashion. People are aware of fashion trends and want to be one of the first to try them, they are confident in their abilities to recognizing fashion trends. Respondents explicate that they spend lot of time in fashion related activities while they buy at least one outfit of latest fashion, mostly prefer to buy designers' label rather than store- branded merchandise. The youngsters are quite inclined towards being a fashion leader.

wherein people think of customized (tailored) fittings. For example, the brands like Raymond and Bombay shirts are exclusively working on customized fittings. A common man use the apparel purchased for six months to 12 months on an average, not specifically, however its unlike celebrity wear apparels once or twice and make them obsolete. It's also important to note that people are influenced strongly in selection of clothing worn by the person they admire.

On the backdrop of the factors extracted and categorized on Behavioral attributes, Functional attributes and Aesthetics, the complexities in the factors are leading to discriminations in their directions. For example

Attrib- "My clothing selections are made with an eye towards the future" is conflicting with

Attrib- "I usually get bored with clothes if I keep them too long",

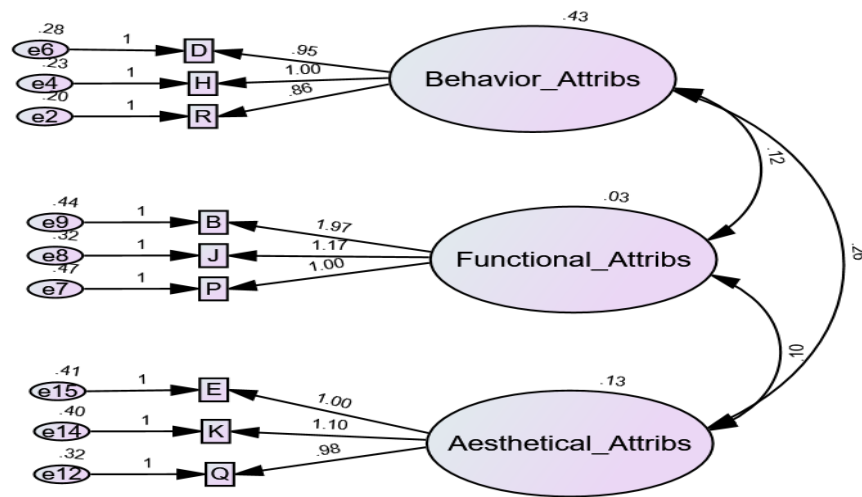
Attrib- "I never read fashion magazines or pay attention to fashion trends" is conflicting with almost all Aesthetical attributes and strongly to

Attrib- "I spend lot of time on fashion related activities"

Attrib- "I am aware of fashion trends and want to be one of the first to try them"

Attrib- "I avoid high fashion clothing because it goes out of style too quickly"

This may require validating and confirming the distinctive attribute variables, a confirmatory factorial analysis is carried out in AMOS and a model fit indices were verified.

**Result (Default model)**

Minimum was achieved

Chi-square = 35.905

Degrees of freedom = 24

Probability level = .056

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	21	35.905	24	.056	1.496
Saturated model	45	.000	0		
Independence model	9	237.609	36	.000	6.600

RMR, GFI

Model	RMR	GFI	AGFI	PGFI
Default model	.035	.912	.836	.487
Saturated model	.000	1.000		
Independence model	.186	.476	.345	.381

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.849	.773	.944	.911	.941
Saturated model	1.000		1.000		1.000

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Independence model	.000	.000	.000	.000	.000

Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	.667	.566	.627
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

NCP

Model	NCP	LO 90	HI 90
Default model	11.905	.000	32.088
Saturated model	.000	.000	.000
Independence model	201.609	156.553	254.163

FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	.466	.155	.000	.417
Saturated model	.000	.000	.000	.000
Independence model	3.086	2.618	2.033	3.301

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.080	.000	.132	.179
Independence model	.270	.238	.303	.000

CFA Model Interpretations

The CMIN/DF value is 1.496 is in the range of 1.0 to 3.0 indicates a good model fit.

Comparative fit index (CFI) value is 0.941 which is greater than 0.90 and close to 1.0 is remarkable good fit.

GFI 0.912 is very close to 0.95 can be interpreted as a good indicator.

TLI 0.911 is less than one and very close to 1.0 specifies a very good fit

The Parsimony – adjusted Comparative Fit Index (PCFI) value 0.627 is moderately fit as it is in between 0 to 1.0.

The Root Mean Square Residual (RMSEA) Value is exactly 0.80 represents a good fit.

The Root Mean Square Residual (RMR) is 0.35 less than 0.05 indicates a strong fit.

It has been observed that the Confirmatory model is fit and the extracted variables are appropriate. Out of twenty-two factors sixteen factors extracted in exploratory factorial analysis while only nine factors were mined in confirmatory factorial analysis. The behavioral attributes, functional attributes and aesthetical attributes classified and extracted three factors in each group.

Behavioral Attributes

1. "I prefer the tailored look in my clothing"
2. "Clothes are one of the most important ways I have of expressing my individuality"
3. "My clothing selections are made with an eye towards the future"

In Indian context people still prioritize a tailor-made looks, the reputed companies consider these choices and provide more options in sizes like slim fit, comfort fit, contemporary fit in shirting and women tops while high waist, low waist, lycra in trousers. The clothing shopping in all the income groups are keen in preserving the clothes for future use of two to three years and hence it is important that "My clothing selections are made with an eye towards the future". It is quite obvious and general in all the age groups, income groups and gender that "clothes are one of the most important ways I have of expressing my individuality".

Functional Attributes

1. "I try to buy "basics" in clothing"
2. "The quality of the merchandise I buy is more important than its fashion appeal"
3. "I like my clothes to be practical"

There is no change in functional attributes extracted in exploratory factorial analysis and confirmatory analysis. The functional attributes are focused on quality of merchandise, clothes preferred are practical

and not like in a fashion show while basic clothing is most preferred.

Aesthetical Attributes

1. "I always buy at least one outfit of the latest fashion"
2. "I spend a lot of time on fashion-related activities"
3. "I avoid high fashion clothing because it goes out of style too quickly"

Folks are quite inclined towards the aesthetical aspects. In all age groups and income groups at least one outfit of latest fashion trend is favored. People spend lot of time on fashion related activities, this can be mostly on screen like while watching TV, OTT platforms and digital boards/kiosks. However, the fashion clothing is avoided because it goes out too quickly also the practical clothes are mostly preferred as a functional attribute, these two are strongly correlated

Conclusion

Apparels shopping online has been increased from the last decade, earlier the buying intentions were wedged on the periphery of the core purchasing like reliability in online shopping, website performance, returns and replacements, billing and discounts etc. today online shopping has become almost regular and easier than shopping in malls. The core buying intentions are studied and categorized in behavioral attributes, functional attributes and aesthetical attributes. A dimension reduction tool, factorial analysis was carried out wherein sixteen factors were extracted. Further to confirm and filter conflicting factors a confirmatory factorial analysis was performed and only nine factors were extracted with a good model fit and categorized and elaborated.

The Indian folks in all demographics are keen in clothing, apparel fitting and use clothes for long time, minimum for one year. The basics and practical approach with quality in clothing is most preferred. There is inclination towards fashion, fashion related activities and so likely to use at least one from latest fashion.

However high fashion clothing is avoided since it may go out of style quickly.

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A REVIEW ON MOLECULAR ORBITAL OF DIATOMIC MOLECULES

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ABSTRACT

Sub-atomic Orbital Theory (MO) is an amazing and broad methodology that depicts electrons as delocalized parts on nearby iotas. These prior hypotheses give generous data on anticipating the construction and restricting properties of an atom by depicting electrons as confined "inflatables" at high thickness. Typically, in diatomic sub-atomic orbitals, nuclear orbitals with the nearest energy level can cover and frame sub-atomic orbitals. Accordingly, nuclear orbitals for the most part will in general cover individually, from the least possible energy to the likely energy of the greatest homonuclear diatomic particle, which implies that the two iotas are a similar component, the equivalent orbitals will cover and shape sub-atomic orbitals. Similar as nuclear orbitals, atomic orbitals (MO) are utilized to portray the σ bond in particles by applying bunch hypothesis. The essential thought of what sub-atomic orbitals are can be the coordinated mixes of nuclear orbitals relying upon the balance of the particles and the qualities of the iotas. By applying the MO chart, properties, for example, attraction and chirality of atoms can be anticipated. Similarly, as nuclear orbitals can be addressed as wave works by applying the Hermitian administrator to Schrödinger's situations, sub-atomic orbitals can be approximated by straight blends of nuclear orbitals.

Keywords: Orbital Theory, atom, inflatables, Molecules.

1. Introduction

Despite the truth that VSEPR and the Valence bond speculation as it should be count on bond homes, they forget about to absolutely elucidate a few atoms. The MO speculation combines the wave nature of the electrons withinside the MO graph. MO graphs count on the bodily and substance homes of a particulate form, the binding energy, the bond length, and the bond point. They additionally offer statistics to expect the digital spectra and paramagnetism of a particle. then be extrapolated to assemble greater tricky polyatomic boundaries. Subatomic orbitals Area wherein an electron is in all likelihood to be determined in a particle. An MO is characterised because the aggregate of nuclear orbitals.

Homonuclear diatom Particles comprising indistinguishable iota are assumed to be homonuclear diatomic, for instance H₂, N₂, O₂ and F₂. LiF. Holding and Antibonding Orbitals Orbitals which are out of scene with every different are "antibonding" orbitals in mild of the truth that regions with thick electron chances do now no longer consolidate, accordingly weakening the particle. . nuclear orbitals and are in phase, as proven withinside the determine below. Note how preservation orbitals meet in a

beneficial way, not like anti-binder orbitals as shown in fig 1.

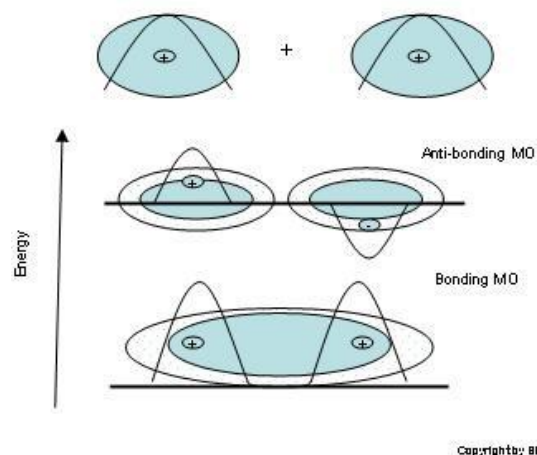


Figure 1- bonding MO and Anti bonding MO

2. Literature Review

Stages and hubs Stages are assigned either (+) or (-) comparative with their wave "up" or wave "down" removals. A hub occurs if the degree symptoms and symptoms alternate from (+) to (-) or the alternative manner around. Notice that the degree symptoms and symptoms do not constitute charges. Hubs are locales wherein the probability of coming across an electron is ZERO.

Sigma and Pi Bonding

A sigma bond is a "start-to-end" bond fashioned with the aid of using symmetrical nuclear orbitals. A pi bond includes a "lateral" crossover. ability or Gibbs strength) of orbitals. Individual nuclear orbitals (AOs) are designed to the a long way left and a long way proper of the limit. Overlapping nuclear orbitals produce atomic orbitals positioned withinside the graph. These MOs pass with a sigma or pi bond and are assigned to hold, unbind, or anti-bind orbitals with recognize to their stages. Electrons in nuclear orbitals are assigned atomic orbitals in step with the Pauli exclusion principle. Low strength MOs are stuffed first, observed with the aid of using sequentially increasing orbitals.

Steps In Deriving Mo Diagrams

There are some degrees ordinary in all MO graphs. Understanding those essential degrees to deduce honest homonuclear and heteronuclear MOs will empower us to construct extra muddled, polyatomic graphs. Stage 1 Discover the valence electron setup of each particle withinside the atom. The valence electrons may be set at the nuclear orbital for that iota. Do this for each iota. Ex) Boron (B) = (He)2s² 2p¹ = three valence electrons Stage 2 Choose if the particle is homonuclear of heteronuclear.

On the off risk that the particle is homonuclear, the AOs may be symmetric. Heteronuclear AOs may be incredibly particular in mild of the truth that the extra electronegative particle may be positioned decrease at the define. This is due to solitary units of electrons being extra regular on extra electronegative additives using them to be decrease in power. Ex) HF = "F" may be set decrease withinside the graph than "H". Stage three Fill sub-atomic orbitals making use of power and protecting houses of the overlaying nuclear orbitals. Remember the power of the nuclear orbitals and sub-atomic orbitals!

The accompanying factors upload to the state of affairs of 1 MO as for unique MOs. • More hubs = extra vivacious = better MOs • Sigma orbitals are extra grounded than pi bonds • Antibonding MOs are better in power than protecting MOs • Constructive cross-over = much less hubs = extra regular (much less vivacious) • Destructive cross-over = extra hubs = much less regular (extra vivacious) Stage 4 Utilize the

graph to foresee houses of the atom, Bond request, bond point, paramagnetism, and so forth (Keep in mind: the amount of man or woman nuclear orbitals must upward push to the amount of MOs) Building Molecular Orbital. Diagrams for Homonuclear and Heteronuclear Diatomic Molecules Because of stability of the

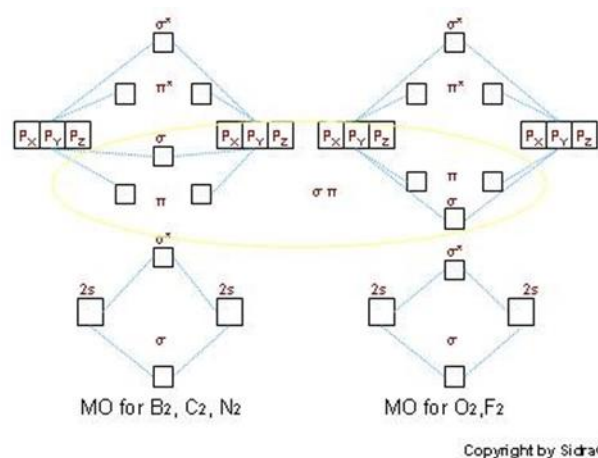


Figure 2- Homonuclear and Heteronuclear Diatomic Molecules

particle, homonuclear MO's are much less tough to deduce than heteronuclear atoms and polyatomic atoms. (Like H₂O, NH₃, and CH₄.) However, be aware the difference among orbitals of homonuclear diatomic for additives with a nuclear quantity now no longer precisely or equal to 7 (up to fourteen electrons framework, for this case in reality don't forget the power stage request resembles π , σ , π^* and σ^*) as opposed to extra than 7 (in extra of 14 electrons framework, for this case in reality bear in mind the power stage request resembles σ , π , π^* and σ^*). As a trendy rule, B₂, C₂, and N₂ have the MO define portrayed at the left. O₂ and F₂ have the MO at the right in fig 2. For what cause does this difference exist.

3. Construction of MO diagrams

for heteronuclear molecules calls for the equal four steps as above. However, take into account that the greater electronegative atom may be decrease at the diagram. Valence rule Bond Heitler and London gave this hypothesis. This is generally fundamentally based absolutely at the considerations of atomic orbitals, format of computerized parts, protection of atomic orbitals, hybridization of atomic orbitals. The protection of atomic orbitals decides the

relationship of a compound bond. Electrons are confined within the job of the bond in light of the cover. The valence bond theory portrays the computerized production of iotas.

The theory says that electrons fill atomic orbitals one bit inside a particle. Likewise, it communicates that the core of one molecule is intrigued by electrons from each unique atom. Presently, we should save and inspect the magnificent recommendations of the valence security theory. Valence Bond Theory Assumptions • The inclusion of half-filled valence orbitals with single particles decides the advancement of the covalent bond. The covering will development the thickness of the electron among strengthened atoms in fig 3.

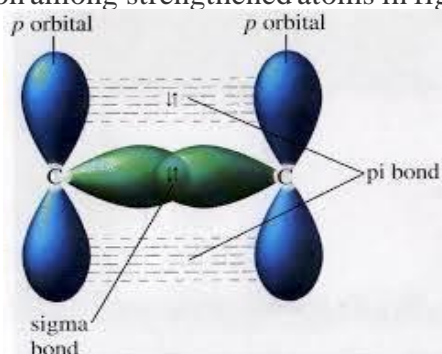


Figure 3- valence bond

Constraints of the valence bond thought As we noted before, presently done something is ideal! Similarly, the valence bond thought isn't best by the same token. It has its cutoff points. They are:

- It neglects to offer a reason for the tetravalence of carbon.
- This thought talks the energies of electrons.
- The theories identify with the space of electrons in explicit positions. In view of the superposition of the orbitals, sorts of covalent bonds are normal, called sigma (σ) and pi (π) bonds.
- Sigma bonds are normal by means of the thwart to-prevent superposition of nuclear orbitals along the internuclear hub known as front facing or pivotal superposition. Endon cross-over is of three sorts, it's miles ss cross-over, sp cross-over and pp cross-over in fig 4.

- A pi bond is normal even as nuclear orbitals explicitly cross-over so their tomahawks stay

corresponding to each particular and opposite to the internuclear pivot. Sigma (σ) and Pi (π) Bonds in figure 5. There are 2 assortments of covering orbitals: sigma (σ) and pi (π). The two bonds are molded from the cross-over of two orbitals, one on each molecule. σ bonds happen while orbitals cross-over in among the cores of molecules, similarly called the internuclear hub. π bonds take region while 2 (unhybridized) p-orbitals cross-over. The p-orbitals, in a solitary π bond, lie above and under the cores of the iotas. By possessing the spot of region this is above, ordered under, and on the edges of an iota's cores, π bonds can shape.

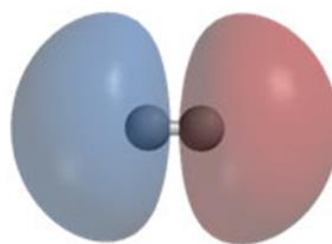


Figure 4 (a) Sigma bond

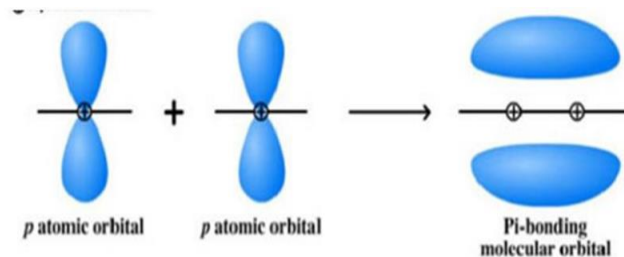


Figure 4 (b) Pi bonding molecular orbital

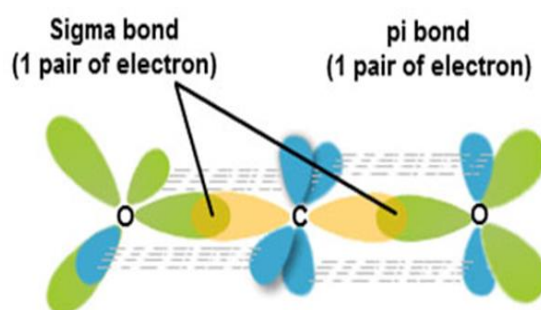


Figure 5- Sigma pi bond

Proposals of valence bond theory

The fundamental propositions of the valence security hypothesis are as follows:

- Covalent bonds are formed when 2 valence orbitals (half-

filled) from two distinct iotas intersect with each other. 'Other.

The thickness of the electron in the area between the two holding iotas increases due to this coating, thus increasing the reliability of the next atom. Various bonds with different molecules.

The paired electrons present in the valence layer do not participate in the development of the bonding substance under the valence bond hypothesis. • The sigma and pi bonds contrast in the example where the cross-linked nuclear orbitals in, for example, the pi bonds are formed by the lateral sheath while the sheath along the hub containing the nuclei of the two molecules advances the sigma bonds.

The uses of the VBT valence bond hypothesis can regularly clarify how covalent bonds are structured.

The diatomic fluorine particle, F₂, is a model. The fluorine iotas structure the individual covalent bonds between them. The FF bond emerges from the cover pc orbitals, each of which includes an unpaired solitary electron. A comparative circumstance occurs in hydrogen, H₂, however bond lengths and strengths differ somewhere in the range of H₂ and F₂ particles. A covalent bond forms in the middle of hydrogen and fluorine in the corrosive hydrofluoric HF in fig 6.

This bond is formed by the cross between the hydrogen orbital and the fluorine 2 pcs orbital, each of which has an unpaired electron. In HF, hydrogen and fluorine share these electrons in a covalent bond.

VBT Constraints Flaws in the valence bond hypothesis include: • The inability to represent the tetravalence displayed by carbon. • No knowledge given on electron energies. • The hypothesis assumes that the electrons are delimited in explicit zones. • Does not provide a quantitative translation of the thermodynamic or motor qualities of coordination substances.

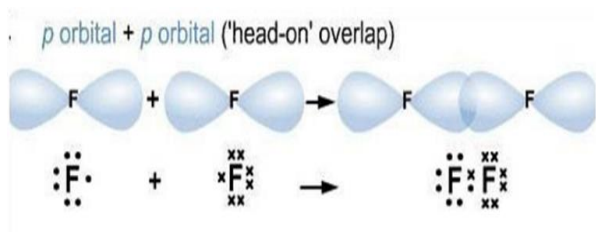


Figure 6- head on overlap bonding

Table 1- distribution of hybrid orbitals

Coordination number	Type of hybridisation	Distribution of hybrid orbitals in space
4	sp ³	Tetrahedral
4	dsp ²	Square planar
5	sp ³ d	Trigonal bipyramidal
6	sp ³ d ²	Octahedral
6	d ² sp ³	Octahedral

A non-holding orbital (NBMO) is a sub-atomic orbital for which the expansion or expulsion of an electron doesn't change the energy of the particle.

Sub-atomic orbitals come from the straight mix of nuclear orbitals.

In a basic diatomic atom, for example, HF, F has a greater number of electrons than H.

The s orbital of H can cover with the 2p_z orbital of fluorine to shape a holding σ and an antibonding σ^* orbital.

The p_x and p_y orbitals from the F don't have some other orbitals to join with. They become NBMOs.

The p_x and p_z nuclear orbitals have become sub-atomic orbitals. They look like p_x and p_y orbitals however they are currently atomic orbitals.

The energies of these orbitals are something similar in the particle as they are in a disengaged F iota. Hence, placing an electron into them doesn't change the solidness of the particle.

NBMOs don't have to look like nuclear orbitals. For instance, the NBMO of the ozone particle has its electron thickness focused on the end oxygen molecules. There is no electron thickness on the focal molecule in fig 7.

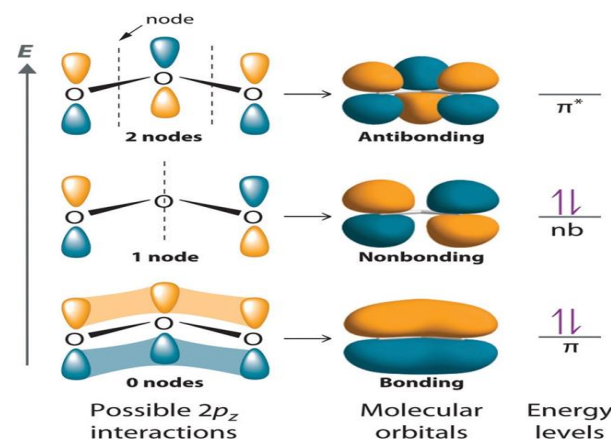


Figure 7- Molecular orbitals

4. Rules for the LCAO technique are:

- 1) The same energy of joining orbitals: The consolidating nuclear orbitals should be of equivalent energy or around same energy
- 2) Same evenness along the nuclear orbital: The joining orbitals ought to have a similar balance along the atomic pivot for legitimate mix
- 3) Proper cross-over between the nuclear orbitals: The two nuclear orbitals will combine to shape sub-atomic orbital. More noteworthy is the reach out of cross-over of nuclear orbital, more prominent will be the atomic thickness.

5. Result

We are accepting right here that the understudies recognize the principles of factor bunch evenness and capacity to differentiate the essential stability additives for an atom: head flip hub and different pivot tomahawks, planes of stability, consciousness of stability (or reversal consciousness), revolution mirrored image tomahawks and individual. Moreover, we assume that understudies understand a way to symbolize a particle as in step with its unique factor bunch and understand that very last portrayals deal with the balances of specific sub-atomic properties, for our situation, the valence orbitals.

It is moreover time-honored that the essential requirements of sub-atomic orbital (MO) speculation for diatomic atoms which understudies have visible in earlier than publications are perceived along the manner that sub-atomic orbitals are direct mixes of nuclear orbitals. These directly blends appear whilst the balances of the nuclear orbitals are some thing comparable and the orbitals are near in electricity. At last, the understudies are taken to absolutely recognize the contrasts among holding, antibonding and nobonding atomic orbitals. Four delegate polyatomic debris may be taken into consideration on this paper, to be unique: H₂O H₂O The factor collecting of H₂O is C_{2v}.

The balances of the valence orbitals of the focal O molecule can directly be gotten from the C_{2v} individual table. The balances of s orbitals are

continuously given with the aid of using the truly symmetric unchangeable portrayals in individual tables, even as balances of p orbitals are gotten from the 0.33 section of the individual tables wherein the x, y and z Cartesian facilitate tomahawks are demonstrated. The d orbitals may be outstanding from the fourth section of the individual tables because the double outcomes of the Cartesian coordinates (z², xy, and so on) To accumulate the balances of the LGOs of H₂O, we want to understand that the C₂ rule pivot hub is ready the z-hub containing the O particle.

To tune down the reducible portrayals for the LGOs, the accompanying splendid collecting hypothetical lower equation is utilized: wherein laptop primarily based totally intelligence is the events the I-th very last portrayal indicates up withinside the reducible portrayal, h is the request for the collecting, R addresses the evenness activity, g is the request for the class, Xi(R) is the very last portrayal individual in R and Xt(R) is the reducible portrayal or all out portrayal individual in R. The orbitals a good way to consolidate at once ought to have a comparable evenness and be near in electricity. The real electricity degrees for man or woman debris are directly gotten from check estimations, for example, with the aid of using photoelectron spectroscopy.

6. Conclusion

To deliver our gathering hypothetical strategy for creating MO energy outlines simpler for college understudies to follow, we have developed the accompanying stepwise broad methodology:

- Stage 1. Recognize the point bunch evenness of the particle
- Stage 2. Decide the balances of the valence orbitals of the focal molecule from the person table
- Stage 3. Discover the balances of the LGOs
- Stage 4. Build the MO energy level chart.

This calculation is altogether reliable with Taber's notable academic way to deal with substance education.

Acknowledgements

We would like to express our sincere thanks to Dr. Chandrashekhar V. Murumkar, Principal, Tuljaram Chaturchand college Baramati, for his

constant encouragement and support. We also thank Mr. Chetan Thakar for his constant support.

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