ISSN 2278-3091
Volume 9, No.4, July – August 2020
International Journal of Advanced Trends in Computer Science and Engineering
Available Online at http://www.warse.org/IJATCSE/static/pdf/file/ijatcse158942020.pdf
https://doi.org/10.30534/ijatcse/2020/158942020

Artificial Intelligence and Future Employment

Sapna Khatri[1], Prof. (Dr.) Devendra Kumar Pandey[2], Prof. (Dr.) Daniel Penkar[3]
[1] Research Scholar, Amity University Madhya Pradesh, Gwalior. India ramani.sapna@gmail.com,
[2] Professor, Amity Business School, Amity University Madhya Pradesh, Gwalior, India dkpandey@gwa.amity.edu
[3] Prof. & Director- Sinhgad Institute of Management, Savitribai Phule University, Pune, India. drdanielpenkar@rediffmail.com

ABSTRACT

AI, as one of the technologies of industry 4.0, is bringing dramatic influence in the existing working setup of organization. AI demands newer work, newer skill-sets, throwing newer challenges, a totally new perspective. This perspective is based on the primary and secondary data collected. There is no single cookie cutter for all challenges. To be future ready, organizations need to prepare themselves through the employment strategies of skill enhancement, new skill development and re-skilling of its human intellect. Whilst AI may threaten to make humans redundant in certain kinds of jobs, it surely opens new vistas for skill-sets, which would be required to manage the new workplaces, and the future employment processes will have to be created around these technologies. The field of AI is growing at break-neck speed, so there are newer things emerging every single day. So this perspective is dated with respect to analysis and outcomes, which have potential to be revisited in short & medium term. It requires different talent, skills & techniques for defining solutions and challenging current employment processes. AI Automation, IoT, Cloud computing, Cognitive computing; has been mesmerizing the workplaces. Whilst all the advances in connected world bring about efficiencies and productivity, these create and influence and support employment processes and pose challenges for the organization, fuelling start-ups and entrepreneurship as social and economic development. The field of AI and its influence on HR is an emerging field, with lot of work being done globally. However, how is AI challenging and creating employment opportunities in the organization and helping development of the society is the key areas of study in this paper.This paper elaborates on the usage of AI for future employment opportunities & challenges.

Key words: Artificial Intelligence, Challenges and Opportunities, Employment, Entrepreneurship, Human Resources development.

1. INTRODUCTION

Future employment is going to move around the AI technology and connected World. Human Talent of any organization is tacitly driven by culture of the workplace environment. Adaptability is the hallmark of the human race but humans are also driven by inertia to change, they resist change before accepting and adapting it. The sneaking impact of the AI is also provoking these inertial mind-sets. This distrust is further heightened by overabundance of Sci-fi movies, which propagate a super image of the supremacy of the automation and machines over Homosapiens. Hence, it's natural for humans to imagine AI automation as competition, potentially a threat and substitute mechanism. Similar scepticism had greeted all previous industrial revolutions and they had been viewed as anti-human. However, human superiority has remained unshakeable and unscathed thus far. Only common factor has been it takes time to settle in collaboration.

AI will surely throw a unique challenge, a new dimension to the employee functions and social processes in the organizations. The work places are destined to be wedged by the intelligence being built into the working systems, be it the manufacturing shop-floors or support systems, whether it's transactional automation or solutions libraries, whether it's human interface or the assessment interface. Most of these are being influenced by the AI and are exploiting the Big Data, using complex algorithms. All these are transforming today's workspaces to be future ready and influencing employment, which are sharp departure from what has been experienced in any of the prior industrial revolutions. One main differentiator in the previous revolutions was that humans were harnessing the aids of productivity and efficiency developed, for delivery of results. AI is changing this whole equation itself, it puts "intelligence" at the centre of the debate, something which has been exclusive dominion of humans and never been replicated. It may not be true any longer and hence the new set of influential challenges are coming to fore. Few people may be considering this as a threat on their jobs and employment on the other hand few are considering AI as opportunity and taking leverage of this technology to build or setup their new entrepreneurship venture or enhance their existing setup and adapt the process to this technological revolution.

1.1 Artificial Intelligence

AI is an extension of machine learning. In this phase of technological progression, machines are trained to respond not only with specific outcome from the set programs but also to learn, relearn, extrapolate, think and respond on its own. AI is a one of the technological disruptions of industry4.0, where in machine may take over human intellect. [11] AI is remodelling machines as smart as feasible, so that they can learn and solve the problems cognitively, a sole domain and asset of the humans until now. Humans are preparing machines for intelligence purpose without realizing or anticipating its deep

infiltration into their sole domain; this could be a real threat or risk.[2] Though AI is bringing assistance for the employee and changes the dimension of job profile by reducing or eliminating the routine and repetitive job, it enables employer to re-visit the whole gamut of employment and HR processes. AI helps employee to think differently and progressively and allow them to accomplish task in collaboration with machines.

1.2 Employment

Employment is to get affianced to any organization to provide or offer services against the remuneration in form of monetary benefits. Organization involves people in form of employee to get the work done from them to achieve organizational goals for the betterment of individual, organization and society at large economically considering the latest use of technology and up gradation of skills. [13] Employment is a progressive process of hiring employees and human talent management. It starts with recruitment and selection and culminates at retirement or separation. [14] It comprises of recruitment, selection, orientation, socialization and finally placement. Training and re-skilling people are also an integral part of employment leading to career and succession planning for the employee under employment. Employment brings mutual benefits for employee and the organization, defined by a frame of contract and defined policies, under which employment can be governed to achieve the common goals and development of both.[12] With the arrival of AI, it is becoming increasingly debatable whether AI will be enabler or competitive force in the employment in the organization. Whereas entrepreneurs are considering AI as a tool of productivity and enhancing the efficiency of business and employee, a lot of leverage will be dependent on the how the complete business processes are re-laid out. Goos et.al philosophise that as the technology effect grows, there is an increase in the relative demand of the high-paid skilled jobs, requiring non-routine cognitive skills. Equally increased demand is seen in low-skilled, low-paid jobs, requiring non-routine manual skills. However, it is seen that there fall in demand of jobs requiring routine manual and cognitive skills, basically the mid-category jobs. The researchers refer to this process as job polarisation.[4]

1.3 Artificial Intelligence and Employment Processes

AI is surely and securely entering the industry and in minds of employees with the focus of economic growth.AI is now taking over the tasks, which was earlier managed by humans in the industry, bolstering the claim that machines can be smarter than human employee. Voice assistants, AI bots, Driverless cars, Drones are playing role of employee and imposing employment challenges and becoming the reason of social development. All these execution are leading to dilemma that what kind of employment is needed in the organization for humans now. [5]

1.4 Problem Statement

What kind of structure is going to shape the industry? Whether nature of the employment would be horizontal, vertical, managerial or strategic? Weather it will be permanent, temporary, contractual or no employment opportunity for the natural intelligence? Innovation in technology is throwing many questions in the current workspaces. However entrepreneur is accepting this as opportunity and responsibility of dynamic need of developing nation. Few names in entrepreneurship venture with the innovation in technology are as Flipkart, Amazon, Facebook, Alibaba, Ola, and Uber; similarly many online applications are the great examples in the field of entrepreneurship. Start-ups have taken different shapes in their business and venture with the help of latest innovation in technology& adapting it to their processes, which indicates social development. It creates more employment opportunities in technical field to create or develop in depth logical algorithm. On the other hand it is throwing the challenge on non-technical field. Let's discuss the combination of AI and human collaboration employment opportunities.

2. REVIEW OF LITERATURE

ALLEGIS group published a white paper on AI, which quotes a 2016 report by analyst group IDC, predicting revenues from cognitive systems and AI technologies to jump from $8 billion in 2016 to more than $47 billion in 2020. The World Economic Forum had forecasted that 60% of the kids entering school today would end-up working in jobs, which do not even exist today. A study by Oxford Martin School of Economics suggests that 47% of all American functions will be automated within next 20 years. KPMG has predicted that over 100 Million global knowledge workers will be affected by Robotic process automation by 2025. However, every prediction is not pessimistic in its outlook. Organization for Economic Cooperation and Development has predicted that 5-10% of labour would be displaced by intelligent automation but new job creation will offset losses. All these are clear indicators that future employment will have new dimensions, in almost all functions and segments of business. [1]

Georgios Petropoulos, in his research paper, debates about multiple approaches, the effect of AI on the labour market, if it will lead to displacement or productivity effect. He cites a research from Mckinsey Global Institute wherein it is expected that AI will disrupt the society at ten times the speed and three hundred times the scale of previous known industrial revolutions. The impact is expected to be three thousand times higher. [8]

In an article published by BCG researchers, Gallego, Krentz, Taplett, Tsusaka, and Yousif (2019), present the arguments on how AI can help or hinder the growth of employee in the workforce. Whilst they argue that AI algorithms can be biased against women employment, as the current statistical data is adversely tilted in favour of men. The same data resources can be used by AI based HR recruitment tools against the women candidates. However, on the upside, the same AI can be enabler for improving the gender diversity at workplaces. AI based support structure can allow the women to focus easily on their career whilst the AI enables them to manage the daily

chores. Such enablers would help women workforce ratio improve in the future. [3]

In a research findings published by MIT Sloan Management Review, based on the research by Mckinsey Global Institute, it is suggested that by 2030, whilst AI will lead to lesser full-time employment, it will not create massive unemployment as dreaded by many. One of the key reasons identified by this research is that early adopters of AI would tend to focus on innovations for growth, which would lead to higher employment prospects and hence more jobs. The whole gamut of employment and human resource processes will be adapted to leverage AI. [2]

In papers published in International Journal of Advanced Trends in Computer Science and Engineering, Nishad Nawaz (2019) talks about the transformation in the recruitment process of CMMI level organizations, where in Artificial intelligence is being used to select right applicant by the organizations for their talent pool. [6] AI is almost swapping the human intervention in the process of recruitment in some of the software companies. [7]

In a critique published in Forbes Magazine, Walch (2019) suggests that AI is going to create entirely new categories of jobs, whilst killing some of the existing categories. Walch exemplifies that two to three decades back no one even had known a job category called social media marketer. Similarly, in coming two to three decades there will be new categories of employment, which no one can imagine now. [9]

In a study conducted by Accenture and in an article published in MIT Sloan Management Review magazine in Summer 2017 edition, the researchers (Wilson, Daugherty, Morini-Bianzino) identified the emergence of new categories of human jobs, which do not replace the existing ones. In fact, most of the jobs will be new, having no semblance to the jobs of today. The researcher defined these categories as trainers, explainers and sustainers. These categories are representative of AI driven business and technology jobs. [10]

3. METHODOLOGY

For this research paper, primary and secondary data is collected. The tools used to collect the data is questionnaire from selected sample and through descriptive qualitative review research articles, periodical, books and journals – both online as well as printed, as well as the experience, learning and observations of the researchers. The field of AI is growing at break-neck speed, so there are newer things emerging every single day. Review of these emerging information and analysis is part of this methodology.

3.1 Scope of the Research

This study will thrust employee in acquiring and accepting the technical advancement. It helps in forming a favourable environment in the working space and social development through enabling processes in the organization. The study can also help in encouraging the employees' optimism and elevated throughput, so that both business and industry would be able to drive maximum gain in terms of human resources management and required skill sets development.

The power of AI is not just going to infest automation traditionally linked to the manufacturing processes. It has rather started making mega strides into the employee's function itself in all domains. AI found its very first takers in the domain of repetitive and predictable processes, which data algorithms could easily replace, bringing higher productivity and efficiency. So the easier targets were routine processes viz. time keeping, payroll processing, resume screening and even the employee induction. The bots, using AI algorithms can very efficiently handle the employee support processes, with human employee not even able to realise that he is interacting with a machine. In today's top organizations, when an employee pushes his or her queries to other department to have an answer by human employee, its highly likely that there is no human on the other side, who is receiving or processing his questions. Same is the case with resume screening and short-listing potential candidates. AI bots are immensely efficient in profiling thousands of resumes in database and mapping them closest to the job description. They can even process the basic transactional interactions and set-up interview schedules. It's said that necessity is mother of invention, when the Human Resources function itself is challenged by AI advancements, it will develop a response mechanism to preserve and reinvent itself. Experience is the biggest teacher, so this reinvention is bound to produce mechanisms for reincarnation of organization processes for future, and managing the human intellect in whole organization itself with changing technological advancement.

3.2 Objectives of the Research

- To understand the future employment processes in the age of AI.
- To study the future challenges and development of human talent at workplaces using AI.

4. SIGNIFICANCE OF THE RESEARCH

The aim of AI is to create an accurate and error free execution; cost and time saving; increase in productivity and seamlessly perform any job as any human would do i.e. intelligently. The composition of AI is Algorithm, Big Data and Machine Learning. AI, Machine Learning and Automation Technologies; in their current state hold humungous opportunities and realms for the human kind. These fields are not only new but also very vast and intriguing for the future opportunity they hold. Very limited research work has been done in these fields owing to limited funding as well the freshness of the whole technology. It is possible to build upon this study and make a comprehensive research, to make more robust conclusions and recommendations than what author and co-author have submitted at end of this paper.

5. EXPECTED OUTCOME

Researcher wishes to establish the correlation between latest in technology and related challenges in employment processes. The opportunities may be different in nature and required different skills to perform it however it is totally depend upon the organizational readiness to adopt it and allow employee to explore it in their domain strategically. The goal of the research is to understand the influence of AI implementation in organization processes and how future job landscape will take the shape. How machine and man can collaborate with each other to get the desirable output in the organization is the key factor of the study. How can employee leverage AI in their tasks to enhance their skills and performance, making it a sign of positive influence?

6. DISCUSSIONS AND ANALYSIS

"AI is a tool, not a threat," said by Rodney Brooks. Following example and case study would explain the concept, which will connect the statement made by Rodney Brooks. Bowery farming in New Jersey in the US is a 5 year-old start-up, where the farming is managed by artificially intelligent machines. Every morning when human farmers arrive at the farm, the computer presents to them a list of tasks, which they need to accomplish. The proprietary software uses reams of data collected from farm to derive several important decisions viz. how much to water each plant, the intensity of the light required, when to harvest, etc. The machine is perpetually learning the farming and knows much more than any seasoned farmer would know. This start-up maintains that AI leads to stacked crops and year round growing season making farming 100 times more productive per square meter. Certainly this example shakes all the notions of conventional employment known to human kind.

The unique dimension provided by human senses, is getting replicated scientifically, bringing far more accuracy. This is surely going to disrupt the human dynamics within industry, causing a potential displacement (employment) of humans. Such future employment would mean Human Resource professionals would have to work on creating new chemistry in the organizational culture, where both human intelligence and AI, not only coexist but also compete and collaborate.

Of course, AI also has potential to kill jobs but as Professor Erik Brynjolfsson, MIT Sloan School of Management maintains that any task, which doesn't require human creativity or strengths like interpersonal skills, its potential target of AI based automation. However, Professor also adds that whilst technology may be destroying one kind of jobs, it does end up creating another kind of jobs. Only trick to remain in demand is to remain flexible and ready for newer jobs, some of which are not even known today.

Let us look at one of the very closely known AI application machine to humans – Smart Phones. Today AI supports the augmented reality and virtual reality mobile chipsets, supporting the features viz. facial recognition and transactions using facial recognition. Language translators, Personalized Contextual Automated calls, Camera based benefits, and Voice Assistants, etc. are some of the applications of AI. Whilst one may argue if AI features of smart phones are making certain kind of jobs redundant, for e.g.: Translators, Photographers, etc. the same AI based applications open a new stream of jobs, that is of programmers, designers, app creators, who can harness the power of AI for human benefits. This very case of smart phones reinforces the contention of Prof Brynjolfsson, who maintains that technology can be enabler for new kind of employment.

At the onset of IT revolution, most feared that computers will take over their lives and jobs. A great sense of insecurity and challenges erupted amongst the public sector employees, government sector employees and even private sector employees, especially those in their late forties or early fifties. They were scared that the kids with computer knowledge will only retain the jobs and it will be a matter of time when oldies will be asked to leave. Many people were also sceptical that new crop of connected organization will usurp the market share from the old. Most underestimated their own capabilities to unlearn and learn. It's just another matter that IT revolution resulted in the opposite. It turned out to be biggest employment sector in India and we ruled the roost of the global IT services scene for decades. Two of the biggest and most prominent IT companies globally by market capitalization (Google & Microsoft) are led by Indians, and there are many more. With training and support, those naysayers who were scared of losing their jobs, not only learnt to use the computers, they leveraged this new skill sets to improve their productivity as well. A similar situation today exists for the AI. To say the least, best of the educated people are worried that AI will render them redundant.

Organizations and leadership teams are however, alive to the potential of AI and benefits of harnessing this potential for the competitive advantage. Indirectly said, such organizations are tacitly working towards killing some of the routine jobs, fuelling the risk of loss of employment and jobs to AI. However, same organizations are unknowingly fuelling creation of other kind of employment, linked to AI development. So the skill sets needed might be very different from the traditional sectors but the story of IT revolution is likely to be repeated. The business processes are continuously being challenged and adapted to incorporate AI as integral part of these.

The industry is investing not only in the database servers, hardware, software, algorithm but also the human talent to leverage these investments. The key is not about the millions of code lines in algorithm but the talent to create these algorithms and use of it. Like robotic automation, the AI based automation and bots need to taught and trained, to imitate human emotions, feelings, thoughts, cultural perspectives, etc. Such trainings are to be provided by humans, creating a new set of trainer jobs. The training is not of any physical entities but the algorithms, which require a skill set never heard of. Another class of skill sets is of the humans who can explain and decipher the

decisions of the AI algorithms. And the last class of skill sets for human talent of AI is the evaluators and promoters of AI algorithms.

These are not the only classes of the employment options, which can evolve from AI. There will be scores of other categories that are not known but will get created, as the AI progresses. The existing class of employments and employment processes may also undergo transformation or elimination, as some skill sets / processes will become redundant.

The authors of this paper conducted a pilot research of the impact of AI on employee job structure in Indian industry. The results that emerged were interesting and thought provoking:

1) As seen in Figure 1, 84.7% respondents clearly agreed that implementation of AI is promoting horizontal job structure in employee management. This indicates that AI will not just cause the loss of jobs but replacement within the same hierarchal structure. The whole processes of employee management will have a reinvention.

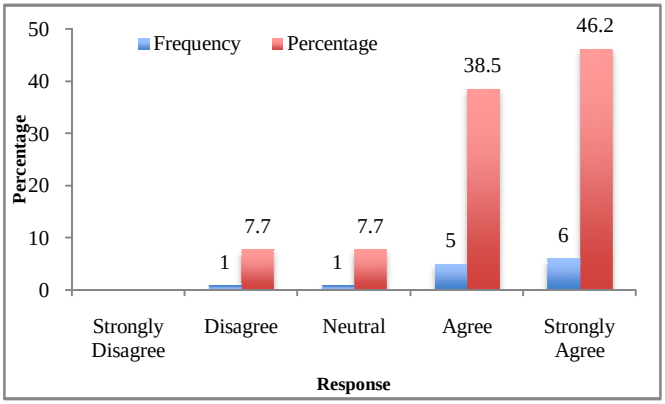

Figure 1: AI - Promoting Horizontal Job Structure

2) As seen in figure 2, 61.6% respondents remained neutral or disagreed that implementation of AI is promoting vertical job structure in employee management. This indicates that AI will not create a vertical hierarchy of jobs, indicating elimination of some the levels.

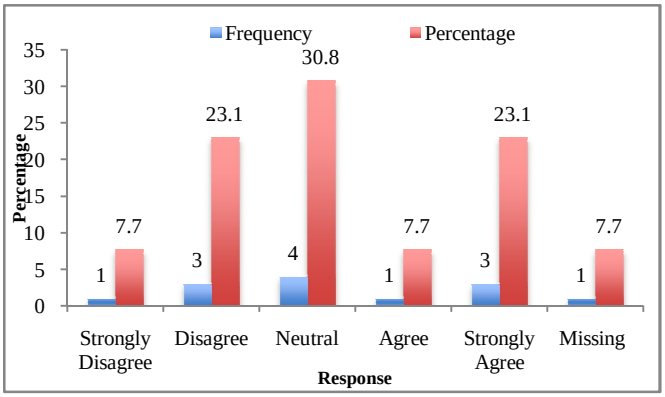

Figure 2: AI - Promoting Vertical Job Structure

The primary research quoted here is a part of a bigger comprehensive research for the doctoral studies, hence cannot be reproduced here in entirety.

7. CONCLUSION

The truth is that technology is moving ahead on many skills, which was propriety of human earlier, on the other hand creating demand for new skills. To be future ready, organizations need to prepare themselves through the employment strategies of skill enhancement, new skill development and re-skilling of its human intellect, making these an inseparable part of business processes. Whilst AI may threaten to make humans redundant in certain kinds of jobs, it surely opens new vistas for skill-sets, which would be required to manage the new workplaces, and the future employment structures will have to be created around these. Indeed, there is a potential of totally new job streams, which never existed, and humans would be needed for such jobs to manage the automated workspaces. All the current developments are pointing to the capability of the artificial intelligent systems in excelling in the predictive domain and adversely influence the employment in such domains. But judgement continues to remain the exclusive domain of humans and we face more situations needing judgement, rather than needing prediction. Future employment will be driven towards the judgement jobs & skill-sets as discussed in the cases cited in discussion.AI Technology is helping employee to take and make decision on the basis of the prediction done by AI. Organizational leadership and the Human Resources have to start steering their energies, focus and strategies in these directions. Future belongs not only to the organizations who adapt and invest in intelligent systems, it will belong to organizations who rewrite their processes, prepare their employees & employment definitions to productively harness the power of the Big Data and AI for the competitive advantage. Of course future also belongs to young entrepreneurs, who perceive AI as aid to accomplish their goal and willingness to adopt it. The history of human race is a fitting example of Human grit and instincts overcoming all the disruptions, AI will not be an aberration. Future employment processes and strategies will have to recognise this influence of AI and harvest it as key enabler for humans to prevail and remain on the roost.

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EMPLOYEE ENGAGEMENT: PROBABLE SOLUTIONS TO CHALLENGES POSED DURING COVID-19 OUTBREAK WITH REFERENCE TO INDIAN IT SECTOR

S. Ramaswamy[1], G.Das[2] and S. Singh[3]
[1]Sinhgad Institute of Management and Computer Application, Savitribai Phule Pune University
[2]Sinhgad Institute of Management, Savitribai Phule Pune University
[3]Dr. D.Y.Patil School of MCA Pune
shubha.ramaswami@gmail.com, gopa.das10@gmail.com sapan23k@gmail.com

ABSTRACT

The last year have been really tough on the global socio and economic changes because on contemporary covid-19 outbreak. The lot has changed in terms of how employee and employer engage themselves at workplace. This change was triggered due to penetration of technology across the all industrial sector and around globe. The past few months of COVID-19 pandemic have resulted in companies' laying-off employees, remote working, work-life imbalance and in general increased employability uncertainty especially among IT employees. This has brought organizational focus back to their employee engagement tactics and motivation as employee morale has touched an all-time low. Though the concept of employee engagement first appeared in an academic journal in 1990's, it remained to be a matter of constant revival. The present study is based on secondary data sources such as review of various research papers from substantial online sources, articles, books, blogs and reports. Such study will act as a supportive hand for any organization in building effective employee engagement strategies in this trying situation. Organizations can reengineer their current employee engagement strategies and policies.

Keywords: *Employee Engagement Strategies, Covid-19, Indian IT Sector, Challenges, Lay-off, Work-Life Imbalance.*

Introduction

The year 2020 will be recalled for ages to come and the credit is not because of any revolution that took place but due to the COVID-19 pandemic which led to the global crisis. India too couldn't escape the outbreak and had witnessed a spike increased number of cases starting from March 2020 and subsequently slide unto the pandemic. Soon after, our country India declared its lockdown, it was being witnessed for the first time ever in the history Indian economy was facing difficulty. Government of India was constantly involved in developing remedial and proactive measures. Organizations were facing tough time as they were forced to remain closed during lockdown yet need to manage their operations and feed their employees. The working pattern changed almost for all sectors.

Statement of Problem

The past few months of COVID-19 have resulted in companies' laying-off employees, remote working, work-life imbalance and in general increased uncertainty especially among IT employees. This has brought organizational focus back to their employee engagement tactics and motivation as employee morale has touched an all-time low.

In the given scenario, the employees were forced to work from home and at the same time the organizations were fighting against their sinking operations, salary payments, absurd overheads and employee turnovers etc. This resulted in shutting down of many startups and companies and commercial activities. From big to small, everything came to a standstill. All this added up to low employee morale and disengaged employees. All organizations including the IT sector were thrusting towards virtual working environments to drive substantial outcomes. Hence, it can be said that the Pandemic scenario was compelling all the organizations to call for more employee engagement with an aim to recover output with efficiencies.HR managers were constantly involved in devising new policies and processes to engage and enhance employees' performances. Employee engagement became the topmost priority issue for the IT-HR managers due to Covid-19 pandemic. Employee engagement is a behavioral attitude at workplace where the employees are committed to their organization and align their individual goals to the organizational goals (Chanana & Sangeeta, 2020). Organizations always keep track of the employees who are engaged in their work and earn profitability for

the organization through their performance especially in IT sector.

Objectives

1) To study impact of Covid-19 outbreak on employee engagement initiatives in Indian IT Sector. 2) To identify the challenges posed and probable solution for the same.

Need & Scope

The current study is limited to study of employee engagement trends during ongoing Covid-19 pandemic and study the impact of said pandemic on employee engagement. Functional scope is limited to identify the contemporary challenges while restarting workplaces and proposing potential solution to handle them. The study reveals the details on widely used top two trends viz. Leadership Briefing and Virtual Team Meetings for employee engagement. It also helped to identify concern challenges and related solution for employee engagement during crisis.

Research Methodology

This paper is a review paper based on secondary data. An extensive literature review was carried out to study employee engagement in general and trends during Pandemic. Also dig in the research papers, blogs, articles, companies report and online newspaper provided insights on the concept of employee engagement and the several initiatives adopted by the IT organizations during pandemic's lockdown. Though the content on Employee engagement is readily available but specific and relevant data pertaining to Indian IT sector is yet to be incited. This gave a direction to the researchers to conduct this study.

Literature Review

According to Adhitama and Riyanto (2020), employee engagement is defined as one of the essential issues that each association endeavors to keep up among their workers and to ensure that workers put their hundred percent of effort in their duties.

COVID-19 Pandemic: A Global Issue: The COVID-19 pandemic can be defined as a global health crisis of time and one of the greatest challenges that we ever faced since World War Two. World Health Organization (WHO) declared novel Corona virus as a pandemic on 11th March 2020. WHO has given a call to all nations to take immediate actions and scaling up responses to treat, reduce and detect transmission to their citizens. Although, China was the first country to face the crisis since Dec 2019, rest of the world has been facing a fast and wide spread of novel virus as of now. More than 90.3 million cases in 185 countries are confirmed as on 11th January, 2021 with approx. 1.93 million deaths. *But the pandemic was much more than a health crisis; it's also an unprecedented socio-economic crisis.*

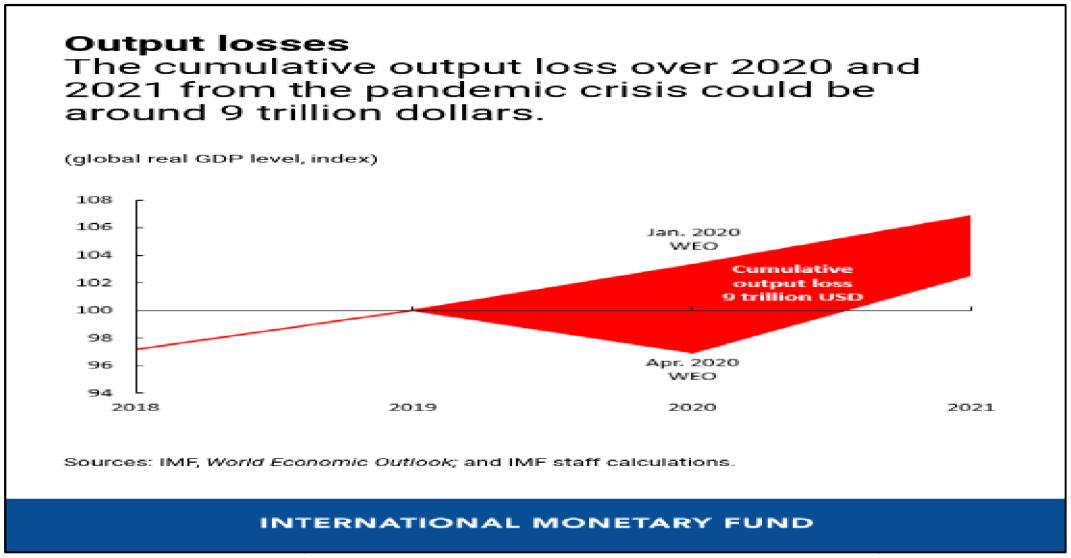

Figure 1: IMF projections of losses due to Covid-19
(Source: IMF Blog- International Monetary Fund 2020)

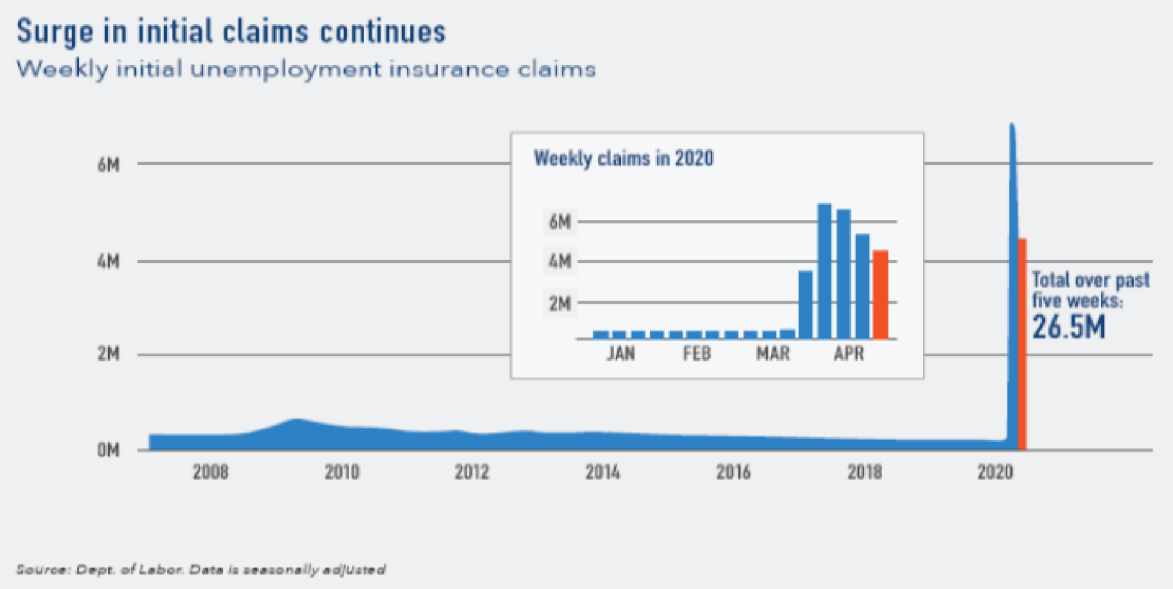

Figure 2: Surge in initial unemployment claims
(Source: quantumworkplace.com 2020)

Unemployment Levels, Historic Rise- During the COVID-19 crisis and subsequent lockdown guidelines, the unemployment rate rose to over 16% – levels not seen since the Great Depression. More than 26 million workers filed for unemployment.

COVID-19 Pandemic impact in Indian Context: According to JHU CSSE COVID-19 Data update as on 8th January, 2021, there were total 10.5 million cases of Coronavirus Covid-19 in its 32 states and union territories. This includes 151k deaths and around 10.1 million people recovered. Indian prime minister had announced country wide lockdown from 25th March 2020 and extended till August 2020.Though the partial lockdown phase was imposed on certain states, the India Government machineries were constantly on toes for the preparedness and safety measures including tracing the suspected cases, setting up diagnosis facilities, prevention of social engagement, hospital logistics, control and containment plans. In a nut shell, India has responded with determination and shown urgency to overcome this unprecedented challenge.

Employee Engagement: Products and Process cannot help organization to sustain loyal customers. They also need highly motivated, dedicated and involved employees who are very passionate about their work and organizations. *To conclude there is a need of 'engaged employees'.* Nurturing engaged employees requires a lot of effort and skill by HR Professionals and calls for different HR Philosophy in the organization. Employee Engagement is the new buzzword. A business success is directly linked to the commitment of the employees. Organizations that constantly keep themselves aware of their employees needs with the help of employee satisfaction surveys will have competitive advantage over those who don't. *To conclude, successful companies are those that recognize opportunities to foster employee engagement.* Employee engagement has always been a key metric to measure success of any organization but the tough situation like the Covid-19 pandemic has rendered more weightage to the given concept. When employees are engaged at their workplace they bring their full selves to work (William Kahn 1990).

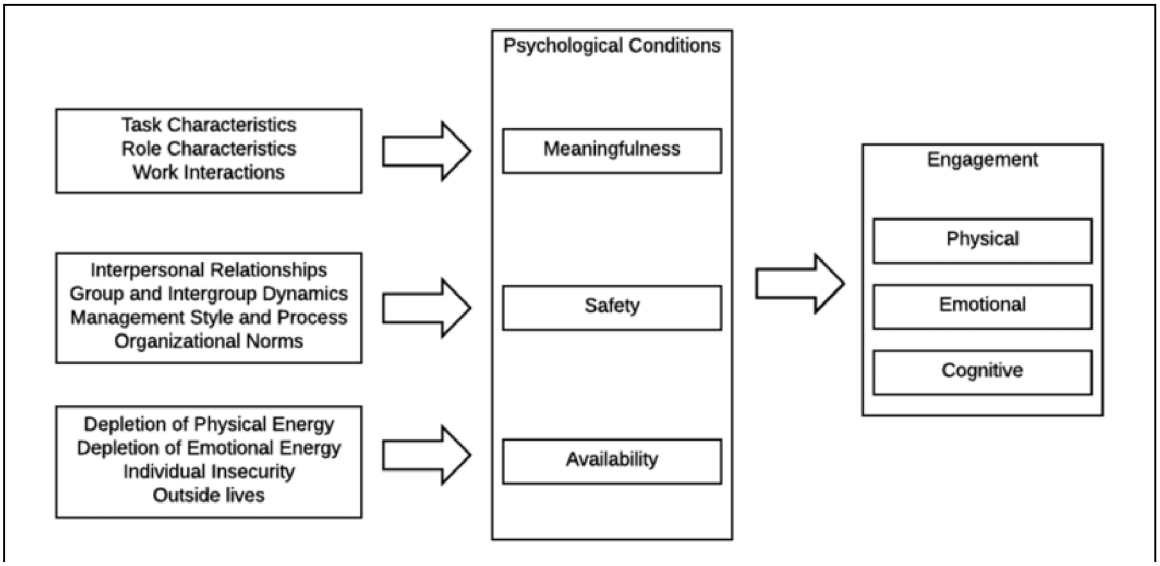

Figure 3: Kahn's model of employee engagement
(Source: Researchgate.net- Kahn (1990) model of employee engagement)

Kahn first time coined the term 'Employee Engagement' presented his research on psychological conditions of personal engagement and disengagement and it outlined three dimensions of engagement. Firstly, physical engagement refers to the extent employees expend themselves at work both mentally and physically. The second level of engagement is cognitive. To be engaged at this level the employees must be aware of their employer's vision and strategy and the level of performance needed to align with their individual goals to the organization's goal. The third is at emotional level and relates to the cordial relationship between the employer and the employee. Kahn cited that a positive interpersonal relationship and team management strategies will pool in a sense of trust and security among employees. Thus the significance of employee engagement can be described as:

1. Engaged employees lead to high performance and boosts productivity.
2. Engaged employees leads to higher level of customer satisfaction.
3. It aids in creating a pool of talented people in the organization.
4. It augments the organization's culture.
5. High Engagement is an indicator of an organization's success

Thus, it is stated that employee engagement is an essential parameter of an organization's success and the managers are constantly working on deriving modern strategies to keep their workforce happy and remained in the organization. To conclude in nutshell as rightly said by Doug Conant "To win the marketplace you first win the workplace"

What areas of Employee Engagement changed dramatically during the crisis?

Quantumworkplace.com (2020) has carried a survey and they have reported significant changes in employee engagement areas like communication and leadership, compensation and benefits, and health, well-being and balance. These are shown in figures 4 to 6.

Figure 4: Change in Communication and Leadership
(Source: quantumworkplace.com 2020)

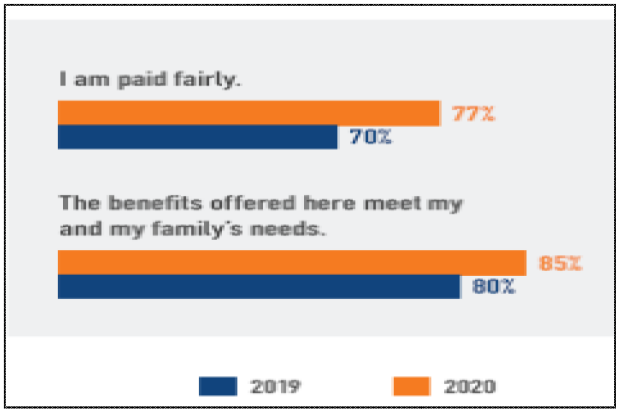

Figure 5: Change in Compensation and Benefits
(Source: quantumworkplace.com 2020)

Figure 6: Change in Health, Wellbeing and Balance
(Source: quantumworkplace.com 2020)

The Pandemic Effect on Indian IT Sector: Indian IT firms faced the full impact of business disruption as the US and Europe due to the Covid 19-induced lockdown in the quarter to June, as analysts expect companies to report 5-10 per cent drop in revenue due to clients cancelling or putting off discretionary spending on technology in the three-month period. IT firms like Infosys, Wipro and Tech Mahindra booked chartered flights to bring home employees and their families, who were stranded overseas due to the pandemic and visa issues. And almost overnight, IT companies big and small embraced work from home. There were initial hiccups but almost 98% of the IT workforce was working from home at the peak of lockdown in India.

KPMG Management Consulting administered survey for 315 organizations across 20 industry sectors. The survey report highlights the survey outcomes and showcase our understanding of the impact of the covid-19 pandemic on wide gamut of HR Practices and processes like employee wellbeing, employee engagement, recruitment, compensation and benefits, performance management and learning and development, etc.(KPMG India's Covid-19 HR Practices Survey 2020) The following practices were adopted by the organizations to keep employee engaged.

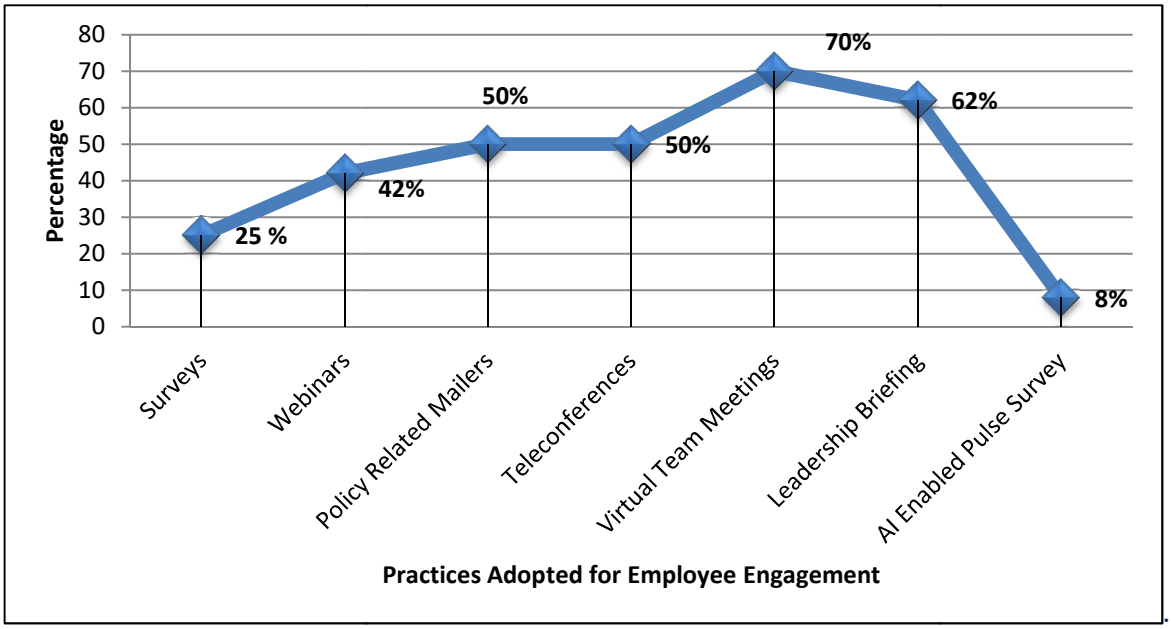

Figure 7: India's Covid-19 HR Practices
(Source: KPMG India's Covid-19 HR Practices Survey 2020)

Challenges Posed to Employee Engagement: According to Charles Darwin - it is not the strongest or the most intelligent who will survive but those who will manage change". Today it is followed as a mantra more than ever.

This Covid-19 pandemic has also impacted the pattern in which the whole world treating employee engagement. Some of the recent challenges are enlisted below:

1. Lack of clarity: There was an urgent need to evaluate employee engagement level to avoid losing top talent of an organization. Enforced lockdowns complete work from home pattern, job insecurity, pay cuts and many more were alarming issues that warned the employees about their sustenance at their workplace.
2. Work life Imbalance: The work from home pattern left the employees with a feeling that there is no start or end time to their work days. Companies were at a point of cost cutting and were finding ways to escape the heat of the pandemic.
3. Revising the strategic framework and the role of HR managers: during pandemic low budgeting, downsizing and revising the strategic framework was needed in a very different context.
4. Amplified use of Artificial Intelligence: Use of AI can be challenging too. An augmented use of artificial intelligence was witnessed during this lockdown period owing to less use of manpower. AI boosted the communication and personalized activities at workplace.
5. Lack of commitment from Top management: There were many issues that the top management was handling simultaneously and it got difficult for them to focus on issues like employee engagement.
6. Trust in the employer trusting the employer was also challenging during the tough time like in the pandemic era. Loose connect and low communications were present during this period of pandemic. Employees were apprehensive in consulting their employers and as a consequence it led to a friction in employee- employer relationship.
7. Decline in Spending: Pain for IT and outsourcing companies stems from a decline in spending on IT projects by companies in the U.S. and elsewhere, especially in such sectors as travel and tourism, hospitality, and aviation, which have lost 80 percent to 90 percent of their revenues.
8. Captive Centers' Struggle: These are one of the segments of IT industry and performs certain functions for the parent company, including data analytics, IT management, and research and development to save costs and benefit from the local talent pool. Walmart Labs and U.S. retailers Target and Lowe's are among those that have such centers based in India, These smaller centers have struggled amid India's lockdown, which prompted industry analysts to say that some of them may eventually be sold off or shut down.
9. Digital Transformations: On a positive note, the pandemic is expected to push more organizations worldwide to undergo digital transformations, which include shifting to digital technologies to manage many business functions, including business processes and customer engagement.
10. Acknowledging technology as a new friend. Though the mainstream work in IT industry is bonded around technology, the HR processes are gradually moving towards technology too. The best way to engage them is through leveraging HR technology.

Discussion and Findings

Formal working was replaced by work from home and online work assignment. This posed as a challenge for the HR leaders to confirm the engagement quotient of their employees and whether they are in line to achieve the organization goals or not.

1. Employees lacked in clarity about the direction in which their company was heading. It created a challenge for the HR managers to motivate and retain the talent in the organization.
2. The HR managers were bounded to have an in-depth knowledge of market conditions, competitions and Company's vision. Situation monitoring and assessment were

added on to an HR's Duties and responsibilities.

3. To be an effective communicator, retaining top talents, maintaining health and hygiene also got included in his duties. Dealing with low morale and disengaged employees was also tough. It became more challenging for the HR professionals to manage all the added responsibilities in an effective way.
4. Embracing AI in day to day routine is expected but it can't overlook the human factor in the organization and is still considered as a challenge to many HR managers.
5. The strategic framework must be compelling enough to draw out results. There is an involvement of technology in almost all facets of HR processes. Considering this, the HR policies must be reframed.
6. During the lockdown the employees were confused, fearsome and curious to know about their job security and survival and ultimately eager to know the company's status.HR managers must work on the deficiency and build strong communication network.
7. Companies need to go an extra mile in support of their employees. This will help in building trust among employees which brings special attention to role of HR managers' compassion and empathy for employees as an important ingredient. Reinventing the human part in HR will become pivotal in the digital era.
8. Inclusion of Team building, wellness and mental health program. This is something almost all companies are adopting.
9. Leadership Briefing, Virtual Team Meetings were top two HR Practices adopted for employee engagement.

Scope for further Studies

As the present study is focused on Indian IT sector only. The study can be extended to other major sectors. An empirical study of employee's opinion about engagement level would be suggested to conduct to get different perspective.

Conclusion

To conclude we can say that balancing business and people is imperative in such pandemic like Covid-19. Leadership, Communication, Employee Support, Compensation and benefits, wellbeing program plays crucial role to protect the organization from talent loss. Employee Value Proposition, Synchronization between Personal and Organizational Goal, Freedom and Autonomy, Employee Orientation, Bridging Performance Gaps, Recognition to be understand and taken care.

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EFFECTIVENESS OF PROMOTIONAL STRATEGIES ADOPTED IN REALITY SECTOR ON CONSUMER BUYING BEHAVIOUR

P. Bhandare[1] and R. Nath[2]
[1]RMD Sinhgad School of Management Studies, Warje, Pune
[2]Sinhgad Institute of Business Administration and Computer Application, Lonavala
pradnyab.26@gmail.com, reenanath29@gmail.com

ABSTRACT

The Real Estate Investment Trust (REIT) platform, which will allow all types of investors to invest in the Indian real estate market, has been approved by the Securities and Exchange Board of India (SEBI). In the ensuing years, it would produce a market opportunity in India worth Rs. 1.25 trillion (US$ 19.65 billion). Indian real estate developers have changed tactics and embraced new challenges in response to a consumer base that is becoming more aware and keeping in mind the impact of globalisation. The transition from family-owned to professionally managed firms has been the most obvious change.The objective of this research paper is to study the effectiveness of promotional strategies adopted in reality sector on Consumer Buying Behaviour. The researcherhas collected the data from 150 respondents using survey method with the help of well-structured questionnaire. The researcher identified that descriptive research designand Non probability convenience sampling method is suitable for the research study. The findings of this study will be useful to reality sector companies to sustain in the competitive world.

Keywords: *Reality sector, Housing property, Consumer buying behaviour, Promotional tools, Advertising etc.*

Introduction

One of the industries with the highest international recognition is real estate. Housing, retail, hospitality, and commercial are its four subsectors. The expansion of the business environment and the demand for office space, as well as for housing in urban and semi-urban areas, are excellent complements to the growth of this sector. In terms of the direct, indirect, and induced effects on all areas of the economy, the construction industry comes in third among the 14 key industries.

After the agricultural sector, the real estate industry in India is the second largest employer. Additionally, greater non-resident Indian (NRI) investment is anticipated in this industry over the long and short terms.From Rs. 12,000 crore (US$1.72 billion) in 2019 to Rs. 65,000 crore (US$9.30 billion) in 2040, the real estate market will increase. In India, the real estate market is anticipated to grow to US$ 1 trillion in size by 2030 from US$ 200 billion in 2021 and to account for 13% of GDP by 2025. Significant growth is also being seen in retail, hospitality, and commercial real estate, which is essential infrastructure for India's expanding demands.

Promotion is a crucial component and a powerful tool used by companies of all sizes to raise awareness and influence customers to purchase the goods and services on offer. Without effective promotion, business would stall and it would be challenging to turn a profit due to limited market exposure. The part of decision-making that deals with selecting the best combination of advertising, sales promotion, personal selling, and publicity for a company's target market communications.

The study of people, groups, or organisations and all the behaviours connected to the acquisition, consumption, and disposal of products and services is known as consumer behaviour. Consumer behaviour refers to how a person's feelings, attitudes, and preferences influence their purchasing decisions.

Literature Review

G.S. Sharma, (2013), in their research paper entitled "Risk and return in European property markets: an empirical investigation" This paper will examine total returns, income, and capital gains in various Indian real estate markets. The nature of returns for various commercial and residential properties is looked into in a comparative study. This distinguishes between total returns, income returns, and capital growth. The research also analyses the risk-return relationships among the various markets and looks at the interactions of local financial markets, real estate markets, and macroeconomic variables. The Sharpe ratio is used as a risk-adjusted performance measure to research the European markets, focusing on the risk-return relationships of the various asset classes and nations.

W. Bhatt, (2013), in their research paper entitled "A different look on risks by property investments" This paper attempts to focus on three aspects of the theory surrounding property investment hazards: the management risk is not taken into consideration; the assumption that the market risk is constant; and the regularity of the dampening of the specific risks with an increase in the number of investments. Instead of the two risk factors mentioned, the risk profile contains three risk factors: specific risk, which depends on unique individual investment factors; management risk, which reflects a problem with the investor's organization's ability to exercise control; and systematic risk, which depends on local level distinction. Although not always, the estimates do demonstrate the benefits of variety. It relies on the sequence in which the assets connected to the various risks are added.

James A. Graaskamp, (2014), in his article "Fundamentals of Real Estate Development", they observe that - three key groups are involved in the development of real estate: the consumer group, the production group, and the public infrastructure group. The fact that each group has a cash cycle enterprise that must be viable in order to thrive is cited as a significant limitation shared by all groups. The research process, which ensures that the development product meets as closely as feasible the needs of the renter or purchaser, the ideals of the politically engaged collective consumers, and the land use or ethic of society, is concluded to be the best risk management tool for the production group.

K. Saratbhai, (2015), in their research paper entitled "Future Directions in Real Estate Research"discusses the effectiveness of real estate markets, valuation concerns, the cost of contract contingencies, prices and price fixing, and the agency industry. It also discusses how real estate has performed as an investment. concludes that there is a growing list of research questions and a great deal of interest in the potential solutions from the public and business sectors.

I. Singh (2018), in his research paper entitled "A Study of Consumer Behaviour in Real Estate Sector" The study concluded that consumer have become very much decision maker they took into consideration so many aspects like the brand of the developer, price of the property, location of the property, future expectations of the property. Income level of the buyer plays an important role in buying decision.

Research Methodology

Objectives of the study

- To study the various promotional tools adopted by real estate companies to attract customers.
- To study the effectiveness of promotional tools adopted by real estate companies on consumer buying behaviour of housing property.

- To study the effectiveness offactors highlighted in promotional tools on consumer buying behaviour of housing property.

Hypothesis of the Study

H1: Promotional tools are having impact on consumer buying behaviour of housing property.

Research Design

- Type of research design: Descriptive research
- Sample method: Non probability convenient sampling
- Sample size: 150
- Data collection method: Questionnaire
- Data collection and interpretation: Primary & secondary data.
- Data analysis tool: SPSS

Sampling

Researcher has collected the data from 150 respondents with the help of non-probability convenience sampling method.

Reliability and Validity

The researcher has carried out reliability test using SPSS. The Cronbach's Alpha identified is 0.760, and it is more than 0.700, that's why the Questionnaire is measured to be reliable. The researcher has used face validity and content validity and confirmed that this research tool is valid for the study.

Primary data

Data used in research originally obtained through the direct efforts of the researcher through surveys, interviews and direct observation. Primary data is collected through Questionnaire by distributing questionnaires to the respondents.

Secondary data

Secondary data is information that has already been collected for a purpose other than your current research project but has some relevance and utility for your research. The researcher has collected secondary data through magazines, newspapers etc.

Scope of the study

The present study is related to the customers opinion about promotional tools adopted in reality sector on their buying behaviour of housing property. In this study only housing property is considered and commercial outlets, land property is not included. The study is conducted only in Pune city.

Data Analysis

Measurement tool – Rating Scale
1- Very less effective, 2- Less effective, 3- Neutral, 4- Effective, Highly effective

Table No. 1 Effectiveness of Advertising on Consumer Buying Behaviour of housing property

Advertising	Mean
Advertising on T.V.	3.2
Advertising on radio	2.1
Advertising on the Internet	4.2
Advertising in newspapers	3.4
Advertising on Outdoor Hoardings	3.6
Advertising on brochures and booklets	3.3
Average Mean	3.3

Graph No. 1 Effectiveness of Advertising on Consumer Buying Behaviour of housing property

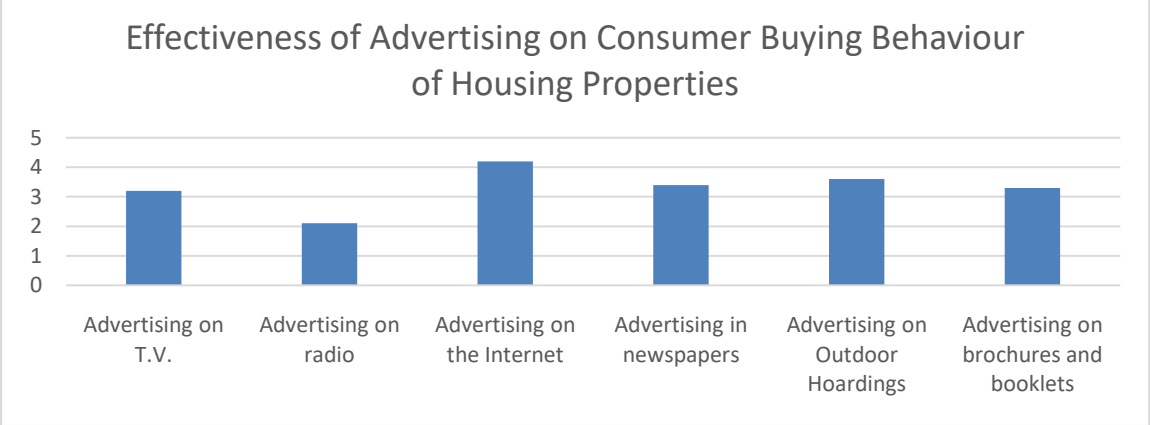


Table No. 2 Effectiveness of Sales Promotional tools on Consumer Buying Behaviour of housing property

Sales Promotion	**Mean**
Contests	2.4
Coupons	2.4
Prizes	2.2
Gifts	3.1
Offers	4.2
Average Mean	2.86

Graph No. 2 Effectiveness of Sales Promotional tools on Consumer Buying Behaviour of housing property

Table No. 3Effectiveness of Direct Marketing on Consumer Buying Behaviour of housing property

Direct Marketing	**Mean**
Marketing through e-mail	3.1
Tele-marketing through SMS	2.7
Telecalling	3.9
Introducing company through existing customers to others	2.2
Average Mean	2.9

Graph No. 3 Effectiveness of Direct Marketing on Consumer Buying Behaviour of housing property

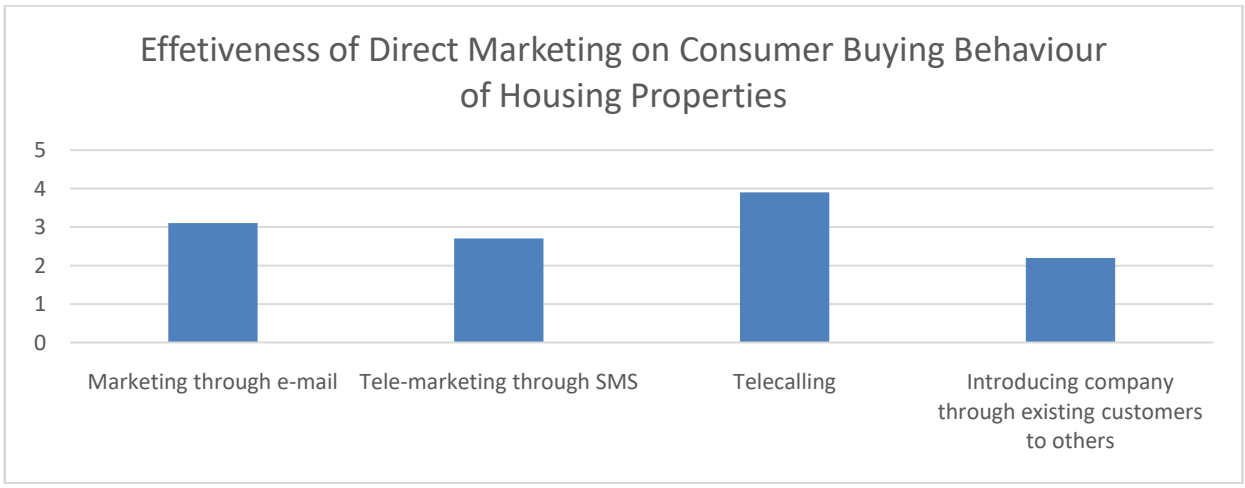


Table No. 4 Effectiveness of Public Relations on Consumer Buying Behaviour of housing property

Public Relations	**Mean**
Active participation in seminars/forums	1.2
Giving interviews to newspapers and mass media	1.3
Taking part in charities and making donations	1.5
Publishing weekly or monthly newsletters	2.2
Average Mean	1.55

Graph No. 4 Effectiveness of Public Relations on Consumer Buying Behaviour of housing property

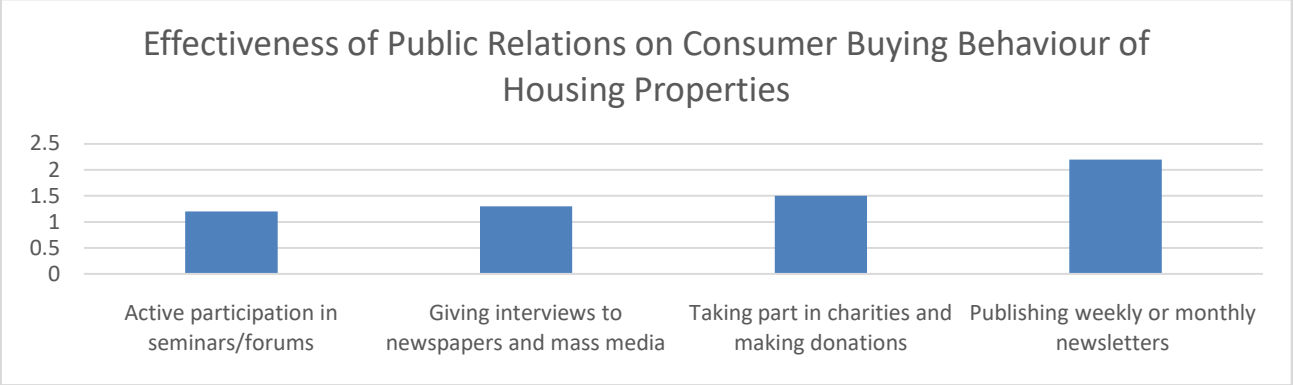


Table No. 5 Effectiveness of factors highlighted through promotional tools on Consumer Buying Behaviour of Housing Property

Factors	Mean
Brand Name	3.8
Project Quality	4.6
Space (Sq. ft.)	4.4
Amenities	3.9
Interior	3.8
Possession	3.8
Location	4.4
Price	4.8
Offers	3.9

Graph No. 5 Effectiveness of factors highlighted through promotional tools on Consumer Buying Behaviour of Housing Property

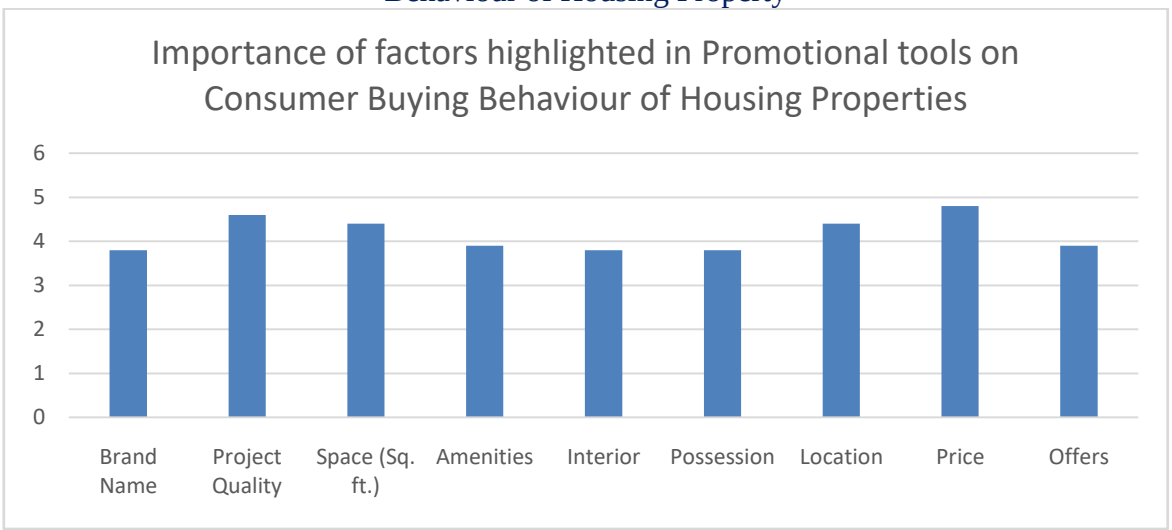
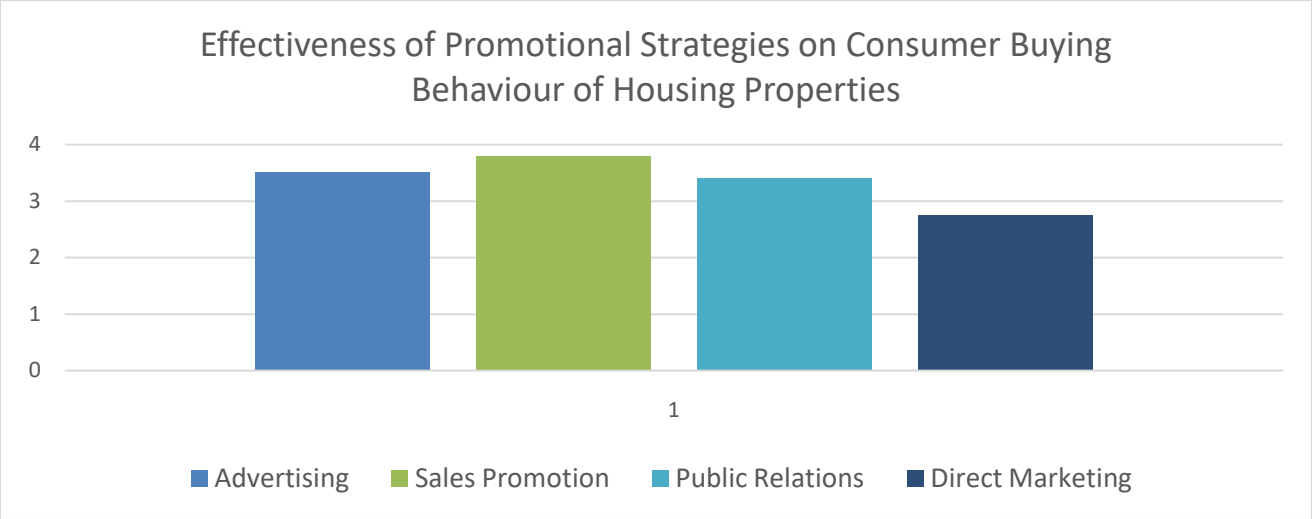


Table No. 6 Effectiveness of Promotional Strategies on Consumer Buying Behaviour of Housing Properties

Promotional Strategies	**Mean**
Advertising	3.51
Sales Promotion	3.8
Public Relations	3.41
Direct Marketing	2.75
Average Mean	3.38

Graph No. 6 Effectiveness of Promotional Strategies on Consumer Buying Behaviour of Housing Properties



Hypothesis Testing

- Null Hypothesis (H0): Promotional tools are not having impact on consumer buying behaviour of housing property.
- Alternative Hypothesis (Ha): Promotional tools are having impact on consumer buying behaviour of housing property.
- The researcherhas tested the null hypothesis with the help of IBM SPSS 20. The researcherhas applied Z test to check the null hypothesis. The P value identified is 0.01 which is less than 0.05 so the null hypothesis is rejected and alternative hypothesis is accepted at 5% level of significance.

Findings

- Promotional tools have influence on consumer buying behaviour of housing property as the average mean observed is 3.38.
- In all promotional tools sales promotion tools have more influence on consumer buying behaviour of housing property as the average mean observed is 3.8.
- In Effectiveness of Advertising on Consumer Buying Behaviour of housing property advertising on internet have more impact as the mean observed is 4.2.
- Effectiveness of Sales Promotional tools on Consumer Buying Behaviour of housing property offers have more impact as the mean observed is 4.2.
- Effectiveness of Direct Marketing on Consumer Buying Behaviour of housing property
- Telecalling have more impact as the mean observed is 3.9.
- Effectiveness of Public Relations on Consumer Buying Behaviour of housing property have very less impact.
- In Effectiveness of factors highlighted through promotional tools on Consumer Buying Behaviour of Housing Property price is the most important factor as the mean observed is 4.8.

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Economic Analysis of Farming Systems in Satara District of Maharashtra

Dr. Tai B. Deokate[1] Dr. Dnyanesh P. Bandgar[2] Hangeshwar Dhaigude[3]
[1]Assistant Professor, College of Agriculture Pune
[2]Assistant Professor, Sinhagd Institute of Management, Pune
[3]HR Manager, Mann Deshi Mahila Sahakari Bank, Mhaswad

Abstract

The present study was based on primary data were collected from 108 farmers by personal interview method with the help of specially design schedule from Satara district of Maharashtra during the agricultural year 2018-2019.In study area three major farming systems were evaluated viz; 1) Crops only 2) Crop + Livestock 3) Crop + Livestock + Horticulture. Resource use pattern in proposed farming system are in varied proportion. Farmers applied their resources in very cogent and excessive manner. Limit the resources use in farming system, farmers go through a very sustainable way of agriculture. It is observed that as farmer shifts from Crop only to C + L and C + L to C + L + H farming system, the income, expenditure and profit goes on increases. Thus, C+L+H Farming system is profitable and farmers should be motivated to undertake horticultural crops and livestock with cash crops for enhancing their income and employment on farms.

Introduction

Traditional farming system used by farmers in India were based on centuries of experiences characterized by mixed farming involving crop production with one or more enterprises like dairy, poultry, sericulture, piggery, sheep, goat, fisheries, bee-keeping *etc*. Their main aims were to achieve stability of production, provide subsistence for the family and guard against weather aberration and other environmental stresses.

In the recent years, farming system approach gave scientific touch to the existing practices and found ways and means to make it sustainable in changing global scenario. ‑Farming system‖ is a resource management strategy to achieve economic and sustained agricultural production to meet diverse requirements of the farm household, while preserving the resource base for future generation and maintaining a high environmental quality. Thus, farming system is the result of interaction among several interdependent components.

Land being the most limited and scarce resource, particularly on small and marginal farms, the scope to increase farm income and employment through crop production alone is too bright. Therefore, one has to look for alternatives in order to get assured increase in the employment of the weaker sections. In this regard integrated farming system is the answer in which dairy, sericulture, poultry, sheep and goat rearing, mushroom cultivation and other allied activities are regarded as important components.

The farming systems is a whole farm approach, where in farm is studied in holistically. The farm situation changes with very little spatial change, therefore the location specific farming system should be identified, studied and the profitable farming system which are perfectly suited to a particulars location need to be suggested, because crop or any other enterprise cannot sustain the farmer in long run. The farming system approach provides a solution for sustainability of farm in long run. In view of this, study was carried out in Satara district of Maharashtra state.

Methodology

The present study was based on primary data were collected from 108 farmers by personal interview method with the help of specially design schedule from Satara district of Maharashtra during the agricultural year 2018-2019. Two tahsils*viz*; Satara and Wai were purposively selected. Three villages from each tahsils were selected randomly purposively and 18 farmers from each village were selected randomly.

The farmers selected from each village were further classified into crop only, crop with livestock and crop with livestock and horticulture farming system. The data was analysed in the tabular form with the help of means and averages.

Result and Discussion

Per hectare resource use pattern

The average per hectare expenditure made on input utilization is given in Table 1.

Table 1: Resource use pattern (2018-19)

(Rs/ ha)

	C		C + L		C + L + H		Overall	
	Rs.	**%**	**Rs.**	**%**	**Rs.**	**%**	**Rs.**	**%**
Total labour	15203.55	(12.17)	13446.8	(6.50)	19861.3	(9.00)	16568.6	(10.20)
Tractor	29408.16	(23.50)	25160.1	(12.32)	31500	(14.30)	18468.8	(11.20)
Seed	34522.21	(27.63)	31307.2	(15.33)	31070.6	(14.15)	17531.7	(10.60)
Manure	2725.24	(2.10)	2476.72	(1.20)	2928.57	(1.30)	1637.8	(0.90)
Fertilizers	41785.31	(33.45)	35742.1	(17.50)	60446.4	(27.50)	31660.7	(19.28)
Plant protection	1269.49	(1.03)	1116.32	(0.50)	1458.75	(0.60)	591.93	(0.30)
Livestock maintenance			94922.1	(46.49)	72257	(32.91)	61139.9	(37.20)
Total	124914	(100.00)	204171	(100.00)	219523	(100.00)	164168	(100.00)

It is seen from the Table 1, that the average per hectare cash expenditure was Rs 164167.75 at the overall. The major portion in the total expenditure was livestock maintenance, which shared 37.2 per cent, followed by fertilizers (19.58 %), tractor (11.2 %), seed (10.6%), labour charges (10.2 %), manure (0.9 %) and plant protection charges (0.3 %).

While the average per hectare cash expenditure in Crops only farming system was Rs 124913. Fertilizers constituted major portion of the total expenditure, which shared 33.45 per cent, followed by seed (27.63%), tractor (23.5 %), labour charges (12.17 %) and plant protection charges (1.03 %).

The average per hectare cash expenditure in C + L farming system was Rs 204171.21 Livestock maintenance constituted major portion of total expenditure, which shared 46.49 per cent, followed by fertilizers (17.50 %), seed (15.33 %), tractor (12.32 %), labour charges (6.5 %), manure (1.2 %) and plant protection charges (0.5%).

The average per hectare cash expenditure in C + L + H was Rs 219522.53 The major portion of total expenditure was livestock maintenance, which shared 32.19 per cent, followed by fertilizers (27.5 %), tractor (14.3 %), seed (14.15 %), labour charges (9.0 %), manure (1.3 %) and plant protection charges (0.6 %).

Resource use pattern in proposed farming system are in varied proportion. Farmers applied their resources in very cogent and excessive manner. Limit the resources use in farming system, farmers go through a very sustainable way of agriculture. In C+ L+ H farming system, farmers used more resources as compared to other two farming system. Next table indicate the how farmers use resources in their farming system.

These findings are confirmed with the results of *Raghav et al*(2015),and *Patil*(2018).

Profitability of different Farming Systems

Profitability of farming systems is important to examine the best farming system in the study area. The information on profitability of different farming system is presented in Table 2.

Table 2: Profitability of farms (2018-19)

Sr. No.	**Particulars**	**Unit**	**Farming systems**			
			C	**C + L**	**C + L + H**	**Overall**
1.	Income (Rs)	Per / ha	373652.67	507994.29	642937.84	508194.93
		Per / farm	657392.19	977071.34	1634345.9	1089603.14
2.	Expenditure (Rs)	Per / ha	174571.79	275029.56	307005.84	252202.39
		Per / farm	305500.64	572978.28	901796.01	593424.97
3.	Profit (Rs)	Per / ha	199080.88	232964.73	335932	255992.53
		Per / farm	351891.55	404093.06	732549.83	496178.15

It can be seen from the Table 2 that,Per farm total income was maximum in C + L + H farming system (Rs. 1664345.9) followed by C + L farming system (Rs. 977071.34) and Crops only farming system (Rs.657392.19), which indicated higher returns in farming system in which livestock and horticultural crop were undertaken. The per hectare income (Rs. 642937.84)were maximum in C + L + H farming system followed by C+ L farming system (Rs. 507994.24) and Crops only farming system (Rs.373652.67).The study revealed that, the among all the three farming systems, C + L + H farming system was found to be highly profitable farming system than Crops only and C + L farming systems.

To sum up, it can be noted that as farmer shifts from Crop only to C + L and C + L to C + L + H farming system, the income, expenditure and profit goes on increases. It indicates that the C + L + H farming system were economically most viable in Satara district as compared to other farming systems.These findings i.e. crop+ livestock+ horticulture farming system is profitable than remaining proposed farming systems, confirmed with the results *of Dorge*(2010*), Raghav and Srivastava*(2015), *Singh and Burak*(2016)

Conclusions

Resource use pattern in proposed farming system are in varied proportion. Farmers applied their resources in very cogent and excessive manner. Limit the resources use in farming system, farmers go through a very sustainable way of agriculture. In C+ L+ H farming system, farmers used more resources as compared to other two farming system. Next table indicate the how farmers use resources in their farming system. To sum up, it can be noted that as farmer shifts from Crop only to C + L and C + L to C + L + H farming system, the income, expenditure and profit goes on increases. It indicates that the C + L + H farming system were economically most viable in Satara district as compared to other farming systems. Since, C+L+H Farming system is profitable farmers should be motivated to undertake horticultural crops and livestock with cash crops for enhancing their income and employment on farms.

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PalArch's Journal of Archaeology of Egypt / Egyptology

AN ANALYTICAL STUDY ON PERCEPTIONS OF EMPLOYEES TOWARDS PERFORMANCE APPRAISAL SYSTEM

Khawaja Mubeenur Rahman

(MBA Department, Sinhgad Institute of ManagementPune, India)

Khawaja Mubeenur Rahman , An Analytical Study On Perceptions Of Employees Towards Performance Appraisal System , Palarch's Journal Of Archaeology Of Egypt/Egyptology 18(9), 917-923. ISSN 1567-214x.

Keywords: Appraisal System, Employee Perceptions, Performance Appraisal, Performance Evaluation, Performance Measurement.

Abstract: Performance appraisal is a necessary and beneficial process, which provides annual feedback to staff members about job efficiency. Appraisal is an important tool in the manpower management, if it is performed correctly and logically, it can help the organizations as well as the employees in achieving their goals. This study sought to examineemployees' opinion about the usefulness of performance appraisal system and its effect on employee motivation. This study was conducted in a Pune based organization to know about the perceptions of the employees towards the existing performance appraisal system of the organization. The data was collected through a structured questionnaire from 124 employees of the organization. The hypothesis was tested with Friedman Chi Square Test.

1. INTRODUCTION:

The capability of any organization depends on its ability to evaluate the performance of the employees and to examine their contribution in achieving the goals assigned to them by their managers. The evaluation of performance of employees is also animportant tool and a necessary element of the company. Evaluations are used by managers as aninspirational tool to communicate performance expectations to employees and provide them with feedback. The evaluation process also identifies areas where an employee needs to improve. It can also provide opportunities for recognition, positive support, and performance enhancement of the employees. Job satisfaction of employee and decisions to stay with the company are associated with him or her meaningful feedback about performance especially from their direct supervisors.

2. REVIEW OF LITERATURE:

Aarathy T. S., D. Venkatarama Raju (2018) concluded that performance appraisal improves the overall performance of the employees. It increases quality and quantity of work. It is very effective and useful to reduce problems, stress, anger and grievances of employees to overcome their problems. It was observed from the study that progress reviews were information about the level of achievement and behavior of subordinate. It also identifies individuals with high potential who can be groomed for higher positions.

Idowu Ayomikun O. (2017) concluded that Performance appraisal systems should be designed in such a way that they create perceptions of fair treatment relative to other employees as well as the employee's own expectations. This can contribute significantly towards positive attitudes, which have been shown in this study to be a significant determinant of employee's level of motivation and consequently work performance.

Venkat Raghav S., Panatula Murali Krishna (2016) found that the employee's perception on various aspects of personal and work related characteristics with performance management system practices reflected that employees are more satisfied with the present performance management practices. The study showed the high level of perception according to their gender, age, annual salary and work experience of performance management practices.

Leila Najafi et. al (2011) found that according to the majority of the respondents, performance appraisal plays an important role in job motivation; thus, managers and employees should be emphasized specially for it.

3. OBJECTIVE OF THE STUDY:

The objective of the study is to know the perceptions of employees towards different aspects of performance appraisal system. It includes employee perceptions towards expectations from the employer, facilities provided to them, employee behavior towards superiors, colleagues and juniors. It also includesdifferent performance measures like remuneration, awards, rewardsetc.

4. RESEARCH METHODOLOGY:

The research methodology explains about the research instrument and research scale used in this study. It also covers about sample size and sampling technique used in this study. Similarly Null and Alternate hypotheses were also discussed in this research methodology.

4.1 RESEARCH INSTRUMENT:

The research instrument used for the study is the structured questionnaire and it was designed on the basis of literature findings and inputs received from employees and management of the organization.

4.2 RESEARCH SCALE:

In this study a 5 point Likert scale was used to measure the perceptions of the employees where 5 = Strongly agree, 4 = Agree, 3 = Neither agree nor disagree, 2 = Disagree and 1 = Strongly disagree.

4.3 POPULATION AND SAMPLE SIZE:

All the employees who were working in the organization at the time of research were considered as part of population. Simple random sampling method was used to select the sample from population. The sample size of the study was 124 employees who were working in the organization.

4.4 RESEARCH QUESTION:

Is there a difference in employee perceptions towards performance appraisal system of the organization?

4.5 NULL AND ALTERNATE HYPOTHESES:

The Null and Alternate hypotheses of the study are as follows.

H_0: There is no significant difference in the importance employees attach to the various employeeperceptions towards performance appraisal system of the organization.

H_A: There is a significant difference in the importance employees attach to the various employeeperceptions towards performance appraisal system of the organization.

4.6 HYPOTHESIS TESTING:

Friedman Chi Square Test was used for hypothesis testing. The Level of significance is taken as 5% i.e. 0.05 and degrees of freedom is taken as 15.

4.7 LEVEL OF SIGNIFICANCE:

5% level of significance was considered appropriate for this study. Hence the value of α is taken as 0.05.

So $\alpha = 0.05$

4.8 VARIABLES AND MEASUREMENT:

Employees were presented with 16 common employee perceptions towards performance appraisal system of the organization. A list of these employee perceptions is presented below.

1. I know what is expected from me at workplace.
2. I am performing a job that matches my skills.
3. I am given with ample flexibility to perform my job.
4. The organization rewards or recognizes employee behavior.
5. I feel comfortable working with my team members.
6. The company provides me a safe working environment.
7. My work does not interfere with my personal relationship & family responsibilities.
8. My salary is fair, equitable and competitive.
9. Rewards in my organization are immediate and appropriate.
10. Performance goals are behavioral, result-oriented and achievable.
11. Performance is regularly tracked and measured.
12. Performance is appropriately rewarded with incentives, rewards and recognition.
13. Performance measurement is used as criteria for promotions.
14. A variety of training & development programs are offered to improve individual skills.
15. I have the opportunity to grow and prosper with the organization.

16. I have a supervisor who is respectful and one who inspires me.

5.1 DATA ANALYSIS:

5.1.1 DEMOGRAPHIC DATA OF RESPONDENTS:

Threevariables of demographic data of the respondents were consideredfor the study. These variables include male and female ratio of employees, their age and salary range.

5.1.1.1MALE AND FEMALE RATIO OF RESPONDENTS:

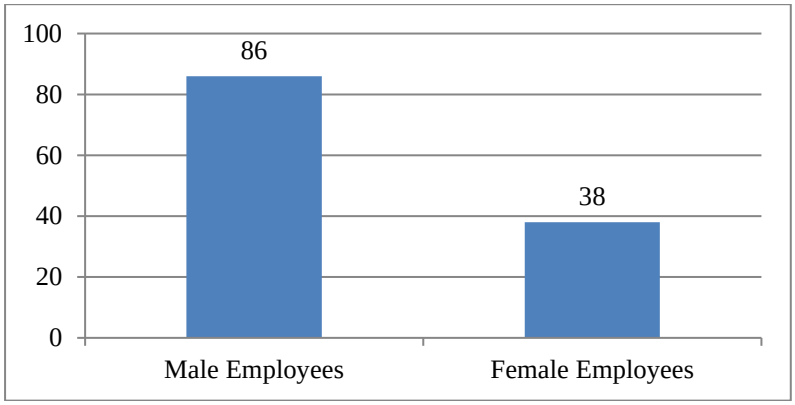

Fig. 1 Male and female ratio of employees

From the graph it is seen that out of 124 respondents who were selected for the study, 86 i.e. 69.35 % of employees were males and only 38 i.e. 30.45 % of employees were females.

5.1.1.2. AGE OF RESPONDENTS:

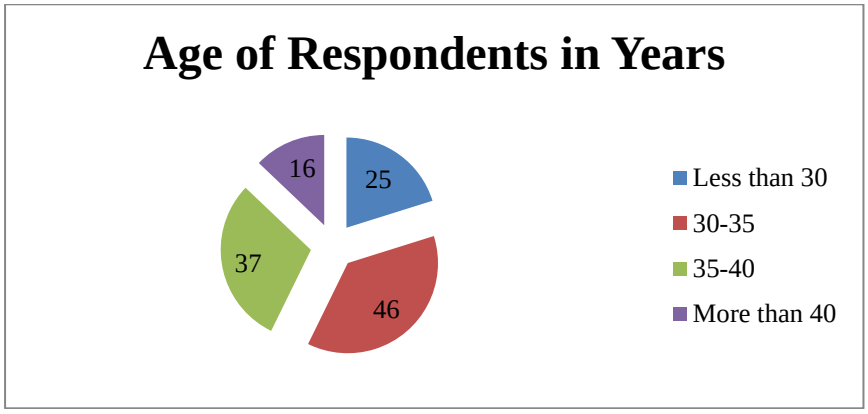

Fig. 2 Age of Respondents in Years

From the graph it is observed that majority (46 out of 124) i.e. 37.09 % of the respondents belong to the age group of 30-35 years followed by (37out of 124) i.e. 29.83 % belong to the age group of 35-40 years. Young professionals whose age is less than 30 years are (25 out of 124) i.e. 20.16 % whereas very less (16 out of 124) i.e. 12.90% are contacted for the study.

5.1.1.3 SALARY RANGE OF RESPONDENTS:

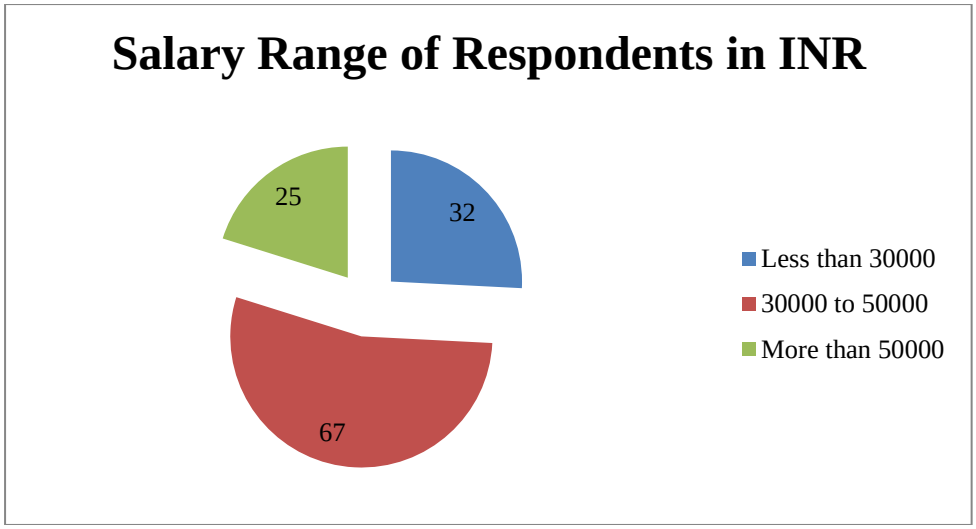

Fig. 3 Salary Range of Respondents in INR

Majority (67 out of 124) i.e. 54.03 % of the respondents who were contacted are having their salaries in the range of 30000 to 50000 followed by (32 out of 124) i.e. 25.80 % respondents whose salaries are less than 30000 Rs. And only (25 out of 124) i.e. 20.16 % respondents' salaries were more than 50000 Rs.

5.2 TEST STATISTICS:

Table 1. Test Statistics based upon perceptions of employees towards performance appraisal system

N	124
Chi-square	1159.307
df	15
Asymp. Sig.	0.000

5.3.5 OBSERVATION:

χ^2 (15) = 1159.307
p value = 0.000
N = 124

5.3.6 CONCLUSION OF HYPOTHESIS TESTING:

Since p value (0.000) is less than level of significance (0.05), the null hypothesis is rejected.

Hence it is concluded that there is a significant difference in the importance employees attach to the various employee perceptions towards performance appraisal system of the organization.

In order to understand where the difference lies, we refer to the ranks table.

Table 2. Ranks Table for the employee perceptions towards performance appraisal system

Perceptions of employees towards performance appraisal system of the	Mean

organization	Rank
I know what is expected from me at workplace.	5.94
I am performing a job that matches my skills.	5.95
I am given with ample flexibility to perform my job.	7.37
The organization rewards or recognizes employee behavior.	6.73
I feel comfortable working with my team members.	9.10
The company provides me a safe working environment.	11.29
My work does not interfere with my personal relationship & family responsibilities.	9.80
My salary is fair, equitable and competitive.	12.57
Rewards in my organization are immediate and appropriate.	9.31
Performance goals are behavioral, result oriented and achievable.	4.42
Performance is regularly tracked and measured.	5.13
Performance is appropriately rewarded with incentives, rewards and recognition.	5.32
Performance measurement is used as criteria for promotions.	12.83
A variety of training & development programs are offered to improve individual skills.	3.69
I have the opportunity to grow and prosper with the organization.	8.69
I have a supervisor who is respectful and one who inspires me.	6.53

From the ranks table it can be seen that 'Performance measurement is used as criteria for promotions' tops the table with a mean rank of 12.83, whereas 'My salary is fair, equitable and competitive' has a mean rank of 12.57 and 'The company provides me a safe working environment' has a mean rank of 11.29. Hence it can be concluded that the top three employee perceptions towards the existing performance appraisal system of the organization are

1. Performance measurement is used as criteria for promotions.
2. My salary is fair, equitable and competitive.
3. The company provides me a safe working environment.

While bottom three employee perceptions towards the existing performance appraisal system of the organization are

1. A variety of training & development programs are offered to improve individual skills.
2. Performance goals are behavioral, result oriented and achievable.
3. Performance is regularly tracked and measured.

6. SUGGESTIONS:

It is found in the study that the training & development programs are not organized on a regular basis. Therefore it is suggested to organize training & development programs more regularly as per the need of the employees to improve the efficiency and effectiveness of the employees.

7. CONCLUSION OF THE STUDY:

It is concludedfrom the observations and hypothesis testingthat majority of the employees are satisfied with the existing appraisal system of the organization. They are also satisfied with their existing salaries, job profile and working conditions of the organization. They are also happy with their team members, superiors and with the flexibility given in the organization.

They also feel that they are having ample opportunities to grow and prosper with the organization.

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Management Education in the 21st Century: Challenges and Strategies

Mr. Anjit Jha, Assistant Professor
Sinhgad Institute of Management (SIOM), Pune, India.

Ms. Seema Navale, Assistant Professor
Sinhgad Institute of Business Administration and Research (SIBAR), Pune, India.

Abstract: *The process of liberalization, deregulation & opening of the economy has affected the demand for quality management graduates. This research, predominantly based on secondary data, takes global facets of management education and in particular as it exists in India. At the end, as a conclusion and suggestions with respect to content & curriculum and duration of the MBA programmes have been outlined.*

Keywords: Liberalization, Management, Paradigm Shift, Growth, Productivity.

INTRODUCTION

This research work explains the evolution of Management education from its earliest days to the present by examining the background, ideas and influences by major contributors. It also profiles significant eras in the development of management thought, analysing various trends and movements. The evolution of modern management enriches our understanding of world experience, allowing us to make comparisons with developments in management education in various countries.

Albeit, management education dates back to late nineteenth century, it has taken its present shape only after World War – II. It has assumed importance as it helps in effectively utilising the resources for developing a nation's economy, both in industrial/productive sector and in social/non-productive sector. Thus, for the national development, management education is very vital. All these could not be left to choice and initiative of a few talented individuals. Creating leaders/managers who are effective at various levels of hierarchy through well designed education and training programme has became vital for developed economies. For developed economies, maintaining competitive edge prompted optimization of resource use and measures for improving productivity and managerial effectiveness.

For any country's management education, the traditional style of education will serve the purpose. Any paradigm shift required can be properly ascertained only after study of the global view of management and its educational needs. The second section the paper has been devoted to the understanding of global management view. The third section has covered management education in India. In fourth section, directions for the future have been outlined. The essential question, "What are the trends and what is desirable?" has been answered curriculum and duration of MBA programmes has been outlined.

Management Education – Global Facets

By the end of the 19th century, local educational traditions were already confronted by emerging American paradigm, but they had to face a massive transfer of American managerial prescriptions and method, after the end of the Second World War. The different reactions of the national educational systems to the American Challenge are presented in this section.

Management Education in USA

For the past 70-80 years, business education and research in business in the USA has focused on an ever-increasing number of techniques and methods. Today, in an environment filled with increased competition and strategies for retrenchment, they are probably more critical than ever. However, today's dynamic and hostile business environment demands understanding of the environment and responding to change effectively, more than basic training in methods and techniques.

Governance and planning models for American higher education were never designed with expediency and responsiveness in mind. Business schools across the US have long and glorious histories of conservative practices and faculty, and administrators have vested interests in the maintenance of past behaviour. However, there no alternative, the current popular press in America is replete with examples of businesses which took risks, did things differently and were willing to live with their success and failures. Innovation, adaptation and change many not come in organized, purposeful and systematic procedures. Rather they may need spontaneity and immediate action.

Management education evolved in USA and the growth was spectacular in post World War II period. Economy of resource use in supply constrained economies in the period of post war reconstruction stressed more on formal models and quantitative analysis. However, slowly after the post war reconstruction was over, economy became sensitive to demand constraints and so management education stressed on marketing, human resource development, management of frustration and conflict. Strategic management and managing change required due to rapid change in environment became important components of management education. Corporate governance, human values and ethics became important components of management education and research, on the basis of such re-examination.

Thus with changes in industrial, social, political and global environment, management education system tries to align itself with these changes. Today in USA, management education is entering a new era which is post modernist of post-fordist (Clegg, Handy). Today in USA, management has become an activity of critical importance in modern US societies. Institutions imparting management education have crucial roles in providing and reproducing practices in management (French and Grey, Huczynski).

Management Education in Canada

Experiences of management education in Canada have a great deal to offer to the developing countries. However, the provincial control of Higher Education has prevented the emergence of adequately – resourced centres of excellence capable of matching the achievements of the strongest US business schools. Growth trend here also followed the USA pattern.

Modern Management Education in Great Britain

For many years, business schools and other providers of management education have been accused of providing programmes, which take little account of needs of employers or of the skills required by the managers in carrying out their roles.

There has been a wide gap between the traditional system and the need of the corporate; the reason being very little is known about skills and competencies required at different levels. If development in the traditional system is implemented it will require large number of additional manpower which will in turn call for huge funds.

Most British Management schools are stressing more on academics than on professionalism. Practical work training should be imparted like high-level consultancy assignments. Such development will have implication on methods of payment, career progression etc. Modern competitive business world has made Management education system more competitive and dynamic. Modern business is rapidly changing in Britain as a result; yet the education will have to undergo considerable changes in years to come.

In UK, one can identify two broad perspectives of management education. In a rapidly changing, complex and dynamic world, management education needs to be quite radically altered in order to work effectively.

The idea of management education as a means of professional training in various aspects of management is a dominant one. Law schools and medical training influence this type of management education. British traditions of developing professionalism through membership of professional institutions coupled with 'apprentice training' in real life management issues were getting slowly superseded by the USA model of management education. Management education under this model becomes professional and practice-oriented. In addition, if it is to become educational, a need to create new concepts and innovation is necessary. Further, it should also be able to critically evaluate existing practices (Gray and Mitev).

The emerging trend may lead to de-coupling of management practices, concepts and philosophies. This implies more than a shift in the content of management education and it suggests shift from skills towards analysis (Alvesson and Willmott). The issues raised here need to be re-examined in-depth, as we look at the future of Indian Management Education.

Management Education in West Germany

Germany is a remarkable country both in management style and in the provision of education for managers. It is conspicuously self-sufficient. Much has been changed in terms of management education but those issues, which are of paramount interest to the country, have probably changed least in the last forty years. In spite of the oil crisis, runaway inflation in mild 1970 & the 1979 oil shock, Germany has achieved remarkable level of economic success that could be attributed to good quality management education. The model followed was not strictly of USA type. They have integrated both the practice and philosophy of management education (Byrt).

Management Education in France

Though management education in France thrived in post World War II period, any attempt to identify the merits and shortcomings of French management education is fraught with difficulty since each distinguishing feature seems to embody both. The system facilitates dialogue between educational, business, financial and public sectors. It encourages young executives to look good and avoid trouble rather than exploit their capabilities.

Though Management education is a great force for change yet it is also a prisoner of the society in which it evolves and besides France has got strong hierarchic society. Thus Management education operates within that framework. The French model has made significant progress since World War II but still is a long way from democratic perfection (Byrt).

Management Education in Japan

Today's management education in Japan is undergoing a drastic changes, be it within a company or available through programmes offered by academic or professional institutes. As the professional bodies offering programmes are frequently engaged in consultancy work with the companies, rapid and flexible responses to company needs can be achieved.

The current international status of Japanese managerial techniques is not only a positive affirmation of the value of managerial training programmes, but has stimulated an intense interest in western nations. The high quality of Japanese products resulting from such training as the quality control circle and zero defects programmes, illustrates the effectiveness of the way in which management has harnessed the energy and creativeness of its work force. Training bodies are now thinking globally to increase the effectiveness of their Training Programmes. Future developments in management education are closely related to the economy. But whatever future holds, it is extremely probable that management will be utilised to achieve the desired goal (Byrt).

Management Education in Australia

At the end of 1986 there were two schools of excellence, New South Wales and Melbourne along with regional schools. Tertiary education in Australia is free for residents except for a small administration fee.

Comparatively little attention was paid to research in the early Australian Business Schools. However, later on, research generated enough interest in business schools. Despite the increased interest in research, there is little evidence that the boundaries of knowledge have been pushed far (W J Byrt).

Consultants had not entered the management education field on a large scale. Perhaps it does not offer sufficient financial rewards over a long period. The Australian management education scene today appears to be characterized by a mixture of growth, uncertainty and opportunism.

Management Education in Developing Countries

As educational issues at stake vary in developing countries from finance to administration to information technology – improving educational policies and management may require diverse strategies. Successful reforms will address these issues, coordinating them with government efforts to decentralize or democratize. It is essential to establish a functioning management education system, which is adept at finding ways to attract private capital to support management educational development in developing countries. The areas such as cross-cultural issues, technology transfer, technology evaluation, transfer of relationship between multinational enterprises and host country governments need to be emphasized in the management education in developing countries.

In a developing economy, institutional and other infrastructures are not adequately developed. We operate in a system of imperfect information, undeveloped or under developed markets and scarcities of resources and skills. Tradition of manufacturing and sophisticated technology is generally not prevalent under such conditions. Management education in developing economies therefore should be appropriately adapted to these conditions.

Achievements and the future

It is difficult to identify one homogeneous concept of management education since the methods vary from country to country. There has been a tendency among English speaking countries to accept the model of management education based on the educational system followed at HBS.

However, other countries have not always followed this model. In many cases, methods of management education have been adapted and their use expanded without any critical assessment of the need or the appraisal of results.

Critics of management education tend to be vocal and indulge in sweeping generalisations. Supporters insist that if so many students wish to undertake so many courses that are offered, they must be good. Accordingly, we will start by considering some of the more common criticisms of management education.

Criticisms

The major criticisms are of its: Organisation, Content, Method and Product.

Organisation

A good deal of management education is carried out within tertiary educational institutions. It is commented that most teaching institutions are bureaucratically managed and that their dominant cultures are inimical to efficient management. Management schools have tried to close the gap between them and business in a number of ways. However, in many institutions, most persons in order to secure job or promotions must follow the academic track of research – doctorates, publications.

Accordingly there is an increasing tendency for staff to be ‘in-bred’ and ‘academic’. Some management education is, of course, provided outside tertiary educational institutions. However, most of these lack the prestige, staff and facilities of the former (W J Byrt).

Content

Early management education focused on economics, to which were later added, accounting, behavioural science and still later, quantitative methods of analysis and decision-making. Although there is little agreement on what subjects should constitute management training, there is a lot of similarity between the offerings of various institutions, which is attributed to copying foreign and local models. A four-fold classification of subjects commonly offered may be made: Basic disciplines; Environmental analysis; Management functions and Management skills.

The relevance of subjects making up the content of any course will depend partly on how well they are taught and partly on what the student hopes to gain from them. It appears that most students wish to be trained in skills, which will help them further their careers. The content of management education designed on the basis of the needs of the industrial era of 20th century may not be totally adequate to the demands of the 21st century. Skills requirements undergo constant changes: management practices also change so it is necessary to equip the content of management education so that the students are equipped both with the capabilities of learning to learn and learning to act (Batra & Srivastava).

Method

Teaching methods in management education vary. Most business schools make use of the so-called 'Harvard case study method'. The use of case studies can be effective, depending on the skills of the teacher, relevance of the case study and the willingness and ability of members of the class.

Other methods used are role plays, group discussion, simulation business games. Each of these is useful if appropriately used. For decision-making, sometimes 'in-basket' exercises are conducted. Where students have no previous experience of decision-making, in-basket exercises are of little value since students fail to appreciate the situation in its proper perspective.

Research in management concepts and practices are extremely essential because such results of research are constantly used to update the contents of the courses to be delivered. Without research and continuous updating of concepts, techniques and policies, 'management' ceases to be a vital, dynamic discipline.

Product

It has been claimed that there is a wide gap between the inflated evaluations of MBAs and employer expectations, whereby employers have high expectations and are disillusioned and critical.

A criticism of management courses is that they are more effective in developing the analytical skills of students rather than their operational skills and skills to get things done. Management education has been attacked as emphasising an elitist philosophy of education, which runs counter to current trends in society. MBA graduates are also seen by some as expensive, arrogant and lacking in loyalty. Management courses, it is said, is too focused on the 'ivory tower' concepts. Design of management education does not cater adequately to an in depth understanding of management processes, logistics management and day to day management at shop floor or branch level. The products of management education are often found ill equipped to tackle the management problems that generally happen in day-to-day management. This mismatch often creates frustration both to the MBA products and their employers.

Trends and Developments in Management Education in India

In 1970s the great majority of persons in managerial position in India were first generation businessmen. Before the Second World War, opportunities for Indian managers did not exist in British owned commerce and industry, which dominated the scene. Business in India was not honoured in society. The best Indian talents were choosing the administrative services of the Government, law, medicine, pure research and teaching.

The realization that British dominance could only be attacked by the adoption of industry had dawned early in the 20th century. It was to the credit of Gandhiji, who himself publicly befriended Indian industrialists at the height of independence movement, made the general public aware that there was more to industry than moneymaking, with the emphasis on industry for national progress and the quickening of the pace of industrial growth in the country.

The greatest revolution of the era of professional management in India came in the mild 1950s when it began to be clear that Industry had forged ahead and would be able to make rapid strides with indigenous management. At the same time both the growth of management associations in major cities and laying the foundations of management education courses took place. Organization of trade

and commerce, and the managing agencies began to take active interest in management education. They began to revise the values needed in applications of managerial positions. During this period two national level management institutions (IIM Calcutta and IIM Ahmedabad) were set up based on USA model (Harvard and Sloan School, MIT). Similarly for training and education at post entry level, Administrative Staff College was set up based on Henley College model of UK. Thus, we see that Anglo-American influences on Indian management education are dominant.

Later, business management courses began to appear in the universities but the courses were reckoned to be of value only to the extent of diploma it offered at the end. But still there was a feeling in certain areas that business may require instinct and heredity, not knowledge and intellect. Slowly the captains of business started feeling that the modern age demands a far higher level of education in industry and commerce.

In the mixed economy which India had adopted, need to display managerial qualities were very important. The future development of country depended upon the skills of people in utilizing men, money, markets, materials and machines. But this awareness of the importance of their role was not present. Therefore it was important for the manager in business to fee that he is a pioneer, blazing a new trail, setting new precedents and it has been given to him to serve India.

It was important to emphasize that management is not only art or science but also that it is a recognizable discipline having series of rationally derived tools and more logic aided. During the 1970s and 80s, it was necessary to practice management knowledge in the industry. The first function was to breed professionalism and for that it was necessary to generate an intellectual atmosphere, dialogue between industry and universities, the research institutions and other organizations.

The style, which the Indian manager must strive for, was very demanding, because Indian manager had to mould the opinion about his business.

The Professional Manager in India

The job of a manager was to make possible the most effective utilization of resources to derive the best out of a given situation. But to do so in a manner which will jeopardize the possibilities of more effective utilization in future, the manager had to command and direct multidimensional resources.

The complexity of the technology, the rapid obsolescence rates of industries and the consequent need to construct ones' technological future rather than be swamped by it, the proliferation of opportunities for business success with growing pace of democracy took away businessmen near monopoly.

India was conscious of the importance of education in management studies, but there were no education policies. The task of awakening the mind of society to the importance of economic operations in the nation's progress so that more dynamic elements of society are encouraged to look upon industry and business as a worthwhile area for mental satisfaction was the major function of education policy. The important need was to put profit, an unholy, mean word in Indian life, in its proper perspective. It was the function of managerial economics to establish the optimum from the minimum use of real resources. Even though it was recognized that Management can be studied through management institutions, these institutions remained only as superstructure. It was necessary to bring change of values throughout the society, so as to recognize importance and role of entrepreneur and business. A very large percentage of people were entering into business not out of deliberate choice and not out of the feeling that here was a sufficiently interesting mental challenge. It was not the first choice of a young man. Strangely, very few accepted that they chose a career in

business because it offered at an early age more money and job satisfaction, along with independent assignments of serving country through industry. The image of business to the outside public was not giving an impression of intellectual challenge. University students should realize that a business career is to be chosen not just for financial incentives but also for intellectual and more challenges. They must be convinced that they have a great role to play in the economic development of the country.

The primary intellectual task of the Indian manger was to develop a historical perspective of the people. It had to be done through the scope they offer, the limitations from which they suffer, the methods by which they can moulded to play their part in an economic and sociological revolution.

The problems of Indian management were that political forces often created a barrier between the workers and themselves. A company's management was unable to fashion a wages payment scheme against norms of efficiency. During the industrialization of traditional Indian, the problem arose due to the lack of determination to face the problem and attempts were made to use foreign practices indiscriminately. The style of Indian management should have been to recognize the peculiarities of the Indian scene, search for the options, which international textbooks cannot give.

Indian management should have advocated modern tools of technology. However, there was a belief that everything must be focused with the purpose to release the mass from poverty through gainful employment, this meant that managers must strike the balance between limitation of capacity on one hand and abundance of labour on the other hand.

Another management problem in India, which arose from culture and history, was lack of generalists we had specialist, but lacked the ability to develop powers of total conceptualization. Therefore, Indian management was in search of a style where totality of professional management can develop. In India the total managers were in short supply.

Currently, India has around more than 50 premium management institutions. They comprise of the IIMs and autonomous and AICTE approved institutes. They have the same common entrance test for around 5 lakhs students.

Majority of the intake for this management courses happen to be IIT graduates and the students from other premium technical institutions; average salary for management graduates from the above premium institutes is anywhere between Rs. 20 and 30 Lakhs per annum.

Apart from the premium Management Institutes there are around more than 3000 other institutes offering management education. These are either affiliated to regional universities or are autonomous. Screening for admitting the students in these institutes is not very meticulous or stringent, moreover, majority of these institutes don not had adequate infrastructure and required faculty. As a result, the quality of the students coming out of these institutes is not up to the mark.

Many students prefer to opt for management courses rather than pursuing and continuing their further studies in their original streams, a trend that has been observed in recent past.

For example, among Arts & Commerce students, Pharmacy & Science graduates prefer to change to management stream for better placements.

Suggestion

Management education is concerned not only with all sectors of the economy but also to the socio cultural and political aspects present in a country. The present changes that have been ushered in because of liberalization, privatization and globalization (LPG) – have sparked off many new trends.

What is taught in B-Schools is as important as how it is taught. Three important aspects of any content and curriculum are quality, relevance and flexibility. While the first is an absolute necessity to ensure quality, the last two are assuming importance in the emerging scenario where change has become the ultimate reality. Unfortunately, many of the Indian B-Schools are dearth of in all three and therefore, have lost relevance.

The heterogeneous background of MBA students is a universal problem, which needs both immediate attention and solution. Students come with variegated academic, experience, socio-economic and cultural backgrounds.

Offer different optional modules in core, specialization and super specialization subjects for students to choose from, after prescribing a minimum number of subject compulsories.

It is felt keeping the educational and professional needs; a better way would be to introduce a 5-year integrated course requiring a change in the course content, curriculum and title of award. This is better way out.

Summary

We have made a brief survey of management education in different countries and have tried to bring out the basic profile of 'Indian Management Education'. The problems of management education and the nature of changes and rethinking required have briefly indicated. It is necessary today to have wider debate about the nature, content, philosophy of management education in the emerging globalized environment for a developing economy like India. Quantity itself will not be enough; we must strive to design a management education of right quality and effectiveness to our economy, society and culture.

This paper points to certain important areas of debate, provides a framework, which need not be considered as unique but as a starting point for a wider debate.

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About the Author:

Anjit Kumar Jha, IIMB (EBC), MBA (HRM), B. Com (Hon.)
Seema Navale, MBA (HRM), B. A (English)

A FOCUSED REVIEW OF LITERATURE ON FMCG MARKETING IN RURAL AND URBAN MARKETS

R. A. Shaikh
Sinhgad Institute of Management (SIOM), Vadgaon, Pune

ABSTRACT

FMCG sector always remain a vibrant, bubbling and a live-wire candidate when it comes to research in marketing. Researchers from academia and from the industry are curious to find out what is the new that is happening in FMCG marketing. With features like stiff competition and all, FMCG marketing requires a solid theoretical and conceptual update. This paper presents a focused review of literature on FMCG marketing in the context of rural and urban markets. The concept thus is FMCG marketing while the context is rural and urban markets. The research gap is quite evident in that in recent times no such study on FMCG sector with reference to both urban and rural markets is on record. A study that will not only present a comparative perspective between the two types of markets but will also factor in views of supply chain partners to generate robust and practical piece of knowledge that will be useful for both academicians and marketers.

Keywords: *FMCG products, Urban markets, Rural markets, Literature review.*

Introduction

The term FMCG (fast moving consumer goods), albeit popular and frequently used doesn't have a standard definition and is commonly utilized in India to refer to products of regular use. Conceptually, however, the term alludes to relatively fast moving items that are utilized directly by the consumer. In this way, a significant gap exists between the general use and the theoretical meaning of the term FMCG. One of the components on which the turnaround depends is the purchase cycle. Notwithstanding, the purchase cycle for a similar product tend to vary across population segments. Many low-income households are compelled to purchase certain products more frequently because of absence of liquidity and storage space while relatively high-income households purchase similar products more infrequently. Likewise, the purchase cycle also tends to vary because of cultural factors. Most Indians, normally, prefer fresh food articles and hence to purchase relatively small quantities more frequently. This is in sharp contrast with what happens in most western nations, where the practice of purchasing and socking foods for relatively longer period is increasingly common. As a matter of fact FMCG as an area basically belongs to the consumers in the market.

This paper carries a focused literature review on FMCG marketing in rural and urban markets in order to understand the recent trends in research in this area.

Following themes were set for the literature review:

a. Review of Literature on Rural and Urban Markets

b. Review of Literature on FMCG

c. Review of Literature on Rural and Urban Markets and FMCG

Review of literature

a. Review of Literature on Rural and Urban Markets

Of late there has been some special research on rural arts and culture linking it with the business environment in which the rural markets operate. Hence initially few reviews focus on rural culture from a perspective of understanding marketing dynamics of rural economy –

1) Johnson, et.al (2019) stated that this review of the scholarly and applied literature was undertaken with 2 goals:

- To recognize what is known about arts and culture, innovation, creativity, and entrepreneurship in rural areas, and how these concepts work distinctively in rural and urban areas, and
- To recognize issues that is not known about these concepts in rural settings and to help build up a powerful research agenda for the future.

2) Wojan and Nichols (2018) reported the results of an analysis utilizing a new and

novel data source, the 2014 Rural Establishment Innovation Survey (REIS), which created unique data on the role of innovation & design orientation of rural businesses. The investigation looked for correlations between arts in the community, the degree to which design was coordinated into the production processes of firms, and the economic performance of the region. The researchers discovered tantalizing support for the hypothesis that "the local arts scene is emphatically connected with design orientation." They additionally found an association between locations with more design-oriented firms and higher paces of job growth and wage increments. More research is expected to affirm causality and to better comprehend the underlying procedures included.

3) Kelliher, et al. (2018) studied the role of trust in formal systems of micro-firms in rural communities in Canada, Ireland, and the US. They found that trust was a developing asset and fundamental to the sustainability of formal networks. Bridging capital between individuals of the local network and outside resources was particularly important to network members in small communities.
4) The National Endowment for the Arts (Wojan and Nichols 2018; Nichols et al. 2017) has recently mined another data source, the Rural Establishment Innovation Survey (REIS), to investigate the distinctions in innovation in performing arts organizations. The consequences of the project are also summarized in a series of research briefs (NEA 2017a, 2017b, 2017c). The investigation uncovered several statistically significant differences between rural and urban establishments. The researchers found, for instance, that nature parks represent for a much larger portion of rural arts organizations than of urban arts organizations, & that performing arts organizations are progressively basic in rural counties with greater levels of natural amenities. Strikingly, while rural non-arts performing enterprises are altogether more averse to be substantive innovators than their urban counterparts, performing arts organizations are similarly innovative in rural and urban settings. The researchers also discovered that rural performing arts organizations attract non-local audiences at greater rates than their urban counterparts, and a greater proportion of rural arts establishments revealed that they give "a lot" of civic leadership to their communities. At last, this research found a positive relationship between the number of performing arts organizations and the extent of businesses categorized as substantive innovators and/or design integrated establishments in rural districts.
5) In its recent report on rural arts, the NEA (2017a) reported that "while 36 % of rural arts/cultural organizations say they give 'a lot' of civic leadership to their communities, only 24 % of urban arts/cultural organizations give that self-reported level of community support" (p. 2). Research is required to see if and how this civic leadership leads to larger social innovation in rural communities.
6) Sarkar, et.al (2016) has analyzed the variations in rural marketing concepts and presented definitions relating to these varying concepts. Nonetheless, there seems to be a general disagreement about the aspects which should be involved in rural marketing. This article considers the contents of various definitions of rural marketing utilizing quantitative techniques in order to determine the probable conceptual expansion of rural marketing. Just definitions of the term 'rural marketing' (not just a mention of 'rural marketing') are considered for the present examination. Dimension reduction technique and frequency tabulations are utilized for the content analysis. Apart from giving a definition of rural marketing utilizing the results of the content analysis, the present study additionally found a strong relationship between developmental marketing and the requirement for rural marketers to encourage demand through developmental activities such as appointing local inhabitants as wholesalers, distributors, and retailers of their products; or by utilizing local manpower in other operations such as trade marketing, obtainment of raw materials and selling and

dispersing information on the marketer's products directly to rural consumers.

7) Essig (2016) perceives that entrepreneurs joined formal business networks to share resources and information, and to impact legislation that influences their businesses (Miller, Besser, and Malshe 2007, p. 637). Essig cites MacGregor (2004), Pittaway et al. (2004), and Nijkamp (2003) as additional proof that formal networks are especially significant for businesses as indicated by Essig "outside of urban centers where density naturally leads to informal networking. Watson (2012) discovers, like others, that having multiple formal and informal networks is related with business sustainability, but only formal networks are related with growth" (p. 5).
8) Kaushal (2016) stated that rural India is becoming one of the attractive markets for the corporates in the recent times. Urban markets are overwhelmed with many different consumer products, in this way marketers now find it hard to create heavy income flows from these markets. On the other hand rural income graph is on an ascent, which has given huge scope to the corporates to tap this market where 70 per cent of India dwells. The study intends to give information on how the corporates carry out the marketing process and the causes for the paradigm shift from Urban to Rural markets. The investigation likewise uncovers the challenges faced by the corporates while marketing their items in rural areas.
9) Renugadevi (2015) stated that the majority of Indian population undoubtedly lives in rural parts of the country. This huge size, high market potential population is often neglected and stays unexplored contrasting with its counter urban population. The present rural populace draws multinational companies to market their products that records positive metamorphosis demanding numerous issues to be handled in rural marketing. The concept of rural market in India is still fit as a fiddle and the sector presents variety of challenges. The present paper will feature the structure of rural marketing environment in order to recognize the challenges that would be looked by the marketers in rural area. The respondents from various income groups rank the issue of purchase and their consensus is analyzed in detail.
10) Anwar-McHenry (2011) reports the outcomes of one of the few statistical analyses observing at the potential role of the arts and culture in stimulating a sense of place and community cohesion in rural communities. She reviewed a rural community in Western Australia, gathering different kinds of demographic data and scores (on a 0 to 10 Likert scale) showing the personal value that respondents placed on the arts, self-rated life satisfaction, the perceived value of the arts to the community, and community satisfaction (direct cognitive well-being). Anwar-McHenry then utilized simple regression analysis to gauge the connection between community satisfaction and other indicators and demographic variables (such as age, gender, and region type—i.e., coastal, agricultural, or mining/pastoral). None of the demographic variables were critical nor was the personal value placed on the arts. Nonetheless, community satisfaction was positively correlated to value of the arts to the community and self-rated life satisfaction.

b. Review of Literature on FMCG

1) Acikgöz (2018) stated that deciding on the right products to offer to the target market is a demanding and crucial task that requires comprehension and knowledge into the customer's needs, wants and demands. Thusly, the continuous development of new product strategies can be a significant determinant of sustained company performance. Product strategies include - apart from product mix decisions - product life-cycle strategies & market introduction of new-product developments (NPD). Since product strategies are a basic part of companies' marketing mix, there has been attempted a lot of conceptual and empirical research to recognize the proper product strategies for critical success of industrial products. This paper analyses the discoveries of empirical work into the

strategies developed for and by industrial FMCG companies for their products. It is the prime target of this work to condense the most significant discoveries in a compact and structured way and also to give theoretical insight as to how these product strategies are arranged, implemented and controlled.

2) Chakrabortyet.al (2015) stated that Indian Fast-Moving Consumer Goods (FMCG) sector with a market share of $13.1 bn has currently proved itself as the 4th largest sector in the Indian economy. Actually, rural India with more than 70 per cent share of the total Indian populace has developed as the most significant FMCG market. During the last 2 decades, deregulation, globalization and liberalization measures approved by the central government have made a worldview change in the FMCG sector. Both the foreign direct & portfolio investments in Indian FMCG sector in the post-reform period have remarkably impacted the financial performance of the companies belonging to this sector. In addition, the expanding presence of MNCs in the Indian market has constrained the existing domestic companies in the FMCG sector to reorient their financial strategies so as to endure. Against this backdrop, the present investigation seeks to measure the changing status of the overall financial performance of sixteen selected companies in the Indian FMCG sector during the period 1993-94 to 2012-13. The paper is sorted out as follows: it reviews the existing literature relating to the financial performance of Indian FMCG sector, trailed by a depiction of the objectives and the methodology adopted to pursue them. In this way, the discoveries of the study are discussed, and lastly, the conclusion is offered.
3) Qasim, et.al (2015) stated that the aim of this research work is to study the consumers' attitude towards Non Alcoholic Beverages. The data for the investigation has been gathered by performing face-to-face interview with the respondents with the help of questionnaire. This study gathers data from 400 consumers across Delhi NCR. This study is begun with objectives of examining socio-economic background of respondents, inspecting the factors influencing consumer preferences towards selected FMCG products that are Non- Alcoholic Beverages, checking the degree of satisfaction of consumers and knowing expectancy of the consumers. This investigation uncovers that consumer preferences are generally influenced by age, place, sex, product, price, psychological, availability, people and brand influences.
4) Malhotra (2014) stated that the paper focuses on marketing of fast moving consumer goods. FMCG are generally low profit margin products and therefore sold in large quantities. Subsequently, it is imperative to concentrate on how to improve brand value for the customers as many brands are accessible for the same categories of products. Another area focussed in the paper is how recession influences the demand for fast moving Consumer Goods and what are the causes for these changes. In such a circumstance, it becomes necessary for the producers or the companies to expand the investments in these brands and items so that consumers are attracted towards them. In order to support these observations Dove's Real Beauty Campaign has been intricately discussed and the points which lead to the achievement of this campaign have been highlighted. Unilever was able to make a brand value for Dove by roping in regular consumers in its advertisements rather than professionals or celebrities. Normal consumer women became its brand ambassadors instead of celebrities. In such a way it was able to relate and connect better with the customers and the public at large in different companies where it was actualized. Although it suffered from different points of criticisms, Unilever was highly successful in creating a brand value for its products in the minds of the consumers.
5) Agarwal (2014) suggested that consumer behaviour research is the scientific investigations of the processes consumers use to select, secure, utilize and dispose of products and services that fulfil their needs.

Firms can satisfy those requirements only to the extent they comprehend their customers. The main objective of this article was to study the demographic differences in the consumers buying behaviour of people living in Madhya Pradesh and when they purchase FMCG products. To attain this objective a survey was developed and directed over some part of Madhya Pradesh. The discoveries affirm the components impacting consumer buying behaviour for tooth paste brands accessible in the market.

6) Mahalingam, et.al (2012) concluded that the consumer behaviour plays a significant role in marketing. This is affected by different factors. In the changing global scenario authors find that consumers wants and needs to purchase a product also changes with it. In this study titled "A Study on Consumer Behaviour towards Selected FMCG in Coimbatore City" the researcher has evaluated the socio-economic profile, shopping pattern of consumers and discovered the factors affecting the consumer to buy the selected FMCG products. The primary data required for the study was gathered through questionnaire which was distributed to 400 samples chosen from Coimbatore city .The tools utilized for analysis are percentage analysis, Garrett ranking and chi-square. From this investigation it was discovered that most of the consumers are impacted by brand and quality in purchase of FMCG products. There by the researcher has recommended improving the quality in FMCG product through product development and external monitoring.
7) Ullah, et.al (2012) depicted that Fast Moving Consumer Goods sector is one of the biggest sectors in the economy of Bangladesh. In the last few years, the FMCG industry in Bangladesh has encountered a dramatic growth; both qualitative and quantitative improvements have occurred in the consumer durables segment. FMCG in marketing context means convenience and lesser involvement products like, pens, salt, flours, chocolates, etc. In last few years, the FMCG industry globally has encountered a difficult market condition. In certainsegments, formerly popular brands were either been squeezed or deleted between the category leaders and low-cost competitors. The study has identified 8 primary factors that impact consumers' purchase decision of FMCG products in Bangladesh. These factors are sales promotion, time constraint, unavailability of brand, in-store TVC, product features, variety-seeking behaviour, end of aisle display and product convenience. This study prescribes concentrating on 3 important factors, i.e., time constraints, sales promotion and non-availability of a brand to facilitate the progress of FMCG industry in Bangladesh. The FMCG industry will discover better development opportunities, if the discoveries of this examination are utilized as an input in its strategic decision making.
8) Deliya (2012) considered the importance of bundling plan as a vehicle for correspondence for bundled FMCG items. This examination utilized a center gathering approach to fathom shopper conduct towards such items. The test for analysts is to consolidate bundling into a compelling buying choice model, by understanding Consumer's conduct towards the bundling of FMCG things. At the point when buyers chase for the cycle data coming up, the item's bundle can contain relevant and significant information for the shopper. Item bundling structures the finish of the 'advancement chain' and is close so as to the genuine buy and may thus expect a critical function in foreseeing buyer results. Bundles similarly convey brand ID and mark data like use rules, substance, and rundown of fixings or crude materials, advices for use and mandates for care of item.
9) Tauseef (2011) endeavoured to discover the factors/factors that impact client hasty purchasing conduct in FMCG area considering retail market in India. The impact of different drive purchasing factors like arrangement of items, deals and advancements, successful value procedure ,window promoting, and so on, on client purchasing conduct have been examined. A speculative model was made in this paper,

which had been thought about for our examination chip away at drive purchasing conduct of shoppers. The investigation depends on the essential information accumulated from shopping centres, Handlooms and stores from the territory of Jodhpur with the help of organized survey on Likert scale. Information examination has been finished using SPSS programming. The factual examination strategy used in this investigation was Factor Analysis. After the intensive examination of the available information it was discovered that since pay of every individual is growing and an ever increasing number of individuals are moving towards western culture in eating, in dressing sense, and so forth, so the buying intensity of people has really gone up and thus the rash purchasing of items is on a high pattern fundamentally in view of estimating techniques of retail players and full celebration offers consistently.

10) Leahy (2008) suggested that this paper analyzes the idea of brand dependability in Fast Moving Consumer Good (FMCG) markets. The essential goal of the examination was to investigate why dependability fills in FMCG markets from the customers viewpoint. What's more, this examination found the customer's viewpoint on the sorts of securities that exist in FMCG markets and the function of securities in the development of brand dependability. The predominant end ascending from this examination is that brand unwaveringness exists in FMCG markets for both enthusiastic and psychological reasons. Fundamentally this examination established that the improvement of brand steadfastness depends on the advancement of client brand securities. This exploration presumes that the test for advertisers is to develop and support the bonds that lead to and that can strengthen brand reliability. The examination additionally infers that brand dependability concentrates later on should focus on both psychological and enthusiastic purposes behind brand steadfastness and the function of securities in that. Investigating brand dependability in this manner should help in the examination of and understanding of brand steadfastness in FMCG showcases and ought to hence bring about the advancement of successful promoting techniques expected to construct brand devotion.

c. Review of Literature on Rural and Urban Markets and FMCG

1) Jayanthi (2017) stated that fast-moving consumer goods (FMCG) are products that are sold rapidly and at relatively low cost. Examples incorporate non-durable goods and soft drinks, over-the-counter drugs, toiletries, processed foods and other consumables.

FMCG is the fourth largest sector in the Indian economy and is esteemed at about USD 49 billion as of 2016 (as per IBEF).Household and Personal Care is the leading segment accounting for 50 per cent of the overall market. This is followed by Healthcare at 32 per cent and Food & Beverages comes next in terms of market share at 18 per cent. Under Household & Personal Care, Hair care accounts for about 23 per cent followed by Oral care at 15 per cent, Home care at 6 per cent and Skin care at 5 per cent Credit Appraisal is the procedure by which a lender assesses the technical feasibility, economic viability and bankability incorporating creditworthiness of the prospective borrower.

In any case, over the most recent couple of years, the FMCG market has developed at a faster pace in rural India contrasted with urban India. Semi-urban and rural segments are growing at a fast pace and FMCG products account for 50 % of total rural spending.

FMCG companies play a significant role in our daily lives. From tooth paste, soaps, daily use items etc. FMCG companies have overwhelmed the Indian market and are set to grow further. The FMCG industry has seen some large players but disruption by new players has likewise changed the Indian scenario. The top Indian FMCG companies incorporate names like ITC, HUL, Nestle and New Entrant Patanjali.

The main purpose of this paper is to study and examine about fast-moving consumer

goods (FMCG) sector in India. This paper focuses on significance of FMCG Sector, Three main segments of FMCG, Evolution of FMCG in India, Challenges in FMCG Sector, Advantages of FMCG Sector, Growth in Indian FMCG Sector, Market Share of Companies in a few FMCG Categories as of October 2017, Top 10 FMCG Companies of India 2017, Trends of FMCG Sector, Strategies Adopted in FMCG, and Scope of the FMCG Sector. Data has been gathered from multiple sources of evidence, in addition to books, websites, journals, and newspapers.

2) Majeed (2014) conducted an investigation on Brand Awareness in Rural Area: A Case Study of Fast Moving Consumer Goods in Pulwama District of Jammu & Kashmir State. He made an endeavour to analyze the brand awareness on fast moving consumer goods in rural areas and to know the interest of the consumers in purchasing the branded products of fast moving consumer goods. He has studied the effect of media on the brand awareness and preferences. He has chosen 100 respondents from the selected 10 villages of 4 blocks in the Pulwama District utilizing simple random sampling technique. He discovered that the brand awareness of consumers towards goods consumed daily has been relentlessly expanding. He has concluded that the utilization of branded goods is seen as a status elevator in villages.
3) Nasrudeen .R, (2014) in the study "Level of Consumption of Fast Moving Consumer Goods by Rural Consumers – An Analytical Study", stated that, ever since independence of India, because of some undeniable reasons, marketing acquired a largely urban bias. It was the green revolution in the 70's which gave a much-needed boost to agriculture-based rural economy in the country. Consequently, many firms began showing interest in the rural markets and stretch out their entrance to arrive at smaller village and towns. Further, presently rural consumers are behaving like urban consumers towards the urban lifestyle, taste, fashion, preferences, etc.
4) Sonia, et.al (2014) in the study "To Study the Satisfaction Level of Customers towards the Brand of Consumer's Goods - A Study Carried out on Rural Masses", stated that the Indian Fast Moving Consumer Goods (FMCG) industry started to shape during the last 50 odd years. The FMCG sector is a foundation of the Indian economy. This sector touches each part of human life. Indian FMCG market has been isolated for a long time between the unorganized sector and the organized sector.
5) Thanigachalam, et.al (2014) stated that the importance promotional offers, accessibility of brands are significant that companies must give it sufficient consideration before they plan and execute their marketing strategies. The FMCGs sector is a very dynamic sector in India. A major goal is to fulfil the needs and wants of consumer and their target markets more successfully and effectively. This article highlights the consumer behaviour towards FMCG in puducherry, but with the prevailing trend, it is necessary to concentrate on the essence and emergence of vibrant in marketing endeavours from the FMCG companies. Thus with more number of companies going into the rural and urban market, with an assortment of products, it is a must for the companies to study the urban and rural consumer behaviour, on FMCG. This investigation will highlight the consumer behaviour before purchase, at the time of purchase, post- purchase and factors impacts the consumer behaviour towards buying of FMCG products.

The present study inferred that, successes of many businesses depend on their ability to create and holding the customers. Companies to sell their products in standard price with good quality, accessibility of brands in all stores and is less costly to attracting new customers. Brand Loyalty gives companies strong and competitive weapons to battle with competitors in the market place. Henceforth the researcher hopes that the information provided in this study will help companies

in shaping their marketing strategies and better serving their customers.

6) Kumar et.al (2014) stated that the rural consumers are known to earn low income, have low level of literacy, asymmetric information, low level of brand awareness, inadequate communication and transportation facilities. The Rural markets and sub-urban markets are currently extending in Kerala with ever greater penetration index, as the development appears to be hindered in the urban markets. In this investigation, Rural & suburban areas of Ernakulam with a sample size of 100 respondents. The investigation intends to recognize the level of influence of various factors on the purchase of FMCG products-soaps & detergents amongst the rural/ semi urban consumers. The examination underscored that rural consumers gave more significance to the 'quality' of the FMCG-personal care brands they purchased as opposed to the standardizing impacts or social appeal vide celebrity endorsements in the mass media.
7) Srivastava, et.al (2013) examined that FMCG sector is a vital contributor to India's Gross Domestic Product. It has been adding to the demand of lower and middle income groups in India. Over 73 per cent of FMCG products are sold to middle class households in which over 52 per cent is in rural India. Rural marketing has become the hottest marketing field for most of the FMCG companies. The rural India market is tremendous and the opportunities are boundless. After saturation and cutthroat competition in urban areas, presently numerous FMCG companies are moving towards the rural market and are making new plans for targeting the rural consumer. The Indian FMCG companies are presently busy in formulating new competitive strategies for this undiscovered potential market. Therefore, a comparative study is made on opportunity, growth, and challenges of FMCG companies in rural market. One of the most alluring reasons for companies to tap rural consumers is that an individual's income is increasing in rural areas and purchasing power of lower and middle income groups is also increasing and they are anxious to spend money to improve their lifestyle. This research paper gives detailed analysis about the contribution of FMCG industry in development of Indian rural market and intends to discuss about customer attitude towards better purchasing decision for FMCG products in rural market with developing awareness and brand consciousness among individuals across various socio-economic classes in rural market.
8) Sulekha, et.al (2013) concluded that in India more than 72 per cent population lives in villages and FMCG companies are well-known for selling their products to the middleclass households; it suggests that rural India is a profitable and potential market for FMCG producers. Rural consumer's incomes are increasing and now they are more willing to purchase products which improve their lifestyle. Producers of FMCG have to craft unique marketing strategies entirely for rural consumers. In this procedure they need to comprehend the rural consumer buying behavior which may vary geographically. The present investigation focuses on understanding the rural consumer buying behaviour for FMCG in Haryana. The investigation emphasizes on the factors which impact the purchasing pattern of rural consumers. The investigation was conducted in 4 districts of Haryana namely Jind, Panipat, Kuruksetra and Gurgaon.
9) Yuvarani (2013) analyzed that liberalization of the Indian economy had extensive results, which prompted the free entry of global brands in Indian markets. Earlier companies focused their marketing endeavours towards the urban markets targeting the educated consumer. Anyway with the immersion of markets in the urban sector, numerous companies concentrated towards the fast growing rural sector. Since the buying behaviour of rural consumers has become the hotly debated issue for discussion because rural India, in recent days, is excitedly devouring everything from shampoo to motor cycles and this ―rural predilection is being considered as one of the noteworthy topics for market

analysis. The study emphases mainly on the rural consumer behaviour towards selected FMCG products, but with the prevailing trend it is important to concentrate on the essence and emergence of vibrant rural marketing endeavours of FMCG companies. Thus, with increasingly number of companies entering into the rural market, with an assortment of products, it is must for companies to examine the rural consumer behaviour over FMCG products. This examination will highlight the rural consumer behaviour before purchase, at the time of purchase and post- purchase. The commodities selected for the research are shampoo, toothpaste, bathing soap, biscuits and mosquito coil/liquid. The commodities chosen for the research has been done on the basis of products accessible for respective industries: hair care; oral care; skin care; food and beverages; and mosquito repellents.

10) Muneeswaran, et.al (2013) revealed that consumer behaviour accept a lot of significance in the present consumer oriented marketing system with specific reference to 'gender attention'. The FMCG sector consists of 4 product categories such as Personal Care; Household Care; Food and Beverages; and Tobacco each with its own hosts of products that have generally snappy turnover and low costs. Every consumer is purchasing a specific item because of the impact of numerous factors. The affecting factors differ from one consumer to another and from product to product also. Likewise the brands which hitherto occupied a place in the minds of the consumers have begun to vanish due to various sales promotion techniques and the quality brands from FMCG have gradually begun to attract the rural consumers. Though there is an alternate ways and means to exhaust and to convey copiously produced Personal Care FMCGs products in markets, but the consumers in the market are affected generously by responding to selling habits of retailers both in rural and urban market. In markets the consumers usually purchase what is accessible at the retail outlet. Therefore the producers of personal care FMCGs should progressively fortify their distribution reach in the market. Simultaneously, there are some challenges such as fragmented rural market, poor distribution system, and heterogeneity of populace which the retailers should meet for satisfying the needs of consumers.

11) Jha (2013) analyzed the consumer preference and brand awareness with reference to FMCG in rural Bihar. He has selected 120 respondents from 5 villages in Bihar state. He discovered that the rural consumers have become value conscious and quality is significant in the context of rural purchase and consumption of FMCG. As indicated by the consequences of his investigation, attractive packaging made a favourable impression in the minds of rural consumers which impacted their buying behaviour. He has proposed that innovative promotional strategies shall be designed by the rural marketers in such a way that the rural consumers could comprehend easily.

12) Daud (2013) aimed to analyze the brand awareness in rural area and to contemplate the interest of consumers in branded products of Fast Moving Consumer Goods. He gathered primary data from the rural consumers of seven villages in two districts of Varanasi and Lucknow in Uttar Pradesh. He found that the brand awareness in rural areas was expanding and the consumers both literate and illiterate prefer branded goods with conviction that quality is guaranteed as the manufacturers are the reputed companies.

13) Md., et.al (2012) revealed with more than 600 thousand villages and more than 70 per cent of the population, rural India has become an enormous consumer goods market. FMCG has risen as a major product category in rural consumption. Companies marketing FMCG to rural consumers can't only stretch out their general marketing strategies to rural markets. Rather, they need to devise rural specific strategies. In this procedure, they need to comprehend crucial issues relating to rural consumer behaviour and more explicitly relating to various geographic regions of the country. This paper focuses on understanding elements that influence the rural purchase

of FMCG in South India. Empirical study was conducted in eight districts of South India to identify the key influencing variables. Factor analysis was utilized to form 24 key variables into 5 groups (influencing factors). Impact of retailer's recommendations has developed as the most significant variable in the trust factor. As indicated by the study, rural consumers in South India consider that utilization of FMCG contributes to their lifestyle.

14) Garga, et.al, (2009) done the one study among the 300 rural consumers in three districts of Punjab found that, rural consumers want to purchase the goods in small packets at lower price. They need the more products at reasonable price, in other words value for money. He likewise clarifies the significance of promotional tools in rural areas. He proposed that FMCG companies must enter and tap the rural market in phase manner.
15) Selvaraj (2007) in his research regarding rural consumer behaviour perceived that 'nearness' was the most noteworthy factor impacting their purchase of the non-durables. It was seen that high price was another significant bottleneck for the rural consumers.
16) Anandan et.al, (2007) observed that the quality was the significant driver to prefer a specific brand in washing soaps in the rural market, and when preferred brands were not accessible, customers purchased the available brands. Also high price and non-accessibility were the key reasons for dissatisfaction amongst the rural consumers.
17) Ghosh, (2007) points that FMCG is a significant contributor to India's Gross Domestic Product (GDP) and is also the 4th largest sector in the Indian economy responsible for giving employment to approximately 5% of the total factory employment. He further perceives that the food processing and the backward linkages built up by eminent companies that have already arrived the rural zone, and with a number of Indian and foreign companies that are stepping in; the buying power of farmers is surely going to rise.
18) Medis, et.al (2007) analyzed in their study that packaging is one of the most significant factors in the face of purchasing made at the point of sale, where it becomes a fundamental part of the selling process. The package standing out on the shelf influences the consumer's buying decisions, and package design ought to be more favourable in the eyes of the consumers. Packaged FMCG products are moving into ever bigger supermarkets and hypermarkets, and there is a multiplication of products, offering consumers vast choice. The competitive context is always extreme, both in the retail store and household. With the transition to self-service retail formats, packaging rises its key characteristic as the "salesman on the shelf' at the point of sale. The investigation analyzes how packaging impacts buying decision of local consumer. The primary data were gathered from a sample survey that was conducted in the areas of Gampaha, Colombo, Kurunegala and Kandy. 200 respondents were selected for the survey and respondents were approached to answer the prepared structured questionnaire. The examination uncovered that both rural and urban consumers observed certain value from packaging and this plays various roles in different circumstances. Further there is a positive relationship between freshness of the products and the good packaging.
19) Kumar, et.al. (2006) conducted an examination on rural marketing for FMCG. The most preferred brands of shampoo, toothpaste and toilet soap in rural areas were recognized on the basis of gender interpretation. The examination uncovered that quality is the first factor that impacts rural customers followed by price, color and taste. Amongst brand preference, Colgate plays an imperative role among female respondents whereas male respondents mostly utilize Pepsodent. Almost half of the respondents don't utilize shampoo because they are utilizing conservative products only and among the users 60 % of them utilize Clinic Plus. No significant relationship between gender and the utilization of shampoo was found.

Majority of the respondents utilizing soaps preferred Hamam as their brand of toilet soap.

20) Nagaraja(2004) investigated the effect of socio-economic influences on rural consumer behaviour in terms of their purchasing practices, to the social status and level of income, and uncovered that rural consumer was more rational as a purchaser and exhibited a higher level of rationality contrasted with the urban consumer. Rural consumer pursued for better value for money spent in the purchase of FMCG products; easy accessibility, Price and Quality were the persuasive factors cited.

Observations

1) Fast moving consumer goods (FMCG) are generally low profit margin products and therefore sold in large quantities.
2) Product packaging forms the end of the 'promotion-chain' and is close in time to the actual purchase and may therefore play a significant role in predicting consumer outcomes.
3) Brand awareness in rural areas is expanding and the consumers both literate and illiterate prefer branded goods with conviction that quality is assured as the manufacturers are the reputed companies. Thus, the majority of the consumers are impacted by brand and quality in purchase of FMCG products.
4) Urban markets are flooded with a wide range of consumer products, thus marketers presently find it difficult to produce heavy income flows from these markets. On the other hand rural income graph is on an ascent, which has given huge scope to the corporates to tap this market where 70 per cent of India resides.
5) Rural India is a profitable & potential market for FMCG producers. However, in the last few years, the FMCG market has developed at a faster pace in rural India contrasted with urban India. Semi-urban and rural segments are developing at a quick pace and FMCG products account for 50 % of total rural spending.
6) Many firms began showing interest in the rural markets and stretch out their infiltration to arrive at smaller village and towns. Further, presently rural consumers are behaving like urban consumers towards the urban lifestyle, taste, fashion, preferences, etc.

Research Gap and conclusion

The research gap is quite evident in that in recent times no such study on FMCG sector with reference to both urban and rural markets is on record. A study that will not only present a comparative perspective between the two types of markets but will also factor in views of supply chain partners to generate robust and practical piece of knowledge that will be useful for both academicians and marketers.

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International Journal of Advanced Science and Technolooy vol.
29, No. 7, (2020), 00. 1 541-1548

Mobile-App-based Authentication Framework for cloud computing

Ankush Kudale [1], Dr. S. Hemalatha[2]
Research Scholar, Karpagam Academy ofHigher Education (Deemed to be University), Coimbatore, India.
Research Guide, Karpagam Academy ofHigher Education (Deemed to be University), Coimbatore, India.
[I] ankush.kudale@gmail.com, [2] drhemashanmugam@gmail.com

Abstract

Cloud computing has been growing day by It has been spreading almost all areas of market. Cloud computing has various merits beneficial to the cloud user, but it has some demerits also, where authentication is very important security issue. To access cloud computing sener or its services users need to login on web. User authentication and access control process need to be scrutinized properly. Various methods of authentication are available in the market today, but there are loopholes that stand in the way ofguaranteeing complete security and hence many organizations hesitate to seek cloud services. The mobile tokens (soft token) are the future of the authentication indusñy. Most modern users keep using smart phones with dozens of apps with convenience with similar methods ofauthentication. In this paper, we have proposed a new mobile-app-based authentication framework for cloud computing users using app without internet too. The proposed framework provides a feasible and efficient mechanism to integrate existing systems. The framework provides protection from unauthorized access, easier to use for the employee and to deploy for the administrator. So, it will be higher cloud security with more convenience. The framework will be incorporated in the upcoming cloud computing services.

Keywords: cloud computing; cloud security; authentication; access control; soft token;

1. Introduction

Cloud computing [1][8] is the provision service over internet for services such as applications, storages, servers etc. that are easy for the customers to manage [2].

1.1 Cloud Computing Services

a. Software as a Service [SaaS][7] Cloud service provider offers to rent out a software (application) to the customer over the internet.

b. Platform as a Service [PaaS] Cloud service provider offers to rent out any hardware, storage, network and operating system for the usage of customer.

c. Infrastructure as a Service (laaS) Cloud service provider offers customers storage, hardware, networking components etc. on "pay as you use basis".

2 Cloud Authentication

Authentication is a very important factor for any web-based system and one of the important issues of cloud computing. It is less expensive than the traditional services with the only constraint being the need for a highly secure authentication.

2.1 Cloud authentication issues

Cloud service providers offer various services over the internet, where the customer has to register providing his or her private information. Most of the time such stored information has been misused by someone for unauthorized access.

Now the challenge is to keep secure private information of user in the case of any kind of service such as SaaS, laaS or Pass [5].

Nowadays two-factor authentication is one the mostly trustworthy types of user authentication to access any resource or data. Two-factor authentication is much preferred to the traditional onefactor password method.

2.2 Existing Authentication Methods

Currently there are various authentication mechanisms available in the market, most of which are web-based. It has been observed in a survey we conducted that most of the industries are still using traditional one-factor-password-based mechanism. It has also been noted that some of industries are using multi-factor authentication mechanism with username-password + mobile OTP. And some of the organizations are using username-password + Biometric mechanisms (fingerprint). And a small number of organizations, specially in IT development and IT services, are found using hard token and soft token mechanisms [6].

There are many schema available in the cloud. Only a few of various biometric methods developed are able to gain approval [9]. And biometric authentication mechanisms are not widely used either because biometric devices and their implementation are highly costly. The patterns of fingers can be damaged easily by common cuts.Hard tokens are available in the form of USB keys, smart card and physical device that are being used for two-factor authentication. But, they have limitations too such as high cost and physical security. They can be phished and cracked and are difficult to distribute for geotropically differenced organizations.

There are some soft tokens used as two-factor authentication. They have been available in the market from top IT service providers in the world, which were not trusted. Existing soft tokens require intemet connection, but some existing apps can't work with internet connection. There is not a single type of authentication soft token that is universally accepted. Each of the existing tokens has some drawbacks. A strong authentication framework [6] for cloud users is proposed for mutual authentication, management of identity, agreement between server and user etc. but is has also loopholes.

A Multi-factor Authentication framework [4] can be integrated with legacy system of authentication. The proposed framework verified by CAM system uses arithmetic captcha to authenticate the user.Nowadays banks are using multifactor authentication instead of single factor username password. For banking employee various banks have adopted fingerprint as a second factor along with password. And for their customers a few banks opt SMS (DTP. But banks need to pay SMS charges on every transaction or login. Another drawback is that if mobile network is not available the customer cannot use the bank system.Along with above literature survey it has been observed that there are various frameworks available in the market, but their adaptation to the actual system has yet been happening.

3. Table List of Notations Used

Notations	Descri tion
CUO	Cloud User Organization
SAS	Secure Authenticator S stem
CSP	Cloud service provider
OTP	One-time assword
IMEI	International Mobile E ui ment Identification
SAC	Secure authentication code

SAA	Secure Authentication A
SK	Secure ke
UID	User
	Username
	Password

4. The Proposed Security Architecture A. Key Entities

l) Secure Authenticator System (SAS): a secure web server, which will verify information of users of CUO and depending on the validity it, will allow them to access the server and services of CSP. SAS system is private cloud server owned by CUC).

2) Cloud User Organization (CUC)): an institute that is actually going to use cloud and its services i.e. services of CSP.

3) Cloud Service Provider (CSP): cloud service provider who provides Saas, PaaS and laaS will actually provide secure information.

4) Secure Authentication App (SAA): this is a mobile phone app, which is going to generate secure app code (SAC).

5) Smart mobile phone: The smart phone which has unique IMEI number is used for user verification of CUC). The same will be used to install SAA and generate SAC.

6) Mobile number: a valid mobile number authorized by CUO and used during the registration and credential modification phase. SAS will send (DTP.

7) Email address: a valid email address provided by CUO for their user and used during the registration phase and credential-modification phase.

8) Secure Key: an encrypted key which is available when required to generate SAC.

B. Key Approaches Used

l) CUO's user information sharing and monitoring: In the proposed framework CUO must have correct user (say employees) information for SAS, which includes user identification number (UID), name of user(UN), password (PW), user's date of birth, date ofjoining, mobile number, email address, smart mobile phone's IMEI and handset description etc. These credentials are stored in SAS system and will be used to generate tokens using SAA.

If there are changes in CUO user's infonnation then it should be done only by the administrator of CUO system, and users need to follow the credential modification phase again. CUO user cannot change any credential.

2) SAA token generation policy: SAA will use CUO user's infonnation which have been shared already on SAS system. Along with user information SK and mobile device information etc. are used to generate encrypted tokens. The generated tokens have expiry time. The flash time is unlimited or time-bound depending on policies decided by CUC). For the first time login SAA will communicate with SAS and keep SK in app for generating tokens. App verifies mobile number/sim present with same handset and the same number is registered with CUC).

3) Multilevel velification for new user: In the proposed framework CUO's new user needs to undergo various stages of verification like email and OTP, after SAA registration by providing proper information and verification.

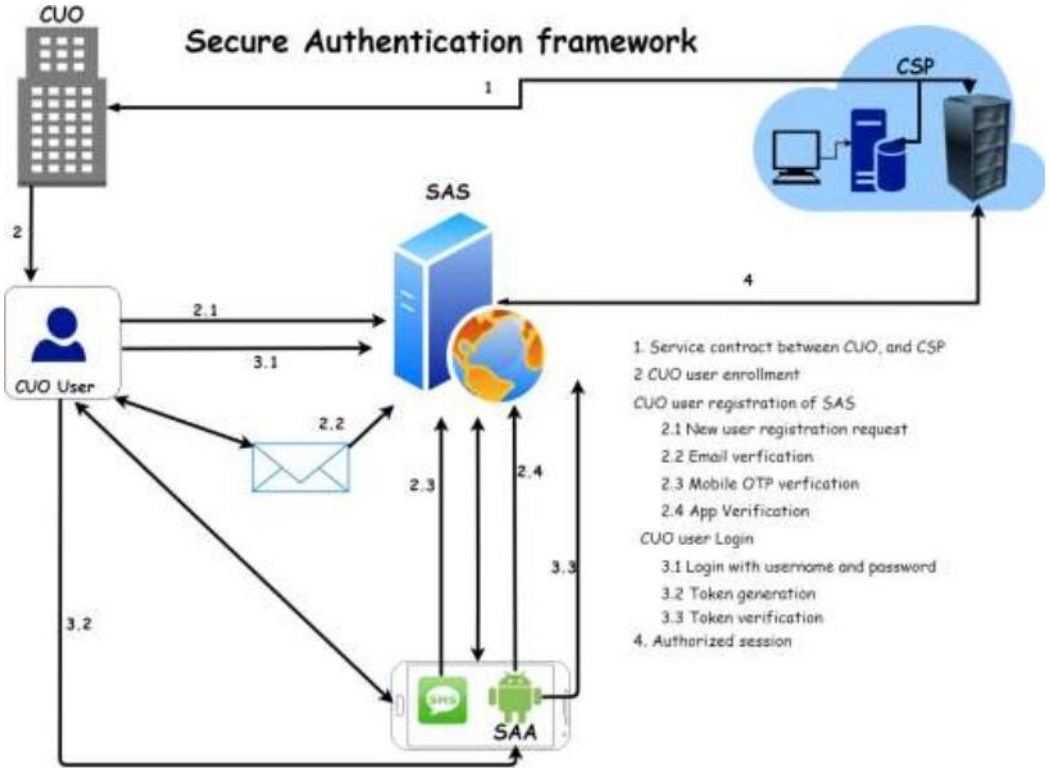

Fig.l Proposed Framework

5. Algorithm for the proposed framework

Here the algorithm of the proposed framework is discussed in brief. The key approach and some of the assumptions that are made for this algorithm cannot be modified during the execution of the proposed scheme. All CUO users and CSP are supposed to be honest during the registration phase. Once the registration phase is completed no user or CSP is trusted. CUO user needs to provide valid and correct information during the registration phase. Once the common authentication is carried out the SAS server will allow creation of a session to access the CSP services. The proposed model consists of different phases like registration phase, login phase, authentication level phase and change in authentication phase.

5.1 Registration phase

In this phase, CUO user needs to do registration on SAS webpage and complete the registration steps. SAS system will update the registration status of each UN+PW, email, mobile OTP, SAA app as "verified". Algorithm for registration is given below:

Stepl: User requests to the SAS service for the new registration and fills UID, UN, PW, email address, mobile number and selects the mobile handset model from a list.

Step2: SAS server will verify the credentials in the database if all the credentials are correct then move to step3 for change in PW for first time; else goes back to stepl by displaying "wrong infonnation". Here the user is allowed only three attempts to provide correct information, failing which the user account will be locked.

Step3: User must generate a new PW by providing the existing PW only at the first-time login. SAS system will update the new PW in the database.

Step4: SAS system will send an email verification link to the registered email address.

Step5: User will check his mail (an account provided by CUO or an account registered with CUC)) and click on link and complete the email verification by providing his credentials. SAS system will update the status of email verification, as "verified"; else the registration process will be terminated.

Step6: user will click to generate (DTP, and SAS system will send OTP message to the registered mobile number. If the entered (DTP is successfully verified then email verification status will be updated as "verified"; else registration process will be terminated.

Step7: After email and mobile number verification, user needs to install SAA mobile app on his mobile device.

Step8: User will do the login on mobile app by providing UN+PW.

Step9: first time registration Mobile App and credentials will be verified at SAS system. If the credentials are correct, the app will ask for mobile (DTP; else app registration process will be terminated.

Step10: User needs to provide mobile OTP for app verification. If app registration is done successfully then SAA is ready to generate SAC; else app registration process will be terminated. Here SAA will communicate with SAS system. App will store SK and other required information in app. At the same time SAS server will get handset information like IMEI number, mobile number, etc. and same will be stored at SAS for decrypting tokens at SAS.

Stepll: If SAA is registered successfully then SAS system will update the status of app verification as "verified"; else the registration process tenninated.

5.2 Login and authentication phase

Here, CUO user will do the login on SAS. After successful login SAS system will decide whether provide a session to access CSP or not. The steps of algorithm are as follows:
Stepl: CUO user will access login page and enter the UN and PW.

Step2: SAS system will verity the UN and PW in the database.

Step3: If login credentials are correct then SAS will prompt for SAA token.

Step4: User will open SAA app which is already registered on SAS system; it will generate token. To generate token SAA will not communicate with server. It will use SK and other information stored on app.

Step5: User will enter SAA token on SAS system, SAS will decrypt the token, and, if token is valid, a session will be created for CSP system; else user will be logged out from the SAS system.

5.3 Authentication levels (phases)

Here we are providing information about different levels of authentication. The proposed framework provides authentication using mobile app token. There can be various reasons like the user not having mobile phone for login, mobile app is not generating token, etc. But, if CUO user wants to login, the solution is to provide a low level authentication.

Now security is a very important factor; so, for each level what kind of permissions can be given to user will be finalized between CUO and CSP.

For the same, separate login link can be provided or separate drop box will be provided to select the level of authentication.

Low- level authentication

In this case CUO user does not have mobile with him; so, neither app token nor mobile OTP will be generated. CUO user can only login with username and password. This level of authentication will be called as low-level authentication.

Middle-level authentication

In this scenario CUO user is not able to generate app token for various reasons like, app is not working properly. The SK is not updated; hence, app is not working. The app is generating wrong token because, for example, date and time of the mobile device are different from those of the SAS system, etc. In such cases user can use username, password and mobile OTP.

High level authentication

The normal user of the proposed framework is called as high-level authentication; here, the user has to have mobile app token with username and password. Without app code token this level cannot be granted to CUO user. This is the default level of authentication for proposed framework.

5.4 Change in login credential

There can be possibilities in case of change in any credentials for many reasons. The credentials can be allowed to change by following certain steps. If CUO user wants to change email, mobile number and mobile handset the user must inform CUO system. CUO system will intimate the same to SAS system. Following are steps for change in login credentials by selecting SAS systems change in credential page where separate links are provided for each credential.

1. Change in password: CUO user directly changes the PW by providing existing PW.

2. Change in email address:
   Stepl: CUO use will provide UN, PW and new email address.
   Step2: SAS system will verify login and the new email address and check if the same in requested by CUO administrator.
   Step3: If new email is correct then SAS will send the confirmation mail on new email.
   Step": User needs to check the mail and click on link and complete the email verification by providing his credentials. On successful verification SAS will update the same in the database.

3. Change in mobile number:
   Stepl: CUO use will provide UN, PW and new mobile number
   Step2: SAS system will verify login and mobile number and check the same as requested by CUO administrator.
   Step3: If the new mobile number is correct then SAS will send (DTP SMS to the new mobile number.
   Step": The user needs to check SMS and enter it on SAS system. On successful verification SAS will update the same in the database and notify the CUO system of the same.

4. Change in mobile handset:

Stepl: CUO user will provide UN, PW, mobile number and select new mobile handset model from the list.
Step2: SAS system will verify login, mobile number and new mobile model number. Also confirm it as requested by CUO system
Step3: The user needs to install the SAA app and do the login
Step": If login is successful then a first time login app will ask for other credentials like, UID, email address, mobile number, etc.
Step": First time registration of Mobile App and credentials will be verified at SAS system. If credentials are correct then app will ask for mobile OTP; else app registration process will be terminated.
Step5: The user needs to provide mobile OTP for app verification. If app registration is done successfully, SAA is ready to generate SAC; else app registration process will be terminated.

5.5 Locked users

CUO user may be locked for many reasons. Such accounts will be kept on hold and under investigation. SAS system will provide report of such activity. CUO system verifies it, after successful investigation such account can be made active.

6. Key benefits of the proposed framework

The proposed framework will be helpful for small as well as large scale organizations to provide secure authentication. It will be low cost authentication for cloud users.

Following are the key benefits of the proposed framework.

- The proposed app will work without internet. It will use stored information to generate token.
- The proposed app will check whether same mobile sim is present or not. If the same sim is not there then it will not generate secure token.

7. Conclusion and future work

Authentication and access control are major research areas which will enhance the security of the cloud service users' data that are stored in cloud service provider's environment. Ensuring authentication control in cloud enhances security.

The proposed framework provides better and secure authentication using mobile phone app over the traditional username and password mechanism. This app can generate token without internet too. The purpose of the proposed framework is to provide a secure environment for authentication to cloud user organizations. The proposed system is feasible to provide only authentication, access control and session management. There are many organizations that are not able to use cloud services because of various security reasons. This proposed framework is an improvement over other available frameworks. Till date there has been no authentication (hard or soft) that will ever be truly universal or bring measures of security. So, the proposal is to provide a universal model for cloud users. Our future work is to implement the proposed framework.

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Dr.Chandrani Singh ,Director –MCA,SIOM

International Journal of Disaster Recovery and Business Continuity
Vol.11, No. 1, (2020), pp. 3002-3007

Blockchain Technology a new era: Architecture and its Core Components

Dr.Vidya Gavekar, Dr.Manisha Kumbhar, Prof.Aparna Kulkarni

Abstract

Blockchain technology has become very trendy and penetrated different domains, mostly due to the popularity of cryptocurrencies.Blockchain, the foundation of Bitcoin, has received wide attentions recently. Blockchain serves as an immutable ledger which allows transactions take place in a decentralized manner. Blockchain serves as an immutable ledger which allows transactions take place in a decentralized manner. Blockchain-based applications are springing up, covering numerous fields including financial services, reputation system and Internet of Things (IoT), and so on. This paper presents a comprehensive overview on blockchain technology. We provide an overview of blockchain architecture and compare some types of blockchain. Furthermore, core components of blockchain architecture and features briefly listed. We also lay out applications of block chain in differnt domain.

Keywords*: Architecture ,Blockchain, Bitcoin, cryptocurrencies ,decentralization, etc.*

1. INTRODUCTION

Blockchain is a digital, secure, public record book of transactions (a ledger). Block describes the way this ledger organizes transactions into blocks of data, which are then organized in a "chain" that links to other blocks of data. The links make it easy to see if anyone has changed any part of the chain, which helps the system protect against illegal transactions. It can be described as a data structure that holds transactional records and while ensuring security, transparency, and decentralization. It as a chain or records stored in the forms of blocks which are controlled by no single authority. A block chain is a distributed ledger that is completely open to any and everyone on the network. Once an information is stored on a blockchain, it is extremely difficult to change or alter it.

A. Creation of trust through Block chain:

There are three key elements needed to establish trust: 1) identity, or who's who; 2) ownership, or who owns what; and 3) verification, or what's true. Blockchains allow users to easily prove their identities, protect ownership of digital assets, and verify transactions without a high-cost intermediary.[4]

- **Who's Who:** Blockchains solve the identity problem with theb help of digital signatures. Each user is given a set of two digital codes 1.private key – It is similar to an account number, and a Blockchains allow users to easily prove their identities, protect ownership of digital assets, and verify transactions without a high-cost intermediary. 2.public key-It is similar to a password that allows them to easily prove an identity and issue authorized transactions.
- **Who Owns What**: Blockchains solve the ownership problem through a technology called "cryptographic hashing." A cryptographic hash is simply a piece of data that has been run through a math function and transformed into a shorter piece of data. In a blockchain,each block contains a hashed representation of the data in the previous block. If you change any previous pieces of data, that change will get reflected throughout the chain, making it easy for the system to see and reject fraudulent attempts to manipulate the data. This allows blockchains to create "immutable" data, otherwise known as tamper-proof records.[9]
- **What's True**:Finally, blockchains solve the verification problem by making it feasible for a group of people to publicly verify that a transaction is true, without the need for a trusted intermediary. In blockchain terminology, this is called "distributed consensus." The ability

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for blockchains to verify transactions with fewer intermediaries is a key benefit that can lead to lower costs.

B. Backbround

Blockchain technology allows all the network participants to reach an agreement, commonly known as consensus. All the data stored on a blockchain is recorded digitally and has a common history which is available for all the network participants. This way, the chances of any fraudulent activity or duplication of transactions is eliminated without the need of a third-party

In order to understand blockchain better, consider an example where you are looking for an option to send some money to your friend who lives in a different location. A general option that you can normally use can be a bank or via a payment transfer application like PayPal or Paytm. This option involves third parties in order to process the transaction due to which an extra amount of your money is deducted as transferring fee. Moreover, in cases like these, you cannot ensure the security of your money as it is highly possible that a hacker might disrupt the network and steal your money. In both the cases, it is the customer who suffers. This is where Blockchain comes in.[9]

Instead of using a bank for transferring money, if we use a blockchain in such cases, the process becomes much easier and secure. There is no extra fee involved as the funds are directly processed by you thus, eliminating the need for a third party. Moreover, the blockchain database is decentralised and is not limited to any single location meaning that all the information and records kept on the blockchain are public and decentralized. Since the information is not stored in a single place, there's no chance of corruption of the information by any hacker.

C. Working of block chain:

A blockchain is a chain of blocks that contain data or information. Despite being discovered earlier, the first successful and popular application of the Blockchain technology came into being in the year 2009 by Satoshi Nakamoto. He created the first digital cryptocurrency called Bitcoin through the use of Blockchain technology. [1]

Each block in a blockchain network stores some information along with the hash of its previous block. A hash is a unique mathematical code which belongs to a specific block. If the information inside the block is modified, the hash of the block will be subject to modification too. The connection of blocks through unique hash keys is what makes blockchain secure.

While transactions take place on a blockchain, there are nodes on the network that validate these transactions. In Bitcoin blockchain, these nodes are called as miners and they use the concept of proofof-work in order to process and validate transactions on the network. In order for a transaction to be valid, each block must refer to the hash of its preceding block. The transaction will take place only and only if the hash is correct. If a hacker tries to attack the network and change information of any specific block, the hash attached to the block will also get modified.

The breach will be detected as the modified hash will not match with the original one. This ensures that the blockchain is unalterable as if any change which is made to the chain of blocks will be reflected throughout the entire network and will be detected easily.[5]

In a nutshell, here's how blockchain allows transactions to take place:[10]

- A blockchain network makes use of public and private keys in order to form a digital signature ensuring security and consent.
- Once the authentication is ensured through these keys, the need for authorization arises.
- Blockchain allows participants of the network to perform mathematical verification and reach a consensus to agree on any particular value.
- While making a transfer, the sender uses their private key and announces the transaction information over the network. A block is created containing information such as digital signature, timestamp, and the receiver's public key.
- This block of information is broadcasted through the network and the validation process starts.

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- Miners all over the network start solving the mathematical puzzle related to the transaction in order to process it. Solving this puzzle requires the miners to invest their computing power.
- Upon solving the puzzle first, the miner receives rewards in the form of bitcoins. Such kind of problems is referred to as proof-of-work mathematical problems.
- Once the majority of nodes in the network come to a consensus and agree to a common solution, the block is time stamped and added to the existing blockchain. This block can contain anything from money to data to messages.
- After the new block is added to the chain, the existing copies of blockchain are updated for all the nodes on the network.

2. BLOCKCHAIN ARCHITECTURE

A. Introduction:

The traditional architecture of the World Wide Web uses a client-server network. In this case, the server keeps all the required information in one place so that it is easy to update, due to the server being a centralized database controlled by a number of administrators with permissions.[6,8]

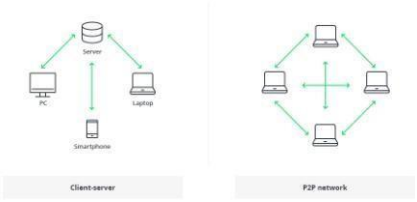

Fig. 1.Data base vs Blockchain Architecture

In the case of the distributed network of blockchain architecture, each participant within the network maintains, approves, and updates new entries. The system is controlled not only by separate individuals, but by everyone within the blockchain network. Each member ensures that all records and procedures are in order, which results in data validity and security. Thus, parties that do not necessarily trust each other are able to reach a common consensus.[3]

To summarize things, the blockchain is a decentralized, distributed ledger (public or private) of different kinds of transactions arranged into a P2P network. This network consists of many computers, but in a way that the data cannot be altered without the consensus of the whole network (each separate computer).

Blockchain architecture is being used very broadly in the financial industry. However, these days, this technology is employed not only for cryptocurrencies, but also for record keeping, digital notary, and smart contracts.

Features of Blockchain architecture :

- **Cost reduction** - lots of money is spent on sustaining centrally held databases (e.g. banks, governmental institutions) by keeping data current secure from cyber crimes and other corrupt intentions.
- **History of data** - within a blockchain structure, it is possible to check the history of any transaction at any moment in time. This is a ever-growing archive, while a centralized database is more of a snapshot of information at a specific point.
- **Data validity & security** - once entered, the data is hard to tamper with due to the blockchain's nature. It takes time to proceed with record validation, since the process occurs in each independent network rather than via compound processing power. This means that the system sacrifices performance speed, but instead guarantees high data security and validity.

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B. Working of Core Components of Blockchain Architecture These are the core blockchain architecture components:

- **Node** - user or computer within the blockchain architecture (each has an independent copy of the whole blockchain ledger)
- **Transaction** - smallest building block of a blockchain system (records, information, etc.) that serves as the purpose of blockchain
- **Block** - a data structure used for keeping a set of transactions which is distributed to all nodes in the network
- **Chain** - a sequence of blocks in a specific order
- **Miners** - specific nodes which perform the block verification process before adding anything to the blockchain structure
- **Consensus (consensus protocol)** - a set of rules and arrangements to carry out blockchain operations

Any new record or transaction within the blockchain implies the building of a new block. Each record is then proven and digitally signed to ensure its genuineness. Before this block is added to the network, it should be verified by the majority of nodes in the system.
The following is a blockchain architecture diagram that shows how this actually works in the form of a digital wallet.

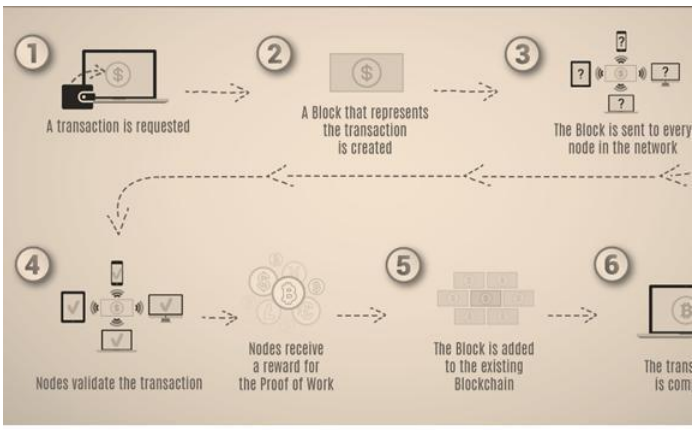

Fig: 2 .Working of Block chain architecture C.Characteristics of Blockchain Architecture

Blockchain architecture possesses a lot of benefits for businesses. Here are several embedded characteristics:[6]

- **Cryptography** - blockchain transactions are validated and trustworthy due to the complex computations and cryptographic proof among involved parties
- **Immutability** - any records made in a blockchain cannot be changed or deleted
- **Provenance** - refers to the fact that it is possible to track the origin of every transaction inside the blockchain ledger
- **Decentralization** - each member of the blockchain structure has access to the whole distributed database. As opposed to the central- based system, consensus algorithm allows for control of the network
- **Anonymity**- each blockchain network participant has a generated address, not user identity. This keeps users' anonymity, especially in a public blockchain structure
- **Transparency** - the blockchain system cannot be corrupted. This is very unlikely to happen, as it requires huge computing power to overwrite the blockchain network completely

C. APPLICATIONS OF BLOCK CHAIN TECHNOLOGY IN VARIOUS INDUSTRIES

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Blockchain technology can be utilized in multiple industries including Financial Services, Healthcare, Government, Travel and Hospitality, Retail and CPG. Financial Services: In the financial services sector, Blockchain technology has already been implemented in many innovative ways. Blockchain technology simplifies and streamlines the entire process associated with asset management and payments by providing an automated trade lifecycle where all participants would have access to the exact same data about a transaction. This removes the need for brokers or intermediaries and ensures transparency and effective management of transactionaldata. [2,7] **Healthcare:** Blockchain can play a key role in the healthcare sector by increasing the privacy, security and interoperability of the healthcare data. It holds the potential to address many interoperability challenges in the sector and enable secure sharing of healthcare data among the various entities and people involved in the process. It eliminates the interference of a third-party and also avoids the overhead costs. With Blockchains, the healthcare records can be stored in distributed data bases by encrypting it and implementing digital signatures to ensure privacy and authenticity.

Government: Blockchain technology holds the power to transform Government's operations and services. It can play a key role in improving the data transactional challenges in the Government sector, which works in siloes currently. The proper linking and sharing of data with Blockchain enable better management of data between multiple departments. It improves the transparency and provides a better way to monitor and audit the transactions.

CPG and Retail: There is a huge opportunity for Blockchain technology to be applied in the retail sector . This includes everything from ensuring the authenticity of high value goods, preventing, fraudulent transactions, locating stolen items, enabling virtual warranties, managing loyalty points and streamlining supply chain operations.

Travel and Hospitality: The application of Blockchain can radically change the travel and hospitality industry . It can be applied in money transactions, storing important documents like passports/ other identification cards, reservations and managing travel insurance, loyalty and rewards.

4. CONCLUSION

The blockchain technology presents a decentralized network and is regarded as having great potential for use in various sectors. It has sensitive nature of data being processed and managed.Block chain has shown its potential for transforming traditional industry with its key characteristics: decentralization, persistency, and anonymity and audit ability. In this paper, we present a comprehensive overview on blockchain. We first give an overview of block chain technologies including overview on working of block chain and features along with the examples. We discussed detailed architecture and core components of block chain. The revolutionary technology of Blockchain holds a high potential of applications in many different industries and sectors. While some industries have already started adopting blockchain in their businesses, many are still exploring the best possible ways to start with.

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AUTHORS PFOFILE

Dr.Vidya Gavekar has completed the Master's degree in computer application (2001) from Shivaji Uni versity ,Kolhapur and she is pursuing Master's degree in Business Administration from SPPU,Pune. Also, she has completed Ph. D. in Computer Management. Currently, she is working as Asso Professor of MCA in Sinhgad Institute of Management,Pune. Her research and teaching interest include computer applications. She has authored and co-authored nearly 22 publications in International journals and peer-reviewed conferences.

Dr.Manisha Kumbhar has completed the Master's degree in computer application (1999) from Shivaji Uni versity ,Kolhapur and Master's degree in Business Administration(2019) from SPPU,Pune. Also, she has completed Ph. D. in Computer Management. Currently, she is working as Professor of MCA in Sinhgad Institute of Management,Pune. Her research and teaching interest include computer applications. She has authored and co- authored nearly 35+ publications in International journals and peer-reviewed conferences. She is Ph.D. guide of SPPU,Pune.

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Prof.Aparna Kulkarni has completed the Master's degree in computer application from SPPU,Pune. Also she is pursuing Master's degree in Business Administration from SPPU,Pune. Currently, she is working as Asst.Professor of MCA in Sinhgad Institute of Management,Pune. Her research and teaching interest include computer applications. She has authored and co-authored nearly 5+publications in International journals and peer-reviewed conferences. Conferences.

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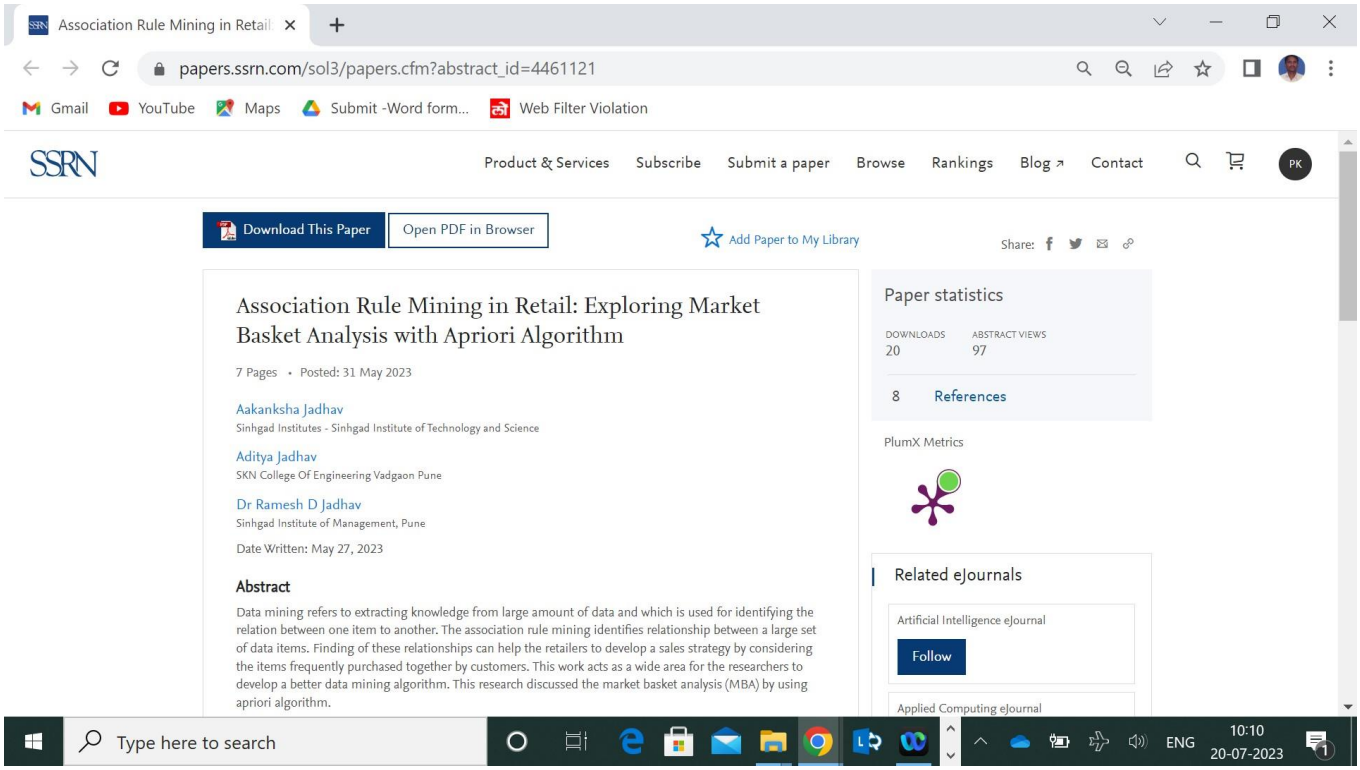
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Date Written: May 27, 2023
Abstract
Data mining refers to extracting knowledge from large amount of data and which is used for identifying the relation between one item to another. The association rule mining identifies relationship between a large set of data items. Finding of these relationships can help the retailers to develop a sales strategy by considering the items frequently purchased together by customers. This work acts as a wide area for the researchers to develop a better data mining algorithm. This research discussed the market basket analysis (MBA) by using apriori algorithm.
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Association Rule Mining in retail: Exploring Market Basket Analysis with Apriori Algorithm

[1]*Aakanksha Ramesh Jadhav,* [2] *Aditya Ramesh Jadhav,* [3]*Dr. Ramesh D Jadhav*

[1]*E&TC - Sinhgad Institute of Technology and Science Narhe-Pune, India* [2]

SKN College of Engineering Vadgaon(Bk)Pune, India [3]*Sinhgad Institute of Management Pune, India*

Abstract*-Data mining refers to extracting knowledge from large amount of data and which is used for identifying the relation between one item to another. The association rule mining identifies relationship between a large set of data items. Finding of these relationships can help the retailers to develop a sales strategy by considering the items frequently purchased together by customers. This work acts as a wide area for the researchers to develop a better data mining algorithm. This research discussed the market basket analysis (MBA) by using apriori algorithm.*

Keyword: Market basket analysis (MBA), Apriori Algorithm, Data Mining; Association Rule Mining

[1] . INTRODUCTION TO MARKET BASKET ANALYSIS

Market Basket Analysis (MBA) is one of the key methods used by vast retailers to uncover associations between items. It works by looking for groupings of items that occur together frequently in transactions. In another way, it allows retailers to identify relationships between the items that people buy. Association Rules are widely used to analyse retail basket or transaction data, and are intended to identify strong rules discovered in transaction data using measures of interest, based on the concept of strong rules. This research is a learning for identifying how the resulted concept, the processing of the rule, and the achieved rule. Therefore, this research gives a new learning from each of the step of the usage system until it forms the resulted system.[1]

[2] . Market Basket Analysis: An Overview

Association rule is a technique which is looking for a relationship among an item with other items. Association rule is usually used if and then such as if A then B and C, this shows if A then B and C. To determine the Association's rules, it needs to be specified the support and confidence to restrict whether the rule is interesting or not.[2][3]

Support: It is the number of transactions with both A and B divided by the total number of transactions. These rules are not beneficial for low support values.

$$Support = \frac{freq(A,B)}{N}$$

Confidence: It specifies how frequently the items A and B are bought together, for the no. of times A is bought.

$$Confidence = \frac{freq(A,B)}{freq(A)}$$

Lift: It specifies the strength of a rule over the randomness of A and B being bought together. It basically measures the strength of any association rule.[8]

$$Lift = \frac{Support}{Supp(A)\ x\ Supp(B)}$$

Mining Association Rules:

Transaction ID	Items Bought
2000	A, B, C
1000	A, C
4000	A, D
5000	B, E, F

Table No 1: Sample Data set

1)For rule A, C

Support = support ({A &C})/Total TID = 2/4 = 50% Confidence

= support ({A &C})/support({A}) =2/3 = 66.6%

2)For Rule C, A:

Support = support ({C & A})/ Total TID =2/4= 50%

Confidence = support ({C & A})/support({C}) =2/2 = 100%.

3. INTRODUCTION OF DATA SET

In the implementation, the dataset used for Market Basket Analysis is the dataset that is publicly available on Kaggle. This dataset includes the list of transactions of a retail company over the period of one week. It contains a total of 9835 transaction records where each record consists of the list of items sold in one transaction.

4. MARKET BASKET ANALYSIS (MBA)

Apriori algorithm for discovery frequency item set. The Apriori algorithm analyses a data set to regulate which combinations of items occur together frequently. It is at the core of many algorithms for data mining problems. The best-known problem is discovery the association rules that hold in a basket item relation. Basic idea behind this algorithm is

- The item-set can only be a large item set if all its subsets are large item-sets.
- The sets of items that have lowest support can be considered.
- Association rules can be generated from frequent item sets.[6] **Step 1: Describe data set of Grocery item.**

	0	1	2	3	4	5	6	7	8	9	...	22	23	24	25	26	27	28	29	30	31
0	citrus fruit	semi-finished bread	margarine	ready soups	NaN	NaN	NaN	NaN	NaN	NaN	...	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
1	tropical fruit	yogurt	coffee	NaN	NaN	NaN	NaN	NaN	NaN	NaN	...	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
2	whole milk	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	...	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
3	pip fruit	yogurt	cream cheese	meat spreads	NaN	NaN	NaN	NaN	NaN	NaN	...	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
4	other vegetables	whole milk	condensed milk	long life bakery product	NaN	NaN	NaN	NaN	NaN	NaN	...	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
5	whole milk	butter	yogurt	rice	abrasive cleaner	NaN	NaN	NaN	NaN	NaN	...	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
6	rolls/buns	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	...	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
7	other vegetables	UHT-milk	rolls/buns	bottled beer	liquor (appetizer)	NaN	NaN	NaN	NaN	NaN	...	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
8	pot plants	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	...	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
9	whole milk	cereals	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	...	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN

10 rows × 32 columns

```
df.shape
```

```
(9835, 32)
```

Table No. 2: Data set

Step 2: Data Preparation prepares the data Once the data resources available are identified, they need to be selected, cleaned, built into the form desired, and formatted. Data cleaning and data transformation in preparation of data modeling needs to occur in this phase. Data exploration at a greater depth can be applied during this phase, and additional models utilized, again providing the opportunity to see patterns based on business understanding.[7],[8]

```
df_clean = df1.drop(['nan'], axis = 1)
df_clean
```

	instant food products	UHT-milk	abrasive cleaner	artif. sweetener	baby cosmetics	baby food	bags	baking powder	bathroom cleaner	beef	...	turkey	vinegar	waffles	whipped/sour cream	whisky	white bread	whit wir
0	False	False	False	False	False	False	False	False	False	False	...	False	False	False	False	False	False	Fals
1	False	False	False	False	False	False	False	False	False	False	...	False	False	False	False	False	False	Fals
2	False	False	False	False	False	False	False	False	False	False	...	False	False	False	False	False	False	Fals
3	False	False	False	False	False	False	False	False	False	False	...	False	False	False	False	False	False	Fals
4	False	False	False	False	False	False	False	False	False	False	...	False	False	False	False	False	False	Fals
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
9830	False	False	False	False	False	False	False	False	False	True	...	False	False	False	True	False	False	Fals
9831	False	False	False	False	False	False	False	False	False	False	...	False	False	False	False	False	False	Fals
9832	False	False	False	False	False	False	False	False	False	False	...	False	False	False	False	False	False	Fals
9833	False	False	False	False	False	False	False	False	False	False	...	False	False	False	False	False	False	Fals
9834	False	False	False	False	False	False	False	False	False	False	...	False	True	False	False	False	False	Fals

9835 rows × 169 columns

Table No.3: Data set After Data Preparation

Step 3: Find Top selling items and will visualize

	items	count
0	whole milk	2513
1	other vegetables	1903
2	rolls/buns	1808
3	soda	1713
4	yogurt	1372
5	bottled water	1086
6	root vegetables	1072
7	tropical fruit	1032
8	shopping bags	968
9	sausage	924
10	pastry	875
11	citrus fruit	814
12	bottled beer	789
13	newspapers	783
14	canned beer	764
15	pip fruit	744
16	fruit/vegetable juice	706
17	whipped/sour cream	705
18	brown bread	638
19	domestic eggs	623

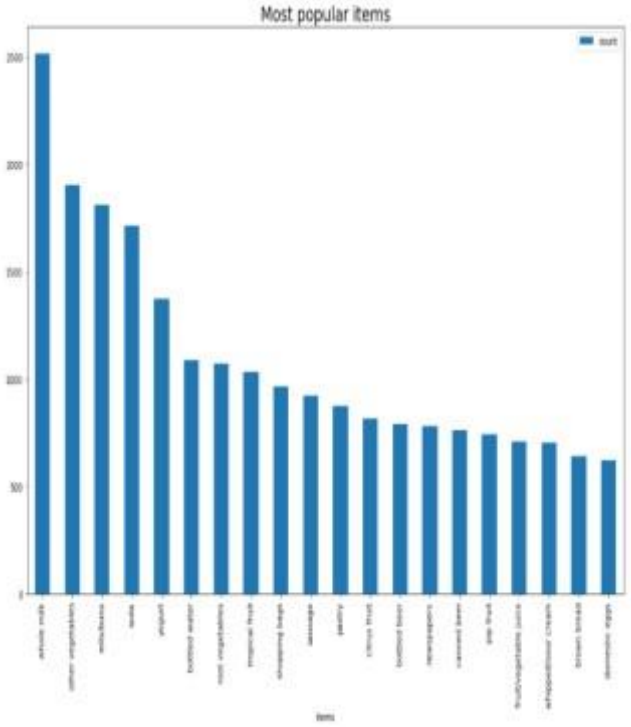

Table No:4 Top selling item.

Step 4: Find a frequent item set for two items in data set.

```
frequent_itemsets[ (frequent_itemsets['length'] == 2)]
```

	support	itemsets	length
13	0.160523	(other vegetables, whole milk)	2
14	0.121265	(rolls/buns, whole milk)	2
15	0.085714	(whole milk, soda)	2
16	0.120174	(whole milk, yogurt)	2
17	0.073501	(bottled water, whole milk)	2
...	...	...	...
85	0.026827	(pastry, sausage)	2
86	0.024209	(sausage, citrus fruit)	2
87	0.016576	(bottled beer, sausage)	2
88	0.020938	(pastry, citrus fruit)	2
89	0.013086	(bottled beer, citrus fruit)	2

77 rows × 3 columns

Table 5: Frequent Item set.

`

Step 5: Eliminate minimum support frequent itemset which are not found regularly .

```
def prune_dataset(olddf, len_transaction, tot_sales_percent):
    if 'tot_items' in olddf.columns:
        del(olddf['tot_items'])
    Item_count = olddf.sum().sort_values(ascending = False).reset_index()
    tot_items = sum(olddf.sum().sort_values(ascending = False))
    Item_count.rename(columns={Item_count.columns[0]:'Item_name',Item_count.columns[1]:'Item_count'}, inplace=True)
    Item_count['Item_percent'] = Item_count['Item_count']/tot_items
    Item_count['Tot_percent'] = Item_count.Item_percent.cumsum()
    selected_items = list(Item_count[Item_count.Tot_percent < tot_sales_percent].Item_name)
    olddf['tot_items'] = olddf[selected_items].sum(axis = 1)
    olddf = olddf[olddf.tot_items >= len_transaction]
    del(olddf['tot_items'])
    return olddf[selected_items], Item_count[Item_count.Tot_percent < tot_sales_percent]
```

```
output_df, item_counts = prune_dataset(df_clean,
2,0.4)
print(output_df.shape)
print(list(output_df.columns))
output_df
```

```
(4585, 13)
['whole milk', 'other vegetables', 'rolls/buns', 'soda', 'yogurt', 'bottled water', 'root vegetables', 'tropical fruit', 'shopp
ing bags', 'sausage', 'pastry', 'citrus fruit', 'bottled beer']
```

Table no 6: Pruning frequent itemset

Step no:6 Implementing Apriori Algorithm.

```
rules_mlxtend[ (rules_mlxtend['antecedent_len'] >= 2) &
       (rules_mlxtend['confidence'] >= 0.3) &
       (rules_mlxtend['lift'] >= 1) ]
```

	antecedents	consequents	antecedent support	consequent support	support	confidence	lift	leverage	conviction	antecedent_len
48	(yogurt, other vegetables)	(whole milk)	0.093130	0.442748	0.047764	0.512881	1.158403	0.006531	1.143974	2
49	(yogurt, whole milk)	(other vegetables)	0.120174	0.352454	0.047764	0.397459	1.127692	0.005409	1.074693	2
54	(other vegetables, whole milk)	(root vegetables)	0.160523	0.207852	0.049727	0.309783	1.490402	0.016362	1.147679	2
55	(other vegetables, root vegetables)	(whole milk)	0.101636	0.442748	0.049727	0.489270	1.105076	0.004728	1.091090	2
56	(whole milk, root vegetables)	(other vegetables)	0.104907	0.352454	0.049727	0.474012	1.344893	0.012752	1.231106	2
...	...	...	...	...	...	...	...	...	...	...
547	(whole milk, tropical fruit, root vegetables)	(yogurt)	0.025736	0.256052	0.012214	0.474576	1.853435	0.005624	1.415900	3
558	(yogurt, other vegetables, root vegetables)	(tropical fruit)	0.027699	0.199346	0.010687	0.385827	1.935466	0.005165	1.303629	3
559	(yogurt, other vegetables, tropical fruit)	(root vegetables)	0.026390	0.207852	0.010687	0.404959	1.948306	0.005202	1.331249	3
560	(yogurt, root vegetables, tropical fruit)	(other vegetables)	0.017448	0.352454	0.010687	0.612500	1.737817	0.004537	1.671087	3
561	(other vegetables, root vegetables, tropical f...	(yogurt)	0.026390	0.256052	0.010687	0.404959	1.581546	0.003930	1.250245	3

Table no 7: Implementing Apriori Algorithm-using Associations Rules

5. CONCLUSION:

In this paper researcher mainly understood and focused on Apriori algorithm how it was predicting the frequent itemset. Apriori produce association rules for better prediction of customer behaviors penetrated items show a correlation between the data and information of support and the confidence that can be analyzed. This information will give additional consideration for the user to make further decision making & also retailer and super market will be implemented in their business for maintaining their stock according with association rules and it will give phenomenal benefits to particular business.

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Dr.Chandrani Singh ,Director –MCA,SIOM

Identifying and Analyzing the Best Software Platforms for Innovative Teaching and Learning Process

Dr.Sunil Khilari **Dr.Sachin Kadam**

Sinhgad Institute of Management, Pune, India.

Abstract: *Technology can be used to encourage global teaching-learning process, support to create innovative learning environment and build relationships between all stakeholders of education system. Educators need to find ways to connect students from different parts of the world so that they can learn simultaneously, exchange knowledge and develop cultural understanding and relationships. Problem based, project based, Model-making, audio-visual presentations, role-playing activities and exploring the physical world help to deliver the message of classroom lessons in a more interesting and effective manner through virtual mode. An innovative environment is one that is capable of progressing and adapting as educational practices enhance, evolve and change – thus residual forthcoming intensive. An innovative learning environment includes the physical, social, and pedagogical context in which learning occurs. An innovative environment is one that is capable of evolving and adapting as educational practices evolve and change – thus remaining future focused.*

Here in this paper researcher is identifying and analyzing the best software platforms for innovative teaching and learning process. A learning environment includes the physical, social, and pedagogical context in which learning occurs. An innovative environment supports strengths-based teaching and learning. It offers students and teachers flexibility, agency, ubiquity, and connectedness. Working in an innovative learning environment where teaching and learning is collaborative, reflections and inquiries are shared, and communities engaged leads to a more robust, continuously improving community of practice. **Keyword:** Innovative Teaching-Learning Environment, Digital and Virtual Learning Systems (SVLS) Digital and Virtual Teaching Systems (DVTS)

1. Innovative Teaching Process (ITP)

The history of virtual learning environment goes back to as early as the 1700s when lessons were sent weekly to the interested audiences by mail in the US. The correspondence used to be in writing. It was the University of Wisconsin – Madison that first used the term “distance education” in 1892. Later, the University of Houston offered its first college course in 1953 on public television in the United States. The live telecasts aired for 13-15 hours each week at night so that working students could watch the classes.

In 1969, the US Department of Defense commissioned ARPANET – a packet switching network to implement TCP/IP (the foundation technologies of the internet). In 1970, the Havering Computer Managed Learning System was developed in London, and over 100 teachers and 10,000 students were using it by 1980. In 1984, the faculty and students at the University of Waterloo developed applications together by using networked IBM PCs.

Innovation in education encourages teachers and students to explore, research and use all the tools to uncover something new. It involves a different way of looking at problems and solving them. Innovation improves education because it compels students to use a higher level of thinking to solve problems. The thinking process that goes into it will help students develop their creativity and their problem solving skills. Another innovative method of teaching involves encouraging student collaboration for various projects. Teachers can help foster this skill in the classroom by allowing students to learn, study and work in groups. There are many new technologies being used in classrooms today: social networking, online teaching, class blogs and wikis, podcasting, interactive whiteboards, and mobile devices. There are many ways in which we can benefit from the new technologies being developed today.

Innovative Teaching Strategies that Improve Student Engagement Inquiry-Based Learning. Inquiry-based learning is one of the most powerful teaching strategies in the classroom because research tells us that students learn best when they construct their own meaning. The Top 6 Technology Innovations for Education

- Virtual Reality (VR) in Education
- Artificial Intelligence and Machine Learning
- Cloud Computing for Education
- 3D Printing
- Social Media in Educational Institutions
- Cyber security

Here are some innovative teaching strategies which every teacher can embrace and make their teaching way more interesting-

- **Teaching through Smart Boards**
- **Teaching through Flipping Classrooms**
- **Teaching through collaboration**
- **Teaching through Virtual Reality**
- **Teaching through 3D printing technology**
- **Teaching through Cloud Computing**

The use of technology in the classroom helps to engage the students with different kinds of stimuli and creates an environment of activity-based learning. It makes the content of the classroom more interesting and makes learning fun. For teachers, technology offers an endless set of resources that they can tap into depending on the need of the students. While this blog lists a few such resources, for a teacher looking for effective teaching methods in a classroom, turning towards the latest technology will offer a vast number of updated solutions.

2. Digital and Virtual Teaching Systems (DVTS)

Digital tools means software and platforms for teaching and learning that can be used with computers or mobile devices to work with text, images, audio, and video Digital education is the innovative use of digital

tools and technologies during teaching and learning, and is often referred to as Technology Enhanced Learning. A digital learning platform is a piece of software designed to heavily assist during the educational process. They include: learning management systems (LMS), learning content management systems (LCMS), as well as virtual classroom tools and virtual learning environments (VLE). Any classroom imparting education, whether it is about teaching cooking, horticulture, or engineering, is accompanied by technology, and is applying digital methods like computers, e-books, etc. is known as digital classroom.

The Shift to Digital Learning gives many benefits as-

Personalized learning.

- Expanded learning opportunities High engagement learning.
- Competency-based learning
- Assessment for learning
- Collaborative learning
- Quality learning products
- Sharing economy

For teaching online we recommend that you use a headset with noise reduction microphone. Your built-in microphone has more of a tendency to pick up sounds from you typing on the keyboard which can be distracting for the students. Some of the schools do require that you have a LAN connection to your computer. We have to plan a virtual classroom in the following ways as-

1. Assess the needs and the necessary conditions to satisfy them.
2. Estimate the development cost, effort, and implications.
3. Plan the virtual classroom.
4. Design the virtual classroom.
5. Prepare and distribute contents.
6. Enable communication.
7. Implement online student assessment methods.
8. Implement class management procedures.
9. Classroom Management Software

Education world. One of the biggest factors transforming the methodologies of education is technology. Including technology in education has enabled instant access to knowledge and made learning a fun activity rather than a burden. The teachers of the current era are educating Gen-Z (people born after 1995) - the generation constantly surrounded by technology. This generation needs everything on their fingertips within a few seconds. Old methods cannot be used to educate this generation. To keep this generation engaged towards learning, teachers need to find innovative ways using technology. Technology plays a major role in imparting education to this generation in an interesting manner. Executing digital methods in teaching can help students to access the information quickly, and grasp the concepts easily. Digital classroom management software not only helps in educating the students in an advanced manner but also facilitates teachers and

administrators in the educational sector to streamline their jobs and decision making processes. It even helps parents to communicate with the teachers and stay updated with the teaching and learning methods.

3. Digital and Virtual Teaching Software's

Choosing the best virtual classroom software for your company, school, or organization is a big deal. Of course the solution needs to work as advertised and the price needs to be right, but there are also other less tangible goals like "What solution is going to enable me to teach my learners most effectively?" or "What platform is the easiest to use?" or even "Which virtual classroom software is going to be the most fun for teaching and learning?" The good news is that it's a choice and today, like with so many other markets, the virtual classroom software market is a buyer's market. There are a lot of different options even with virtual classroom software for online teaching so in this post we'll try to narrow down your initial list.

Before we get into how to choose the best virtual classroom software for your organization, it's important for us to clear the air around what virtual classroom software is. I mean, what's the difference between a video conferencing app like Zoom or WebEx and actual virtual classroom software as we discuss below? Well, you can find a really great breakdown on the eLearning Industry article Virtual Classrooms vs. Web Conferencing. It comes down to purpose. Why do these solutions exist? In web conferencing apps, you can connect from anywhere with your webcam and share your screen. Is that a classroom? Is that the best way to engage your learners? Probably not. Web conferencing apps enable some basic things, but they do not offer the flexibility nor direction of purpose-built tools for online instruction like the best virtual classroom software.

When discussing the difference between video conferencing apps or virtual classroom software, I like to talk about cars. There are many different cars that are great for many different things. If I live in a city, then a subcompact car is perfect for running errands and fitting in parking spots, but if I'm commuting 2 hours each way, then I'd probably opt for a sedan. The point is you want to make sure you are investing in a solution that meets your specific needs.

Choosing the best virtual classroom software-

Will you be teaching several students simultaneously or more one on one lessons? Will you be providing courses for students or training with adults? People in training and development use virtual classroom platforms a lot more nowadays. Instructors in the K-12, higher learning and tutoring spaces have also stepped up their use of online learning platforms. So how do you choose the best virtual classroom software for your particular purpose? Well, you'll need to understand what is important to you, your facilitators or teachers, and your learners and students. The best way to do this is to first brainstorm with key stakeholders on what you really need to deliver an amazing learning experience. I suggest creating a list of features that you absolutely "must have" along with a list of features that are "nice to have". You can then start comparing some of the virtual classroom software options you come across to see where they land. Once you narrow down your list, you can reach out to each company and try out their virtual classroom software for free. It's incredibly important to test run your preferred virtual classroom software before making a decision.

To help you on your journey, we have compiled a list of the 7 best virtual classroom software solutions in

2019. The list isn't scientific, but we took into account ease of use, pricing and features.

The Best Virtual Classroom Software for Online Teaching

Newrow Smart	Moodle
Vedamo	Udemy
BigBlueButton	TutorRoom
LearnCube	Smartometry
Electa Live	Easyclass
Adobe Connect	ezTalks Webinar
WizIQ	PeopleLink
BrainCert	

Education management tool s depend upon sources such as smart classes, virtual lessons and such digital solutions to make interactive learning accessible to even the farthest of situated learners. Learners and knowledge seekers on the other are free to select the best course available that matches their understanding levels and course requirements. While selecting from the list of best virtual classroom software, look for some essential features like HD video, session recording, mobile connectivity and advanced sharing capabilities. These features of online teaching software will help you connect with an increasing number of students online through virtual classroom platforms.

4. Innovative Learning Process (ILP)

Having taught in various grades, and spending years as an academic advisor for new teachers, I've had the chance to spend time in various classroom environments. I've seen many different ways educators approach teaching--from the traditional learning model to some of the most innovative and creative classrooms. For the purpose of this article, I will focus on some of the most creative and innovative areas I've practiced or have seen over the past decade across classrooms. To create an innovative, open, creative and trustworthy place for students to grow, take risks, and feel comfortable in their own patterns of learning, there are a few key actions teachers can take to create a more innovative and entrepreneurial classroom. The ability for students to connect, grow and innovate not only with class content, but also with each other, the world around them and with me, was the culture I developed in the classroom. I view culture as one of the most critical aspects to invite innovation and make the classroom a safe place to create, ask questions, and fail in order to learn. Teachers create the mood and tone of the room. Positive classroom cultures that invite authentic learning can lead to more opportunities for students to positively connect with content, their peers, and their teacher.

Here are ten ways teachers can create innovative learning spaces.

1. Mindset
2. Self-Reflection

3. Ask Open-Ended Questions
4. Create Flexible Learning Environments
5. Personality Matters: Create A Place For All Learners
6. Use Problem-Finding
7. Let Students Take Risks And Fail
8. Consider A Flipped Classroom Model
9. Invite Entrepreneurs And Innovators Into The Classroom
10. Use The Design-Thinking Process

5. Digital and Virtual Learning Systems (SVLS)

Digital learning is any type of learning that is accompanied by technology or by instructional practice that makes effective use of technology. It encompasses the application of a wide spectrum of practices including: blended and virtual learning.[1]

Digital Learning is sometimes confused with online learning or e-learning, digital learning encompasses the aforementioned concepts.

A digital learning strategy may include any of or a combination of any of the following:

- adaptive learning
- badging and gamification
- blended learning
- classroom technologies
- e-textbooks
- learning analytics
- learning objects
- Mobile learning e.g. Mobile Phones, Laptops, Computers, iPads.
- personalized learning
- online learning (or e-learning)
- open educational resources (OERs)
- technology-enhanced teaching and learning
- virtual reality
- augmented reality

Through the use of mobile technologies, digital learning can be used whilst travelling as mobile technologies gives us this advantage.

A virtual learning environment is an online-based platform that offers students and professors digital solutions that enhance the learning experience. ... Virtual learning environments are often part of a higher education institution's wider learning management system (LMS). Online Learning: This is any form of instruction that takes place over the Internet. It includes Internet-based instruction; remote teacher online instruction; and blended learning and facilitated virtual learning that involves these two virtual learning methods. It excludes computer-based learning. Simple management. Virtual learning environments help teachers to plan lessons,

manage administrative work, track students' performance, activity, and level of engagement as well as provide additional materials and support for those who need. Specifically, virtual learning uses computer software, the Internet or both to deliver instruction to students.

This minimizes or eliminates the need for teachers and students to share a classroom. ... Remote Teacher Online: Instruction is provided by a teacher, but that teacher is not physically present with the student. Given the range of different systems available, the first step is to outline what your goals are. Identify your specific needs, prepare a list of questions for providers and see which solutions appear to be the best fit for your setting and budget. Personal computers and the Internet have revolutionized entire sectors of American society. Facebook, Twitter, YouTube, Skype and other online communications media have allowed billions of people around the world to share ideas in a matter of seconds, mostly at a very low cost. These advances in computer technology are as remarkable as they are familiar.

But most people are not aware of how computers and Internet technology are transforming the way students learn. This emerging education paradigm is often called “virtual learning,” [*] and it has the potential to improve student achievement, educational access and schools’ cost-effectiveness.

Specifically, virtual learning uses computer software, the Internet or both to deliver instruction to students. This minimizes or eliminates the need for teachers and students to share a classroom. Virtual learning does not include the increasing use of e-mail or online forums to help teachers better communicate with students and parents about coursework and student progress; as helpful as these learning management systems are, they do not change how students are taught.

Virtual learning comes in several forms:

- Computer-Based
- Internet-Based
- Remote Teacher Online
- Blended Learning
- Facilitated Virtual Learning
- Online Learning

Key Tactics to Create an Impactful Virtual Learning Environment

1. Break learning activities into short, video-based modules
2. Build “extracurricular” learning paths
3. Promote employee collaboration & ideation

4. Try gamification on for size
5. Encourage employee feedback
6. Market new skill development offerings internally

Virtual learning is usually associated with online courses or online environments, but it has much broader dimensions. In this article we will discuss its definition, characteristics, and benefits. We have also made for you a list of the most common forms of virtual learning, which describe the different aspects of learning and teaching process. Virtual learning is a learning experience that is enhanced through utilizing computers and/or the internet both outside and inside the facilities of the educational organization. The instruction most commonly takes place in an online environment. The teaching activities are carried out online whereby the teacher and learners are physically separated (in terms of place, time, or both). **Virtual Learning – benefits**

- ✓ Remote access to an unlimited array of educational services (topics and tutors) offered worldwide
- ✓ Individualized learning process that takes into consideration the personal level of competence, individual needs, and different learning styles
- ✓ Safe and secure learning environment
- ✓ Flexible learning in terms of time, location, and pace ✓ Cost-effectiveness, time-effective, easily scalable

Virtual learning combines all of the above-mentioned terms. It can overcome many drawbacks of the physical environment such as time, facilities, location, etc. Online environments allow teachers to work with larger numbers of students and optimize their routine tasks. Virtual learning also brings new pedagogical techniques into the traditional forms of education and makes learning more personalized and convenient.

6. Digital and Virtual Learning Software's

A virtual classroom is an online learning environment in which students and teachers interact via the technical tools provided by the software. Virtual classroom software is used by educational institutions to host classes remotely while maintaining the functionality available in a traditional classroom environment. A virtual classroom holds real-time lessons remotely while offering the same collaborative tools and level of interaction possible in a physical classroom. Educational institutions utilize virtual classroom software to provide access to students who may not be able to attend in-person courses. Through the virtual classroom environment, teachers can interact with students and students can engage with lesson materials, view presentations and videos, and take tests, all in real time.

Online course providers may either offer virtual classroom software or utilize it to provide their lessons. Virtual classrooms may come as an integrated part of a learning management system (LMS) or integrate with one.

To qualify for inclusion in the Virtual Classroom category, a product must:

- Contain live video streaming capability

- Provide screen sharing
- Contain an online whiteboard feature
- Provide a comprehensive online classroom environment designed for use by educational institutions as well as individual teachers and tutors
- Stream live rich media interactive presentations **Top 10 Virtual Classroom Software**

1. Microsoft Team
2. Zoom
3. Cisco Webex Meetings
4. Adobe Connect
5. Schoology
6. Blackboard
7. Panopto
8. Top Hat
9. LearnCube
10. BigBlueButton

Key Benefits/Features of Virtual Classroom Software

- Enables instructors to deliver live online learning experiences to any student with an internetconnected device
- Facilitates online collaboration among students
- Video conferencing
- Video encryption and password protection
- Multimedia presentations
- Whiteboard
- Text chat
- File sharing and storage
- Screen sharing
- Polls and surveys
- Breakout rooms
- Mobile compatibility
- Quizzes
- Hand raise
- Browser-based connectivity Real-time code editor

Digital learning tools and resources

There are a plethora of tools and resources online (many that are free) that can be used to create and enhance a digital learning environment. Listed below are resources and tools 21st century teachers can use for digital learning-

1. RSS or Social Readers
2. Google+ Communities
3. YouTube Channels
4. iTunesU
5. Cloud-based Word Processors (i.e. Google Drive)
6. File-sharing platforms (i.e. Dropbox)
7. Evernote
8. Digital Pocket
9. Zotero
10. Video conferencing software (i.e. TrueConf, Zoom, Cisco Webex, Microsoft Teams)

7. Conclusion

Virtual classroom platforms can capture a variety of data about student attendance, engagement, and performance, then compile it into reports or visual dashboards as a real-time analytics of teachinglearning system. An innovative environment is one that is capable of progressing and adapting as educational practices enhance, evolve and change – thus residual forthcoming intensive. An innovative learning environment includes the physical, social, and pedagogical context in which learning occurs. An innovative environment is one that is capable of evolving and adapting as educational practices evolve and change – thus remaining future focused.

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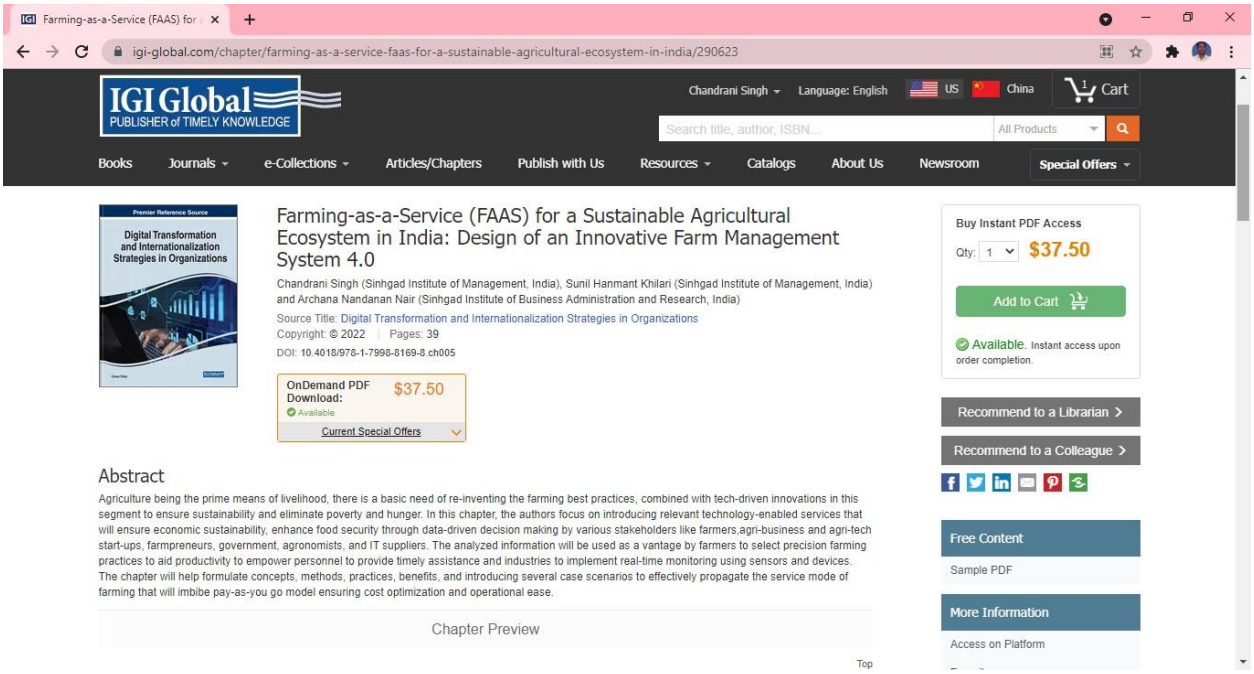

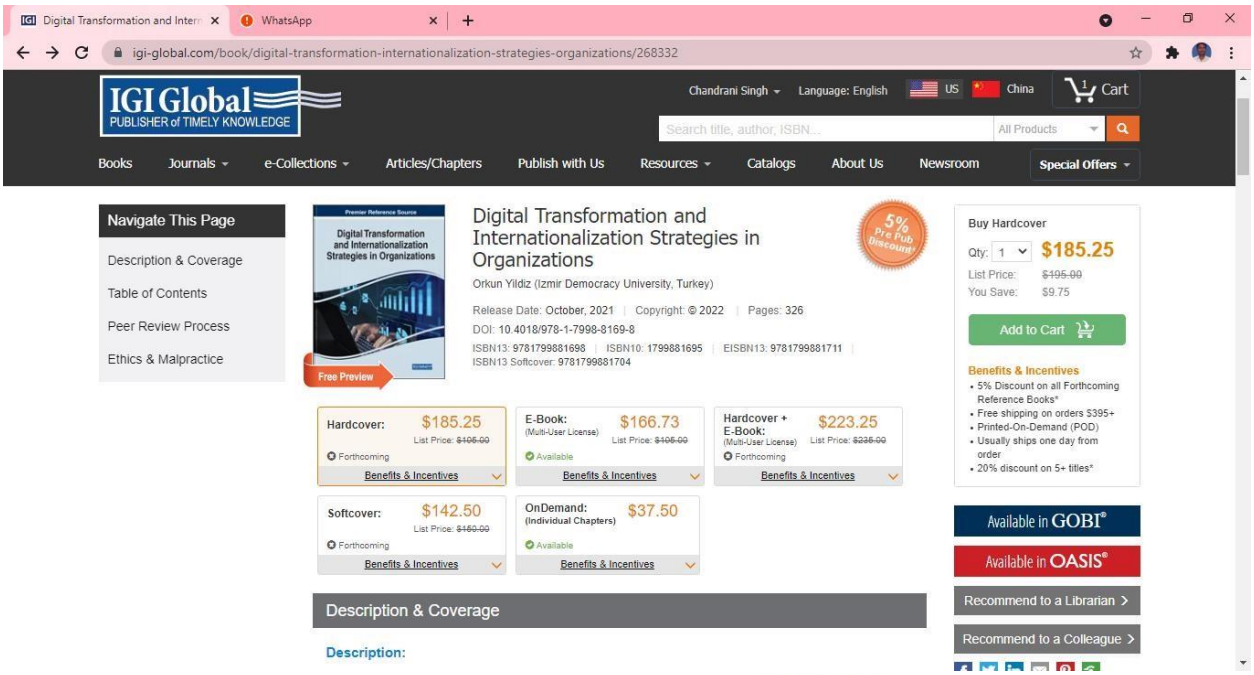

Dr.Chandrani Singh ,Director –MCA,SIOM

Chapter 5
Farming-as-a-Service (FAAS)for a Sustainable AgriculturalEcosystem in India:
Design of an Innovative Farm Management System 4.0

Chandrani Singh
Sinhgad Institute of Management, India

Sunil Hanmant Khilari
Sinhgad Institute of Management, India

Archana Nandanan Nair
https://orcid.org/0000-0001-7982-7235
Sinhgad Institute of Business Administration and Research, India

ABSTRACT

Agriculture being the prime means of livelihood, there is a basic need of re-inventing the farming best practices, combined with tech-driven innovations in this segment to ensure sustainability and eliminate poverty and hunger. In this chapter, the authors focus on introducing relevant technology-enabled services that will ensure economic sustainability, enhance food security through data-driven decision making by various stakeholders like farmers,agri-business and agri-tech start-ups, farmpreneurs, government, agronomists, and IT suppliers. The analyzed information will be used as a vantage by farmers to select precision farming practices to aid productivity to empower personnel to provide timely assistance and industries to implement real-time monitoring using sensors and devices. The chapter will help formulate concepts, methods, practices, benefits, and introducing several case scenarios to effectively propagate the service mode of farming that will imbibe pay-as-you go model ensuring cost optimization and operational ease.

DOI: 10.4018/978-1-7998-8169-8.ch005

OVERVIEW

India is primarily considered to be a nation where agriculture and its connected initiatives are considered as the chief source of livelihood for more than 80 percent population. The share of agriculture in the gross domestic product (GDP) has reached almost 20 percent in the year 2021 due to the resilience of farming communities within the current varieties. The agriculture sector has been the only entity that has clocked a positive growth in recent times and the consistent supply of tacks has enabled to provide food security for Indians as healthy as global citizens. Agriculture is the key means of livelihood, there is a basic need of re-inventing the farming best practices, combined with tech-driven innovations in this domain to ensure sustainability and reduce the poverty and hunger. Promoting new technologies to strengthen India's agricultural research and productivity is one of the most important needs for a sustainable agricultural ecosystem. To ensure efficiency, productivity, quality, capacity, and continuous supply of tacks, farmers in India are progressively adopting smart farming technologies operating drones and robots (Saraswathi & Kaushik, 2018). Successively with the introduction of Farming-as-a-Service (FaaS), various models are being created to build a sustainable eco-system to address the emerging issues in this domain. The awareness, accessibility, and availability of infrastructures, hard and soft resources to the majority of Indian farmers are to date scarce and very poor, and hence there is a dire need to familiarize and propagate the thoughts, ideas, studies, and researches concerning the implementation of Agriculture 4.0. The focus being information and technology-enabled farming practices. In this chapter the authors focus on introducing relevant technology-enabled services, that will ensure economic sustainability, enhance food security through data compelled decision making by various stakeholders like farmers, agri-business and agri-tech start-ups, 'farmpreneurs', government and non-government agencies, equipment suppliers, agronomists, IT suppliers, and vendors. The analyzed information will be used as a vantage by farmers to select precision farming practices to aid productivity, to invest personnel to provide appropriate assistance, and industries to implement real-time monitoring using sensors and devices. The chapter will help to formulate concepts, methods, practices, benefits and presenting several case scenarios to effectively proliferate the service mode of farming that will imbibe a pay-as-you-go model ensuring cost optimization and functioning ease.

1. FARMING-AS-A-SERVICE: AN INTRODUCTION

The forthcoming era necessitates, farming to be multi-functional and at the same time environmentally, profitably, and ethnically sustainable. The era is a proponent of ecosystem goods and services provisioning as well as ensure livelihoods to producers and the community at large. Farming needs to effectively and efficiently address local and global challenges. These challenges comprise of an absence of food security and also water and energy, change in climatic conditions, permeative rural economic condition, and degradation of earthy resources. Farming-as-a-Service (FaaS) offers modern, professional-grade methods for agriculture and related services via a subscription or pay-per-use model (Mitchell, Sehgal, Mathur & Priyanka,2020). These farm management offerings permit stakeholders to make data-driven decisions to aid productivity and skillfulness. Conversion of fixed upfront costs to changeable ongoing costs for farmers, make the methods more low-priced for most agriculturists. FaaS deals with tools that can broadly be categorized as in Table 1:

Dr.Chandrani Singh ,Director –MCA,SIOM

Performance Testing Tools: A Comparative Study of QTP, Load Runner, Win Runner and JUnit

D.O.I- 10.51201/12440
https://doi.org/10.51201/12440

Dr. Manisha Kumbhar, Professor Dr. Vidya Gavekar, Asso. Professor Prof. Aparna Kulkarni, Asst. Professor Sinhgad Institute of Management, Pune-41

Abstract: Testing has become most important parameter in the case of software development lifecycle (SDLC). Testing assesses the functionalities of a software item and quality of the product. Automated software testing utilizes different tools to execute testing activities. Software testing provides a means to reduce errors, cut maintenance and overall software costs. Testing automation tools enables developers and testers to easily automate the entire process of testing in software development. The aim of this research paper is to evaluate and compare four automated software testing tools. This paper focuses on solid differences between automated and manual testing as well as learns and explores various characteristics of automated testing tools by having real-world experience of testing effectively. The main objective of this research paper is to evaluate and compare the four automated tools such as the Quick Test Professional (QTP), LoadRunner, Win Runner and JUnit based on criteria such as quality parameters including Usability, Security, Efficiency, Accuracy, Reliability and Robustness etc. It also analyzed all four tools to determine their efficiency, effectiveness and capability of generating script.

Keywords: Performance testing tools, Quick Test Professional, LoadRunner, Win Runner and JUnit etc.

1. Introduction: -

The aim of research project is to identify and find out the best one software testing tool according to various quality parameters and gathering knowledge of software testing tools with its quality parameters. It is the process of exercising and evaluating a system or system components by manual automatic means to verify that it satisfies specified requirements or to identify differences between expected and actual results from various tools. The paper surveys a set of tools that support the testing process in a variety of ways. Some tools simulate the final execution environment as a way of expediting test execution, others automate the development of test plans, and still others collect performance data during execution. In these tough economic times, software- development managers are pushing to get more and testing done faster. Most recognize the automated testing tools facilitate higher quality and more productive testing, but acquiring such tools is often complicated. The paper has given the evaluation criteria for selecting the testing tools.

2. Manual Testing Vs. Automation Testing:

Software testing is a huge domain, but it can be broadly categorized into two areas: manual testing and automated testing. In manual testing, test cases are executed manually without any support from tools or scripts. But with automated testing, test cases are executed with the assistance of tools, scripts, and software. Testing is an integral part of any successful software project. The type of testing (manual or automated) depends on various factors, including project requirements, budget, timeline, expertise, and suitability. Three vital factors of any project are of course time, cost, and quality - the goal of any successful project is to reduce the cost and time required to complete it successfully while maintaining quality output. When it comes to testing, one type may accomplish this goal better than the other.

Automated testing is more reliable as compared to the manual testing. Initial investment of automation testing is higher than manual testing. Performance Testing like Load Testing, Stress Testing etc. is a practical option in automation testing whereas such type of option is not available in manual testing. Automation testing covers all the problems of manual Testing. Automation testing automates the steps of manual testing using automation tools. Various tools can be used for automation testing but for study purpose four tools has been considered like Quick Test Professional (QTP), LoadRunner, Win Runner and Junit. Automation tools help to increases the test execution speed, more reliable, repeatable, programmable, comprehensive, and reusable. These four tools are very largely use in software testing process. Each of these is fulfill with quality parameter which are used for testing the quality of software testing tool.

3. Automation Testing Tools:

3.1 Quick Test Professional (QTP): QTP is an automated functional Testing tool that helps testers to execute automated regression testing in order to identify any errors, defects or gaps in contrary to the expected results of the application under test. It was designed by Mercury Interactive and later on acquired by HP and now Micro Focus. It is an icon-based tool that automates the regression and Functional Testing of an application. Both technical, as well as a non-technical tester, can use Micro Focus QTP. It provides both features- Record as well as Playback. We can test Desktop as well as the Web-based applications. It allows Business Process Testing (BPT) and it supports the largest pool of software development environments like SAP, Oracle etc…QTP tool helps the testers to perform an automated functional testing uninterrupted.

3.2 LoadRunner: It is a software testing tool from Micro Focus. It is used to test applications, measuring system behavior and performance under load. LoadRunner can simulate thousands of users concurrently using application software, recording and later analyzing the performance of key components of the application. Loadrunner from Micro Focus is the most widely used Load Testing tool. Performance Test Results produced by Loadrunner are used as a benchmark against other tools. Simplify testing with a project based testing solution supporting the widest range of technologies and protocols in the industry. LoadRunner Professional is part of the LoadRunner Family, a unified set of performance engineering solutions.

3.3 WinRunner: HP WinRunner software was an automated functional GUI testing tool that allowed a user to record and play back user interface (UI) interactions as test scripts. As a functional test suite, it worked with HP QuickTest Professional and supported enterprise quality assurance. Win Runner is the most used Automated

Software Testing Tool as a functionality testing tool. It Supports C/s and web technologies such as (VB, VC++, D2K, Java, HTML, Power Builder, Delphe, Cibell (ERP)).

3.4 Junit: JUnit is a unit testing framework for Java programming language. JUnit has been important in the development of test-driven development, and is one of a family of unit testing frameworks collectively known as xUnit, that originated with JUnit. JUnit is a simple framework to write repeatable tests. It is an instance of the xUnit architecture for unit testing frameworks.

4. Statement of Problem:

Testing is a critical part of the software development process. There are a lot of different automated software testing tools currently in the market. Some of these are only able to perform specific kinds of testing and only work. When we start research for the right automated software testing tool, it is need to create a list of requirements to review when choosing a tool for evaluation. If we do not have list of requirements, we may waste time downloading, installing and evaluating tools that only meet some of requirements, or may not meet any of them. This research evaluate four major tools that are LoadRunner, Quick Test Pro (QTP), WinRunner and Junit with their test tool characteristics, quality parameters, data driven testing capability, capability of generation of script , recording efficiency, test execution capability, test reporting capability, scripts reusability capability etc.

5. Data Representation, Analysis and Interpretation

This research is aimed to study the comparision of various automation tools like Quick Test Pro (QTP), LoadRunner, Winrunner & Junit and identify the results of record efficiency, Capability of generation of script, Data Driven Testing, Test result report. Also test is applied on various general parameters that are mainly focuses on usability, security, efficiency, accuracy, reliability and robustness. For analysis purpose of we used scaling technique like 1 indicates Bad followed by 2 indicates Average whereas 3 indicates Good further 4 indicates Very Good, and 5 indicates Excellent.

5.1 Quality Parameters: To do the comparative study of various testing tools, various quality parameters are considered like Usability, Security, Efficiency, Accuracy, Reliability & Robustness. Following Table No. 1 shows the different parameters that are used to measure the software quality by using various tools

Table No. 1: Quality Parameters

Quality Parameters

Tools -→ ↓ Parameters	**QTP**	**LoadRunner**	**WinRunner**	**Junit**
Usability	5	5	5	5
Security	5	4	4	5
Efficiency	5	3	3	4
Accuracy	5	4	4	3
Reliability	5	4	3	3
Robustness	5	5	5	5
Quality Parameters	5	4.16	4	4.16

As per above table it clears that, QTP is excellent tool with quality parameters like Usability, Security, Efficiency, Accuracy, Reliability & Robustness followed by LoadRunner and Junit have very Good and WinRunner is Good.

5.2 Data Driven Testing: For data driven testing, Access data from external source, Change the data without effecting script, Way of testing parameters are considered. Following table No. 2 shows the result of Data Driven Testing.

For measuring quality of data driven testing various parameters are considered like Access data from external source, Change the data without effecting script and Way of testing. As per the following Table No.2, it clears that QTP, LoadRunner & WinRunner has excellent (5) quality of Access data from external source as compared to Junit. QTP and LoadRunner has excellent (5) quality to change the data during testing without effecting script followed by WinRunner has a very Good (4) quality to change the data during testing without effecting script.

Table No. 2: Data Driven Testing

Data Driven Testing				
Tools -→ ↓ Parameters	**QTP**	**LoadRunner**	**WinRunner**	**Junit**
Access data from external source	5	5	5	-
Change the data without effecting script	5	5	4	-
Way of testing	5	4	4	3
Data Driven Testing Quality	5	4.6	4.3	0.33

It clears that QTP is excellent data driven testing quality followed by LoadRunner & WinRunner have Very Good and Junit is Very Bad.

5.3 Recording Efficiency: Various parameters like recording type, insert command, Access to record control and Auto documentation are considered with respect to various testing tools like QTP, LoadRunner, Win Runner & Junit are considered for comparison of recording efficiency of various. For measuring the efficiency 5 scale has been considered like 1- Bad, 2 - Average, 3-Good, 4-Very Good, 5-Excellent.

Table No.3 shows the recording efficiency of various automated tools. It shows that QTP & LoadRunner has excellent recording efficiency quality that is 5 followed by WinRunner has Good quality that is 3 whereas for insert command all tools has very poor performance. For access to record control Junit has a good quality that is 4 followed by WinRunner has a 2 and QTP & LoadRunner has 1. All tools has excellent auto documentation quality that is 5 followed by Junit has Very Good that is 4.

Table No. 3: Record Efficiency

Recording Efficiency				
Tools → Parameters ↓	**QTP**	**LoadRunner**	**WinRunner**	**Junit**
Recording type	5	5	3	-
Insert command	1	1	1	1
Access to record control	1	1	2	4
Auto documentation	5	5	5	4
Recording Efficiency	3	3	2.75	3

Also we have calculated average value of recording efficiency by considering various parameters like recording type; insert command, access to record control and auto documentation. Average value of recording efficiency of QTP, LoadRunner & Junit is 3 followed by WinRunner has a 2.75. QTP, LoadRunner, Junit have a Good record efficiency and WinRunner has also on an average good record efficiency. So it clears that recording efficiency of QTP, LoadRunner, Junit is Good as compared to WinRunner.

5.4 Capability of Generation of Script: For measuring capability of generating script of testing tools language parameter is considered. Following Table No. 4 shows the Capability of generation of script. As per the table capability of Junit is 5 followed by QTP is 4 and LoadRunner & WinRunner has 1 resp. Junit has Excellent Capability of generation of script followed by QTP has Very good capability whereas LoadRunner and Win Runner have very bad capability.

Table No. 4: Capability of generation of script

Capability of Generation of Script				
Tools → Parameters ↓	**QTP**	**LoadRunner**	**WinRunner**	**Junit**

Language	4	1	1	5

5.5 Test Report: As a result of testing and for a Test Report various parameters are considered like Report Presentation, Information about applied check point, Graphical information. As per the following Table No.5, it clears that QTP has excellent presentation quality that is 5 followed by LoadRunner & WinRunner have Very Good quality that is 4 and Junit have a Good quality that is 3. QTP and LoadRunner gives excellent information about applied check point that is 5 as compared to WinRunner has Very Good that is 4. Also all the tools are excellent in generation of graphical information that is 5.

Table No.5: Test Report

Test Result Report				
Tools -→ Parameters ↓	**QTP**	**LoadRunner**	**WinRunner**	**Junit**
Report Presentation	5	4	4	3
Information about applied check point	5	5	4	-
Graphical information	5	5	5	5
Quality of Test Result Report	5	4.6	4.3	2.6

As per above table and calculations, it clears that QTP is Excellent tool (5) regarding testing result report as compared to the other tools like LoadRunner (4.6) followed by WinRunner (4.3) and further Junit (2.6).Hence it clears that QTP is a excellent tool for generating test result as compared the other tools like LoadRunner, WinRunner & Junit

6. Findings and Conclusion

In this paper performance result of different performance testing tools like QTP, LoadRunner, WinRunner & Junit with various parameters have been analyzed. The same parameters have been used for comparing performance result of various tools. These comparisons provide information to select the better tool for performance testing of applications according to performance requirement. This research work can be extended to more experiments with more tools and different comparison parameters to provide more realistic results.

6.1 Findings

- Recording efficiency of QTP, LoadRunner, Junit is Good as compared to WinRunner.
- Junit has Excellent Capability of generation of script followed by QTP has Very good capability whereas LoadRunner and Win Runner have very bad capability.
- QTP, LoadRunner & Win Runner has excellent quality of Access data from external source as compared to Junit.
- QTP and LoadRunner have excellent quality to change the data during testing without effecting script as compared to WinRunner and Junit.
- QTP , LoadRunner & Win Runner has excellent data driven testing quality

- QTP is excellent data driven testing quality followed by LoadRunner & WinRunner have Very Good and Junit is Very Bad.
- QTP is Excellent tool regarding testing result report as compared to the other tools like LoadRunner followed by WinRunner and further Junit .
- QTP is excellent tool with quality parameters like Usability, Security, Efficiency, Accuracy, Reliability & Robustness followed by LoadRunner and Junit have Very Good and WinRunner is good.

6.2 Conclusion

- Automated software testing has become necessity of companies because it saves both time and money. QTP, LoadRunner, WinRunner and Junit all are very good tools for test automation and is used in IT industry in large size.
- LoadRunner has easy to use UI and efficient playback. Using one of them can be decided based on the application features and scope of testing.
- JUnit is a Java framework for performing unit tests on code. By testing code after every change, programmers can be reassured that changing a small amount of code does not break the larger system and Winrunner used to quickly create and run sophisticated automated tests on your application
- Recording efficiency of QTP is very high as compared to other tools whereas QTP requires data security even while testing.
- LoadRunner will be best to use for applications with lesser security.
- WinRunner is best for to create reusable test script
- Junit is best for testing java based application and has Excellent Capability of generation of script as compared to other tools
- QTP and LoadRunner have excellent quality to change the data during testing without effecting script.
- QTP , LoadRunner & Win Runner has excellent data driven testing quality
- QTP is a excellent tool for generating test result as compared the other tools like LoadRunner, WinRunner & Junit
- WinRunner used to quickly create and run sophisticated automated tests on your application and is best for create reusable test script.
- Finally we found that the Quick Test Professional (QTP) is the best software testing tools among all the testing tools.

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Dr.Chandrani Singh ,Director –MCA,SIOM

Analysis and Assessment of Impact of Covid-19 Pandemic on Education With Respect To Professional Courses in Karad City

Dr .A.V. Nikam[1], BVDU, YMIM, Karad, avnkrd@rediffmail.com

Dr. Sunil Khilari[2], SIOM, Pune, sunilkhilari@hotmail.com

Abstract: This paper aims to showcase the impact of covid-19 on education system of different professional courses in an around. Karad city. Due to Covid-19 there is slowdown in each and every field and education system is not exceptional. Researcher has taken the survey of students from various professional courses like BBA, BCA, MBA and MCA from professional institutes in and around Karad city.

Due to Covid-19 normal life of the people got disturbed and in situation like lockdown it became essential to follow the rules govern by WHO, like keeping social distancing, wearing mask, use of sanitizers etc. Technology play very important role in such Covid-19 pandemic situation in almost all domain to serve the people. In education system it is possible to take the online education due to the technology using various apps. This paper focuses on how technology is helpful to bridge the gap between the stakeholders. Similarly the paper reveals the various advantages and disadvantages of online education.

This study also includes the mobile, laptops, internet availability, different applications used by the students, ability to access the content, whether both stakeholders are satisfied with the teaching learning process and suggestions given by them.

Keywords: Covid-19, WHO, Online education, Profession courses, Technology.

Introduction

In the last 20 years, the Internet has grown from being nearly non-existent into the largest, most accessible database of information ever created. It has changed the way people communicate, shop, socialise, do business and think about knowledge and learning. Much more than just a new twist on distance learning, online schooling is changing the face of traditional classrooms and making education more accessible than ever before.

Online education is a form of education where students use their home computers through the internet. For many nontraditional students, among them all those who want to continue working

full time or raising families, online graduations and courses have become popular in the past decade. Often online graduation and course programmes, some of which are conducted using digital technologies, are provided via the online learning portal of the host university.

Definition:

Computer-based training, Web-based training, Internet based training, online training, e-learning (electronic learning), m-learning (mobile learning), computer-aided distance education - online education goes by many names and comes in a variety of styles, but at its core:

"Online education is electronically supported learning that relies on the Internet for teacher/student interaction and the distribution of class materials."

From this simple definition comes an almost infinite number of ways to teach and learn outside of traditional classrooms and away from college campuses. With online education, students can turn anywhere with Internet access and electricity into a classroom. It can include audio, video, text, animations, virtual training environments and live chats with professors. It's a rich learning environment with much more flexibility than a traditional classroom.

When used to its full potential, online education has been shown to be more effective than pure face-to-face instruction. It can be engaging, fun and tailored to fit almost anyone's schedule.

Read:All about MOOCs (Massive Open Online Courses) in India & Abroad

1. Online Education Programs

- **100% Online Education -** Fully-online degrees are earned from the comfort of your own home with no required visits to your college or university campus.
- **Hybrid Education -** Hybrid education allows students to pursue a combination of online and on-campus courses.
- **Online Courses** - While online courses may be part of a degree program, they can also be taken on their own in order to master a certain subject or learn a specific skill.
- **MOOCs** - MOOCs, or massive open online courses, are usually delivered in lecture form to online "classrooms" with as many as 10,000 people.

It's not easier studying online! Online institutions must meet with the same quality requirements as brick-and-mortar institutions. With the advancement of online learning technologies, virtual institutions have enhanced automated processes to deter fraud and/or plagiarism.

Many online institutions will partner with universities on campus to develop and deliver online programs. This enables an online service, while providing validated course studies through the brick-and-mortar institution, to benefit from the advanced expertise and technology that an online provider provides.

2. Objectives of Study

Researcher has considered following objectives for the research study:

1) To study the present scenario of online education in different professional courses.
2) To find advantages and disadvantages of online education system.
3) To give suggestions for improvement of online education system.

3. Research Design

Researchers have selected the students from the different professional courses from professional institutes in and around the Karad city.

The different institutes and students selection is done by the random sampling method which is shown below:

Sr. No.	Name of institute	Course	Total students	Students selected for study(20%)
1	BVDU, YMIM, Karad	MBA-I,II	160	32
2	BVDU, YMIM, Karad	MCA-I,II	110	22
3	BVDU, YMIM, Karad	BBA-I,II,III	325	65
4	BVDU, YMIM, Karad	BCA-I,II,III	320	64
5	Swaraj Institute of Management, Vanwasmachi- Karad.	MBA-I,II	110	22

6	Dadasaheb Chavan Institute of Management, Masur	MBA-I,II	114	23
7	Krishna Institute of Management, Watar	MBA-I,II	115	23
8	Krishna Institute of Management, Watar	BBA-I,II,III	180	36
9	Krishna Institute of Management, Watar	BCA--I,II,III	150	30
Total students selected for study			1582	**317**

Researchers have finally selected the 317 students by random sampling method as whole for further analysis and interpretation. After that based on the data analysis and interpretation findings, suggestions and conclusion are drawn.

4. Data analysis and interpretation

Researchers have prepared questionnaire and collected the responses from the students of professional courses. Collected data has then arranged properly and done the analysis and interpretation.

Table no.:1 Do you have mobile?

Sr. No.	Availability of mobile	Yes	NO	Total
1	317	307 (97%)	10 (3%)	317 (100%)

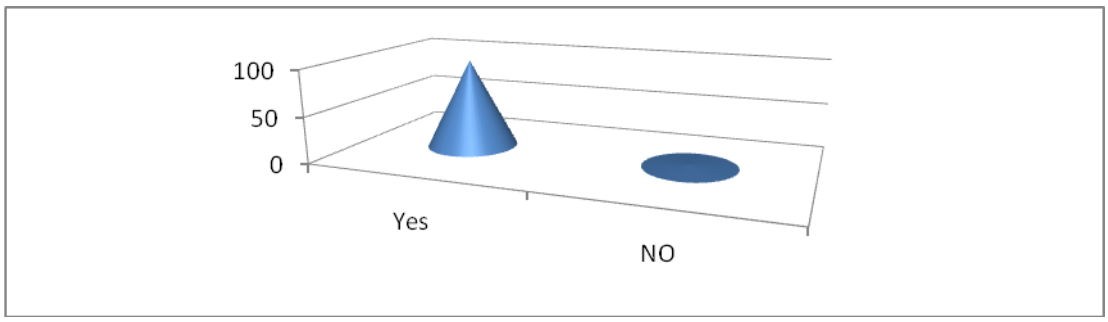

Fig: Availability of mobile

Above table shows the information about availability of mobile towards the selected students for taking online education.

It is found from above table that majority (97%) of the students are having the availability of mobile phone for online educations purpose.

Therefore it is interpreted that availability of mobile towards students is satisfactory for taking online education.

Table No. 2 Internet facility

Sr. No.	Internet facility	Yes	NO	Total
1	317	299 (94%)	18 (6%)	317 (100%)

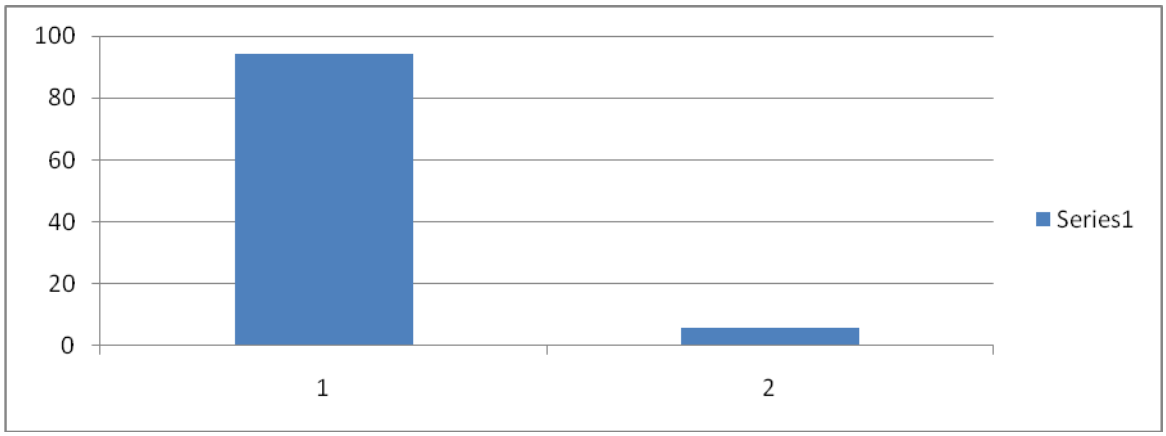

Fig: Internet facility

Table No 2 shows the information about the internet facility available in their native area. It is observed that 94% respondents are of opinion that the internet facility is available in their area and only 6% are saying that internet facility is not available.

It is interpreted that majority of the respondents are having internet facility in their native area.

Table No.3 Internet Range

Sr. No.	Internet range	Yes	NO	Total
1	317	219 (69%)	98 (31%)	317 (100%)

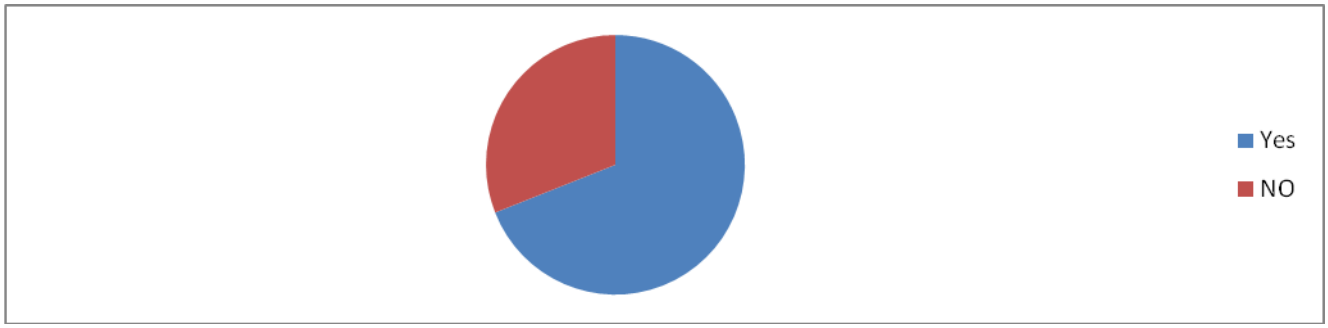

Fig: Internet range

Table No.3 depicts the information about the Internet range of various companies which provides the internet.

It is observed that 69% students are responding the internet range is sufficient for attending the online lectures whereas 31% are saying not sufficient internet range or disturbances in internet. It is interpreted that majority (69%) of students are of opinion that internet facility is sufficient. **Table No. 4 Attended the online lectures conducted by the Institutes**

Sr. No.	Online Lectures attended	Yes	NO	Total
1	317	297 (94%)	20 (6%)	317 (100%)

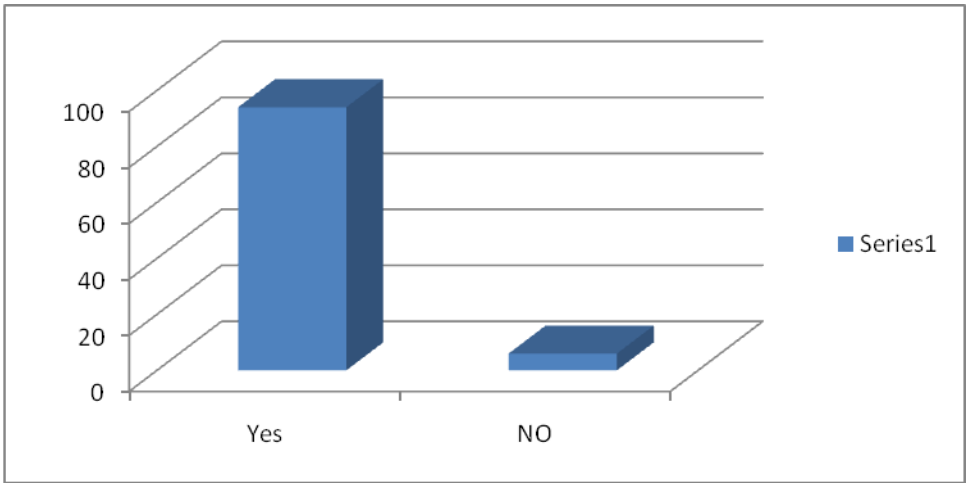

Fig: Online Lectures attended

Table No.4 shows the information about the attendance of student for online lectures/sessions taken by the institutes.

It seems from above table that majority (94%) of students are of opinion that they are attending the online lectures whereas only 6% are not attending the online lectures.

It is interpreted that majority (94%) of the respondents are attending the online lectures conducted by the institutes.

Table No. 5 Attended online lectures without technical disturbance

Sr. No.	Online Lectures attended without technical disturbance	Yes	NO	Total
1	317	185 (58%)	132 (48%)	317 (100%)

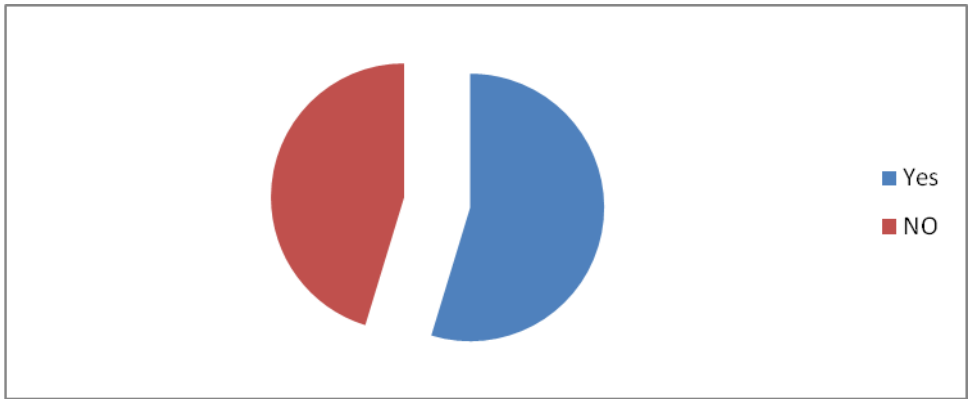

Fig: Online Lectures attended without technical disturbance

Above table shows the information of online lecture attendance without disturbance of technical problem.

It is observed that 58% students are attending the online sessions without any technical disturbance whereas 48% students are facing technical problems and disturbance while attending the online lectures.

It is interpreted that the technical disturbance is the major problem while attending the online lectures.

Table No. 6 Are you satisfied with the present online education:

Sr. No.	Satisfaction with online education	Satisfied	Fully satisfied	Dilemma	Unsatisfied	Highly Unsatisfied	Total
1	317	169(53%)	79(25%)	20(6%)	31(10%)	18(6%)	317 (100%)

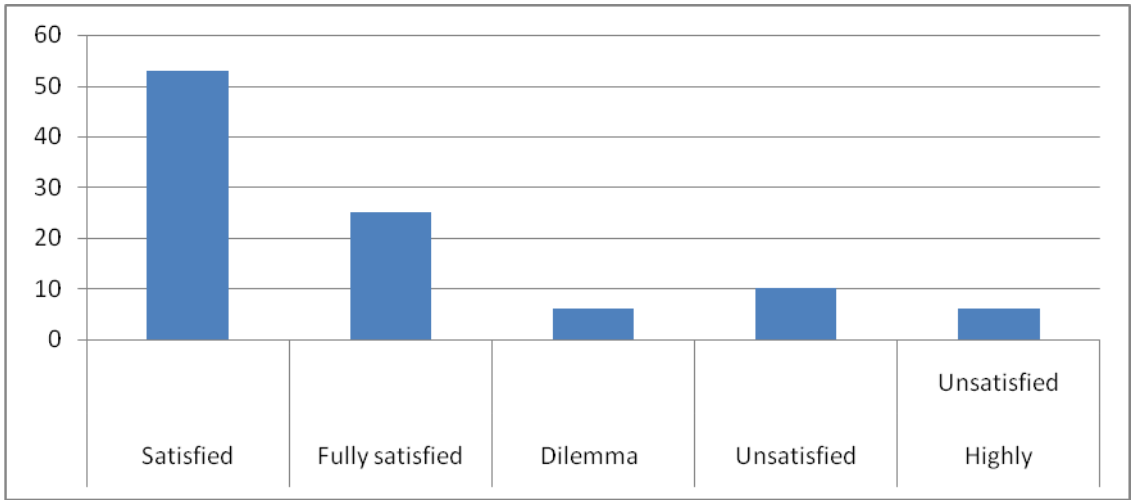

Fig: Satisfaction with online education

Table No.6 shows the information about the satisfaction of students due to online education. It is observed that the majority (53%) of the students are satisfied whereas 25% are fully satisfied, 6% are in dilemma, 10% are unsatisfied and 6% are highly unsatisfied.

It is interpreted that majority of the students are satisfied and even some technical problems like internet range, networking, quality of lectures etc must be focused to improve the quality of education.

5. Findings

1) It is found that majority (97%) of students are having mobile facility for online education.
2) It is found that majority (94%) of students are having internet facility to attend the online education.
3) It is found that the majority of the students (69%) are having the internet range whereas 31% students are facing the internet range problem.
4) It is found that majority of the students (94%) are attending the online lectures.
5) It is found that the majority of the students (52%) are attending the online classes regularly whereas 42% students are trying to attend the lectures but they are facing some technical disturbance like range problems , networking, device problems etc.
6) It is found that 53% students are satisfied, 25% are fully satisfied, 6% are in dilemma state whereas 10% are unsatisfied and 6 % are highly unsatisfied**.**
7) It is found that the physical control of teacher over the class is not that much strong and enough to see what exactly students are doing during the online session.

8) It is found that physical teaching learning process is more effective because during the course students are listening writing, and reading and those old methods are beneficial to the students for understanding the subjects.
9) It is observed that subjects like mathematics, statistics and accounts are hard to understand due to problems and examples solving in the subjects.
10) It is also found that the teaching learning should not remain local it should spread global.

6. Suggestions

1) It is suggested to the students those who do not have the mobile phone should purchase the mobile phone for the sake of online education.
2) It is suggested to the students those who do not have the internet facility should make available these facility for the purpose of online education.
3) It is suggested to the internet provider to provide wide range of internet facility to make use for online education to their customers to increase the customer base.
4) It is suggested to the students those who do not attend the online lectures to attend the lectures compulsory to avoid the further academic loss.
5) It is suggested to the teachers to make online lectures more interesting by adding diagrams, graph, charts, tables, facts, animations etc to attract more students and understandability purpose also.
6) It is suggested to the teachers after completion of a particular point they should be asked few questions to the students related to that topic to keep students binding , awareness and control of class purpose.
7) It is suggested to the teachers that they should take MCQ test and descriptive type of examinations for sake of more practice of the subject.
8) It is suggested to the teachers of mathematics/statistics/accounts etc to solve more problems and give more problems to the students for practice purpose as these subjects are hard to understand.
9) Teachers should prepare various other subjects for taking online lectures globally to teach the students located at different places in the world, they should record maximum

lectures/blogs/articles etc. and put it on YouTube /websites etc. channels to improve the quality of online education.

7. Conclusion

It is concluded that the online education is boon to the students and faculty for teaching learning purpose when it is properly implemented. One of the drawback of online education is faculty do not have the control over the class and those old methods like reading ,writing and listening should be used even online sessions for sake of better understanding of the subject. Advantages of online education are reduction of the paper work, reduces electricity, avoidance of class cleanliness etc. Therefore online education is very useful to teacher and students community at the situation like Corona 19 pandemic and other emergency time.

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Author Affiliations

Dr.Anil Nikam[1]

Ph.D, M.Phil, MCA, MBA(HR & Marketing)

Mentor for MCA students for creating learning environments for the subject “Object oriented analysis and design, Artificial Intelligence ,Information Security and Audit, computer network, DBMS”. Sharing and transferring his 20+ years of IT industry experience for the betterment of student community. Focusing on constant upgradation of educational system and process to facilitate its core purpose through FDP, Conference, seminars, workshop, and industry visits. Published 26 research paper in reputed journals,

Dr.Sunil Khilari[2]

PhD, MCA, MBA(IT), MCP, DSQM, ITIL,IPPro

Mentor for MCA students for creating learning environments for the subject “Information Security and Audit, Data Science and Software Testing and Quality Assurance”. Sharing and transferring his 14+ years of IT industry experience for the betterment of student community. Focusing on constant upgradation of educational system and process to facilitate its core purpose through FDP, Conference, seminars, workshop, and industry visits..Published patent on “Green Calc-Com” in the Government of India –IPR Gazette and two software copyrights and one Trademarks achieved as IPR. Implementing f IT good Practices as per ITIL for the bridging the gap between Academic and Industry. Researcher in Software Patenting for formalization of software prior art, claims and Inventor of all prior art related to software, Also responsible to reconcile patent life cycle and software engineering life cycle. Preparing and prosecuting patent application.

Dr.Chandrani Singh ,Director –MCA,SIOM

Novel COVID-19: the Pandemic Analysis of Country India using Machine Learning Algorithm

Moh Majeed Yakub Shaikh[1], MBA (Business Analytics),

Mr. Ramesh D Jadhav[2], Assistant Professor,

Dr. Bharti P Jagdale[3], Associate Professor

Mr. Deven Sanjay Patil[4], MBA (Business Analytics),

Sinhgad Institute of Management, Pune-411041, India.

Abstract:

The corona virus has affected almost the whole world since its first case found in China in late 2019. The world health organization (WHO) has given the name Covid-19 for coronavirus (SARS-CoV-2) that has been spreading all over the world and now it has become global pandemic. The COVID-19 has not only sickened millions of people around the world but shut down major cities in most of the countries. The COVID-19 has affected almost every person around the world and it has spread panic, mental stress and fear in all groups of people. India is also not untouched from COVID-19 and trying hard for controlling the virus outbreak and taking strict measures this study presents the current situation of COVID-19 spread in India along with its impact and various measures taken for it. In India, the disease was first detected on 30 January 2020 in Kerala in a student who returned from

Wuhan. The total number of confirmed infected people is 67, 57,131 till now across India (07th October 2020).Most of the research and newspaper articles focus on the number of infected people in entire India. However, given the size and diversity of India, it may be a good idea to look at the spread of the disease in each state separately, along with the entire country. For example, currently, Maharashtra has more than 14, 50,000 Confirmed infected cases, whereas Kerala has less than 2, 25, 000 Confirmed infected cases (till 07th October 2020).

Keywords: Covid-19, Coronavirus, Pandemic, SARS-CoV-2, Machine Learning Algorithm-SVM, Time series.

1. Introduction of COVID-19- Corona Virus Disease.

COVID-19 is an infectious disease caused by the Coronavirus, biologically known as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The disease was first identified in Wuhan, the capital of China's Hubei province in December 2019 and has spread all over the world since then.

Most people infected with the COVID-19 virus will experience mild to moderate respiratory illness and recover without requiring special treatment [1], [2]. Older people and those with underlying medical problems like cardiovascular disease, diabetes, chronic respiratory disease, and cancer are more likely to develop serious illness. The COVID-19 virus spreads primarily through droplets of saliva or discharge from the nose when an infected person coughs or sneezes, so you might have heard caution to practice respiratory etiquette (for example, by coughing into a flexed elbow).

WHO declared Coronavirus disease 2019 (COVID-19) as a global pandemic on 11 March 2020. The disease has spread across 210 countries and territories around the world, with a total of more than two million confirmed cases [3]. In India, the disease was first detected on 30 January 2020 in Kerala in a student who returned from Wuhan. The total number of confirmed infected people is 67, 57,131 till now (07th October 2020) across India.

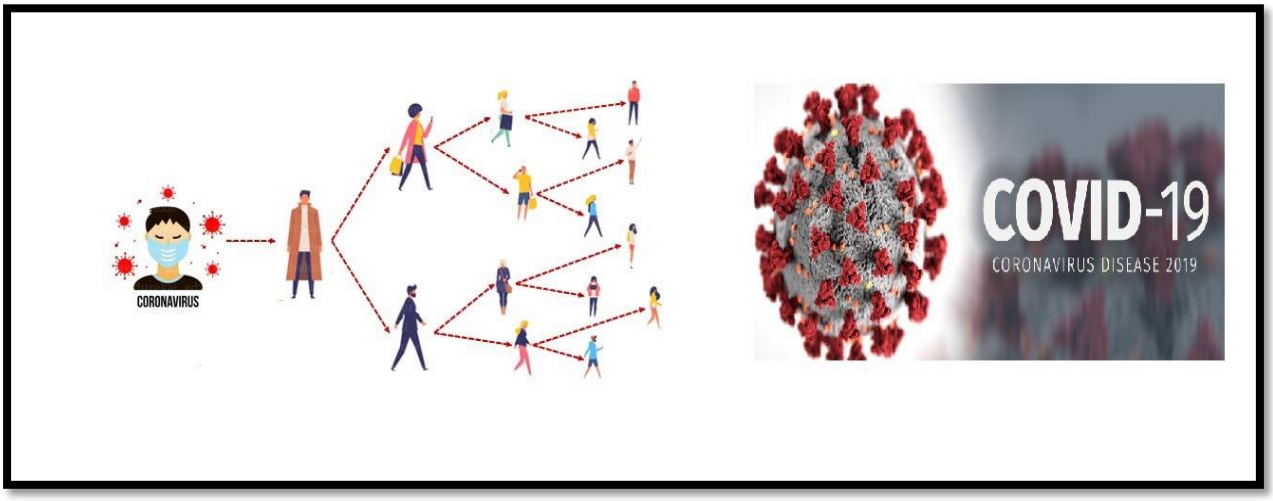


Fig. no.1: Covid-19 Corona viruses Disease 2019

a) Symptoms:

It's thought that people can have the virus for up to 14 days without having any symptoms. This time before symptoms develop is called the incubation period [12], [14]. Most people who catch COVID-19 will have an illness like a bad cold or flu. Some people will have a more severe illness, like have certain other health problems. These include high blood pressure, diabetes, severe obesity, a weaker immune system, receiving an organ transplant, and diseases affecting the heart, lungs, liver or kidneys.
Children seem to be infected less frequently than adults. Most common symptoms:

- Fever
- Dry cough
- Tiredness

b) Prevention:

You can take measures to reduce your risk of catching the infection

Fig. no. 2: Prevention of covid-19

2. Literature Review:

Ekta Gambhir et al (2020), focus the current trend of the transmission of Covid-19 in the world. Anticipating the further spread of the Covid-19 or better known as Novel Coronavirus will help in taking necessary actions to control the spread. The paper also presented a comprehensive study of the spread of the virus outbreak situation in India which will further help in taking necessary steps to manage the huge population of India. For the same, two Machine Learning models were used but in future Deep Learning models or hybrid two or models can be used to forecast the further spread of the virus. [1]

Dr. Abhishek Sharma et al (2020) describe the disease of COVID-19 shows mild or negligible symptoms in most of the population, but usually it progresses with people of old aged groups or patient having low immunity. In the cases it started with dyspnea, progress towards pneumonia and might lead to multiple organ failure. Now a days most of the people or patients show no symptoms or otherwise are asymptomatic. Final diagnosis of the virus is confirmed by presence of virus in the secretions of respiratory tract with the help of molecular tests. First case of this pandemic was from city of Wuhan, from china on 7th January, 2020. In this review, the WHO convention of referring to the disease condition as novel coronavirus disease (COVID-19) has been followed. The virus will be referred to as SARS-related CoV-2, or SARS-CoV-28. COVID-19 has been labeled as a public health emergency of international concern (PHEIC), and the epidemic curves are still on the rise. [2]

Ram Kumar Singh et al (2020) describe the basic form of the SIR model, which is arguably too simplistic to provide realistic COVID-19 predictions, in particular for the longer-term. For this aim, several authors have proposed more advanced compartment models, derived from the SIR model. This paper demonstrates the performance of short-term statistical forecasts using Holt-Winters method and suggests that this method could be suitable for providing operational COVID-19 forecasts in India aimed at different administrative levels. Hence, the Holt-Winters method is integrated into most statistical software, making it readily available to non-experts from outside the mathematical-epidemiological modelling community. 48-day re-forecasts of cumulative infections, cumulative deaths and active cases in India based on a trained Holt-Winters model reproduce the observed values reasonably well. For a future period, Holt-Winters forecasts are found to be comparable to those of a basic SIR model.[4]

Naresh Kumar et al (2020) have done with analysis and prediction study of the disease using widely accepted forecasting models; ARIMA and FB Prophet. We have collected COVID-19 data of 10 highly affected countries US, Spain, Italy, France, Germany, Russia, Iran, UK, Turkey, India, and worldwide latest by May 20, 2020. For the most of the countries data, ARIMA has better performed compared to Prophet on scale of MAE, RMSE, RRSE, and MAPE error matrices. The trend analysis shows rapid growth in the infected cases, and prediction study shows great rise in the expected active, recovered, and death cases worldwide. However, lockdowns and containment policies may affect the prediction results. The adopted models have performed well but it limits our study to the effectiveness of the models, which can be further improved using ensemble of multiple prediction models. The obtained forecasting results further can be improved by taking various variables into account like population density, weather, health system, patient history etc. using deep learning techniques, and artificial intelligence. [5]

The objective of this paper is to provide evaluative study of prediction models using COVID-19 cases, and forecasting the impact of the virus in the affected countries, and worldwide. We present trend analysis of COVID-19 cases, and compared the performance of the models using the metrics such as the mean absolute error (MAE), root mean square error (RMSE), root relative squared error (RRSE), and mean absolute percentage error (MAPE). We generate forecasting results for COVID19 confirmed, active, recovered, and death cases. The results show that ARIMA outperformed the Prophet model.

3. Research Objective:

1. To understand current COVID-19 Situation around India

2. To Predict and forecast COVID-19 Cases using Machine Learning Algorithm

3. To Visualize the State Wise Analysis

4. Research Methodology:

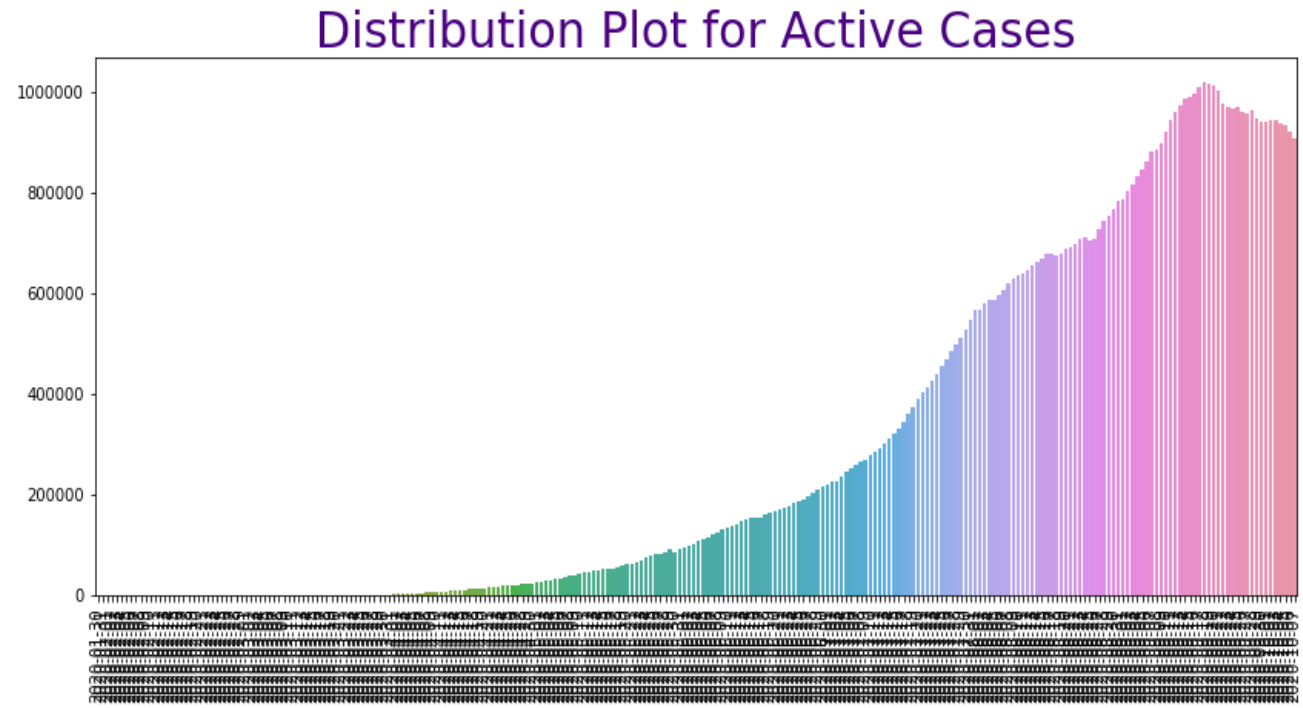
Research as a scientific and systematic search for pertinent information on a specific topic. In fact, research is an art of scientific investigation. It is an academic activity and as such the term should be used be in a technical sense. Research is, thus an original contribution to the existing stock of knowledge making for its advancement. It is as per suit of truth with help of study, observation, comparison and experiment. In short, the search for knowledge through objectives and systematic method of finding to a problem is "Research". Definition of Research Methodology According to Advance Learner's Dictionary, "A re-search is a careful investigation or inquiry especially through search for new fact in any branch of knowledge. Research Methods It refers the process used to collect information and data for the purpose of making decisions. One can also define research methodology as a scientific and systematic search for required information on a specific topic. The word research methodology comes from the word "advance learner's" dictionary meaning of research as a careful investigation or enquiry especially through research for new facts in my branch of knowledge.

5. Data Collection and Analysis:

In this Research I have Collected COVID-19 data from Kaggle and Wikipedia. Kaggle (dataset up to 7th October 2020): The dataset provides a day by day record of the number of cases found in a specific state in the country. On further inspecting, we find that this dataset contains 7086 entries and contains 9 features. These are as seen contains some vital data like the number of confirmed cases, deaths, and cured people till a specific day in a specific state. The Confirmed Cases are further broken down into Indian Nationals and Foreigners.

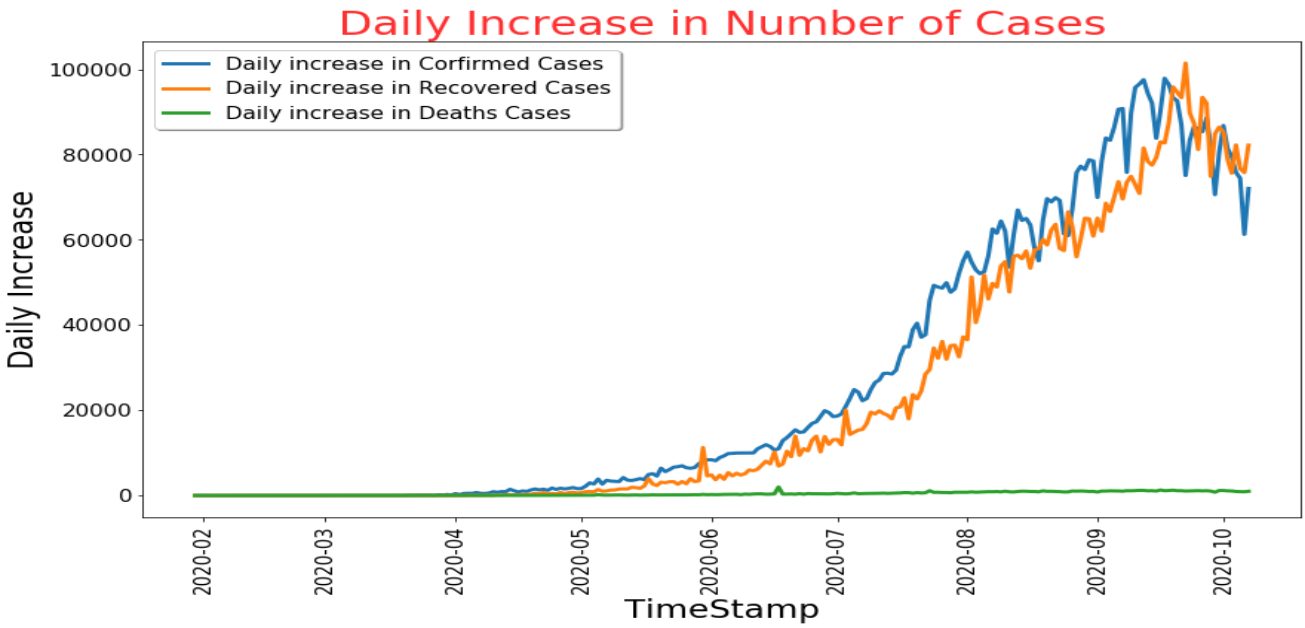
From this dataset I have collected basic Information of COVID-19 Cases like what are the total number of Confirmed Cases, Recovered Cases and Death Cases till 7th October 2020.

- Total Number of Confirmed Cases around the India is 6757131
- Total Number of Recovered Cases around the India is 5744693
- Total Number of Death Cases around the India is 104555
- Total Number of Active Cases around the India is 907883
- Total Number of Closed Cases around the India is 5849248



Graph No. 1: Distribution plot for active cases.

As we seen that from graph no: 1, the Active Cases Curve is exponentially increases from 22nd January to 25th September. After that it decreases. The decline has come regardless of the ease in travel restrictions and other activities that have begun to return to normalcy.



Graph No. 2: Daily increase in number of cases details.

On the above graph no: 2, we see that the total number of Confirmed cases and Recovered Cases on daily basis is increases from month of April to September 2020. After 25th September 2020 the total number of Confirmed Cases and Recovered Cases start decreasing.

In research I have used Support vector Machine, Linear Regression for prediction and Time series analysis for forecasting COVID-19 Cases [1], [4], [5].

6. Findings:

	Date	Confirmed Cases Using LR	Confirmed Cases Using SVR	Holts Linear Model Predictions
32	2020-11-09	418129	12533078	8683904
33	2020-11-10	419826	12755330	8756280
34	2020-11-11	421522	12980722	8828656
35	2020-11-12	423219	13209290	8901032
36	2020-11-13	424916	13441065	8973408
37	2020-11-14	426613	13676082	9045784
38	2020-11-15	428310	13914374	9118160
39	2020-11-16	430006	14155976	9190536
40	2020-11-17	431703	14400921	9262912
41	2020-11-18	433400	14649246	9335288
42	2020-11-19	435097	14900983	9407664
43	2020-11-20	436794	15156169	9480040

Table No. 1: Confirm cases using LR, SVR and Holts linear Model Prediction

On the above table no: 1 we can see that LR (Linear Regression) would not predict the consistent Confirmed Cases, because of Linear Regression uses general Regression technique of ordinal least square and it is one degree equation. Whereas SVM (Support Vector Machine) predict the Consistent Confirmed Cases, because of SVM uses Canonical Method or Kernel Method and canonical technique is going for Polynomial.

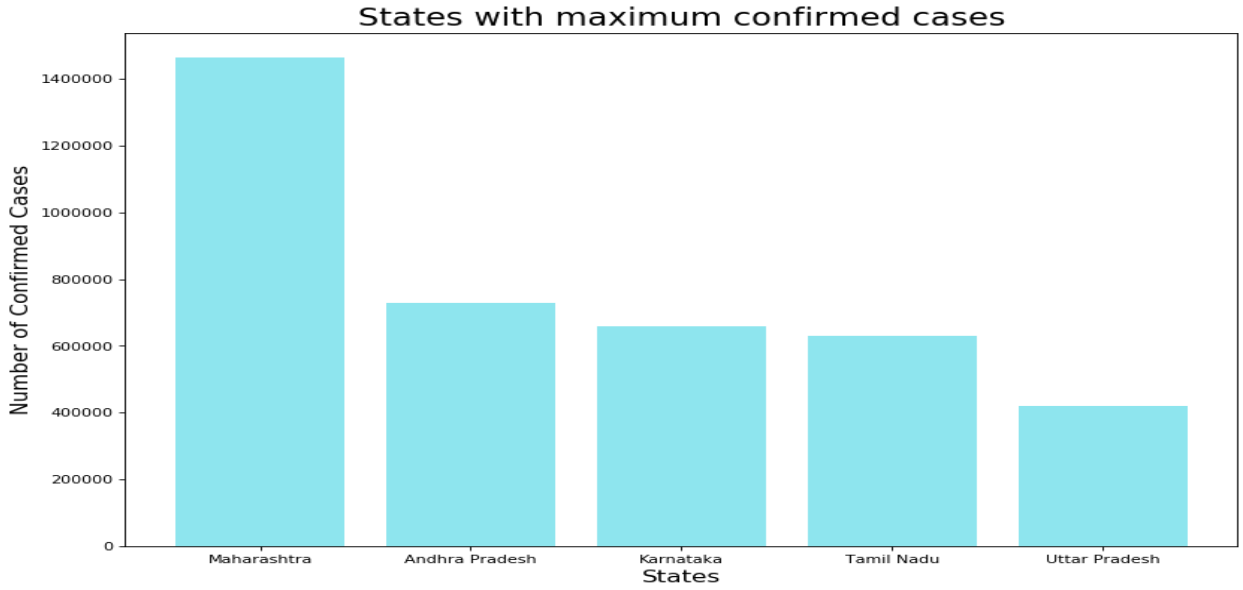
Second reason for linear regression is not predicting accurate result because of it uses linear data and predicts continuous output. Whereas SVM supports both linear and non-linear solutions using kernel trick.

From these three algorithms I suggest that we can use Time Series Analysis to forecast the COVID-19 Cases, because as the as the name suggest Time Series that is Collection of data collected at Constant Time Intervals. These can be analyzed to determine the long-term trend so as to forecast the future analysis.

7. State wise Analysis:

I) Confirmed Cases:

So now we have filtered the dataset of 7086 records on the basis of the most recent data for every state. On inspecting this data, we see that India has a total of 6757131 Confirmed cases till 07th October 2020.

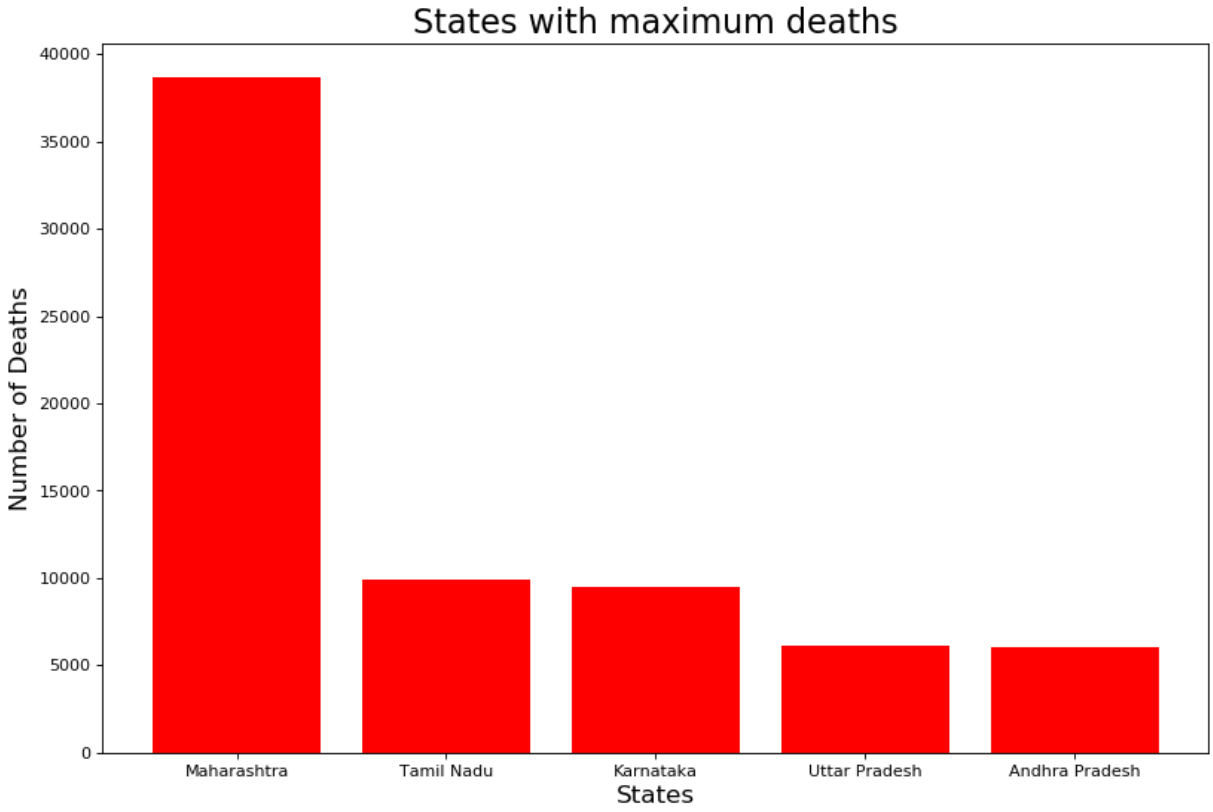


Graph No. 3: State wise Confirm cases analysis.

On inspecting the above graph no: 3, visualization, we see that Maharashtra has the most number of inspected cases as of now. Maharashtra is almost crossed 14, 50,000 cases and may well have crossed that figure by the time. The situation in Maharashtra is so grave that no other state in India has crossed even half that mark as per the data we have. Andhra Pradesh and Karnataka are about to above the 6, 50,000 mark whereas Tamil Nadu have just over 6, 30,000 cases and Uttar Pradesh is almost touching 4, 50,000 cases.

II) Death Cases:

As per the data in the dataset, India has had 104555 deaths across all states. We will now see which states have the most deaths.

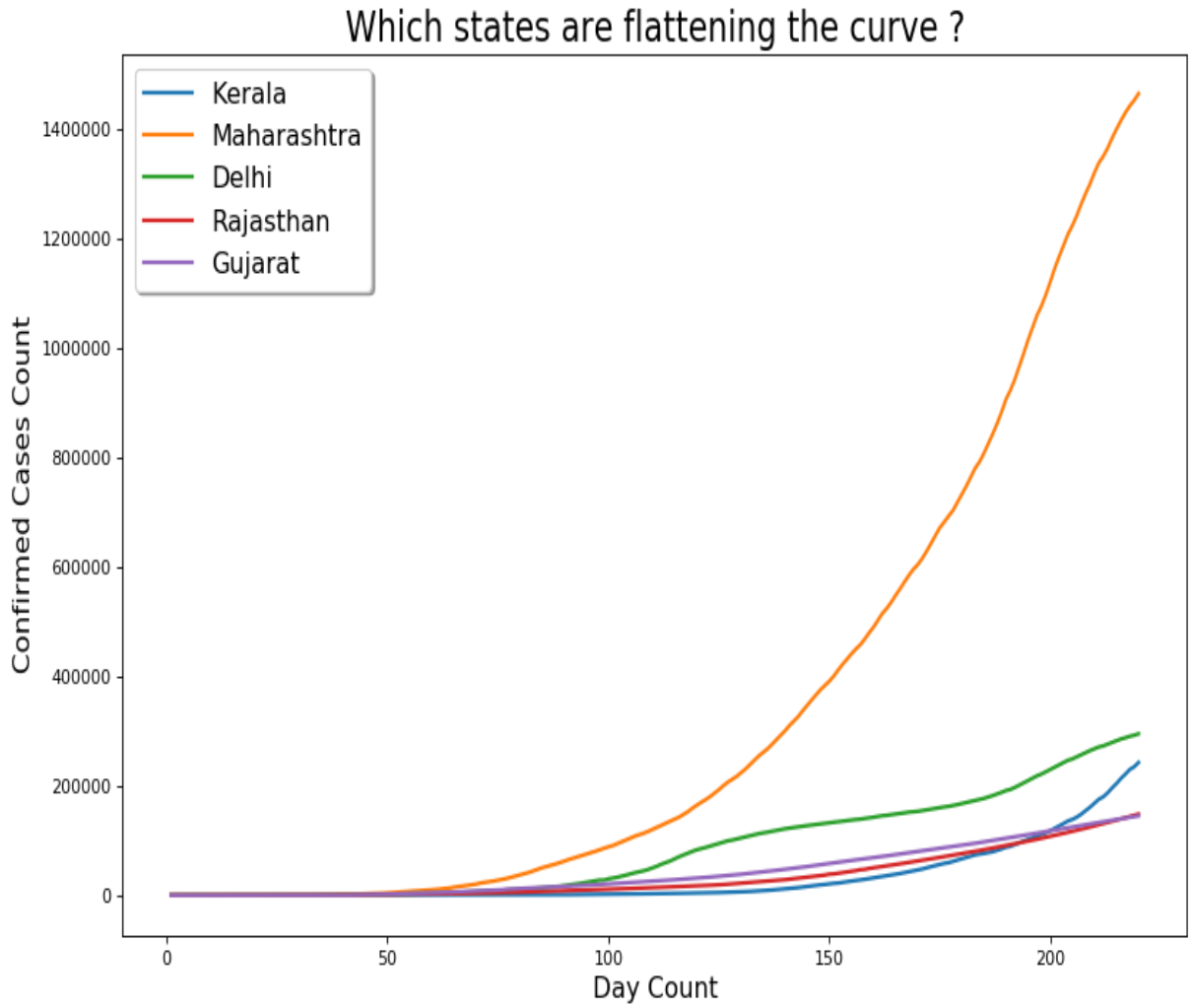


Graph No. 4: State wise deaths cases analysis.

From above graph no: 4, we can analyzed that Maharashtra currently account for almost half of the deaths in India due to COVID-19.Maharashtra having above 37,000 death cases. Second placed Tamil Nadu and Karnataka have not reached the halfway mark here as well. Tamil Nadu and Karnataka having almost 10,000 death cases. Uttar Pradesh and Andhra Pradesh are having almost 6,000 death cases in India.

In the next analysis, I prepare and process the dataset to group the data in terms of different states. I used the following five states for this next analysis:

- Maharashtra
- Kerala
- Delhi
- Rajasthan
- Gujarat

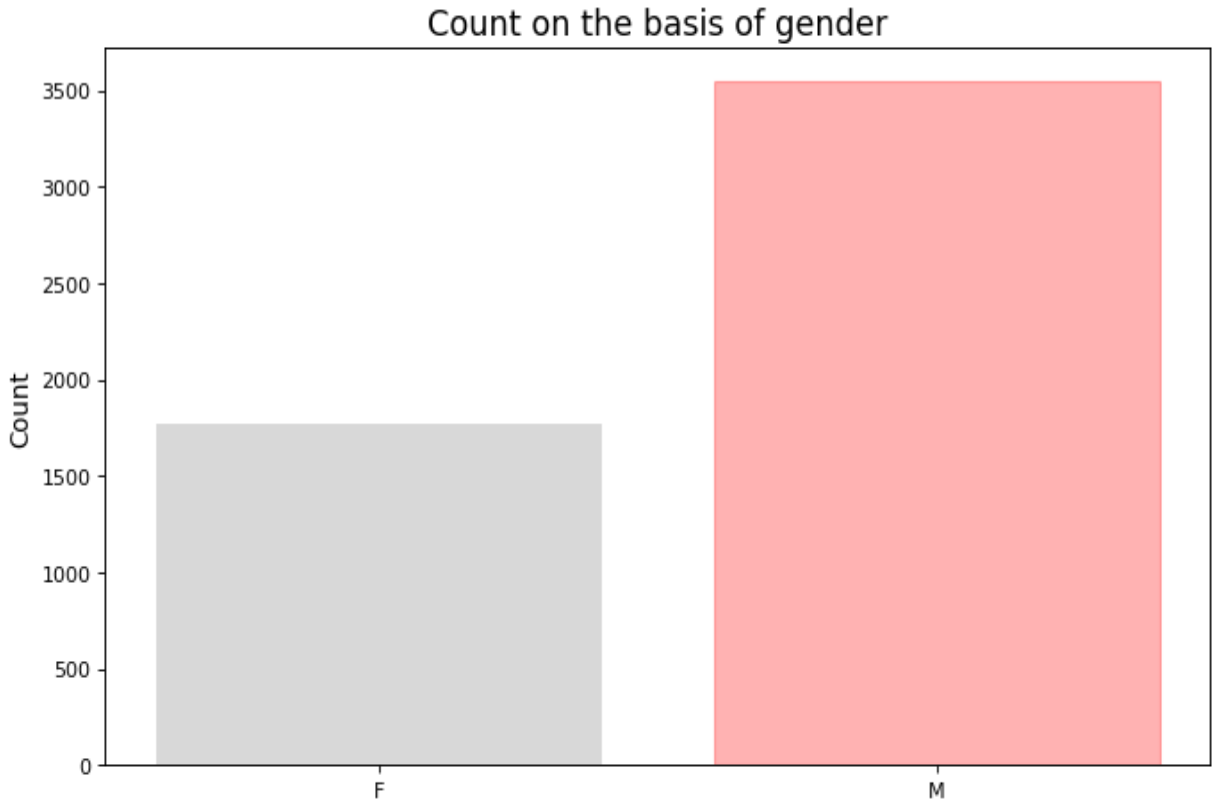


Graph No. 5: State wise confirmed cases count.

We see from graph no: 5, almost all the curves follow the curve which is displayed by the nation as a whole. The only anomaly is that of Kerala. Kerala's curve saw the gradual incline in the period between 20–115 days as seen in other curves. But what Kerala managed to do was it did not let the curve incline further and manage to flatten the curve. As a result, the state has been able to contain the situation.

The situation in Maharashtra looks very grave indeed. The curve has had an immense steep incline and shows no signs of slowing down. Delhi's curve steeped at a later time interval compared to the rest. It remained in control till the 30-day mark and the steep worsened after 40 days.

In this research I found that there are some states like Gujarat, Maharashtra and Punjab where the number of cases and deaths are pretty low as of now and it appears things are in control. But other states like Ladakh, Haryana, and Tripura look well hit by the condition, [6].



Graph No.6: Gender wise cases count.

Continuing our analysis, I thought about looking at how the case count is distributed according to gender. We see that there is no parity in this distribution. From above graph no: 6, it seems that the virus is affecting males more than females in India, because women tend to have stronger immune systems than men.

8. Recommendation & Conclusion :

The only way we can as a whole prevent this impending crisis is by flattening the curve. All state governments need to follow the Kerala model. It is the only state which managed to flatten the curve and hence, must have done most things right. It's time we followed the Kerala model. The main aim of the Central Government of India is to prevent further spread of the COVID-19 through promotion of respiratory hygiene. The trend analysis shows rapid growth in the infected cases, and prediction study shows great rise in the expected active, recovered, and death cases in India. However, lockdowns and containment policies may affect the prediction results. The adopted models have performed well but it limits our study to the effectiveness of the models, which can be further improved using ensemble of multiple prediction models. The obtained forecasting results further can be improved by taking various variables into account like population density, weather, health system, patient history etc. using deep learning techniques, and artificial intelligence.

In this research I found one important activity which track the record of COVID-19 Cases is testing, because that identifying those who are infectious, that being able to provide them supportive isolation, tracking and contact tracing, and quarantining all the contacts, making sure that people continue to comply with the physical distancing, with wearing a mask with avoiding crowded places, avoiding closed settings, where there are a lot of people, washing hands, respiratory etiquette, staying home if you're sick. All of these things together definitely make a difference in bringing down transmission.

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10. Author's Affiliation:

Moh Majeed Yakub Shaikh[1]

MBA (Business Analytics) Pursuing (2019-2021)

BE (Computer Engineering) (2015-2019)

Email ID: mshaikh.ms900@gmail.com

Sinhgad Institute of Management, Pune-

Jadhav[2], Assistant Professor

(2019MCA, MBA (IT & Production), Ph.D. (Pursuing)

Subject Taught: Data Science, Big Data Analytic, ADBMS, DW& DM,

Email ID: rameshdjadhav@gmail.com,

Dr. Bharti P Jagdale[3], Associate Professor

PhD. (Computer management), M.Phil. (Information Technology Management), MMS/MBA (HR) (Mumbai University) MCM (Pune University), MCA.

Email ID: bhartijagdale@sinhgad.edu

Sinhgad Institute of Management, Pune – 411041.

Mr. Deven Sanjay Patil[4], **MR. Ramesh D**

MBA (Business Analytics) Pursuing 2021)

Email ID: patildeven28@gmail.com

Sinhgad Institute of Management, Pune - 411041.

ramesh.jadhav@sinhgad.edu
Sinhgad Institute of Management, Pune - 411041.

Dr.Chandrani Singh ,Director –MCA,SIOM

Sentiments Analysis of The Medical or Pharmacy Shops Business To Develop in Terms of Communication, Productivity & Efficiency in Their Retails Business

Mr. Ramesh D Jadhav[1]

Research Scholar, AIMS, Pune-01, India

Dr. Manik S Kadam[2]

Research Guide, AIMS, Pune-01, India.

Abstract:

Blog Survey data collected from the internet sources over the World Wide Web, blogs refer to record individual's opinions, feelings, stories, and different works. The researcher has selected 222 blogs to study different views and opinions of experts, researcher, and pharmacy retailers, patients, customers, doctors, and pharmaceutical company, Food & drugs administration (FDA) regarding the on pharmacy shop business performance concerning communication, productivity and efficiency blogs discussed personal feeling, thoughts, opinion and different works like the photo, videos. To analyze blogs survey text- mining tool is used. Text mining is a logical field which derived high-quality information from text. Text mining is widely used in the industries when data is unstructured. Derived information can provide in the form of numbers (indices) categories or clusters, summary of the text. In this blog will focus on the application of text mining workflow and examples.

Purpose: This research paper expresses the view of blog expert and sharing their opinions about medical shops business-related positive or negative comments for business improvement.

Methodology: The research paper study based on secondary data like blogs, articles & view about pharmacy retail business experts.

Results: In this information, it really about that medical or pharmacy shops business-related facts and how business can be handled & get better with the help of new technology concept and now its requirements.

Originality: This research paper sharing sentiment analysis of medical or pharmacy shops. Business-related comments. And that comments necessitate applying in the medical shops business to enhance the communication, productivity & efficiency in their place.

Keyword: Sentiment analysis, communication, productivity & efficiency, medical shops & retail business, FDA.

1. The Workflow of text Analysis:

Data collection: Unstructured information from blogs, social media, websites, and user comments,

Process Documents and filtering: this step involves the extraction of a word, parts of speech tagging, word filtering (removing preposition, numbers, and punctuation) synonyms, tokenization, and stemming. Removing irrelevant terms, building stop word dictionary and removing stop words.

Text Analysis: text analyzer offers different text analysis possibilities. The count of words tokens, clauses and syllabus

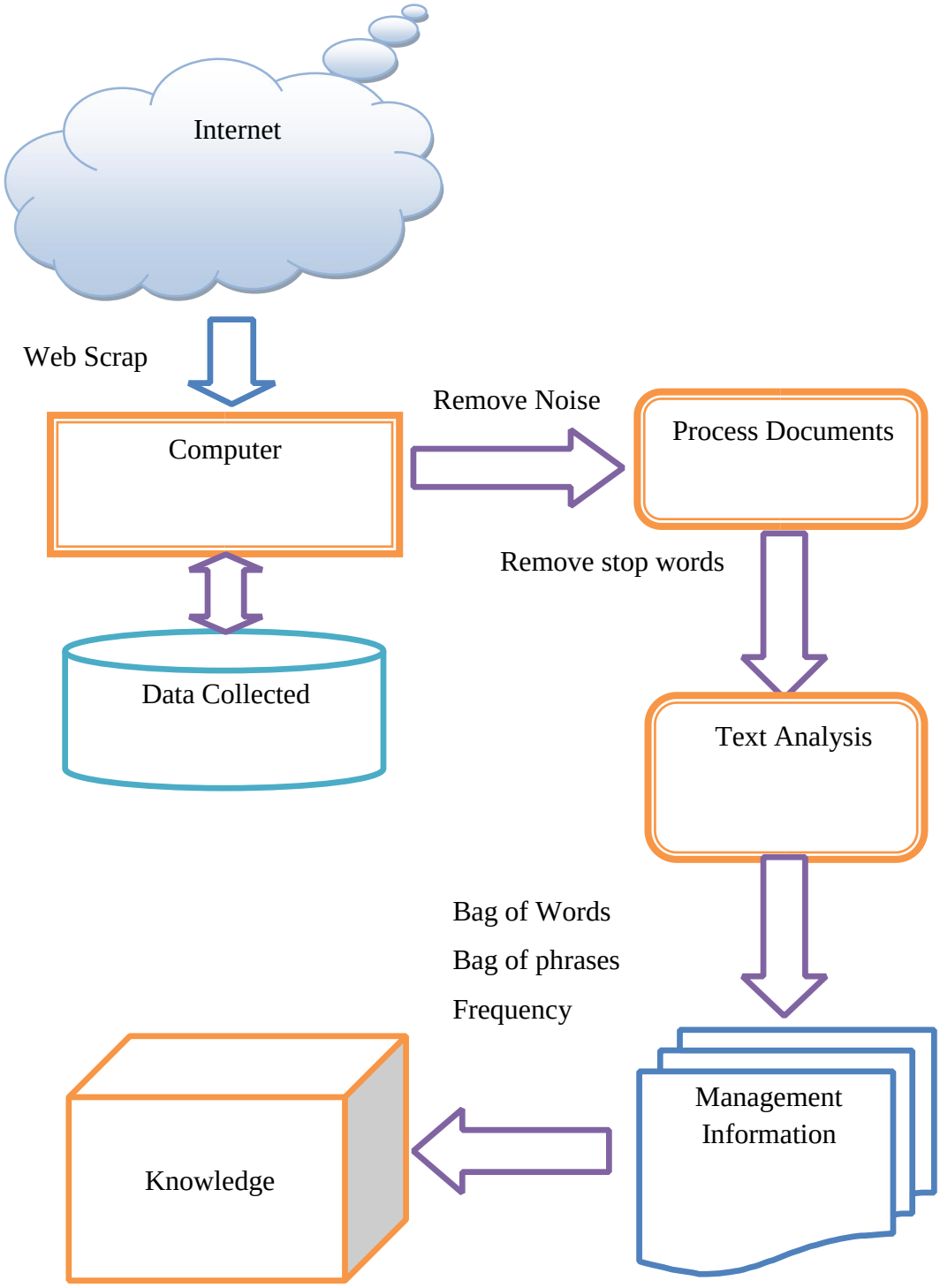
For this analysis researcher has:

Total word count :	(34,947) 19,858
Number of different words :	4585
Complexity factor (Lexical Density) :	23.1%
Readability (Gunning-Fog Index) : (6-easy 20-hard)	10.1
Total number of characters :	176364
Number of characters without spaces :	144608
Average Syllables per Word :	2.42
Sentence count :	2596
Average sentence length (words) :	9.08
Max sentence length (words) :	105
Min sentence length (words) :	1
Readability (Alternative) beta : (100-easy 20-hard, optimal 60-70)	69

Table no. 1: The count of words tokens, clauses and syllabus

We see the result of the analysis using textalyser default option (Minimum characters per word =3, Number of words to be analyzed =20, apply stop list = English). The output gives us immediately the lexicometric measurements[5, 6, 7, 8].

2. Block Diagram of Text Mining:



Source: Researcher Contributions.

Fig. no. 1 Block Diagram of Text Mining

3. Frequency and Top Word:

Word	Occurrences	Frequency	Rank
Pharmacy	1228	6.3%	1

Drugs	905	4.6%	2
Patients	483	2.4%	3
Health	358	1.8%	4
Technology	277	1.5%	5
Retail	220	1.2%	6
Data	219	1.2%	6
Generic	216	1.2%	6
Online	169	0.9%	7
Doctor	165	0.9%	7
Productivity	157	0.9%	7
Profits	115	0.6%	8
Staff	86	0.4%	9
Performance	82	0.4%	9
Insights	79	0.4%	9
Analysis	76	0.4%	9
Research	75	04%	9
Communication	64	0.3%	10

Table no. 2: Frequency and top word.

The above table indicated frequency and top words. Top words are those who used frequently. From the above words, can say that technology application used in pharmacy retail business to manage all business activity like drugs inventory status, Drug consumer status, doctor's recommendation fact, patient's details, and data analysis to check patient's health and also retail business performance can be enhanced through measure the productivity in sales, staff, inventory, cost-effective generic drugs, and technology application tool used to maintain healthcare. Effective communication by pharmacists is essential to improve the use of medications by patients, and

ensure optimal therapeutic outcomes—moreover, communication, appropriately written recommendations to the physician to determine drug analysis and treatment[9, 10, 11, 12].

4. 2-Word phrase Frequency:

Expression	Prominence
Digital healthcare	80.7
Service offering	80.9
Customer service	80.9
Largest consumer	81.8
Consumer antibiotics	81.8
Opportunities generic	82.2
Healthcare data	84.2
Pharmacy supplies	85.6
Pharmacy value	86.6
Technology solutions	86.7
Drug data	87.4
Clinical data	87.4
Improve patients	87.5
Pharmacy news	87.9
Pharmacy performance	88.1
Improving efficiency	88.3
Real data	88.5

Data available	88.9
Health data	89.0
Technology improve	89.3
Drugs sales	89.5
Analyze data	90.0
Government agencies	90.8
Digital tools	91.3
Digital pharmacy	91.7
Digital prescription	91.9
Data standardized	92.1
Pharmaceutical service	95.0
Pharmaceutical healthcare	96.0
Supply pharmacy	96.2
Research pharmaceutical	96.3
Improve sales	96.7
Improve productivity	96.8
Data driven	96.8
Drug discovery	98.0
Latest trends	98.2
Pharmacy times	98.4

Table no.3: 2-Word phrase Frequency

From the above 2-word phrases frequency table, the prominence of expressions is more for the expression like pharmacy business times taking the help of latest trend technology for business improvement concerning productivity measurement in the sale, Drug monitoring, patients data, analysis data of patients, customer consumption, medicine service, medicine supply details, measure pharmacy retail sales also improve the pharmacy business productivity and efficiency in their business with the help of new analysis, Digital tools, Digital prescription and continues to develop new business[13, 14, 15, 16.].

5. 3-Word phrase Frequency:

Expression	Prominence
Pharmacy retail system	81.1
Fastest growing segment	82.3
Retail pharmacy India	82.5
Improve patient care	82.6
Technology improves patient	82.7
Changing patients needs	83.9
Largest consumer antibiotics	84.2
Science based pharmacy	85.5
Generic pharmacy pills	86.9
Large number Drugs	87.1
Online affordable pharmacy	88.2
Cost effective Drugs	88.3
The pharmacy data	89.6
Medicine pharmacy planet	89.8
Related apps available	89.2
Healthcare related apps	89.2
Electronic healthcare records	90.4

Digital medicines pharmacy	91.7
Drugs data databases	91.8
Technology can be	92.1
Improve pharmacy efficiency	92.7
Improve efficiency sales	92.8
Analytics key operating	92.9
Data analytics key	93.1
Medicines development services	93.5
Research pharmaceutical services	96.2
Supply pharmaceutical manufacturing	96.2
Daily news pharmaceutical	96.3

Table no.4: 3-Word phrase Frequency

From above the 3-word phrases frequency table, the prominence of expressions is more for the expressions for pharmacy management system application are using by pharmacy retailer in business to control all daily activity of pharmacy business Technology can improve efficiency sales and Improve pharmacy efficiency. Drug data database maintained that data analytics key operating, Data analytics key-based pharmacy business and it will find related the business statistics and sale situations[17, 18, 19, 20] .

6. 4-Word phrase Frequency:

Expression	Prominence
Speed up the pharmacy	80.1
Speed pharmacy retail store	80.4
Online pharmacy retail store	80.6
Average profit medical stores	80.9
Needs top latest technology	82.8

Pharmacy needs top latest	82.9
Technology can be used	83.6
Technology improves patient care	84.9
Growing alarm surrounding antibiotic	85.7
High quality generic medicines	86.3
Data analytics key operating	90.2
Ways improve pharmacy efficiency	90.5
Digital prescription pharmacy companies	91.9
Contract research pharmaceutical services	96.4
Hospital healthcare pharmacy system	96.4

Table no. 5: 4-Word phrase Frequency

From the above 4-word phrase frequency table, the prominence of a word like Speed up the pharmacy needs top latest technology. & technology improves patient care, Affordable best medicine retail, Pharmacists push generic drugs, Improve productivity community pharmacy, Improve efficiency sales team; technology can be used for Data analytics key operating, Implement programs increase the percentage. Moreover, it will help the medical shops retail business to increase productivity and efficiency [21, 22 23, 24].

7. 5-Word phrase Frequency:

Expression	Prominence
Push generic drugs max profit	80.9
Pharmaceuticals market expert forecasts analysis	81.1
Growing pharmaceuticals market expert forecasts	81.2
Analytics key operating successful pharmacy	82.6
Affordable best medicine retail stores	85.9
Speed up the pharmacy retail	86.8

Store India retail provides prescription	86.9
Online pharmacy retail store India	87.8
Needs top latest technology competitive	90.2
Pharmacy needs top latest technology	90.2
Market pharmacy needs top latest	90.3
Improve patient care with healthcare	90.3

Table no. 6: 5-Word phrase Frequency

From these above frequency statistics, we can see that technology improve patient care with, Pharmacy needs top latest technology, Affordable best medicine retail stores. Tips improve productivity community pharmacy; Best medicine retail stores sell, Push generic drugs max profit, Analytics key operating successful pharmacy, Data analytics key operating successful, Pharmaceuticals market expert forecasts analysis, Tips improve productivity community pharmacy, Ways boost med reps productivity [25, 26, 27, 28] .

8. Sentiment Analysis:

Studies the personal information in an expression, that is, the opinions, appraisals, emotions, or attitudes towards a topic, person or entity. Expressions can classify as positive & negative.

Catch line	**Positive or Negative**
Drugs sales	Positive
Analyze data	Positive
Data driven	Positive
Improve sales	Positive
Improve productivity	Positive
Improving efficiency	Positive
Opportunities generic	Positive
Healthcare data	Positive
Electronic healthcare records	Positive

Data analytic key	Positive
Fastest growing segment	Positive
Technology improve patient care	Positive
Improve productivity community pharmacy	Positive
Analytics key operating successful pharmacy	Positive
Pharmacy needs top latest technology	Positive

Table no. 7: Sentiment Analysis

The researcher has used text mining analysis to understand the thought, opinions and suggestions from the expert related to the impact of pharmacy business management system with concerning of their performance in term of productivity, efficiency and communication, by selecting some blogs from an internet source. The blog considered as opinions. Thought or suggestions of experts which can be feeling. So based on text analysis researcher concludes that pharmacy shop and its business application is useful for the retailer as well as wholesaler. Also, it can see from the text analysis that pharmacy management system plays a significant role in the pharmacy business. So pharmacy business and its impact of various software applications in medical shop business have a positive impact on pharmacy business [28 to 43].

Also, blog expert strongly suggested to the retail business they can adopt the latest technology and need to analyze business data which is helping to an organization to understand what will need to take actions for business improvement, business tracking, business monitoring and control, & business sustainability plan for future growth.

9. Objective:

To study of the blog expert's opinion about retails medical or pharmacy business shops associated implication for growth.

10. Finding:

It observed from text analysis expert powerfully recommended to the retail business they can implement new equipment, and analyze business data, or use data analytics key to understand business tracking and necessities for business developments.

11. Conclusion:

The researcher has used text mining analysis to understand the thought, opinions and suggestions from the expert related to the impact of pharmacy business management system with concerning of their performance in term of productivity, efficiency and communication, by selecting some blogs from an internet source. The blog considered as opinions. Thought or suggestions of experts which can be feeling. So based on text analysis researcher concludes that pharmacy shop and its business application is useful for the retailer as well as wholesaler. Also, it can see from the text analysis that pharmacy management system plays a significant role in the pharmacy business & found a significant result. So pharmacy business and its impact of various software applications in medical shops business have a positive impact on medical or pharmacy shops business.

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Author's Affiliation:

Prof. Ramesh D Jadhav[1], MCA, MBA (IT & Production), Ph.D. (Pursuing)

Guide for MCA understudies for making learning situations for the subject "Database Management system, Advance DBMS and Big Data Analytical, Data Sciences ". Sharing and moving his 12+ long periods of IT industry experience for the improvement of the understudy network. He has published the book and the analyst research paper in the universal meeting, UGC care listed Journals also Scopus.

Dr Manik Kadam[2], MSc, MBA, M.Phil, Ph.D.

He is an exploration guide of Savitribai Phule Pune University for Computer Management the executives' discipline. He had served as a Head of Department and Director in the Management Institutes affiliated to Savitribai Phule Pune University. He is currently working as a Professor at Allana Institute of Management Science since last 7 more years. He has more than 15 years of experiences of various universities and institutions like Bharati Vidyapeeth's College of Engineering, JSPM, Pune. As a research guide, eight research scholars have completed a PhD under his guidance from Savitribai Phule Pune University. More than 25 Research Papers published in National and International Journals.

Dr.Chandrani Singh ,Director –MCA,SIOM

Cloud Computing: An Analysis of Authentication Methods Over Internet

Information and Communication Technology for Competitive Strategies (ICTCS 2020) pp 765-773 | Cite as

- Ankush Kudale (1) View author's OrcID profile (View OrcID profile)
- S. Hemalatha (1) View author's OrcID profile (View OrcID profile)

1. Karpagam Academy of Higher Education, , Coimbatore, India

Conference paper
First Online: 06 July 2021

Part of the Lecture Notes in Networks and Systems book series (LNNS, volume 190)

Abstract

Technology is upgrading day by day, today a common man cannot survive without internet. Most of the services offered over the internet and so managing personal credentials are very difficult for the common people. Most of the organizations using cloud computing platform not only using for their IT environment and related offered services but also for consumer services. It means that soon all the IT-enabled services will be offered via cloud computing platform. There are issues in cloud computing security out of it authentication and access control is one of the key issues. The current research is to find out the best alternatives or provide the solution for authentication and access control. In this research paper, a survey approach is used to study various authentication methods widely used in the industry.

Keywords

Authentication Access control Cloud services

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Copyright information

About this paper

Cite this paper as:

Kudale A., Hemalatha S. (2021) Cloud Computing: An Analysis of Authentication Methods Over Internet. In: Kaiser M.S., Xie J., Rathore V.S. (eds) Information and Communication Technology for Competitive Strategies (ICTCS 2020). Lecture Notes in Networks and Systems, vol 190. Springer, Singapore. https://doi.org/10.1007/978-981-16-0882-7_68

- First Online 06 July 2021
- DOI https://doi.org/10.1007/978-981-16-0882-7_68
- Publisher Name Springer, Singapore
- Print ISBN 978-981-16-0881-0
- Online ISBN 978-981-16-0882-7
- eBook Packages Intelligent Technologies and Robotics Intelligent Technologies and Robotics (R0)

- Reprints and Permissions

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Dr.Chandrani Singh ,Director –MCA,SIOM

ISSN: 0474-9030

Our Heritage

Vol-78-Issue-15

January-2020

UGC Care Listed Journal

A Study on HR Analytics and Quality of Work Life of Employees in Micro, Small, and Medium Enterprises (MSME)

Prof. (Dr.) Manisha Kumbhar*, Prof. Kavita Divekar**

**Professor, Sinhgad Institute of Business Management, Pune*

*** Research Scholar, Sinhgad Institute of Business Management, Pune*

Abstract:

MSME (Micro Small Medium Enterprises) plays a vital role in the economic growth, especially in developing country. MSMEs contribute towards the economic development of any country through its earnings as well as generating employment. MSME are considered as the pillars of our growing economy since it employs people who possess technical skills irrespective of their qualification. Hence it is important task of MSME to attract and retain the talented employees. Providing better quality of work life is a mean by which organization can achieve employee satisfaction and minimize labour turnover and enhance productivity. Human Resource analytics (HR Analytics) is branch of analytics which assist the management to enhance the performance of employees as well as minimize labour turnover. This paper emphasize on the significance of HR policies as well as HR strategies in MSME. Literature review was done systematically to examine the various dimensions of HR Analytics and its impact on quality of work life.

Keywords: *Quality of work life (QWL), Human Resource analytics (HR Analytics), Micro, Small and Medium Enterprises (MSME).*

Introduction

As per the 2018-19 report generated by Ministry of Micro, small and medium enterprises, MSME sector acts as the pillars of the economy of developing nations like India. In Indian economy, MSME contributed 45% of India's Total Industrial Employment. Not only in employment generation, but also 50% of the total exports is borne by the MSME. MSME occupy the major portion of 95% of the industrial units in the country. On the other side they manufacture more than 6000 types of product and try to compete with corporates as well as MNC. The growth of this sector flourishes the economy and contributes 6.11% of GDP. These were familiarly coined as Small-Scale Industries (SSI)[i].

In this era of Industry 4.0, there is a dramatic change in the roles and responsibilities. Earlier employees used to perform few common jobs but now they have to handle multitask. Hence employees cannot balance both work and family life. Employees try to balance their life in various roles, if any disparity leads to strain, pressure and discord and hamper the smooth functioning of the organization as well as productivity. Hence organizations are concentrating on the HR policies for their employees to keep the environment to balance their work life[ii].

It is believed that only wages or salary is the most important parameter to rate employee conditions. But nowadays the total Quality of Work Life along with wages and salaries are prominent factors for rating employment conditions. Effective management is to ensure the better quality of work life prevail in the organization. Organizations should focus on the total living conditions of the working class rather than the working climate provided within the unit. Employee does not lead on the job work life only. In fact, off the job life is equally important[iii].

ISSN: 0474-9030

Our Heritage

Vol-78-Issue-15

January-2020

UGC Care Listed Journal

HR analytics is the blend of HR functions using the strategic tools and analytical data in the areas of HRM to enhance the performance of the employees as well as overall business.

HR analytics derive meaningful insights from the work history data of the employees. Example the major hurdle of every organization is the attrition. Hence many organizations lose the best performers due to various reasons.

HR analytics paves the platform to the labour attrition at early stage when employee is looking for job change before it is late.[iv].

HR analytics not only collect data about employees performing work, in, but also to provide better insight into each of the human resource processes, gathering related data and then using this data to make informed decisions on how to improve these processes [v].

The power of HR Analytics and Data Analytics is channelizing the companies "intuitions" for making decisions. The decisions have become more promising and accurate with the use of these practices. Hence the organizations are investing huge money into talent management software as well as a brigade of experts such as data scientist, statistician and analysts.

1.1 Quality of work life and HR analytics

The productivity as well as performance are affected by the incorrect hiring decisions and can lead to disaster in any organization. Organization has to shed their money even if they hire one wrong people also. The mismatch of required skill sets pertaining to Job description and recruitment will lead to repeat the recruitment process again. HR Analytics is tool to support the HR team to eliminate the mistake of hiring wrong employees for the post.

Training plays a significant role to improve one's efficiency. Wrong training can cost very earnestly to the organization in terms of time as well as money. HR Analytics provides precise data on training needs and the patterns to render the need based training to improve skill sets. The biggest challenge of any organization is retention. Employee attrition can be easily captured with the help of HR Analytics. It articulates what is the reason people leave organization, whether it is for better growth opportunity, better salary, working environment or job mismatch. From the historic data the relevant is put forth before the management for taking relevant decision to retain the performers. Example, Employee Satisfaction Survey, Employee Opinion Survey, and Exit interviews etc., these statistics help management in retaining the best talent. Identify top performers, with the help of huge data stacked in HR department, and this leads to better decision making in terms of promotion, increment, job role change etc. Measure employee Satisfaction at Job: HR analytics provide insights such as how employees feel happy about their work place and what can keep them more engaged.

Absenteeism is another milestone for the organization. HR analytics provide solutions as to why employee remain absent to duty by analyzing his / her past record of absenteeism. It will give you the analysis of reason for remaining absent and helps the organization to come out with better engagement plans.

ISSN: 0474-9030

Our Heritage

Vol-78-Issue-15

January-2020

UGC Care Listed Journal

1.2 Benefits of HR Analytics

1. LITERATURE REVIEW

Several researches have been conducted on Quality of work life, but a few studies are in the MSME sector.

Hosseini and Jorjatki (2010), in his study specified that career satisfaction, career achievement and career balance are not only the important variables to accomplish good quality of work life. But quality of work life (QWL) or the quality of work system as one of the most interesting methods to motivate the employees as well enhance job enrichment. QWF has its roots in staff and managers' attitude to motivation category that is more attention to fair pay, growth opportunities and continuing promotion improves staff's performance which in turn increases QWL of social insurance employees in Tehran.[1]

Muftah (2011) mentioned that QWL was one of the vital areas of human resource management which is capturing the attention of the researchers. This is based on dynamic shift of treating employee as Human Capital or as Human Assets instead of "Human Resources" and costs.[2]

Stephen, A. (2012) in his study regarding perception of employers and employees on QWL variables, exposed ten important QWL factors in SSI. These are social support, interpersonal relationship, Recognition, autonomy, working environment, relationship with boss, working hours, governance by rule of law, role clarity and fringe benefits. [2]

Ahmad (2013) stated that the essential pillar of QWL was to establish a smooth work environment so that employee can work cooperatively with each other as well as achieve organizational objectives.[3]

Molefe (2013) very well told that HR analytics field will grow in the organization so that efficiency and productivity can be enhanced. The main purpose of HR analytics is to gain competitive advantage in the Industry. It is the peak time for HR managers to start focusing on business outcomes and must focus to improve employee engagement score or increase participation rates on their initiatives.[4]

Narehan Hassan et al. (2014) found that quality of work life programs influences quality of life (QOL) of employees in organization. The most influence factor on QWL, were work environment followed by job facets. Others were emotional wellbeing, personal development, social inclusion and interpersonal relations.[6]

HR Analytics literature has reviewed in this section and status of HR Analytics checked in context of organization performance. The literature depicts that HR Analytics has mixed impact or reaction to the organizational performance. This has been elaborated in this section of the paper. Current business analytics field are identified that are the issues of machine learning, data mining, social media and cloud which was found by Jalali and Park (2017).[4]

In today's era the purpose of using analytics in companies is to hold itself accountable for the various things which are associated with its staff as they know happier and healthier employees create better-satisfied guests. Also, if they want to perform better and expects better performance from their top management which is their greatest asset and largest expense. They probably do well to favor analytics over their gut instincts. This is also stated by Muscula and Serban (2017).[4]

2. CONCLUSION

With its deep insights and accurate predictions, big data analytics became the new force in contemporary HR management. However, it is a fact that organizations using data analytics take more valuable decisions to benefit themselves, maximizing profits ensuring long term success. From the literature survey, following 9 important components of quality of work life were considered for the literature review.

ISSN: 0474-9030

Our Heritage

Vol-78-Issue-15

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ISSN: 0474-9030

Our Heritage

Vol-78-Issue-15

January-2020

UGC Care Listed Journal

"Analysis and implementation of Big Data Analytics for social media marketing"
-From 'Big Data' to 'Big Impact'

Ms.Priyanka Sakat[1] ,Dr.Manisha Kumbhar[2]

MCM, MCA [1] , MCA,MBA,PHD[2]

Abstract:

With the advent and increased use of the internet, social media has become an integral part of people's daily routine. Social media is not only used to connect with others, but it has become an effective platform for businesses to reach their target audience. With the emergence of big data, social media marketing has reached an altogether new level. It is estimated that by 2020 the accumulated volume of big data will reach 44 trillion gigabytes. With such an enormous amount of data available, marketers are able to utilize it to get actionable insights for framing efficient social media marketing strategies. The use of big data in social media has many aspects when it comes to marketing. A review of the recent works is presented to obtain a broad perspective of the social media marketing using big data analytics. The objective of this paper is to study current and future applications of big data analytics on social media marketing, and to examine the impact it has created.

Key Words: *Big data analytics, social media data, social media marketing, Personalization, Specified Demographics, Digital media etc.*

Introduction:

The success of any business is how well you understand the customers. Monitoring customer's online behaviour is therefore becoming key for the success. Businesses are investing in gathering such analytics using big data.Big data analytics has recently emerged as an important research area due to the popularity of the Internet and the advent of the Web technologies. Social media corporations find big data useful for analysing markets and predicting client behaviour. In 2012, Jay Parikh, engineering VP at Facebook, disclosed that Facebook handles over five hundred terabytes of knowledge a day, three hundred million photos daily, 2.6 billion 'Likes' and a couple of 5 billion content uploads.Supported communication techniques and accessible to any or all, the media promote social interaction through the internet. Several social networks exist and there are a unit over 900 social media sites on the market on the net. Variant of fifty eight million tweets per day. Massive information is that the edging of the flexibility of an enterprise in term of storing, process and accessing all the information it desires for the effective functioning, and to create choices cut back risks, and conjointly to serve the various customers among on additionally economical time. Social media analytics are the synthesis of the behaviour of internet users. The availability of data on consumers' web browsing, online shopping behaviour, customers' feedback and marketing research on social networks allow organisations to gain timely and extensive insights into consumers. Therefore, organisations can focus their market intelligence strategies based on different objectives such as advertising and product launches; publicity and brand management; promoting customer loyalty; providing personalised services to customers; keeping a tab on market trends and competitors; minimising risk; saving cost and business expansion in general.

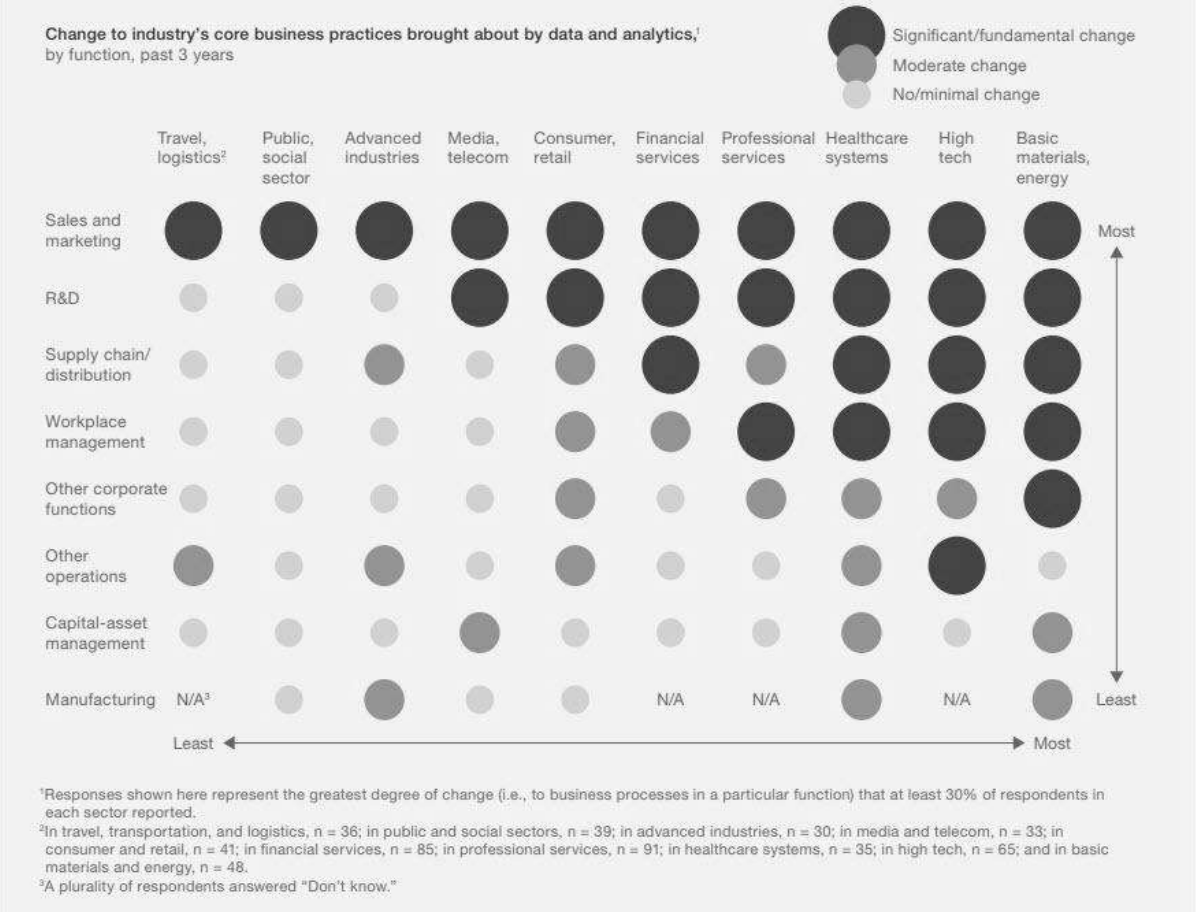
Big Data Analytics on Social Media

Big data available on social platforms and the development of the social media marketing scene can help us better understand how smart technology might change our lives in the near future.If there is one thing that social media companies specialize in, it's data. And this they have a lot of it, thanks to their tendency to get users to share information about each waking minute. The large body of data at the disposal of social media companies mirrors how people interact with each other, and at the heart of these interactions lies invaluable information about what individuals and societies hold important. This

volume of data, together with the fast rate of data flow for which social media is well known for, represent the essence of big data.

By applying analytics to social media data, big data applications in different industries go beyond the mechanics of interaction to seeing how the content contained in the interactions will affect business performance and people's view of a brand. Content analytics allows companies to zero in on actionable information from the messages that users post. For instance, analytics tools can be programmed to track negative or positive sentiment about a brand as this could threaten reputation and revenue.

Nearly 50% of respondents to a recent McKinsey Analytics survey say analytics and Big Data have fundamentally changed business practices in their sales and marketing functions. Also, more than 30% say the same about R&D across industries, with respondents in High Tech and Basic Materials & Energy report the greatest number of functions being transformed by analytics and Big Data. Source: Analytics Comes of Age, published in January 2018 (PDF, 100 pp., no opt-in).



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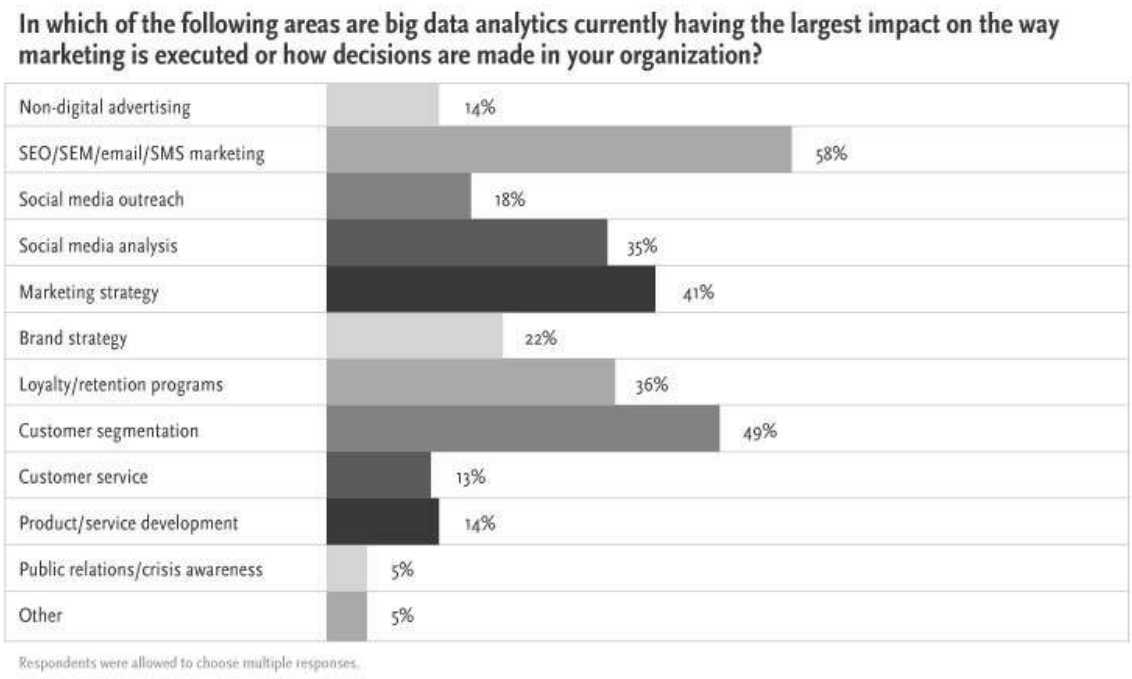
Many businesses appreciate the powerful nature of social media for personal-level interaction with their customers. Through social media analytics tools, businesses will build data-driven choices. Moreover, social media analytics tools mean that companies will look on extreme side the conversation contain in unstructured information to seek out purposeful data that will guide choices and action. Through analysis of applied mathematics information like impressions per post, audience distribution, interactions on mobile versus desktop, responses, click-through rates for URLs embeds, and

transactional history, an businesses will live the effectiveness of its social media strategy for promoting complete recognition and loyalty.

Impact of Big Data on Social Media Marketing

In today's era, Social Media Marketing through email, mobile, search engines and other Internet-connected electronic devices has become conventional. The quantity and imminence of the data generated from these marketing channels can provide insights to help marketers' better target audiences, shape offers and marketing content, and make rapid adjustments to marketing campaigns. Indeed 58 percent of survey respondents said it is in those areas of digital marketing — search engine optimization (SEO) and marketing, email marketing and mobile — where big data is having the largest impact on their marketing programs today.Other areas where data and analytics are having a significant impact on marketing include customer segmentation, marketing strategy, and loyalty and retention programs.



Source:https://www.spencerstuart.com/research-and-insight/big-data-and-the-cmo-whats-changing-for-marketing-leadership-cmo-summit-survey-results

All the status updates, photos and videos posted by users on their social network contain useful information about their demographics, likes, dislikes, etc. Businesses are utilizing this information in numerous ways, managing and analysing it to get a competitive edge. Marketers to plan for future social media campaigns by learning everything they need to know about their potential customers and approaching them use big data. Following are the applications of big data on social media marketing.

Personalization

Big data enables personalization-allowing brands to approach their customers in a more personalized way based on their choices and likes. It gives in-depth insights and a complete understanding of the customers, which aids businesses in creating communication for them to enhance retention and uplift their trust.With big data, it will become easier for brands to display only those advertisements, which interest consumers, turning ads into a non-obtrusive experience. Advertisements will be targeted based on users' social media posts, what they watch and share, etc. With personalized ads, it will be possible for marketers to strengthen their relationships with social media users and convert them into customers after identifying the most effective platform, time and format for their ads.

Decision making

Big data allows marketers to identify social media trends and gain insights, which can be used to make engagement decisions like which users to communicate with, which group of users should receive marketing emails, etc. It also makes it easier to keep track of the demographics to decide which social media platform to target.Businesses can easily understand the sentiments of the market through big data, enabling them to build winning strategies. Instead of relying solely on past performance to ascertain what improvements are required, big data aids in making informed decisions to better meet the future needs and expectations of consumers.

Effectiveness of campaign

Big data is useful in tracking the performance of social media campaigns and finding out the gradual changes in ROI. It also allows marketers to test their campaigns before launching it, analyze the results, make changes in the campaign as required, and retest it. Predictive analytical tools enable businesses to take decision regarding when to pause the campaign to avoid losses.By deriving actionable insights from big data, businesses get an idea about the peak timings of customers, their preferences, behaviour, etc., leading to increased effectiveness of the social media campaign. Marketers can get important information about the process their clients took right from the first stage of the buying cycle to post-purchase interaction, making them fine-tune the campaign at every stage of the cycle.

Product Insights &Creation

Social media marketers can effectively use big data to analyse future buying patterns and trends. Big data increases the predictability regarding what consumer's want, when they want it, and how they want it. This gives businesses insights into what their new products should be like.Businesses can utilize big data to analyse the selections of people, their complaints, what products are missing, faults in the products, etc. This will enable them to make changes in the current product and come out with new innovative products.Companies are using the multitude of data collected from you and others to judge what their new up and coming products should be. They use this big data to analyse what people like buying. More importantly, they are using this data to figure out what people are complaining about, what products are missing, or what is wrong with a certain product. Big data helps companies make adjustments to their current products and helps them create new innovations catered to you and other social media users. It is almost like they know what you want before you know it yourself.

Specified Demographics

Online marketers used to utilize generic demographic info such as age, sex, location, and marital status to judge what kind of things you might be interested in. Now, with big data, social media marketers are separating those who like non-fiction books from fiction books, separating the artists from the jocks, the rockers from the rappers, and so on and so forth. Their ability to judge exactly what a specific niche of people wants to see is constantly getting better. E-commerce companies are also starting to use Stack Tomé, an automated marketing system that allows reaching their existing customers outside email by utilizing their sales data.

Vision recognition

When you use big data in social media to recognise images in the pictures, it gives assistance by generating custom classifiers. After uploading a photo, the application returns terms that represent the things it has found in the photo like events or objects. You can train your app on specific image sets like logos for recognising customised images in real-time. This method will help you as a marketer to detect customers that are posting on your social pages and prompt you to involve.

Personality insights

Big data in social media analyses personality traits from posts like emails and social posts so that you get the right insights about customers. The users will discover a better understanding of the customer's

needs, characteristics, personalities, and values that drive personalisation. Big data outputs a profile with three personalities in the dimension of needs, values, and the five big traits that describe the way an individual engages with the world.Personality insights will help you as a marketer to capture a complete understanding of the customer with the available demographic information and social media data. When you understand your customers, you have the ability to personalize interaction and then improve conversion.

Promotion

Big data in social media will help you to target the most likely targets of purchasing your product by allowing you to complete a profile that fits an average customer. When you are the right marketer using big data, you can connect it to predict and test the likely reactions to specific consumer messages. You can test the headlines with a small sample population then sending them to those people that have the likelihood of opening them. You will then use click through and open rates to qualify the leads into the sales channel.

The Prospect

In the future, advanced social media marketing methods will involve the following:

- ✓ **Product prominence:** Because more people are starting to research products on social platforms, successful brands will provide in-depth product information and will find ways to encourage consumer participation in reviewing and talking about products.
- ✓ **Audio Visual Prominence:** By 2020, 50 percent of searches will be either visual or vocal; successful brands will provide plenty of visual content, and they will construct product descriptions and other marketing copy to reflect how people talk.
- ✓ **Messaging apps and chatbots:** By 2020, 80 percent of smartphone owners will use a messaging app; successful brands will dominate at selling directly to consumers through chatbots on messaging apps.
- ✓ **Videos:** Social media users are consuming a ton of video, and anticipates video saturation by 2020 because 46 percent of brands are implementing a video marketing strategy; video will need to stand out by being entertaining, unique, and full of value to the consumer and their community.
- ✓ **Accentuating virtual and augmented reality:** By 2020, the virtual and augmented reality market will be worth an estimated $150 billion; successful brands will find ways to use AR and VR to appeal to a Generation Z audience that loves novelty, and marketers will increasingly use VR to do research.

Conclusion

There is a constant increase in the number of people interacting with brands on social media platforms. This makes it obligatory for you to be data savvy to remain competitive and stay relevant in the social media platform. Seeing the massive amount of data produced by these platforms, it becomes crucial that you make use of big data in your social media marketing campaigns.Big data will allow you to analyse the behaviour of buyers and target an exact group of people. By giving you in-depth insights, it will assist you in fine-tuning your social media messages and choosing the right platform to communicate them to buyers. The more information you get about consumers, the better you will be able to target them through your social media campaigns.Through Big data analytics, businesses can increase their profitability. Apart from that, Big data also used to identify the right and related keywords to your website and that helps to drive more traffic to your website. With the help of big data analytics, you can discover the customer needs that help you to create quality content so that you can increase your viewer’s engagement.

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Medical Shops Drugs Sales Transactions Data Fact & Data Size Measurement

Mr. Ramesh D Jadhav[1]

Dr. Manik S Kadam[2]

Research Scholar, AIMS, Pune-01

Abstract:

The role of a medical shop even if the doctor is not present, still conventional medicines can be made available by a qualified pharmacist to the people. Each area of the world should have a Medical shop or pharmacy. There are a vast number of medicines and millions of different chemicals and compounds used for treating various health issues. Even the best of the pharmacist cannot remember everything. The software can make the life of a pharmacist much easier. This paper focuses on medical shops sales drugs as per the doctors prescribed template. And these drugs data are stored in medical shops. That data size and data fact is essential for business understanding and identifies what types of diseases are present. Therefore the researcher has discovered data size & data fact based on the total number of medical shops and considered per day average sales transaction in each medical shop.

Purpose: This paper understanding of drugs sales data size in medical shops sales transactions in medicinal shop stockiest relate drugs and actual sale out drug data size calculations. And this data size will help to use for investigation of drugs, patients, business analysis.

Methodology: The study based on secondary research data and sales data size of the retailer business insights.

Results: In this learning, it observed that medical shops drug sales data that data will discover all facts of drugs and real-time business situation and condition.

Originality: The sales data size and data fact. This present study will help to understand the real-time data size and data facts have in the medical shops business.

Keyword: Medical shop: sales Transactions, Data Size, sales Data fact, business analysis.

1. Introduction of medical shops sales transactions data

The patients or customers purchase drugs as doctors advised medicines, its details stored in systematical format is called a database of sales. Like as a customer name or patients name, address, medical shop name, doctor's name, qty, price, medicines name & drugs recommended details, this all above data is called as structured data. And presently the digital transformation is started through like the online shopping or advance selling system. and more information about digital products and data is generating in terms of text and PDF, Image of medicines, text information of drugs. And video, audio. This type of data is also called unstructured data. And log file, log history, excel data, XML, and HTML this data is called semi-structured data. Furthermore, that data is receiving the system like volume-wise, velocity wise and variety wise, and these 3V's is called Big data[8].

Therefore, the classification wise example is showed below of the medical shop's medicine or pharmacy drugs data size is approximately have measured based, on per day transactional data entry receiving in the system of medical shop retailer stockiest. India has around 8.5 lakh retailers, and Maharashtra has 85 thousand retailers; also, Pune city has approximately 15000 thousand retailers[1].

2. Data Unit of measurement in the computer system:

Data size has been calculated based on per day average transactions data received at the medical shops or pharmacy shops. Moreover, approximately considered the total number of medical shop available. Furthermore, the total number of transactions data stored at the medical shops. Also, that data has been converted into the in Kilobyte (KB), after Megabyte (MB), Gigabyte (GB), Terabyte (TB) & Petabyte (PB). Details data calculation has shown in various expected data size tables and with the help of data UOM table[9].

Data UOM in Computer system	
0-1	Bits
8 bits	1 Bytes
1024 bytes	1 KB
1024 KB	1MB
1024 MB	1 GB
1024 GB	1 TB
1024 TB	1 PB
1024 PB	1 EB
1024 EB	1 ZB
1024 ZB	1 YB

Table no: 1: Data UOM in Computer system

3. Example of Structures data in Medical Shop business Management system:

Sr. no.	Invoice/ Bill.& date	Medical shop name	Doctors Name	Doctor Address	Patient Name	Patient Address	Medicine/Drug name	Exp. Date	Qty.	MRP	Total Amt.
1.	101/25. Dec.19	Shree Ram Pharmacy store	Dr. Joshi	Sinhgad Road Pune-41	Mr. Rajesh Naik	Pune-41	Amoxycilling Capsules IP 250 mg	03/22	10 Nos.	150/-	150/-
2.	202/26.Dec.19	G.P Pharmacy Store	Dr. Patil	Sinhgad Road Pune-41	Mr. Mahesh Mane	Pune-41	Levocetirizine Tablets IP 5 mg	01/21	10 Nos.	60/-	60/-
3.	402/26.Dec.19	Ganesh Pharmacy Store	Dr. Sujay	Sinhgad Road Pune-41	Mr.Raju More	Pune-41	Medigrip Elastic Adhesive bandage	01/22	07 Nos.	170/-	170/-

Source: Researcher Contributions.

Table no: 2: Structure data in medical shops system

4. Example of structures data size & fact, based on sales transaction in Medical Shop management system:

The above reference table no: 6.1 & 6.2 considered for the data size calculation of one transaction or the total numbers of word letter in one transaction has been considered & with the help of Characters to Bytes Conversion Tool. After that It also showed one-day data size in kb, then this data is converted into one-year data size, 2-years data size, 3-years data size, 4-years data size, 5-years data size and 6-years data size. Hence it is all above data size is expected in the system. Data size details are given below in the table[9].

Structures data size calculation chart of medical shops sales transactions												
Years	Days	Transactions	Tot. word letter per Transaction	Per Day medical transactions	Total Letter	1024 bytes =1kb	Total no. medical shops in Maharashtra	Total KB	1024kb = 1MB	1024MB = 1GB	1024GB =1TB	1024TB = 1PB
0	1 day	1 Transaction	100	200	20000	19.53125	850000	16601562.5	16212.4634	15.83248	0.01546141	1.5099E-05
1	365							6059570313	5917549.13	5778.857	5.64341462	0.00551115
2	730							12119140625	11835098.3	11557.71	11.2868292	0.01102229
3	1095							18178710938	17752647.4	17336.57	16.9302439	0.01653344
4	1460							24238281250	23670196.5	23115.43	22.5736585	0.02204459
5	1825							30297851563	29587745.7	28894.28	28.2170731	0.02755574

Source: Researcher Contributions.

Table no: 3: Structure data calculation based on sales transactions in medical shops system.

That is important to interpret the results from the above table correctly is that the Structures data size calculation-chart of medical shops sales transactions it is clear that medical shops business has real-time customers or patients data along with drugs details, doctors details. Furthermore, this data is very significant for business statistical analysis. It also seen that data received in large volume. Hence it needs to store & maintain for further to use for pattern analysis[9].

5. Example of Unstructured data size & fact, in medical shops business system:

The example of unstructured data like the image of the doctor's drugs recommendation template, product image, product video, product audio, CCTV footage. Data size details are showed below.

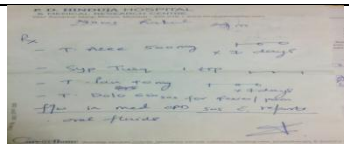
Sr. no.	Description of medicine	Medicine Product-Image/ Video/Audio/Text/PDF	Approximately Data size of Image
1.	Doctors Drugs recommendation Template		93.4 KB
2.	Amoxycilling Capsules IP 250 mg		42.7 KB
3.	Ofloxacin Otic Solution		5.52 KB
4.	Generic/ Allopathic- medicine information Video (4 minute)		13,251 KB
5.	Audio of Medical Microbiology (5 minute)		225 KB
6.	Medicine Collection Catalogue (50 pages)		1524 KB
7.	CCTV System: camera, lens, monitor and recorder.		2333MB (8 hours)= 2388992 KB

Table no: 4: Unstructured Data in medical Shop business Management system.

Here is significant to interpret the results from the above table correctly is that the Unstructured data size & fact, in medical shops business system or e-pharmacy. It is clear that medical shops business or e-pharmacy along with Doctors drugs recommendation template, drugs image, Drugs text information details. Besides, it also seems that this data is called Big data, and this data is very significant for business statistical analysis. Hence it needs to store & sustain for further to use for pattern exploration[8].

6. **Example of Semi Structures data size & fact, in medical shop business system:** The example of semi-structured data like product search logs, login logs, e-mail, & EID. Details are below.

Sr. no.	**Semi Structures data description**	**System evident**	**Approximately Data size**
1.	XML file, A CSV is a comma-separated value file Excel file, JavaScript Object Notation (JSON,HTML, NoSQL databases, Electronic data interchange (EDI),RDF	Product Search logs, Login logs, On line Transaction logs, Product purchase logs, E-mail, EDI, RDF.	1kb

Table no: 5: Semi Structures data in medical shop business management system.

From these outcomes, it is explicit that the above table is that the Semi Structures data size & fact, in medical shop business system or e-pharmacy. It means that medical shops business or e-pharmacy system along with login logs, XML file, JSON, & HTML. Moreover, it also found that this data is called semi-structured, and this data is essential for investigation. Hence it needs to accumulate & maintain for further to use for pattern discovery[3].

7. **Unstructured data and Semi Structures:**

Approximately considered data size based on the above example of unstructured data and Semi-structures data in medical shops business management system or e-pharmacy system.

Sr. no.	Unstructured data + Semi Structures data	Considered Data size
1	Suppose Data size per transaction stored = Doctor's Prescription template, product image, video, audio, text, CCTV Footage, HTML, XML, logs etc.	= 280kb (Doctor Prescription template image, Drugs image & text, etc.)

Table no: 6: Total data size of unstructured data and Semi Structures data in medical Shop business system.

Together, the present findings confirm from the above table is the total data size of unstructured data and Semi Structures data in medical Shop business system or e-pharmacy system. Suppose per day transactions stored with data product image, video, audio, text, CCTV Footage, HTML, XML, & logs. Moreover, suppose approximately data size considered per transaction is 280kb (Doctor's prescription template, Drugs image & text) [10].

8. **The final data size of structured Data, Unstructured data and Semi Structures:** Final data size expected based on the above example of structured data, Semi-Structured data and unstructured data (Table no: 2, 3, 4 & 5) in medical shops business management system, data size detail is given below in the table.

Sr. no.	Structured data + Unstructured data + Semi Structures data	Final Data Size
1	Suppose per day transaction stored = like Name of medicine, Name of Patients, Doctors name, rates, Qty, total amount, product image, video, audio, text, CCTV Footage, HTML, XML, logs, etc	Data Size=(Structured+ Unstructured+ Semi Structures) Data Size = (19.53+280+1) **Final Data Size = 300kb**

Source: Researcher Contributions.

Table no: 7: The final data size of structured data, semi-structured data and unstructured data in the medical shop's system.

Another promising finding was that from the above table is the final data size of unstructured data, semi-structured data and structured data in the medical shop's system or e-pharmacy system. Suppose per day transactions stored with data Name of patients, name of medicine, Doctors name, rates, Qty, & product image, video, audio, text, CCTV Footage, HTML, XML, & logs. (Table no: 1, 2, 3 & 7) & therefore, the final data size considered per transaction is 300kb[8].

9. Considered per transaction data size, & average sales transactions per day of medical shops of India based data size chart.

The above reference table no. 1 chart used for conversion of data size and. Moreover, the total number of Medical shops available in India has considered. Based on the calculation and data is converted into KB to PB is that details data has shown in the following table. (Table no: 3, 4, 5 & 6)

Considered Expected Per Day Data Size & Converted into KB to PB.	
Total Medical Shops in India	8.5 lakh (approximately.)
Avg. Per Day Transactions in a medical shop	100 (approximately.)
Data Size per transaction	300kb
1-day Transactions	85000000
Total. Size Per Day in KB	25500000000
Total Size in MB	24902343.75
Total. Size in GB	24318.69507
Total Size in TB	23.74872565
Total Size in PB	0.023192115

Source: Researcher Contributions.

Table no: 8: Total medical shops in India, 1-day transactions data converted into KB to PB.

The above table researcher has considered a total number of medical shops in India are 8.5 lakh. Moreover, the average per day transactions is 100 nos. have been considered. Also, approximately data size per transaction is 300kb has considered. Base on total medical shops available data and multiply with an average per day transactions number. Finally, get a one-day transactions data size, after that this data size also converted into the total data size in KB and PB[9].

10. Day one to 5 years of data expectations in India:

Based on the above table data is converted into a one-year data size to five-year data size.

Expected in total medical shop data calculation have been shown following table. Also, understand medical shops transaction data necessary for business insights & example wise data has been shown in the following table. (Table no. 6.8)

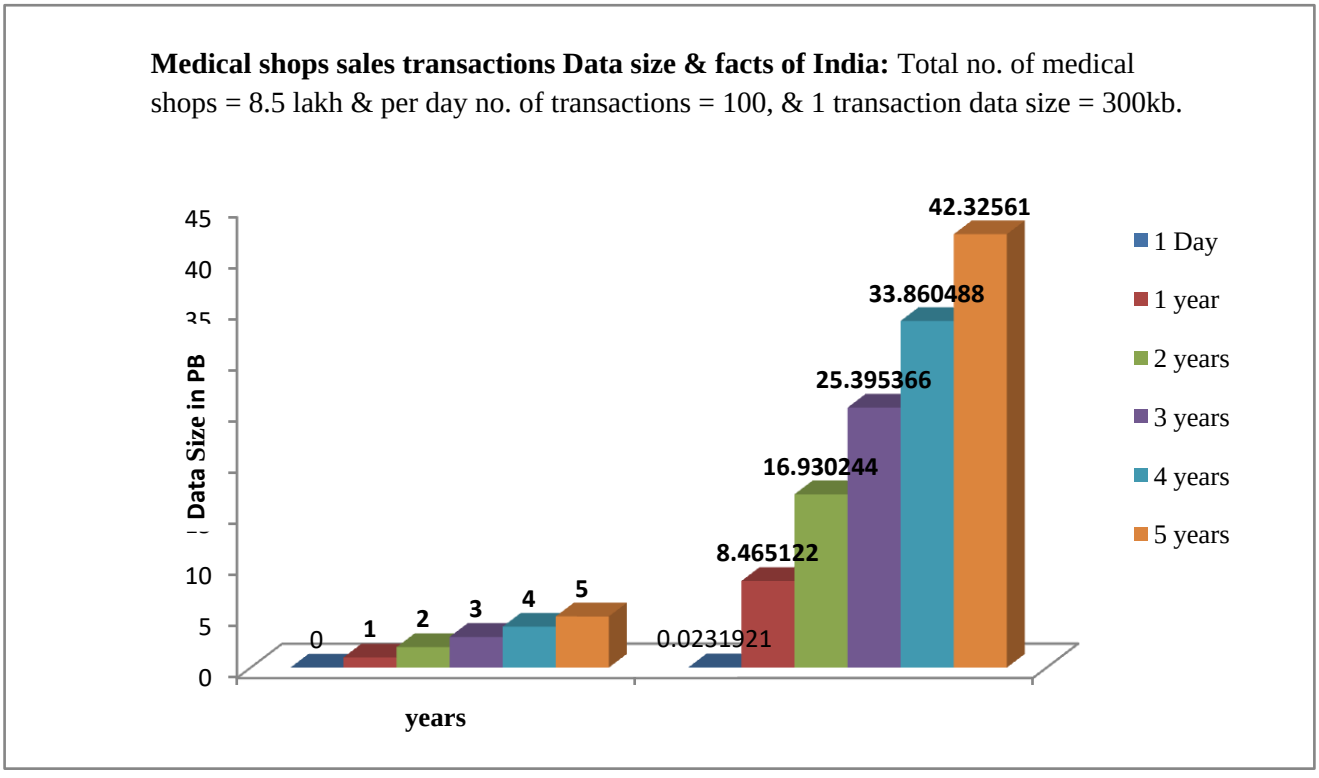
Day one to 5 years of data size expectation chart of India. (300kb)					
Years	Total no. Days	Tot. data in MB	Tot. data in GB	Tot. data in TB	Tot. data in PB
0	1	24902343.75	24318.69507	23.74872565	0.0231921
1	365	9089355469	8876323.701	8668.284862	8.465122
2	730	18178710938	17752647.4	17336.56972	16.930244
3	1095	27268066406	26628971.1	26004.85459	25.395366
4	1460	36357421875	35505294.8	34673.13945	33.860488
5	1825	45446777344	44381618.5	43341.42431	42.32561

Source: Researcher Contributions.

Table no: 9: **Day one to 5 years, data size expected chart of India**.

The following Graph is showing How exactly data is exponential is growing from 1 day one to 5 years of data size in PB.

.



Source: Researcher Contributions.

Graphic no: 1: Medical shops in India, 1-day to 5 year's transactions data size & facts in PB.

The above data expectation chart and bar graphic review that a total of 8.5 lakh medical shop in India, we have considered per day average number of transaction is 100, and also one transaction data size is 300kb considered. After that whole one-day data size is received 0.0232PB, & 1-year data size is received 8.5PB, two years data size is received 16.93PB, and three years data size is received 25.4PB, four years data size is received 33.7PB, & 5 years data size is received 42.33PB[10].

Hence it is concluded that from the above data expectation chart and bar graphic review shows massive data have in Indian medical shops retail business. It can use this data for business analysis and find out the various fact-finding, real-time case studies, real-time consumer fact. & this purpose data need to store and maintain.

11. Day one to 5 years, data size expected chart of Maharashtra State medical shops.:

Considered data size per transaction is 300 kb, and per day minimum 100 patients or customers buying the drug from medical shops and approximately 85000 in a total number of the medical shop have in Maharashtra state, and that data size is converted data into MB, after GB, TB and PB and this data size shown into one year to 5 years. Actual data size and fact showed in the below table and graphic wise data size of medical shops in Maharashtra state[10].

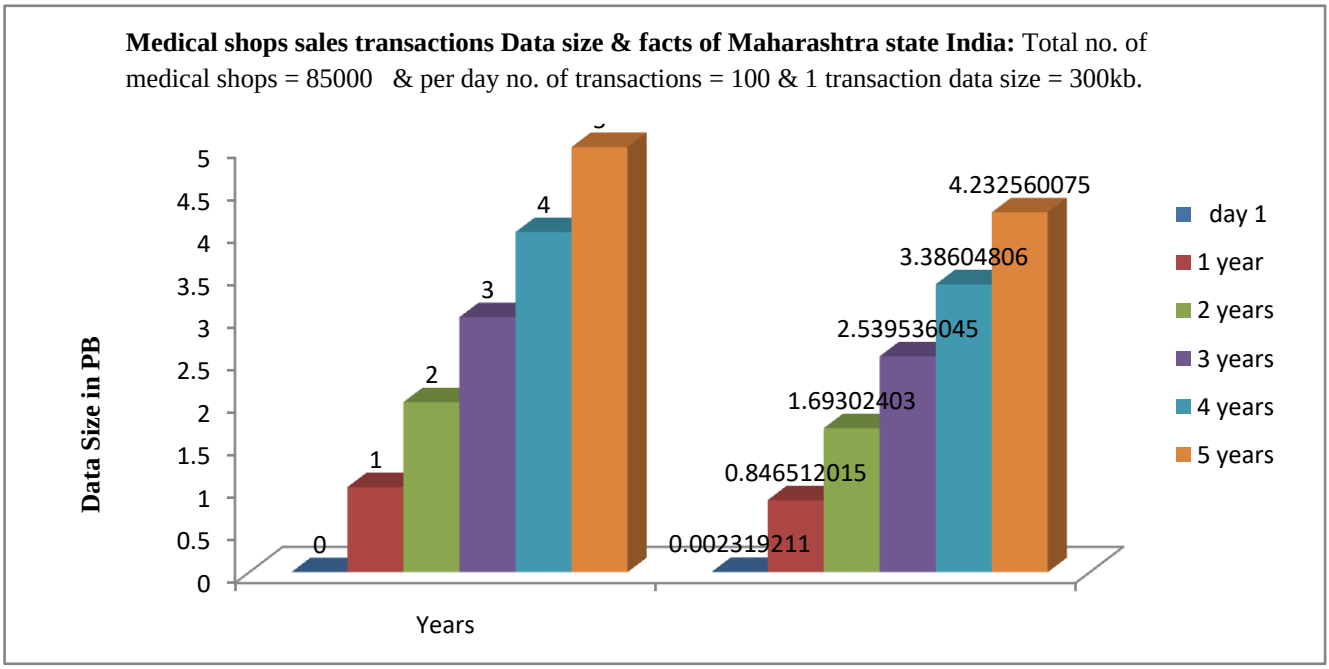
Day one to 5 years, Data size expected chart of Maharashtra State:

Total no. of medical shop=85000, & per day no. of transactions= 100, transaction size =300kb.

Years	Total no. Days	Tot. data in MB	Tot. data in GB	Tot. data in TB	Tot. data in PB
0	1	2490234.375	2431.869507	2.374872565	0.002319211
1	365	908935546.9	887632.3701	866.8284862	0.846512015
2	730	1817871094	1775264.74	1733.656972	1.69302403
3	1095	2726806641	2662897.11	2600.485459	2.539536045
4	1460	3635742188	3550529.48	3467.313945	3.38604806
5	1825	4544677734	4438161.85	4334.142431	4.232560075

Source: Researcher Contributions.

Table no: 10: Day one to 5 years, data size expected chart of Maharashtra state.



Source: Researcher Contributions.

Graph no: 2: Medical shops in Maharashtra state, 1-day to 5 years transactions data size & facts in PB.

The above data expectation chart and bar graphic review that a total of 85000K medical shop in Maharashtra, we have considered per day average number of transaction is 100, and also one transaction data size is 300kb considered. After that total one-day data size is received 0.0023PB, & 1-year data size is received 0.846PB, two years data size is received 1.69PB, and three years data size is received 2.54PB, four years data size is received 3.38PB, & 5 years data size is received 4.233PB[9].

Hence it is concluded that from the above data expectation chart and bar graphic review shows massive data have in Maharashtra state medical shops retail business. It can use this data for business investigation and discover a variety of insides related to real-time consumer fact.

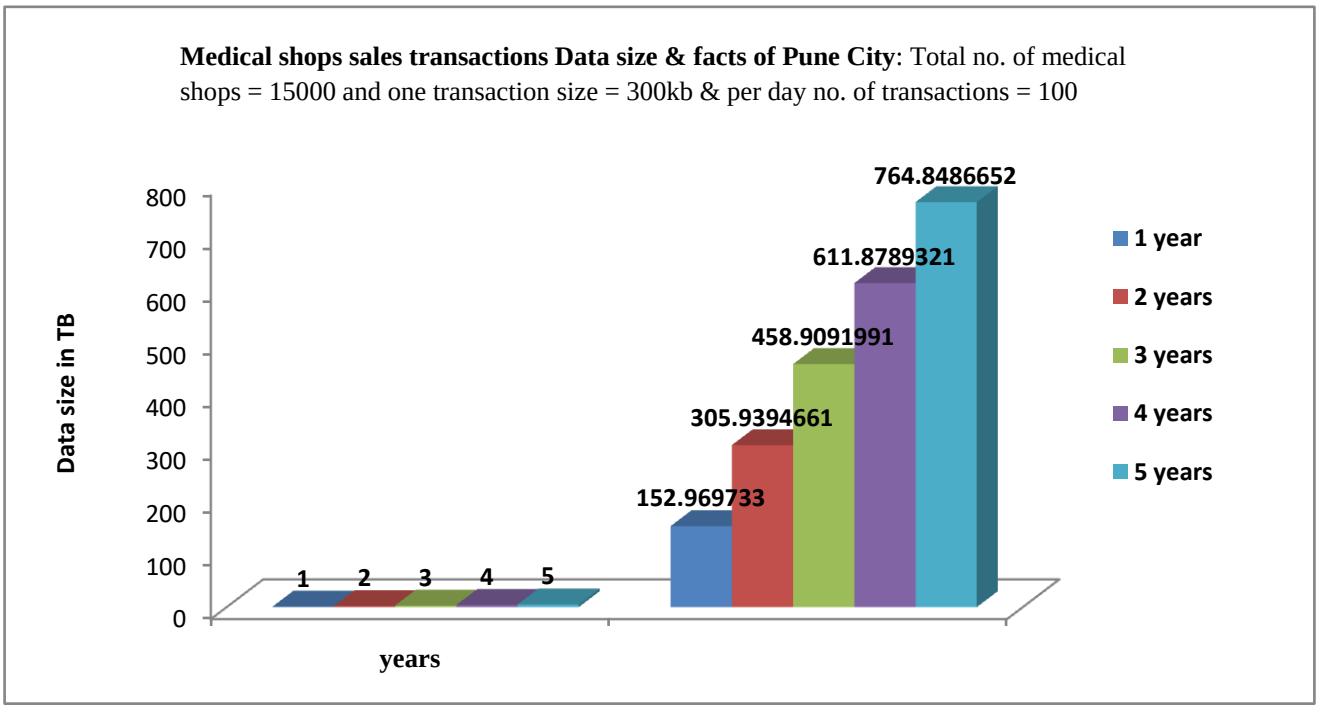
12. Day one to 5 years, data size expected chart of Pune City medical shops:

Considered data per transaction is 300 kb, and per day minimum 100 patients or customers buying the drug from medical shops and approximately 15000 in the total number of medical shops in Pune City and this data size converted data into MB, after GB, TB and PB and this data size shown into one year to 5 years. Actual data size and fact showed in the below table and graphic wise of medical shops in Pune City[10].

Day one to 5 years, Data size expected chart of Pune City : Total no. of medical shops=15000 and one transaction size =300kb. Per day no. of transactions= 100.					
Years	Total no. Days	Tot. data in MB	Tot. data in GB	Tot. data in TB	Tot. data in PB
0	1	439453.125	429.1534424	0.419095159	0.000409273
1	365	160400390.6	156641.0065	152.969733	0.149384645
2	730	320800781.3	313282.013	305.9394661	0.29876929
3	1095	481201171.9	469923.0194	458.9091991	0.448153935
4	1460	641601562.5	626564.0259	611.8789321	0.59753858
5	1825	802001953.1	783205.0324	764.8486652	0.746923225

Source: Researcher Contributions.

Table no: 11: Day one to 5 years, data size expected chart of Pune City.



Source: Researcher Contributions.

Graphic no: 3: Medical shops in Pune City, 1-day to 5 years of transactions data size & facts in TB.

The above data expectation chart and bar graphic review that a total of 15000K medical shop in Pune City, we have considered per day average number of transaction is 100, and also one transaction data size is 300kb considered. After that total one-day data size is received 0.41TB, & 1-year data size is received 153TB, two

years data size is received 306TB, and three years data size is received 459TB, four years data size is received 612TB, & 5 years data size is received 765TB[9].

Hence it is concluded that from the above data expectation chart and bar graphic review shows enormous data have in Pune City medical shops retail business. It can use this data for business exploration and determine the diversity of insides related to real-time patient's fact, medicine fact, and doctor's facts. & data is a core part of business analysis[5].

13. PROBLEM STATEMENT:

To study of the medical shops sales transaction data size and data fact is very significant to the business understanding to find which disease present and which drug is utilized.

14. OBJECTIVE:

To study sales data size and data fact in medical shops drug sales transactions.

15. FINDING:

It observed that from the above data expectation chart and bar graphic review shows massive data have in india, Maharashtra state & Pune City medical shops retail business. It can use this data for business investigation and discover a variety of insides related to real-time consumer fact, real-time case studies and various fact-finding.

16. CONTRIBUTION TO BODY OF KNOWLEDGE:

Explored and analyzed current practices of medical shops business system increase the daily performance medical shops retail business.

This study model will give real-time drug consumed data by patients, it will be a help to future research, and for patients, analysis based on diseases, & pattern analysis of drug mining.

Pharmacy industry will help this model to check competitor's medicines market demand and current situation in the market expectations, or market issue in any drug required for the pandemic situation.

17. SCOPE OF FUTURE RESEARCH:

The study on drug sales fact in area wise and its impact on medical shop business this assumption might address in future studies

Future analysis should additional develop and verify these initial findings by the study of data preprocessing and central data storage of the medical shops business management.

Future analysis should additional develop and verify these initial findings by the study of data preprocessing and central data storage of the medical shops business management.

18. CONCLUSION:

Thus, keeping these facts in mind the researcher has attempted, through this research, to study the impact of the use of data size and data fact in performance wholesale stockiest and retailers of pharmaceuticals in Pune PMC region of the state of Maharashtra in India. It will help to understand Deep business insights, drugs recommendation fact, & diseases level and current situation.

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Author's Affiliation:

Prof. Ramesh D Jadhav [1]
MCA, MBA (IT & Production), Ph.D. (Pursuing)

Guide for MCA understudies for making learning situations for the subject "Database Management system, Advance DBMS and Big Data Analytical, Data Sciences ". Sharing and moving his 12+ long periods of IT industry experience for the improvement of the understudy network. He has published the book and the analyst research paper in the universal meeting, UGC care listed Journals also Scopus.

Dr Manik Kadam [2]
MSc, MBA, M.Phil, Ph.D.

He is an exploration guide of Savitribai Phule Pune University for Computer Management the executives' discipline. He had served as a Head of Department and Director in the Management Institutes affiliated to Savitribai Phule Pune University. He is currently working as a Professor at Allana Institute of Management Science since last 7 more years. He has more than 15 years of experiences of various universities and institutions like Bharati Vidyapeeth's College of Engineering, JSPM, Pune etc. As a research guide, eight research scholars have completed a PhD under his guidance from Savitribai Phule Pune University. More than 25 Research Papers published in National and International Journals.