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MANAGEMENT MATTERS

AIM & SCOPE OF MANAGEMENT MATTERS

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Acquiring Intellectual Capital (Sprinting): Industrial (Intellectual) Revolution for the future workplace, A conceptual frame work Study.

Lucas M[1] and S.Rajamohan[2]

Abstract:

The business workplace is witnessing the new dawn of Intellectual innovation and Revolution which combines the vital nature of several innovative practices of technologies such as artificial intelligence, human intelligence and machine learning. Though there is not much research on this area devoted to intellectual sprinting. The proper understanding of the intellectual sprinting process in the modern workplace in the future leading to the smartness, creativity and the skillsets of the employees for the future talent acquisition. The objective of this research paper is to explain and describe the intellectual sprinting in acquiring knowledge and skills, and how they need to be adaptable in trending with vivacity to become smart and intelligent employees at intelligent workplace in the future techno world. The intellectual sprinting concept is new and it is heavily depending upon the capturing and grasping the emerging trends in one's profession according to the signs of the times. It is appropriate time for the professionals who are highly experienced (from the middle level executives to senior executive age group) to stop their past laurels. It is an appropriate time to initiate intellectual sprinting for the future career progress. In the future laterally all levels of job positions up to the level of middle level positions, the prior experience is a signal and the indicator for hiring. It is a high time to recognise and keenly observe the future trends and to acquire knowledge and skills in order to adapt and upgrade the new required skills especially for the post pandemic 19 scenario. The novel virus Corona has taught the lessons of shedding away the old skins and to embrace the new set of knowledge, skills with the combined challenging ideas in the post pandemic 19 situation. The future workplace is going to be dominated by the trends of knowledge, skills, abilities and potentials.

Keywords: *Intellectual Sprinting, innovative technologies, artificial intelligence, human intelligence, machine learning, acquiring - knowledge/Skills.*

INTRODUCTION:

"The illiterate of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn and relearn" - Alvin Toffler, American futurist, Author and Management consultant [1]. The future workplace is an intelligent workplace. It is moving

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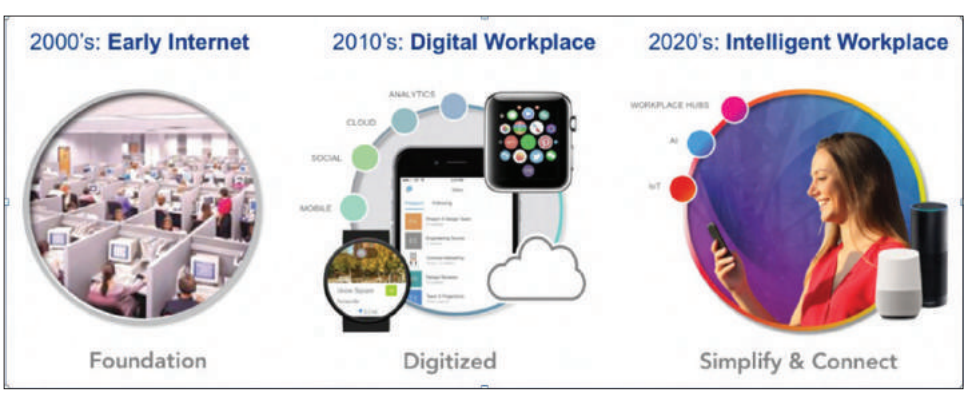
into a new era. The concept of intellectual sprinting can make the future workplace as filled with intellectual capital workplace. The workplace undergoes different evolutionary and metamorphosis process from time to time. At the present modern scenario, the external business environment is undergoing a dramatic changes with regard to customer tastes, consumer mood and government rules and regulations. As a consequences, the competent strategies and abilities which will lead the innovative initiatives, dominating in functional and operational competency are most required. [2].

The employees with the mind set of "I am experienced '' is going to be declining in the future workplace. The future Recruitment are going to be based on obtaining new knowledge and skills which are going to be purely on intellectual sprinting. Acquisition of novel and fresh knowledge, abilities, skills, behaviour and attitude are the new intellectual sprinting. The circumstances and the context demands the future Z generations need to stay relevant. It is the most appropriate time for up gradation and one needs to sprint themselves intellectually. This the time to wake up from deep slumber from this desperate times towards a better measures of career competency in future. Therefore this research article explains and describes the significance of becoming and sprinting intellectually in the VUCA (Volatility, uncertainty, complexity and ambiguity) world. [3]

Why it is an important issues? (Intellectual sprinting).

Intellectual capital is the chief source of wealth at workplace. In this context, ISP maximizes the employee's high productivity at workplace. [4].

The workplace is moving into a new era in today's business world. It is becoming the intelligent and smart workplace with high intellectual capital. Technology is powering the workplace with its technological revolution which combines the intellectual revolution parts and parcel of it. IPS is well connecting the employees at workplace instead of disconnecting. Employees want and need a comfortable work environment that reflects their technological as well as the intellectual revolution by acquiring latest skills with intellectual capital strength [5]



(Source: https://www.workgrid.com/blog/2018/03/20/the-intelligent-workplace) [6]

Characteristics of a intellectual Sprinting:

Intellectual sprinting calls for the professional competitiveness for one's career. It is an investment in one's human capital and intellectual capital investment. Intellectual sprinting is the only way out to be successful in career growth in future. The so called experienced professional need to change their mind set and attitude and get attuned to the evolving competitive environment. The future yardsticks for one's performance and the ultimate deliverables are developing the quest and inquisitiveness to learn new things according to the signs of the times.

Emerging technologies of 4.0 rapidly revolutionising the business models and workplaces. The leaders, especially from the mid-career professionals of pivotal experience need to shift their focus and mind set who are ready and willing to up skill themselves. [7]

The concept and the idea of Intsprint (intellectual sprinting) is Embedded and strongly registered in the minds of the experienced professionals for a change. Intsprint is the idea of Accelerated Reverse Mentoring (ARM). ARM enhances and helps the career professionals about keeping up-to-date with latest developments occurring at the future workplace. ARM creates the need of applying social media to the maximum. The future career skills demands everyone adept at the most use of the technology. The future learning is going to be a lifelong and continuous learning 'do-it yourself' techniques and platform. The readiness for learning these new workplace skills are the absolute truth now at this juncture. Unlearn what is learnt is another pivotal component of intellectual sprinting. The unlearning is a moment of celebration gets entangled with intellectual sprinting. The 'I know everything attitude' must deviate in the technological revolution age. Acquisition of new knowledge, ability, skills, behaviour and attitude are the built-in dimensions of intellectual sprinting. The application here is how to stay relevant during the technological and intellectual revolution age.

What were considered most important in the past are today considered with less importance. The development and application, practices, initiatives and implementations of new age technology in almost all dimensions of business are fast changing from time to time.

Definition of Intellectual Sprinting

To bring it to the future, the past experience cannot help the employees anymore. It is because the intellectual sprinting is for the future workplace. It is going to bring the future at workplace. It is not going to wait for it to happen. It is an evidence and witness to the new modern hi fi technological business world in which employees are in the dire need to upgrade and abreast to the trends of future workplace. This is clarion call for the z generation to acquire new skill sets.

What is Intellectual Sprinting?

It is a continuous attempt to realise and recognise the apparent practices and trends in one's career profession. It is a combination and the outcome of the consent and agreement to shed one's old skin (the past glory, laurels and emotions, behaviour and attitude) and the prowess to take and assessment and inquire with challenging ideas on a lifelong and continuous process [8].

It is time to unlearn what is learnt. It is upward towards up skilling for the future career

survival and ultimate success. The future generation of working professionals is in a situation to collect, gain and gather fresh and new experiences. The new order is the intellectual sprinting. The survival of the fittest to eliminate the rest is the new revelation to stand boldly in the future business world.

The speed of the intellectual sprinters are like that of a lighting speed through various functions. It is the function of long hours of practice and learning which may require investment for learning. The most required for intellectual capital sprinting are the intense social networking, social capital skills, keeping abreast with up skilling, especially with new workplace skills and exploring career growth continuously.

Significance of the research: Transformative changes such as globalization, new forms of organizing work, and advances in automation and artificial intelligence (AI) have important implications for the world of work. This is everyone's business: Governments, employers and workers all have a stake in skills development. Governments need to adopt more relevant skills policies to develop the skills required by rapidly evolving labour markets. Education and training systems will also need to take advantage of new educational technologies and give greater attention to digital skills. Enterprises and employers will need to make new investments to expand their involvement in educating, training and the reskilling of workers to support economic growth. And, workers will need to proactively upgrade their skills or acquire new ones through training, education and lifelong learning to remain employable.

Problem statement:

This paper extends to examine and describe the significance of Intellectual Sprinting. This study has more implications in the new normal scenario as the workplace dynamic and the challenging skills and trends rising more on the technological revolution. The new normal is generally referred as the situation which prevails after a crises has occurred in the entire workplace arrangements unexpectedly. It is also the time and the total responsibilities of the Governments, societies, communities, universities and business organisations to innovate and improve the new novel and modern practices to function more effectively in the new scenario. Intellectual sprinting especially the challenging skillsets and new trends. This is an emergency call for the Z generation to acquire new skill sets. Intellectual capital assumes a lots of significance here.

Originality:

This research paper tries to find out the influence of Intellectual sprinting more than employees experience. There are not much research studies were conducted earlier in the same field of research, but the study is something unique by itself because it tries to figure out the influence of intellectual capital and its future dominance at workplace more than the experience gained in the past.

Applied Aspects:

Intellectual capital sprinting factors are the key factors for the success of the future Business. Talents acquisitions are the foundation for all the functions over the experience alone. There is always high spirit in which every organisations want to boast themselves having talented and smart employees who are strong is job skills and the job knowledge. It shows the competitive

advantage and the edge at the market level conditions. Among all these factors the trends of acquiring knowledge and skills can have a major effect on successful career. It is really crucial at this present pandemic crisis situation to start sprinting oneself intellectually. It is in keeping with the competition and in order to build the intellectually talented employees, the top management, managers to initiate as a measure of indicator for selection and an elevation recruitment practices so that these can have a major interventions to build a smart, creative, skilful and intellectually talented employees.

Literature Review:

Intellectual sprinting is the approach of the intellectual lifting according to the signs of the times as the business model is changing from time to time. Skilling, reskilling and up skilling is the need of the hour to enhance one's own intellectual foundation. The intensity of the intellectual sprinting is the applying a smart progression through technological revolution which demands the future employees to be part of the technological system and its revolution. The technological aspects of the intellectual sprinting can transform the employees and shift the focus to performing sprints which builds employees proficiency. Intellectual sprinting fine tunes the employee's knowledge and skills from time to time periodically.

Intellectual sprinting is acquiring a skill, like any other skills and it must be practiced continuously throughout the career, and be honed to achieve greater results at workplace. It is all about building knowledge, skills, talents and intelligence gradually to upgrade and makes the employees well fit and be smart at workplace. Intellectual sprinting can be the biggest challenges for employees to compete themselves especially in the in the VUCA (volatility, uncertainty, complexity and ambiguity) business world. [9]

Marte and Uwalomwa (2011) examine the impact of IC on business performance in their article "IC and Business Performance: Evidence from Nigeria". The importance of IC has been discussed by many scholars. Handy mentioned that intellectual assets are three or four times the tangible book value of a company and suggested that intangible assets represent more than two-thirds of the corporate value, while, Osborne indicated that 80 per cent of a company's value is not tangible. Furthermore, traditional accounting measures are inadequate to determine the real value of the company, in the so-called "knowledge-based society". Thus, valuing IC is vital to enabling companies to appreciate their exact corporation value. [10]

Helmiatin, Olivia Idrus, and Irma Waty (2016) in their research study titled "The influence of IC on the performance of employees" are directed towards the modern competitive environments. There is tendency that the drivers of values' creation lay in the IC that is purely owned by the company, instead of physical and financial capital. The authors in this study reiterated that the role of IC greatly affects the performance of the employee and in the long term will affect the performance of the organization. IC is the one which increases organizational competitiveness and the employee's performance. [11]

Dooley E (2016) in the article entitled "IC in the software industry" - emphasized employee job performance with improvement, learning and development in order to achieve the overall business strategy and to create a high performance workforce. Therefore, job performance of an employee becomes one of critical importance and value for achieving organizational goals and organizational performance results. Employees' job performance is defined as a

process for establishing a shared workforce understanding about what is to be achieved at an organization level. It is about aligning the organizational objectives with the employees' agreed measures, skills, competency requirements, development plans and the delivery of results. [12]

Allam Hamdan, (2018) in his research article, "IC and firm performance"- differentiates between accounting- based and market-based performance. This study sheds light on the relation between IC and firm performance. The study argues that traditional performance measurement based on accounting is still able to explore the relation between IC and performance. The study was conducted at 198 firms from two Gulf cooperation council countries at the kingdom of Saudi Arabia and kingdom of Bahrain for the period 2014-2016. To measure IC, the value added intellectual coefficient model was adopted along with two measures of performance. The Study findings came up with evidence that supports the relation between IC and accounting based performance. [13]

Amina Buallay, Alaa Adden Awni Abuhommous and Gagan Kukreja (2020) in their Article, "The relationship between intellectual capital and employees' productivity: evidence from the Gulf Cooperation Council," established the relationship between intellectual capital (IC) and employees' productivity (EP) in the Gulf Cooperation Council (GCC) region. They showed the importance of investment in the human capital as a key contributor of firm's performance. The study encouraged the firm leaders and the management in the GCC to invest and focus their management/leadership styles on human capital to achieve their goals. [14]

Methodology:

This study applied descriptive research design and only secondary data sources have been used to collect the data from the research articles and various research studies, books, research reports, journal Articles, related magazine, business newspapers and webliography and so on. The same data have been analysed and discussed and used for building the theoretical conceptual framer work model for the study.

Objectives.

To explain and describe the significance of Intellectual Sprinters.

To understand the ingredients/Characteristics of Intellectual Sprinting.

To analyze how various types of technological Revolution can enhance Intellectual Sprinters.

To recommend the best policies and programs in making the employees as Intellectual Sprinters.

Research Questions:

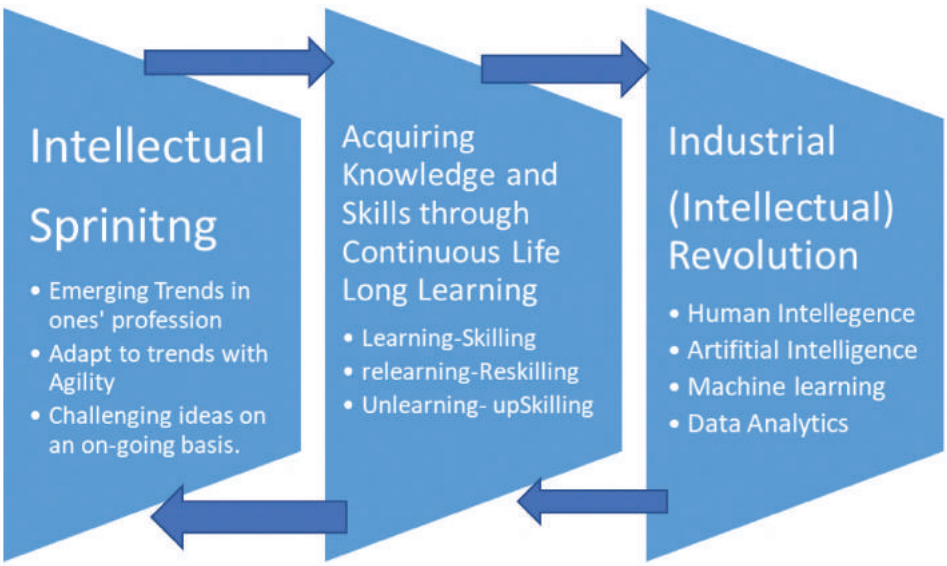
What does matter at workplace? Skills or experience?

Are Skills more important than Experience?

What are the significance of Skills at workplace?

What are the various Technological Revolution can enhance the skill sets and trends for the future workplace?

Theoretical Framework:



Conceptual Frame work Model

Intellectual sprinting: Intellectual Sprinting makes the employees how to stand competitive. The employees keeps up with the latest trends of the business models and learns various skills to become a good performer in the frontline. The theoretical and conceptual frame work model further explains how and what makes an employees to be upbeat in the workplace in order to be smarter and intelligent. Intellectual sprinting is becoming apparent and most prominent as the technology is growing fast. The need of the hour for one's profession in the future are the intelligent workplace and it's up gradation. The learning takes the main center stage and it is a culture of connectivity. The employees need a frame of mind which embraces 24/7 learning and it includes active participation both formal and informal training initiatives. It engages the employees to technologically enhanced. The employees need to stay relevant longer only when they embrace learning. In the future there is a full range of learning options are available at workplace. The employees in future need to engage regularly and participate in learning initiatives and stay current. [15]

Change agility is the ability to identify the latest trends and seize the opportunities. It is the competitive spirit in which the employees at the workplace adapts to the various trends in the hi-fi techno world. The future workplace is in a be prepared position to understand the changing environment of the business. Employees need to adapt and develop the abilities and capacities to respond to the challenging demands as a competitive force in nature. Adapting the trends of agility always emerges a quality [16]

Challenging and demanding ideas ongoing basis are the intellectual sprinting main characteristics. Because the future has nothing to do with experience but with intellectual smartness. It is all about how the future techno workplace of the Z generation and the future

workforce are going to adapt with how someone applies intelligence, which will be the true sign of overall intelligence. The future will be the situation where the employees need to challenge their own intellect. The high performance is going to be related with geniuses, and the best and brightest to think and act to the future demands and challenges.

Acquiring Knowledge/Skills: LLL: Acquiring knowledge and skills are called the global teachers today. Learning is unavoidable and it happens everywhere. Lifelong and continuous learning is a motivational factor and it is a positive and vibrant attitude for holistic growth and development. Lifelong learning skills are the future sustainability. Reskilling and up skilling are the intellectual sprinting which are considered as the intellectual renewal for keeping one self-fit for the future workplace demand. Therefore learning, relearning and unlearning are the workforce up skilling which is a continuous process to keep competitive.

The new industrial (intellectual) Revolution: The 4.0 is the intellectual revolution that will be reflected in the future of jobs. Human intelligence is going to be replaced by artificial intelligence. The hi-fi growing technologies are going to cause much widespread disruption at 360 degree dimensions both in business models and in the labour market. It will bring the enormous and drastic changes with the prediction of new skill sets that will prosper in the new landscape of the in sprint workplace. Everything leads to inclusive growth with the integration of innovation, cooperation, growth and stability. The fourth Industrial revolution, has reshaped the entire workplace now such as the internet has given the proper solution to the traditional trade, diversity is redefined in a cross-cultural environment with the balanced gender, and the nature of work has changed with the gig economy. [17]

Right time to start intellectual Sprinting:

The right and appropriate time to initiate the intellectual sprinting the moment employees are feeling stagnated in the existing role for more than two years. The omen the workplace gets new boss/ manager or a leader who is younger is than you. The time when employees are feeling and facing problems in networking. The past accomplishments and their achievements are no longer are important. The juniors, millennial juniors and the Z generation employees are resolving day today issues and challenges faster with their IT skills savvy. The measurable scales, assessment and the yardsticks are getting changed in the organization [18]

Strong empirical contributions:

The empirical contribution suggests there is a gap between the experience of the employees and start sprinting intellectually. It is a clear evidence from the above theoretical analysis and literature review, it calls for building the professional spirit of competitiveness for the millennial generation in future workplace. The millennial generation employees have to put their effort in continuously acquiring skills through lifelong learning in upgrading their emotional management and cognitive building, which are nothing but their skills and knowledge to handle the future work challenges. The intsprint is the only way out for the new employees. The new workplace, career management and development, have phenomenally changed over the past decade. The yesterday's so-called experience employees cannot keep singing the glory of their past.

The truth is that the intellectual revolutions and the fast growing hi-fi technologies of

4.0 revolutions are drastically altering the business trends, applications, practices, models and workplaces. Therefore it demands the employees to upgrade themselves to best suitable to the future work demands.

Therefore there is a dire need from the various research conducted in several companies to take Intellectual sprinting to the next level at workplaces. The younger generation workforce is in the competitive scenario to reskill and up skill their career model continuously to keep themselves more fit and challenge with intellectual sprinting throughout their career development.

There should not be the mind-set of the 'I know everything' will work out at workplace anymore. Operating with the mind set of 'I am-experienced' may be a dangerous mind set. Therefore the attitude and the mind-set of 'I don't need to acquire any new knowledge and skills' will not prove any counterproductive.

The changes are as follows. Here are a few examples:

Email was the primary communicator in the past. These re not much in practice in application and in usages. These are replaced with several other technologies and tools to communicate every day at the workplace, such as What Sapp, Facebook Messenger, Skype etc. Data analytics which was unheard until 2010. The business regulations, labour regulations, companies act are under constant changes, review and undergoing lots of changes. Today the consumers are addicted to data packs. These days Data is considered as merely a channel and the via for content. The rise of mobile and social usage peaked during 2010. The workplace today is completely getting metamorphosed and transitioned to the digital workplace. The cloud applications, Bring your own devices (BYOD), social intranets, wearable's, messaging, and video conference took over outsmarting the prior tools and technologies. The new ways of productivity, collaborative technologies are going to solve the workplaces issues and problems. [19]

Covid 19 – Impact: Skill based Hiring.

The new generation of employees differ from previous generation. The future workforce requires and need new or different skills. It is very clear that hall the business sectors are responding to these changes. These are the success drivers for the Industrial revolution. Today the business organisations are hiring for skills over experience. The employees holistic skills are required more than just industry experience or educational credentials. Also the pandemic-19 has forcibly changes the business organisations to rapidly adapt to changing the talent capital needs. The best talents are recruited for the jobs. Dare to think beyond the educational qualifications are the new approach and attitudes of the future recruitment demand. Almost many business organisation have started adapting to the skills focussed employees only rather than experience. Therefore it is evident that the future talent based recruitment is going to be based on the skill-based hiring, going to the extent of harnessing and extracting the latent potentials of the talented employees. [20]

Discussion/Argument:

The theoretical and conceptual frame work model is a clear indication and it further explains

how and what makes an employees to be upbeat in the workplace in order to be smarter and intelligent. Intellectual sprinting is becoming apparent and most prominent as the technology is growing fast. It is the competitive spirit in which the employees at the workplace adapts to the various trends in the hi-fi techno world. The future has nothing to do with experience but with intellectual smartness. It is all about how the future techno workplace of the Z generation and the future workforce are going to adapt with how someone applies intelligence, which will be the true sign of overall intelligence. The employees are going to challenge their own intellect for handling the future projects and assignments.

Lifelong and continuous learning is a motivational factor and it is a positive and vibrant attitude for holistic growth and development. Lifelong learning skills are the future sustainability. Reskilling and up skilling are the intellectual sprinting which are considered as the intellectual renewal for keeping one self-fit for the future workplace demand. Human intelligence is going to be replaced by artificial intelligence. The hi-fi growing technologies are going to cause much widespread disruption at 360 degree dimensions both in business models and in the labour market. Learning new skills are the most important for the employees what they can do on the job, as it has the double advantage of helping the employees to grow as well as showing their willingness to learn.

Apart from talent and skills the attitude and mind-set of the person also matters a lot. It is always argued and said that the attitude determines your altitude. Every employees at workplace can increase his potential through this concept. A proper training and self-learning interest can transform the future generation employees more successful in their career. The natural inborn talents and skills can also contribute a lot at workplace. The constant efforts must be put in for learning new skills every day which can make employees to reach their full potential. Intsprint is the good platform for employees to stand on their toes in the techno and competitive market globally.

Can we just discuss and argue that an employee's gets job based on the experience alone? Today many companies are changing their usual norms of recruitment. The candidate's potential is more important than the experience. Candidate's potential is the most important aspect of their application.

The Pandemic 19 crisis are forcing the business environment and the employees to change their way they worked in the past. There is going to be a new way of working styles with techno revolution skills. The new changing technologies, and the new ways of working are totally disrupting jobs and the skills employees need to keep learning. The novel coronavirus pandemic made employees across business industries, adapting to the new changing environments with up gradation of Job knowledge, skills and the new trends.

The greater the employees invest their time for learning and upgrading, the greater the career success, he can always reach the pinnacles of one's success growth. Therefore there is no time for employees to relax in future as the business demands challenges requires new skills according to the signs of the times the business models, process, applications are getting evolved from time to time. Intellectual sprinting is going to be the determinant factors of employees' performance tomorrow.

To meet all these challenges in the pandemic crisis, companies should evolve, draft and craft talent strategies more than the employees experience. It should develop employee's digital

skills, cognitive abilities, social and emotional skills. It is the right time for the Business organizations to increase the learning budgets towards reskilling and up skilling.

The new industrial (intellectual) Revolution represents the fundamental change in the way we live and work. The extraordinary technologies enhances the potential workplace. The rise of the Artificial intelligence machine which will bring a massive productive boom

The simple way to grow and excel in one's career is to get passionate to keep abreast with latest technology and skill set. Nothing should limit one's performance. Enhancing employees' capacities everyday can make unique and apart from others. Passion has a great gravity pull and that is a synergy which makes the future generation to learn. It is all about passionate about learning, acquiring new skills to be more competitive in the competitive market environment. The force of the intellectual sprinting is going to be powerful in future tomorrow.

The intellectual sprinters can accelerate their career longer and steadily with the changes happening around in the society and especially in the modern and techno business world. The executives, leaders and managers put their magnitude and proper direction to learn continuously new knowledge and workplace skills, which is a long unending journey. Intellectual sprinting is a skill, yes, it is the future skills which will assemble the most talented workforce at the workplace.

The word sustainability in the competitive business environment makes an impact. If employees of the future looking for a change and sustainability in their career such as their creative and innovative role and responsibilities, then the stronger need arises to learn update new skills, knowledge and technology. The professional social capital network can enhance employees with intellectual sprinting. The organisation and the employees need to survive within the professional network. It is essentially so important that the employees need to completely navigate through the VUCA competitive and with the changing business models. Let us not feel very proud about claiming an experience employees. The experience is outdated and the intellectual sprinting is updated. Therefore what is that driving the business organisation today is a big question mark? The employees are required to take the synergetic form as an intellectual sprinters. The cult is the intellectual sprinting and it is the culture of the organisation in future.

The employees are going to be blessed with talents, ideas, unique abilities and power with the intervention of intellectual sprinting. It is a high time to rise and wake up from the deep slumber to the call of updating to the new trends, new technology and becoming an intellectual employees with the required intellectual capital. Let the intellectual sprinting start and let the employees grow in their career progressively. Intellectual sprinting calls for extraordinary performance. The departure for life long and continuous learning starts today for accomplishing one's career arrival.

Findings and Recommendations:

So, how to be a good intellectual sprinter is a major recommendation and how it could make the employees to be upgrade with new knowledge and skills are the major task in the competitive business environment. The employees need to Participate in more up skilling trainings at relevant Learning networking events from time to time. The investment of learning can come from any side and it is not the issue who is going to invest, whether the company or

employees or it could be any source. The employees or the organisations need to Collaborate and corroborate with the new age generation stakeholders across domains, just for the valid that they sound creative and innovative. They are the catalyst for changes. Embracing on going learning are the most essential things to do and the employers must invest on this. Intellectual sprinters by building the networking system, acquiring the new knowledge, embracing the new development and business models and learning the new skills according to the signs of the times in a future position to experiment their career success continuously. This research has made the employees to become completely aware of what is going to happen in the future competitive workplace.

Conclusion:

"Never lose an opportunity to see the good in someone" – Anonymous

The overall purpose of this study was to explain the significance of the intellectual sprinting and its relevance in the future workplace and creating and the proper understanding of the ingredients and characteristics of the Intellectual sprinting. Though there are not much research which was carried out in the past on this subject area. The research study was trying to focus more on the technological revolution and how it can enhance the intellectual and potential employees for the future workplace with the future skills. This study is totally depending upon the secondary data and not the primary data used for this study. It is the major limitations for this research study. There are not much research carried out on this area, but still there are certain contributions were made despite the major limitations. But the fact that there are certain significant differences brought through this study with the following thoughts.

1. The complete contributions of this research is emphasising on the talented and potential employees for the future workplace. There are a few lessons we can learn from this novel coronavirus. Dismissing people on the basis of "lack of experience," The experience or direct experience in a specific job, may result in losing out on talented People should be given the opportunity to demonstrate their skill in a job interview situation. At the time of choosing candidates in these ways, the organization and new employees and be assured that they have found people who will "fit" better in our organization.
2. There are very less research is done on the intellectual capital sprinting area. Today it is a clear indication that the competitive workplace is looking for talented and skilled workforces more than experience.
3. The applicability of the research findings at workplace are the upgrading oneself to stand competitively is the need of the hour. The employees need to Participate in more up skilling trainings at relevant Learning networking events from time to time. Today most employers choose passion over experience. The employee must show their interest to learn. Today the employees must say yes to the new opportunities for their survival. The employees should not be afraid of taking new responsibilities. Employee's skills matter more than their experience. The employees career success, today depends on the capacity to think critically, communicate clearly, and solve complex problems is more important than his or her experience.
4. This research further contributes to the future generation how to make their career

sustainable by constantly by upgrading the new skills. The research paper has made the employees to get enlightened about their future roles, positions, functions and their holistic career profession. The intellectual sprinting is going to make the future generations to navigate their career through the VUCA world that are volatility, uncertainty, complexity and ambiguity. The career strategies keep evolving from time to time. If the future employees are going to say yes to the VUCA world, then there is enough space for the employees to upgrade the future skills at workplace. This process make the employees to become intellectual sprinters. It is a high time that the employees respond to the clarion calls and wake up themselves from the deep slumber. In case if failed to wake up and keep oneself abreast with what is going to happen environmentally, then it becomes desperate to grow.

5. Further research can be carried out on differentiating the advantages and disadvantages of Intellectual sprinting. Perhaps analytical research study could be carried out on how intellectual sprinting going to dominate the future workplace.

6. In order to address these challenges between Experience and skill sets, and regarding these two unique classifications of Experience vs. Knowledge and skills trends need to be focussed more at the time of Recruitment.

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Artificial Intelligence in Information Technology Tools and Techniques for successful project implementation

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Abstract:

This study has been undertaken to investigate and determine the impact of Artificial Intelligence in Information Technology Industry and how effectively it can be used for BCP (Business continuity planning) during unpredictable situations like Covid 19 pandemic. AI has been one of the most influential technologies and can be termed as the fourth Industrial revolution. It has changed the way people live and work, and project management isn't an exception. Though companies implement various project management strategies, their success rate still seems to be discouraging. This is a worrying situation that has a great economic impact so alternative tools for project success prediction must be proposed in order to estimate project success or identify critical factors of success. There is always debate about the use of AI technology in different areas of industry. This article first explains the need for the organizations to use AI technology. At first glance, project management (PM) seems to be less suitable for automation due to the inherent uniqueness of projects by definition. However, AI is also creating new application possibilities in the PM area, which will be explored in this contribution by involving an extensive review as well as real-world examples. Here, after considering the reward and risks of AI, this paper aims to propose several AI technologies/ tools that project management can adopt to reap the benefit in an agile organization.

Keywords: Artificial Intelligence, Project management, BCP, Machine Learning, Risk for AI

1. INTRODUCTION

In every generation, the emergence of new technologies will have a colossal impact on people's lives and working methods. Application of these technologies will greatly improve work efficiency and create huge economic benefits for the organization, also bring opportunities and challenges. Therefore, actively understanding and applying new technologies is essential to improve the company's competitiveness in the globalised era. The United States Patent and Trademark Office (USPTO) has issued an increasing number of patents for inventions developed by AI, which prove that AI's innovative capabilities to revolutionize our industries and affect the world economy (Qiankun Wang, 2019). AI was born at a workshop in 1956 and after more than 60 years of development, AI has achieved breakthrough. Especially in the 21st century, high- performance hardware/software and massive amounts of data generated by the Internet have paved the way for it. Various complex algorithms were implemented, such as convolutional neural networks (CNN), support vector machines (SVM), decision trees. These technologies have been researched by scientists and have produced many new applications

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such as face recognition, image recognition, Finger print recognition, Retina detection, Thermal scanning and natural language processing, which have brought changes to various industries and people's lives.

AI was described as "The designing and building of intelligent agents that receive percepts from the environment and take actions that maximize its chance of successfully achieving its goals"(Stuart J. Russell and Peter Norvig, 2010)

As per the executive of LinkedIn "The largest skills gap is in the area of soft skills, such as verbal and written communication, leadership and project management. These skills are what make humans unique in the age of automation" (Jeff Weiner, 2020)

The popularity of software products in the market has resulted in a massive amount of data about software projects which AI techniques can leverage. We dream of that AI will transform software project management practice in many aspects, from automating basic administration tasks to delivering analytics-driven risk predictions and estimation, facilitating project planning and making actionable recommendations. In this paper, we present a framework of how various AI technologies are adapted and integrated to support various areas of project management. Also the Project management has thus witnessed a shift away from the traditional

"waterfall" process and towards a more adaptive, agile model. The number of projects following agile has increased significantly in the recent years, not only in the software industry but also in other non-IT domains

.As a project manager, the organization should think of AI a tool to help you do your job better. It's really no different than driving a car to the grocery store instead of walking there. In this way, AI becomes a project manager's friend by curating and validating large volumes of data that can be delivered when need it most. Imagine one day preparing a status update, instead of parsing all of the data using spreadsheets and project management software, call on the digital analyst to crunch the numbers and give the results. The job will be to spot trends, come up with an action plan, and present the final findings to upper management. Additionally, it will also able to refine the system over time, so that it can get even better results. This is now can be achieved by the different tools in AI.

Project management in IT Industry – Traditional Approach

IT project management is the controlling of processes and activities that are related to IT service projects. The IT project deals with IT infrastructure, information systems or computers related to any client. The role of project manager will be similar to those of other managers in an organization, but their scope will focus more on meeting the IT needs of the organization keeping in mind the goals of the organization. For example, if they are handling banking projects and programs will make sure those tasks are done with the view of client organization in mind to perfection.

Project manager must have an in-depth understanding of the IT needs of the company and take a leadership role in assembling the team that will develop and implement the desired solutions. The primary responsibility of an project manager is to maintain the computer network in an organization. Every organization has IT needs but depending on the structure and size of an organization the requirement will defer. Some of the IT needs

of the organizations are as follows

Installation of network: The network required for the origination to perform the basic of the operations. The installation of laptops and desktop computers, Smartphone's, PDAs, GPS-based vehicle units, and other electronic devices used in accessing the network. They will grant access to users to access the organization's software and programs besides creating user accounts.

Communication: Inter departmental communication is very important to know the needs of each department so that infrastructure and IT requirement can be assessed .This will include departments to choose hardware/software required to be used and giving training as to how to use the tools. For example, the IT project manager must work closely with the finance manager to determine the hardware and software to purchase for the organization.

Maintenance of the network: The project manager will have the responsibility of upgrading and updating software besides troubleshooting. These actions are critical in protecting the integrity of the system & organizations and there can be data leakage which might be fatal to the organization.

Securing of network: Network security is an expansive role that goes beyond installing antivirus software. Security measures that the project manager will implement by determining the employees who'll have access to confidential information on the organization, monitoring how employees use company internet and equipment, and protecting company information from outside threats such as hackers and other intruders.

The project approach can be seen in the below diagram

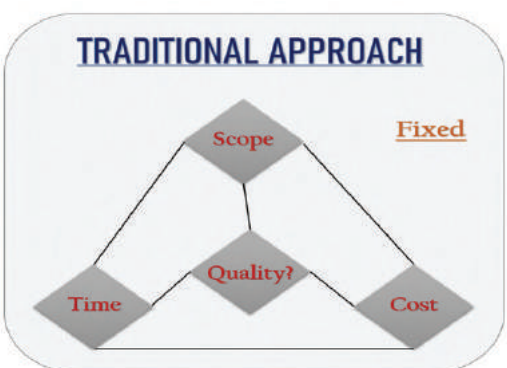

Fig.1- Traditional Approach

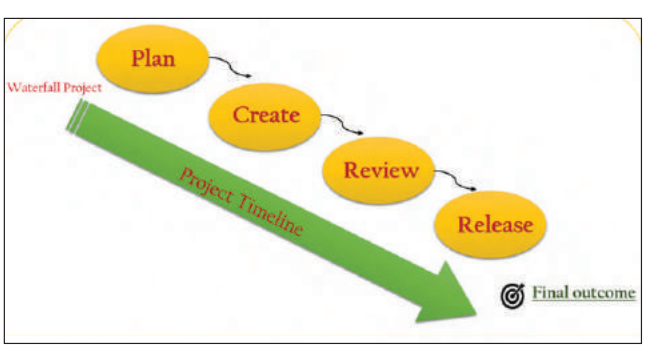

Fig.2.Waterfall model

Today's IT project managers (IT PM) must be able to juggle between wide range of tasks and responsibilities. They must be able to handle firmware and software integrations, website construction, database storage and management, and also build complex and geographically diverse infrastructures and networks, all while planning for potential security and data risks. Throughout the projects, PM is responsible for setting goals, communicating and motivating team members and stakeholders, identifying the right resources for each task, researching, managing change, performing needs assessment, and properly sequencing tasks.

Challenges Faced by IT Project Managers:-

The complexities and interdependencies of large-scale, long-term, diverse IT projects are among the most challenging issues of IT projects. Some of the top challenges faced by IT project managers are Making multiple assumptions when integrating different hardware, networks, and software to the existing system, Unclear expectations from the business, end-users, and stakeholders, Rapidly changing technology, leading to necessary mid-project upgrades that can affect timelines, Geographically diverse offices and remote work associated, Budgeting issue (Cost factor of the project) etc.

2.AI in project management – Need of organization to use AI

Project management AI is called "an integrated system that can administrate projects without requiring human input."(Burger, R, 2017). Nowadays, AI can be considered as these two types: Narrow AI (or Weak AI), Artificial General Intelligence (or Strong AI) (Wirth, N., 2018).

Narrow AI, which lacks the flexibility of dealing with different tasks, are well-trained to solve a specific problem and may be more powerful than human in their domain. Famous examples are DeepMind's AlphaGo and IBM's Deep Blue which are proficient in chess and can defeat human players. Automated mail notification from CEO all the employees with personal touch. They are programmed to do a single task.

Artificial General Intelligence, or strong AI, can be as flexible as humans and combines the advantages of a computer which means it can use massive amounts of data to get more reliable answers and reduce risks. The interesting thing is that most scientists think it will be implemented even though it's still just speculation. Algorithm that has been created using deep machine learning to predict the stock market movements and to identify which security to buy and sell. This will help to identify the correct place to invest there by reducing the losses.

In addition to the above we have Artificial super intelligence which is more capable than a human. Artificial super intelligence (ASI), is the hypothetical AI that doesn't just mimic or understand human intelligence and behavior; ASI is where machines become self-aware and surpass the capacity of human intelligence and ability. Artificial Super intelligence has long been the reflect of a science fiction in which robots overrun, overthrow, and/or enslave humanity. The concept of artificial super intelligence sees AI evolve to be to human emotions and experiences, that it doesn't just understand them; it evokes emotions, needs, beliefs and desires of its own. In addition to replicating the multi-faceted intelligence of human beings, ASI would theoretically be exceedingly better at everything we do; math, science, sports, art, medicine, hobbies, emotional relationships, everything. ASI would have a greater memory and

a faster ability to process and analyze data and stimuli.

Consequently, the decision-making and problem solving capabilities of super intelligent beings would be far superior to those of human beings.(Brodie O'Carroll, 2017).The potential of having such powerful machines at our disposal may seem appealing, but the concept itself has a multitude of unknown consequences. If self-aware super intelligent beings came to be, they would be capable of ideas like self-preservation. The impact this will have on humanity, our survival, and our way of life, is pure speculation

From weak AI to strong AI, the technical breakthrough influences the forms of AI in project management, and it's mainly considered as four different types (Lahmann, M., 2018)

Integration & Automation (IA)

Narrow AI including many specific functions. Some companies use computer vision to check the product quality automatically. Natural language processing (NLP) can help extract keywords from emails. Project Manager will have more time to deal with other complex tasks. RPA (Robotic process Automation)is one of the tool , that can be used to eliminate the rudiment manual job which is no longer required to be done by human. Blue prism is one of the leading organizations in RPA sector. It is estimated that by 2030, 80% of the routine work will be eliminated and would be replaced by robots (Meulen R, 2017)

Digital Assistants (Chat Boat)

In this case the AI to give menial work such as organizing a regular meeting, analyzing the emotion of people and answering some simple question. As an assistant, AI improves the efficiency of human-computer interaction. This will give 24/7 support without any interruption. City Union bank use the chat boat Lakshmi to answer the questions for customer.

Machine learning-based project management

In this case the AI will have an impact on the decision regarding the project that is being considered. To analyze a project AI needs plenty of past case data which can be a form of "experience" for AI. When project managers input the data of current project, AI can analyze the current data in conjunction with Old data, AI can provide the comparison of the Old project how it went wrong or factor for success. Also AI can assess the progress of the current project, predict whether the cost exceeds the standard, predict the probability of being behind or ahead of schedule, and even find out possible problems in advance. It's important to note that AI is good at identifying slowly ramping trends in the stream of data while humans are not. The more data AI gets, the more reliable its analysis results are. AI reports a feasible solution to the project managers based on the

analysis results, but the final decision is still in the hands of humans. Examples like Stock Price Prediction using Machine Learning.

Autonomous Project Management (APM)

This gives the fourth category of strong AI. At this stage, AI can proactively get the information it needs to analyze from the past projects, and the new project details available in

database and manage the project. AI will take the decision and take reasonable action to create value to meet key stakeholders. This technology has not been implemented yet, but most of the organization have analyzed and hold the view that it is about to be implemented. It is not sensible to ignore it.

The AI based projects will follow the methodology below which makes it more agile

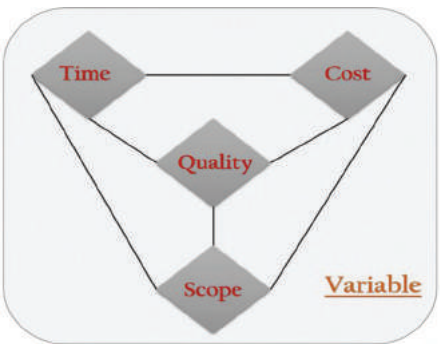

Fig.3:- Agile approach using AI

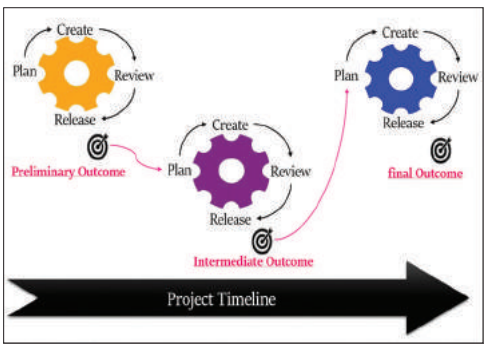

Fig.4.Agile project

Key risk factors why AI is not implemented in Projects

(1) Loss of Jobs

AI would take over the job of people which are similar in nature in next couple of years. Also AI technology is gradually being applied to diverse industries and many people are beginning to feel anxious, worrying that AI will replace their work.

(2) Fear of failure due to Limited understanding of AI technologies

AI system is a complex system, some people worry that over-reliance on AI will lead to serious consequences in project and organization. For example, the car accident caused by driverless car driving technology. AI calculation errors may cause the project to fail.

(3) Difficulties in deciding the best AI applications, due to limited experience

Companies will not research new technologies themselves but they outsource or contract or buy the professional services, which will also increase the cost of the project while deciding to use which technology in project.

(4) Data privacy, digital ethics and security risks

The more complex the function is, the more data is needed. This may lead to privacy issues. And the resources of data can be a problem too. Not many companies have enough data to train the model to give the accurate result

(5) AI solutions are not mature enough for the full deployment

AI technology is a cutting-edge technology that is still evolving. The maturity of the technology will affect the reliability of the method and the accuracy of the prediction. Over-reliance on immature technology will lead to project failure. The Performance Improvement is the most important attribute. Projects need to bring value to stakeholders, and a high level of performance improvement can help the company to keep competitive in the new era. The second important attribute is the Requirement of Data. About 49% of IT decision-makers

reported that “their organization is unable to deploy the AI technologies they want because their data is not ready to support the requirements of AI technologies.”(Davos, 2018). AI would definitely bring a paradigm shift from the traditional form of project management by brining the productivity, Decision, Performance by having serious impact in terms of saving the cost and time of the project.

3. AI Tools

In the robotic and scientific environment that we are in, the business dynamics is changing rapidly so selection tools plays an important part while applying AI into projects. Depending on the type of the project that organization deals the selection of different tools that are apt for the project is vital for the success . Some of the tools that is easily available in the market as given below.

Textio: - This tool uses predictive technology to help organizations write better job listings, as it analyzes every word and make it sound lucrative to potential candidates.Textio recognizes over 50000 phrases using AI and scores a document based on its capability to lure users and also eliminate subconscious gender bias, if present in a job description. Most of the companies, such as Atlassian, Twitter, Microsoft, Square, and Starbucks, are already making use of this tool.

Conversica:- This tool is to reach out and connect with the gross sales leads, Conversica is a virtual sales assistant, which helps sales team to focus on selling and closing the deals, rather than chasing down sales leads and prospects. This AI tool connects with the leads multiple times and for whatever duration of time required, through automated, two-way email conversations.

X.AI:- is a smart assistant app that is extensively used for handling meeting requests. As soon as an individual receives a meeting request, X.ai works back-and-forth to pin down a place and time and also responds and schedules all emails like a natural user. X.ai is totally addictive and the users can just update their status, as "busy" or "available", this tool will then plan the meetings and events accordingly.

Data RPM:- This is one of the best AI-based tools, which processes a variety of company data in a short time and predicts various things, such as potential asset failures, factors responsible for frequent repairing of tools, and the importance of timely maintenance. In this way, DataRPM helps businesses in reducing their operational costs by a considerable extent.

Digital Genius: - This is a smart tool that is fueled by AI and natural language processing (NLP) and carries out human-like conversations with customers via calls and SMS. The tool makes use of predictive automation and artificial intelligence to analyze the question first and then take it to the right answer, thereby helping businesses to improve their customer service operations. This AI tool outperforms most of the existing customer service operations, as it analyzes customer service logs, understands everyday transactions, and then chooses the most appropriate response.

4.Conclusion

AI plays an important role in maintaining the company's competitiveness and improving profits. Applying it to project management can effectively improve the efficiency of the project

team. The idea of using artificial intelligence in business needs to be normalized and companies should focus towards increasing the efficiency of business processes and finding better ways to generate greater revenues. Today, there are several AI apps and tools, which can be carefully chosen to improve business processes. It's easy to see the spread of automation as a threat and there's no doubt it will cause some painful disruption in the workforce. In the end, though, the transition from productivity-centered jobs to creativity-centered ones will be positive. After all, the satisfaction that comes from performing the same old task a little more quickly can't compare with the pleasure of creating something unique and seeing it connect with other people. We just need to make sure that we're preparing everyone to thrive in a more creative future—and we need to start today.

As a general view, employees want to know what AI means for their job and future prospects, while businesses are asking how they can capitalize on the opportunities that AI presents and where investment should be targeted. Going through all these considerations, important is how to build AI in a responsible and transparent way needed to maintain the confidence of customers, skilled professionals and wider stakeholders. Consequently, investment in AI is a leap of faith in future.

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Challenges And Impacts Of Achieving Sustainable AI For Business And Society

Harshit Gupta

Abstract

Artificial Intelligence has a great potential to help in addressing some of the biggest challenges that our society is facing. AI is soon not only going to be a major part of technological advancements but our lives also. This paper is concerned with the social and economic impacts of AI. This paper demystifies AI, thus removing unnecessary myths created about it in the minds of the people. Discussions and case studies have been done on why AI has taken off in recent few years and how AI is helping to transform societies and economies to bring a new AI era and a new AI transformation. Although the advantages of AI are numerous but it is also susceptible to attacks and misuse. This paper discusses various solutions through which adversarial attacks and adverse uses of AI can be prevented. This paper also talks on lifelong learning and community knowledge transfer so that the goal of beneficial and sustainable AI could be achieved.

Keywords: Artificial Intelligence, Demystifying AI, AI Transformation, Impact of AI on Business, Impact of AI on Society, Impact of AI on Jobs, Sustainable AI

1. Introduction

McKinsey's latest forecast [1] on the impact of AI on the global economy is that it is estimated to create a $13 trillion economy across the world by 2030 and is even capable of outperforming our expectations. The companies that would move first to adopt the AI enabled technologies would be capturing the most of the benefits and the companies those lagging behind to adopt the AI enabled technologies would be paying the expense for that. AI is also likely to widen the gaps between the developed and the developing nations because the developed nations have more resources and infrastructure to build AI enabled technologies and thus would have more access and economic benefits than the developing nations. The companies are also replacing the repetitive jobs with AI which explores the power of automation and there is now an increasing demand for the jobs that are non- repetitive in nature and these jobs would generally require high digital skills.

In today's world it is really hard to think of an industry in which AI cannot be used and there are a lot of industries[2] where AI is in best practices like Retail, Travel, Transport & Logistics, Automotive & Assembly, Basic Materials, Advanced Electronics/Semiconductors, Healthcare Systems and Services, High Tech, Telecom, Oil & Gas, Agriculture, etc.. It may be possible that AI would not be able to perform very complicated tasks related to a particular industry but still it may perform the basic tasks like automation effectively.

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2. Demystifying AI

Although there has been a lot of excitement about the capabilities and power of AI, in parallel there is also a lot of hype [3] about its demerits which is creating a false fear in the minds of people. One of the best ways to detach this fear is by properly demystifying AI thus making it clearer and easier to understand. Consider this figure 1 below and see how demystification is done.

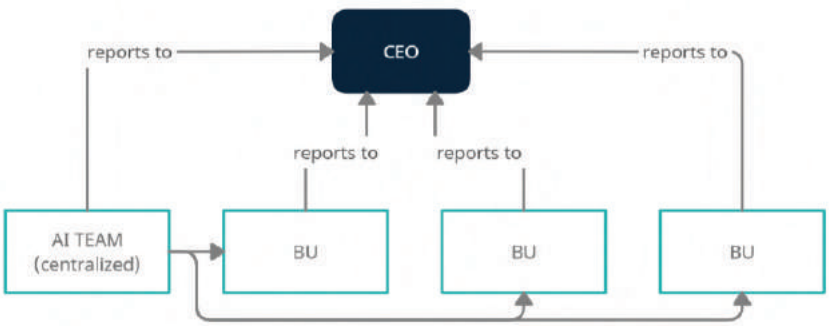

Figure 1 – Demystifying AI into four categories which are ANI (Artificial Narrow Intelligence), AGI (Artificial General Intelligence), ASI (Artificial Super Intelligence) and GREY GOO.

2.1 ANI (Artificial Narrow Intelligence): This type of AI is only capable of performing simple and single tasks such as a self driving car, a smart speaker, an intelligent web search giving some useful suggestions etc. This is only the level of artificial intelligence mankind has yet achieved through the technological advancements.

2.2 AGI (Artificial General Intelligence): The goal of this is to create an AI which can do almost anything that humans can do and is also referred to as the human level AI.

2.3 ASI (Artificial Super Intelligence): This type of AI is smarter than the collective intellect of the smartest humans in every field.

2.4 Grey Goo: This is the hypothetical end of the world where AI would leverage its full power and capabilities and would self replicate to create another AI maybe which is smarter than itself. This would be a destructive scenario where AI would consume all the biomass on the Earth.

From the above four categories it is clear to which extent we have achieved the technological advancements. Although there is a lot of progress that can be seen in AI but this is evident that till now we have achieved the level of only Artificial Narrow Intelligence and we have not even taken a step towards what is called the Artificial General Intelligence where AI can perform almost all tasks that humans can do. Achieving the level of ASI and Grey Goo is far way behind our imagination and can be only seen in hypothetical sci-fi movies. This is the thing that is highly misinterpreted because people believe that we have come up to AGI, ASI and Grey Goo but the reality is that we are still in advancements in the ANI only and stand

nowhere to achieve the level of AGI in the next few hundred or maybe thousands of years. Although AGI is an exciting goal for research workers to go on but this would seriously require multiple technological break-through to do so. So, that clearly defines why there is hype about the demerits of AI and creating a false fear in the minds of the people and what the reality is. So, there is nothing to worry or to fear about AI that the self replicating robots would destroy mankind one day soon.

3. Why Has AI Taken Off

The type of AI which learns from the input output mappings is known as the Supervised Learning where AI is provided with some sample data points in the form of the input output pairs and the role of AI is to learn from these mappings and then predict the future outputs corresponding to the given inputs. Although this supervised learning has a limited number of implementations but it works very effectively for its dedicated use cases. If we specifically look over the applications of AI in ANI then there is generally a large share of supervised learning and due to the advancements in the ANI in recent years, supervised learning has seen a great hype.

Let us take a rough graphical picture in order to have a clear and simple understanding as to why AI is taking off these days. The figure 2 as shown below shows a graph in which the x- axis (horizontal axis) represents the amount of data we have and the y-axis (vertical axis) represents the performance of the learning algorithm corresponding to the amount of data with us. The following four graphical lines can be seen corresponding to Traditional AI, Small Neural Network, Medium Neural Network and Large Neural Network from the Origin point.

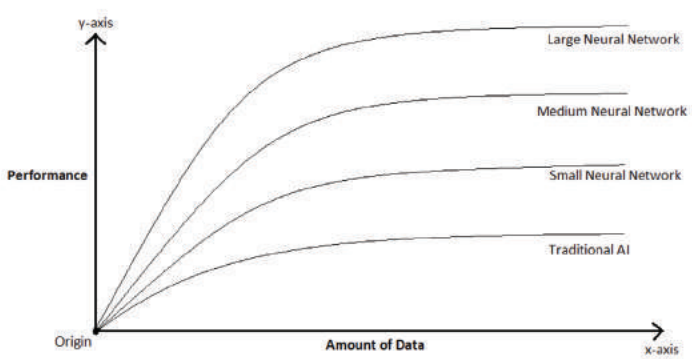

Figure 2 – This figure shows how performance has considerably increased with increasing amount of data that we have today and with the use of advanced complex algorithms like large neural networks. X-axis representing the amount of data and Y-axis representing the performance of algorithms. The graph is not drawn to scale and gives a rough view.

A few years back when there was not much advancement in the technology and there was scarcity of useful data with us maybe because of the lack of digitization and most of the data was recorded in paper rather than recording it digitally so that it can be easily used further. So, with the limited amount of data even the Traditional AI would perform best up to a certain level but then it started achieving a saturation stage and became stagnant even when you supply

more data to the Traditional AI. With the advancements in the technology we have more and more sources of data collection for us which are continuously gathering data and supplying it to the learning algorithms. And with this ample amount of data with us, the use of Neural Networks and Deep Learning became more prominent and researchers started developing more complicated and extensive Neural Network architectures. The benefits of using these large Neural Networks is that they have a great hunger for data and give high performance as more data is supplied to these large Neural Networks. The use of these complex algorithms is more because we have now achieved great computation capabilities.

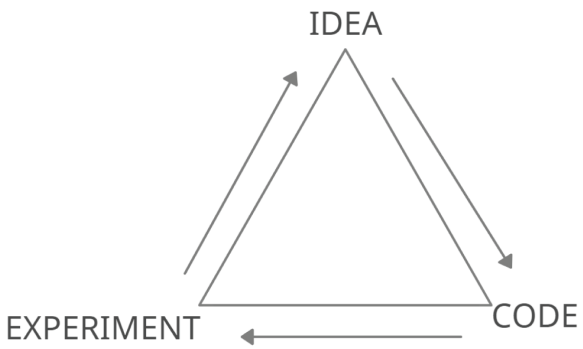

Figure 3 – This figure shows the continuous iteration process of getting an idea, coding it down and performing experimentations and tuning on it to improve the performance of learning algorithms.

In reference to the figure 3 as shown above, suppose that we have an idea and then we implement this idea in the form of code by using some complex Neural Network algorithms that uses a large number of hyper parameters which are needed to be tuned to achieve more accuracy. And for tuning purposes we do some alterations in the hyper parameters and then again test our results. This is a continuously iterating process. And with the increased computation power, with use of modern GPU's and cloud technologies the experimentation and testing time has been significantly reduced. And this has played a crucial role in increasing the performance of the large and complex Neural Networks.

4. The AI era

In recent years there have been a lot of advancements in AI. Just like the internet, AI is another break-through in the technology that we are experiencing and its usage and applications are increasing rapidly. This is the coming of the AI era [4]. Every company whether it may be a small one or a big one wants to implement AI into it in some or the other ways. It may or may not be able to use AI to perform complicated tasks but the tasks that are repetitive in nature can be easily automated using AI and the companies are extensively using it to remove unwanted labor and to cut costs. But the question is that only using the AI to this extent would make a company an AI company?

Let's try to understand this with the help of a simple example. Suppose that there is a shopping mall and due the era of digitization the owner of the shopping mall decided to make

a website and sell its products on the internet. Although the shop's commodities are sold online now, we cannot call it an internet company like Amazon or Flipkart. So, exactly what is it that defines which company is an internet company and which company is not if selling its products online doesn't make the shopping mall an internet company. An internet company is one which does the things that the internet really allows us to do well. Like we engage in the progressive A/B testing which means that we throw two different versions of the website to the customers and then test which one actually works better and if you take a shopping mall then it is really hard and time consuming to compare the two shopping malls at the same time side by side and see that which one sells better. Internet companies usually have a short iteration time which means there is continuous shipping of the products within intervals and the stock rotation and rearrangements takes place regularly but this cannot be the same in the case of a shopping mall because the stock does not generally rotate and rearrangements are not done so frequently. In the internet company the decision making is

generally done by the head council and the decisions are pushed down in a hierarchical manner where it is ultimately the responsibility of the engineers and people with specialized roles to implement those decisions. On the other hand in a shopping mall the CEO makes all the decisions and these have to be strictly followed by all. These traditional models do not work well with an internet company and that is why a shopping mall website on the internet could not be called an internet company.

Similar to the example stated above, in the era of AI, if a company uses neural networks and deep learning algorithms then this would not make it an AI company. So, exactly what is it that defines which company is an AI company? A company is called an AI company if we are doing what AI enables us to do really well. Collecting the useful data is really a tedious task for any AI company. An AI company uses strategic data acquisition and one of the best ways in which AI companies do is by launching some products which generally have low profit margin and are less expensive and which continuously gather data from its consumers and then use this gathered data to develop, enhance and monetize its other products. It is also a big challenge for any AI company to have a centralized data warehouse as it enables the researchers to have proper data accessibility and then exploit that data. It's just like gunpowder which we are collecting at one place to make a big bang. AI companies are also good at replacing repetitive tasks with automation so that human efforts can be reduced and using the human efforts in some other crucial tasks. The concept of an AI company has also created new roles in companies such as a Machine Learning Engineer, Deep Learning Engineer etc.

5. The AI transformation

For a company to become an AI company there are a few transformations [5] that have to be carried out. It turns out that even Google and Facebook were also not good enough at implementing AI in the beginning but eventually facing advancements and improvements each year they have now become probably one of the best companies harnessing and leveraging the powers and benefits of AI. Becoming a good AI company isn't a magical or a mysterious process but it requires a few transformations [6].

The first thing a company can do in order to become an AI company is to execute pilot projects because this will show you the feasibility of the project that whether AI is capable

enough to solve a given problem or not. Many companies just start to implement the whole project at once without any feasibility study and end up wasting their valuable resources like time and manpower. It is also important to see that the pilot project chosen has to be such that it has a good chance of succeeding because it would ultimately give you a good flow for proceeding further. The pilot project should be such that it should start showing some traction within 6-12 months so that one or two pilot projects could be done before the final one. The company can also outsource the teams to execute its pilot projects because it may be possible that the in-house teams sometimes are not capable or sufficient enough to execute such projects. Thus, outsourcing the teams would also help the company to gain some momentum on the project.

Now, beyond a certain point you cannot rely only on the outsourced team for the project. So, one of the important tasks is to build an in-house AI team now which would now look after the project.

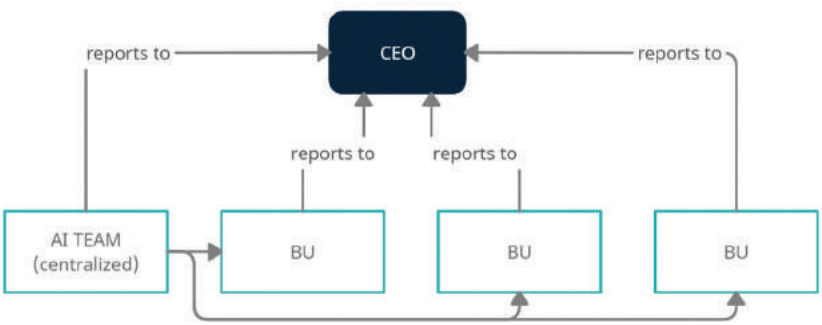

Figure 4 – This figure shows how organizations can bring a change in their hierarchy and include in house centralized AI team which would be in continuous synchronization with other BU (Business Units) also.

The in-house AI team should be a centralized team and along with other BU(Business Unit) teams it should also report to the CEO or any senior authority like CTO, CIO, CDO or a new position is seen these days in organizations which is CAIO(Chief AI Officer). Well, it is not necessary to create a dedicated position for any senior authority instead if any senior officer has enough knowledge and practices regarding the domain then it can report the same. The role of the centralized AI team is to take the talent in the matrix organization and matrix that talent to different BU's to help in their respective domains because it may be possible that BU's may have good knowledge about their domain but they may not be good at implementing AI. So, in this case the centralized AI team is responsible to help the BU teams. One more important responsibility of the centralized AI team is to build the company wide platforms like if there are software platforms, tools or other data infrastructure that could useful for the whole company then a single BU may not have the resources or the incentives to make these companywide platforms that support the whole company but the AI team may have enough tools and resources to make the company wide platforms. It is also important to note that the AI team should be funded from the CEO and their incentives should not be given from the BU. Although the AI team would have to show its usefulness

and importance in due course of time but for the time being in order to gain some momentum the AI team should be funded directly from the CEO.

Apart from building an in-house AI team it is also good for any company to provide a broad AI training to its executives. So for a company to be good at AI it is not important to only have some engineers who have good knowledge about AI but it is also important to have a judicial segregation between their roles at multiple levels such that each one of them should know how AI interacts with their roles. So for each level of roles in an AI team separate training should be provided as accordingly. For example, the executives and senior business leaders should be trained on what AI can do for their enterprise, they learn enough about the AI strategy and resource allocation. Leaders of the division working on the AI projects should learn to set the project direction whether it may be technical or it may be business diligence, how to allocate the resources and how to track and monitor the progress of the project. Many companies can be nowadays seen hiring AI workforce in the organization but apart from hiring the talent from outside the power of the in-house engineers should not be neglected. It is also important to train AI engineers within the organization. Ai engineer trainees should be able to build and ship AI software, should know how and from where to gather data and should be able to apply their knowledge to build specific AI projects.

If you want a company not only be called a good AI company in a short term but you also want it to maintain that status for a long time then it is very much necessary for the company to have a very good AI strategy because it will help your company to leverage AI to create an advantage specific to your industry sector. It is often confusion that this step of making an AI strategy should be put first even before making the pilot project. But this often seems to be a problem because if done so then most of the companies end up adding some useless

strategies to their list and end up making the project non feasible for them. So, before making any strategy for your company it is more important to look over what is more important and specific for your company and then make the strategy accordingly. Another great strategy for any AI company is to align its project with the virtuous cycle of AI. For example, web search. One of the main reasons why web search is a very tenable business is because it is very hard for the new players in the web search technology to compete with the existing large web search engines.

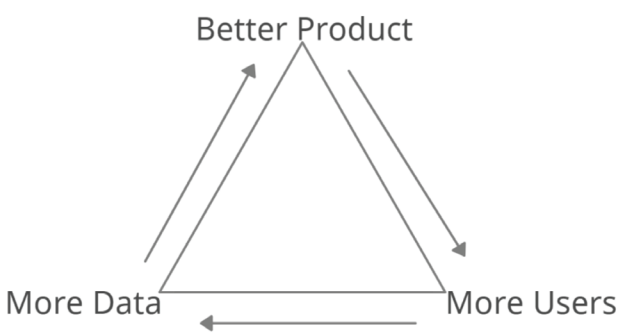

Figure 5 – This figure shows the virtuous circle of AI where usually old AI companies having a lot amount of data gets the maximum benefits and this enables them to defend themselves from new competitors in the market.

The figure 5 as shown above depicts that a better product (here web browser) will attract more users and more users will contribute more data and thus it will have a large amount of data about its user and their practices. Using this data to bring advancements in its products using AI is one of the great strategies that the company can use in order to be a leader in its industry.

Case Study: Another great AI company taking advantage of this virtuous circle of AI is the Blue River Technology [7]. It has been acquired [8] by John Deere [9] in the year 2017. But the question is what does Blue River bring to John Deere's table? Blue River's project uses technologies such as computer vision, machine learning and robotics in agriculture in which they often refer to these as the eyes, brain and hands of their project. The aim of this project [10] is to distinguish between the crops and the weeds and then spraying only on the weeds.

When the Blue River Technology started as a startup they just used to click pictures of crops from their mobile phones. But as the company grew up it piled up more and more valuable data that even the big tech companies don't have. Using AI on this data Blue River grew up and this helped it to be acquired by the tech giant John Deere.

The final and the last AI transformation strategy is to develop internal and external communications because AI is really changing the way companies and their products work. AI companies should focus on investor relations also so that the companies keep a regular check if the investors are valuing and rightly measuring its concept of AI transformation or not. Companies should also focus on maintaining good government relations because there are many fields like healthcare, finance etc. where AI is making big impacts and these sectors have a great share controlled by the government because every government wants the safety and wellness of its citizens and also protect the consumers. If there are some changes in the product or services in due course of time then it is the responsibility of the company to make its consumers aware about these changes in its products/services. AI talent acquisition is also very important because there are not enough people working on this technology as of now but if a company shows its initial success then the chances of recruiting highly knowledgeable engineers increases. It is also important for a company to maintain good internal relations because there may be a lot of loggerheads within the organization regarding the technological shift of the company to become an AI company.

6. Impacts of AI on society

AI has not only put a great impact on the businesses but also had a great impact on our society and people[11]. It is thus very important for us to have a realistic view of AI as we should neither be very optimistic towards nor too pessimistic towards AI. In our childhood days we have often heard the story of Goldilocks and the three Bears [12] where one of the parts of the story was that the porridge should never be too hot or too cold and the bed should neither be too firm nor too soft. This also implies the view that we should have towards AI and that's why we should not be too optimistic because if people start to think that someday soon some killer robots would come and take over control on Earth, then we are unnecessarily wasting our valuable resources in defending something that's isn't going to happen for too long. It is absolutely right to think about it and have some debates and research that what could happen of killer self replicating robots would come to invade the Earth but it is just deviating people from the real issues of the society and creating false fear in the minds of the people. People should also not be too pessimistic about AI because there are a lot of things that AI cannot do. People generally see only the success stories related to AI and just don't look over to the unsuccessful stories behind AI. Looking over to both the stories helped us to get a realistic view of what AI can do and what it cannot do. Sometimes people expect more from AI to do then it has currently developed and ends up losing their faith and belief in the technology [13]. There are also some cases where the value has decreased and companies have started losing

their returns on investments in AI [14]. There is a lot more to be developed in AI and till now we have harnessed very less of it. One of the big differences in AI a few years back and what AI is now is that today AI is not only limited to academic and research work but it is performing tremendously in combination with the businesses. Today AI is creating a lot of economic value and is sure to rise in the near future. Instead of having this very optimistic or very pessimistic view of AI, we should have a very realistic view of AI that AI cannot do everything but it has enough capabilities to transform the industries and organizations.

There are many limitations of AI. One of the limitations of AI is the performance limitations. Building an AI requires lots and lots of data and it may happen that it may not perform up to one's expectations. Another limitation of AI is that it is really hard for an AI to explain what it is doing and how it is doing although it may work accurately and many high performing AI systems are black boxes.

Case Study: CheXNet[15]: Radiologist-Level Pneumonia Detection on Chest X-Rays with Deep Learning, an algorithm that can detect pneumonia from chest X-rays. Although this algorithm tells with high accuracy that the person is suffering from pneumonia or not but how do we trust whether the algorithm is giving correct results or not.

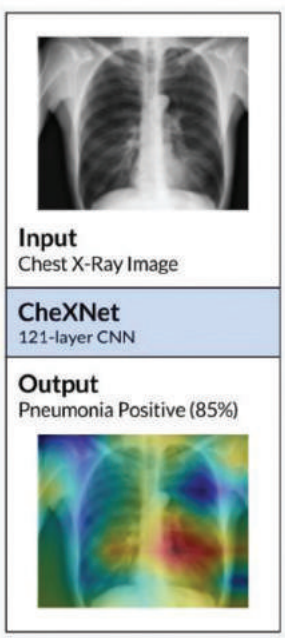

Figure 6 - CheXNet is a 121-layer convolutional neural network that takes a chest X-ray image as input, and outputs the probability of pathology. On this example, CheXnet correctly detects pneumonia and also localizes areas in the image most indicative of the pathology.

The AI system tells that the patient has left sided Pneumothorax(collapsed lungs) and there has been a lot of work carried out so that the AI could itself tell us how it is detecting whether the person is suffering from pneumonia or not. In the figure 6 as shown above, the output picture is the heat map of the input chest x-ray image. This heat map shows some unusual red heat spots on the left lungs which is some kind of an indicator that AI is using to tell us that a person is suffering from pneumonia and this gives us some confidence that AI is making

the right choices. Although, humans are also sometimes not good at giving explanations. For example, if you are holding a coffee cup in your hand and someone asks you what you are holding in your hand then your simple answer would be a coffee cup and you would have no justification as to why it is only called a coffee cup and not anything else because since your childhood you have been only calling it a coffee cup and it has a handle to hold the cup and it can hold coffee. But in the meanwhile we expect AI to be pretty reasonable and explain its outcomes because it's very new to us and has not developed enough trust till now like we humans who have a very old history of existence [16]. This is one of the major areas of research and most of the time people working on AI themselves try to make some explanations as to why AI is giving such results on providing a particular set of inputs. This not only lets them deploy AI reasonably but also helps them to overcome any errors and shortcomings in future.

There are some more limitations of AI. As a society we done not want to have problems like gender bias or economic bias in our society but sometime AI is seen to have shown some of these traits if it is not feed on proper data and instead it is feed on data which is in itself supports discrimination and biasness. Although discrimination and bias is a serious problem for our society but serious efforts are often carried out to eradicate this social evil. But why does it sometimes happens that AI shows discrimination and bias and how can we actually solve this problem?

Case Study: Man is a Computer Programmer as Woman is to Homemaker? Debiasing Word Embeddings [17], in this paper by Tolga Bolukbasi, Kai-Wei Chang, James Zou, Venkatesh Saligrama and Adam Kalai, certain outcomes have been made if you try to input the documents and texts available on the internet as the training data for the AI. If we try to relate a man with a woman and ask AI what is Father related to then its answers would be mother which is a good answer. If we try to relate a man with a woman and ask AI what is king related to then its answer would be queen which is again a pretty reasonable answer. But, if you relate a man with a computer programmer and ask what is women related to then AI answered in homemaker which is a biased answer. The biases that AI did is that if a man is related to a computer programmer then a woman should also be related as a computer programmer and if a woman is related as a homemaker then a man should also be related as a homemaker.

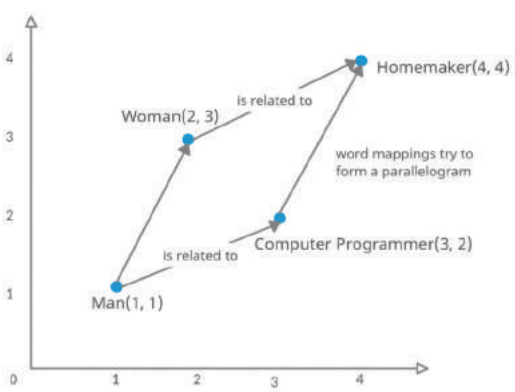

Figure 7 – This figure shows the use of word embeddings where each word is represented in the form of a mapping such that it tries to form a parallelogram and outputs the relations between the words.

This is simply the use of word embeddings where each word is represented in the form of a mapping. For example, in the figure 7 as shown above, suppose that the word Man is at (1, 1), Computer Programmer is at (3, 2) and word Woman is at (2, 3). Then if you try to relate Man(1, 1) with Computer Programmer(3, 2) and ask AI to relate work Woman with some word then it would try to map it in the same way as word Man(1, 1) is related to Computer Programmer(3, 2). For doing this it would form a parallelogram and it has now found a word Homemaker(4, 4) and relates it to word Woman(2, 3). Thus, a parallelogram is formed and in this way AI makes relations with words.

Bias in AI is not only limited to this but it has produced some more adverse effects also. For example, there was a company that uses AI for it hiring activities and later found that the results produced by AI were biased because it mainly hired male professional and did not gave much importance to the female professional which is the case of gender discrimination. The blunder that the company did is that it provided the biased data to the AI for training where mostly male candidates were hired and thus resulted in discrimination. Another area where AI suffered from bias and discrimination is facial recognition. Many times AI has been found working better for light skinned individuals than dark skin individuals. If an AI is trained on a dataset that has more light skin individuals then it is sure to give best results for light skinned individuals only. There are also the cases where AI loan approval systems have seen suffering from bias and discrimination. There are cases where it is found that AI denied giving loans or gave loans at very high interest rates to certain minority communities or ethnic groups.

7. Impact of AI on developing economies

Although AI is a great technology and has the potential to change the world, at the same time the disruptions and benefits caused by AI are not evenly distributed throughout the world. It has created uneven impacts on various economies of the world. The developed economies are finding it more convenient to harness the power of AI in a more effective manner than the developing economies. The real struggle today is to in some ways ensure that AI is making even impacts all over the world and uplifting all economies equally.

One of the things that the developing economies have done in order to develop is to firstly focus on developing the low end sectors of their economy [18]. For example, developing nations should first focus on developing sectors like agriculture which would help their economy to gain some momentum and when the people of the economy start to become weather then it should focus on developing some high end products and then it should focus on inducing technologies like AI within their ecosystems so that more automation can be done. But one of the main problems with this approach of growth for developing economies is that when AI gets introduced to their ecosystems then it firstly disrupts low end sectors like agriculture by automating most of the tasks and thus this creates a problem because it reduces job opportunities for people which were the first ones involved in uplifting the economy of that country.

Apart from disrupting the low end sectors first on benefit that AI has created is that it has enabled some of the developing economies like India to make a leap like a frog in adopting new technologies than the developed nations. For example, as the USA and China are developed economies so they already had a very large infrastructure of landlines in their country. Now, with the coming of mobile phones it was much easier for the developing economies like

India to adopt it because the landline infrastructure was not much laid in the country and this helped it to take a leap in the technology and adopt mobile phones more quickly. A similar example is in case of mobile payments where the developed economies have developed a system of money transaction via credit and debit cards whereas developing economies worked on cash payments. Now, with the coming of online mobile payments it was much easier for the developing nations to take a leap and adopt this new technology as they didn't have to dismantle their existing ecosystem.

Countries like the USA and China have built up advanced AI ecosystems, countries which are on the verge of becoming developed nations have also built up vibrant AI ecosystems but most of the countries are still immature in adopting and using AI. Even though AI is sure to make significant changes and developments in the world but the truth is that most of this development has not been done yet and still there remains a great scope left for the countries to do and come up with their efforts and contribute in helping AI to change the world. One thing that the developing economies can now do is that they can focus on strengthening their countries' vertical industries. For example, it is highly irrelevant for any developing nation to build its own web search engine because one of the widely used ones is already available in the market. Instead of this they should try to improve their industry verticals. Like India is great at farming and agriculture so it should focus more on how AI could help to disrupt this sector and should come up with its own new AI enabled technologies so that AI could help India strengthen something that it is already good at. This would create a monopoly of India across the world. So, instead of every country waging war against USA and China in AI each country should firstly analyze on what it is good at and then it should use AI to strengthen this sector more.

Another way to strengthen the AI community within the country is by doing public private partnerships so that governments should come up to help the private sector of its country to develop more AI enabled solutions. On a vast scale this can be deployed by allowing the private sectors to deploy AI in highly regulated sectors like healthcare, finance, transportation and education. But there should also be some strict checks on the developments by these organizations so that safety and privacy of the citizens of the country should not be harmed and no adversarial uses of AI can be possible. Governments should not only help the private sectors for financial support but should also encourage various organizations and nations to conduct inter country meets, discussions and summits so that individuals working on AI should have a great scope of developing their skills and get through with the latest developments happening in the industry across the world. If the governments of the countries are trusting private companies to land the man on moon then in the same way it should also trust on them to build great AI solutions so that AI technology and citizens would be more uplifted.

8. Impacts of AI on jobs

Although there has been tremendous development and growth with AI but there are a few adverse effects that AI has created in economies and societies. The AI community is thriving hard to eradicate these evil impacts of AI but there is a lot more to do and is now a great area of research and development. Automation is not a new thing. It is happening even before AI technology started to develop. People started to find out ways in which jobs that are highly repetitive in nature could be somehow replaced by some mechanism so that less human efforts are required and the saved human resource could be utilized in doing some more productive

work. As AI started to boost up, it enabled the automation of more sectors and now more applications of automation can be seen seeking the help of AI. There are certain

adverse effects of AI like AI is causing great changes in jobs [19]. Although there is uncertainty that in due course of time how many jobs would be demolished due to automation and how many new roles would be created that would require a higher skill set but there are certain studies that have been carried out but some organizations and estimated the impact of AI in the near future.

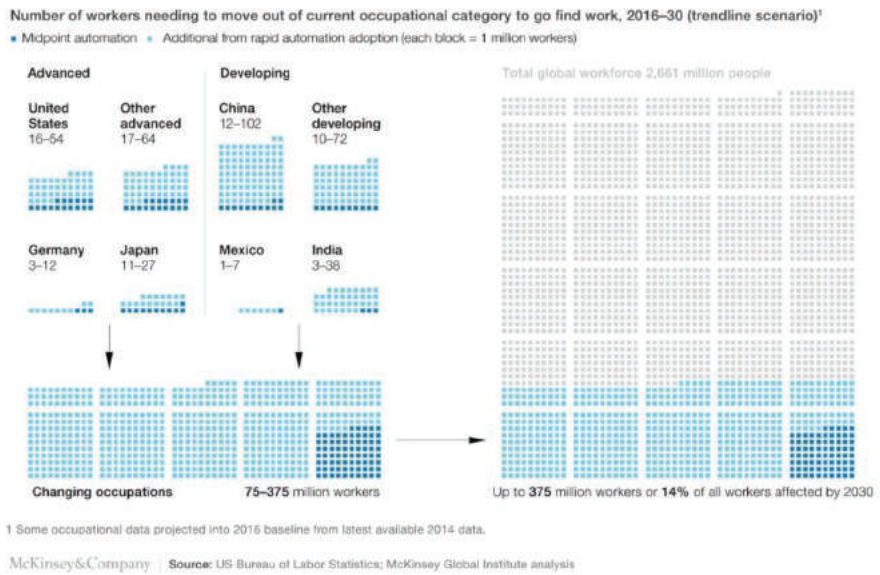

Figure 8 – The number of workers needing to move out of current occupational category to go find work, 2016-30 (trendline scenario)

There are certain statistics (see figure 8) given by the US Bureau of Labor Statistics and its analysis by McKinsey&Company states that globally up to 375 million workers may need to switch their occupational categories. The problem with this analysis is that it may be somewhat okay for any worker to remain in a particular domain and just change the specialization but here the workers would require to change their occupational categories which is going to be really hard time for them because this will require more than simply applying for the job, but, it would also require some formal level of training in the new

domain to get familiar about that new job. AI is not only displacing the jobs but it is also estimated that AI has the capability to create even more jobs than it is going to displace by 2030. There are even more new designations and job positions that are going to be created that we are still unfamiliar with.

The figure 9 as shown below shows the mean probability of automation by industry of 20 industries that are at highest average risk of automation and 20 industries at lowest [21]. The industry with high risk of automation belongs mostly to the primary and secondary sectors and at the opposite end of the ranking; the industries with low average probability of being automated are a part of service sector, with the exception of oil extraction. Most of these industries belong to the category of Knowledge Intensive Business Services (KIBS).

Figure 9 – The mean probability of automation by industry of 20 industries that are at highest average risk of automation and 20 industries at lowest.

There are few ways in which job losses due to AI powered automation can be reduced. One of the effective ways in which governments do so is by providing conditional basic income to its citizens just as the governments give their citizens universal basic income. This would really be a boon for people who are presently unemployed but are willing to gain new skills in order to match their level with the industry standards. This conditional basic income should inculcate incentive learning so that more and more people come up by themselves to up skill themselves and get better job opportunities. Apart from this lifelong learning opportunity should be created where the knowledge gathering and up skilling would not only

be limited to the colleges but afterwards also. Lifelong Learning would enable all to match up with continuously changing technology trends with time.

9. Conclusion

AI has made significant impacts on economies as well as societies. To build a technology that is both safe and beneficial for society is a tough task. Maintaining and advancing technology induces safety and privacy risks whereas while maintaining safety and privacy it is really tough to develop advanced technology. AI has a huge potential to contribute to world economies and countries are now taking this opportunistic approach in trying to emerge as new AI giants. Apart from using AI people also have myths related to it. These myths should be removed as organizations are continuously working hard to remove the adversarial impacts of AI. The coming of modern technologies with huge storage and computational capacities has

enabled more and more experimentations and developments in AI. AI has brought a new era of technological advancements and it is changing the way people live in a society. It is directly or indirectly going to affect the lives of the people. AI is a new technology and developing countries are making efforts to use it to uplift themselves. To prevent the adversarial attacks and adverse uses is still a key problem to be solved and with each such type of wrong incidents, society is trying to learn more and keep it up safe at individual levels without hindering the growth of AI. More and more adoption of AI by people and societies would help in its improvements as it would provide more use cases and data on which AI could be trained. Many people see AI as it would take all the jobs in future but studies have shown that AI would create more jobs then it would take in the long run and is sure to create jobs that today we are not even familiar with.

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Redefining Banking with Artificial Intelligence Strategy for Future

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Abstract

Artificial Intelligence (AI) has been around for decades, ever since John McCarthy defined it as "the science and engineering of making intelligent machines". Artificial Intelligence is the theory and development of computer systems which are able to perform tasks that normally require human intelligence, such as visual perception, speech recognition, decision-making and translation between languages. Artificial Intelligence (AI) is widely used in service sector and application of AI in banking sector is an emerging area that is fast becoming a necessity. Banks are facing a lot of competition from FinTechs who harness the power of AI to enhance their business process. Thus, it has become imperative for banks to embrace AI or risk obsolescence. We tried to comprehend various applications of AI in banking sector with special note of the steps taken by the Indian banking industry. This paper focusses on understanding the artificial intelligence applications deployed in banking sector. We further tried to assess the benefits for the banks while implementing AI. We found that AI is strengthening competitiveness of banks through enhanced customer experience, cognitive process automation, realistic interactive interfaces and robotic automation of processes. Banking system has immensely benefitted out of this at the time of pandemic. One thing that the industry should remember is that the privacy and data security in the country is still at stake. A long-standing solution for this could be framing regulations on flourishing technologies and data security and privacy by the Reserve Bank of India (RBI).

Keywords: Artificial Intelligence, Applications, Banking, Customer Experience

1. Introduction

Disruptive technologies are redefining industries and business functions. With a fast-changing customer preferences and habits, companies are assessing opportunities and adopting methods to create value. Artificial Intelligence (AI), blockchain, and Internet of Things are emerging technologies that are changing the business landscape. Amongst these, AI is probably the most ubiquitous and disruptive in nature.AI has been around for decades, ever since John McCarthy defined it as "the science and engineering of making intelligent machines". However, it is only lately that AI technology has undergone rapid

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evolution and raised significant interest among the banking sector. Artificial Intelligence is the theory and development of computer systems which are able to perform tasks that normally require human intelligence, such as visual perception, speech recognition, decision-making and translation between languages. It is fast evolving as the go-to technology for companies across the world to personalize experience for individuals. The technology itself is getting better and smarter day-by-day, allowing more and newer industries to adopt the AI for various applications.

Banking sector is one of the fast-changing sectors with a drastic change in customer behaviour and expectations. Having exposed to advanced technologies, customers expect quick and seamless service experience from banks. While these progressions have allowed customers to avail most of the banking services at their fingertips anytime, anywhere, it has resulted in high costs for the banking sector. Understanding banking in these fluctuating times is a challenge. Banks today cannot afford to be complacent. They need to constantly revaluate their competitive advantages in light of profound changes driven by advances in IT and competitive pressures. They need to shift the focus from the traditional systems where mostly humans did majority of the back end operations to disruptive technologies to improve efficiency. There is growing need to adopt AI as it helps to retain clients and improves the processes and personalize the customer's experience. Artificial Intelligence could be the key to transform many of these crucial customer-facing processes and retain the competitive edge.

According to Accenture's Banking Technology Vision 2018 report, 83% of Indian bankers trust that AI will work together with humans in the next two years — a higher than the global average of 79%. 93% of the bankers in India said they progressively use data to drive serious and automated decision-making. More partner-supplied customer data means a higher degree of responsibility for banks. Yet, 77% Indian bankers agree that most firms are not prepared to confront imminent waves of corrupted insights from falsified data. Implementation of a high-end technology like AI in India is not going to be without challenges. From the lack of a credible and quality data to India's diverse language set, experts believe a number of challenges exist for the Indian banking sector using AI. A key challenge is the availability of the right data. Data is the lifeblood of AI, and any vulnerability arising from unverified information is a serious concern for businesses. Imagine for example, the risks that could arise from KYC compliance AI systems if the data sources are incorrect. Alternatively, consider the efficacy of a fraud detection AI system without the right kind of data. Structured mechanisms for collecting, validating, standardizing, correlating, archiving and distributing AI relevant data is crucial.

We tried to comprehend various applications of AI in banking sector with special note on the steps taken by the Indian banking industry. This paper focusses on understanding the artificial intelligence applications deployed in banking sector. The next section of the paper talks about the literature available on artificial intelligence in banking sector. Following that, applications of AI in current banking scenario and the transformation of Indian banking sector as a result of adopting artificial intelligence are explained. We have also done a study among 120 bank employees regarding their perceptions on AI applications in Indian banks.

2. Review of Literature

AI has been a topic for decades, and it is finally starting to impact our daily lives. AI is being used in so many applications nowadays from language translators, face recognitions to assisting applications such as Siri that we barely pay attention to it. Besides these applications, several firms operating in different sectors are increasing their AI use in their systems. The use of AI in the financial sector took place in various activities like chats bots and instant message replying solving the customer service problem, fraud detection by analysing the data, underwriting, Robo – advisory, prediction, regularity compliance and many more.

Matthew (2012) have mentioned in their study that artificial intelligence (AI) has been identified as the next technological frontier for banks as they look to leverage their investment in mobile to drive greater customer engagement. Banks including Standard Chartered and Citi are developing AI solutions to assist with staff attrition and training, and reduce human error at all points in the engagement and transaction process. Banking executives see potential in AI programs to fulfil the role of a virtual personal assistant, following the success of Apple's Siri platform. According to PwC, fintech will drive the new business model and digital becomes mainstream. It also states that block chain will shake things up and 'customer intelligence' will be the most important predictor of revenue growth and profitability. (PwC 2018). The motivations behind the AI installation in business processes seem to be the speed, accuracy and volume of computers in comparison with the existing human counterparts. Many companies already use robotic process automation devices to shift daily information and to crunch figures. Kensho for instance is a smart computer system usually used by stock traders and shareholders to asses portfolio efficiency automatically and to forecast transitions in the economy. The software is defined as the world's first computer science tool for the financial sector. KPMG has been using McLaren Applied Technologies (MAT) innovations since 2015 in its audit process. Predictive analytics permit the automation of the collection of data and the output of complicated information records that saves time and improves customer service. (O'Neill, 2016.) Finance institutions carry out a variety of activities, ranging from gathering basic data to making complex decisions and advising business leaders. Today, financial function procedures are purposely intended to harness many people's collective brainpower and understanding. Managers must be prepared to reengineer their processes to unlock AI's complete capability. (Plaschke et.al. 2018).

To establish and maintain a dynamic atmosphere for AI to profit the economy more widely, adequate preparation and policy is required. Investing in digital infrastructure is a main metric to guarantee that businesses can compete effectively across different sector and places. AI is a primary set of methods to be used in a specific business case (Ernst, Merola & Samaan 2018). AI is being used to proactively screen and avoid different occasions of misrepresentation, illegal tax avoidance, negligence and the identification of potential dangers. For example, companies use the data and behaviour of the individual to recognize patterns and detect irregular transactions. As part of their monetary service network, Mastercard has also been working to incorporate AI technology in the

"identification" of individuals frauds. Similar techniques have been utilized to decide trade misconduct. (Goudarzi, Hickok & Sinha 2018).

Bachinskiy (2019) suggested that AI offers a quicker, more precise evaluation at lower costs of a prospective borrower and reflects a broader range of variables leading to a better-informed, data-backed decision. AI's credit scoring is based on more complicated and advanced rules opposed to traditional loan scoring schemes. It enables lenders to differentiate between high-default risk candidates and those who are worthy of credit but lacks a credit record history. Objectivity is a further advantage of the AI system. Contrary to a person, a machine is unlikely to be partial. Digital banks and loan-issuing apps use machine-learning algorithms to analyse credit status with optional information (e.g., smartphone data) to check loan eligibility and to offer customized options. With the need to implement a competitive edge in technology, banks and financial firms are now progressively beginning to embrace chatbots in their system. The impact is so much that chatbots are now regarded as an industry standard. For businesses, chatbots are the starting point of AI. They are primarily used for their customer service purposes as a 'virtual assistant.' Some studies found that millennial generation clients are very happy using the AI to remain in contact with their bank, rather than interacting with a real person. Only 12% prefer to use the phone out of this group, whereas many choose to chat, social media or message. (Mubarak 2019).

3. AI in Banking Sector

Artificial Intelligence (AI) has progressed in fits and starts since the term was first coined in 1956 by the American computer scientist John McCarthy. In the 1980s and 1990s, AI was focussed on rule-based ‘expert systems’ that implemented predefined logical rules. Since the 2000s, data-driven AI has emerged as the main enabler of technologies. AI has now evolved to the point where it can interact and communicate with humans through analytics and automation. It can perform human-like cognitive functions (e.g., recognising patterns from data and understanding images, text or speech), as well as make predictions, recommendations and decisions. In a nutshell, the goal of AI is to enable computers to mimic human intelligence so that they can learn, sense, think and act, in order to achieve automation and gain analytic insights. Many sectors have been growing significantly and contributing more to the economy. By adding the technology in these core sectors, the result would be more positive. The sectors like infrastructure, financial services, technology, education and healthcare have been growing rapidly in the country.

Artificial Intelligence (AI) is poised to be a game-changer for the banking industry. With numerous AI applications in the pipeline, huge gains could be realised over the coming decade. The industry is expected to save more than $1 trillion by 2030 thanks to AI, with traditional financial institutions shaving 22 percent from their costs.31 In this section, we dive into selected use cases and explore the impact that AI is making in the banking industry. The following are some of the areas in which AI applications are used in banking.

a. Chatbots And Virtual Assistants

Pressure is mounting on banks to adopt a digital mindset. They need to adapt to evolving customer expectations, reduce costs, prevent losses of business to nimbler start-up competitors, and find novel ways to grow revenues. Banks trying to expand face a barrier in the form of rising customer costs caused by rapid growth and widening product lines. They often struggle to deal with an inflating volume of call-centre queries and customer emails, as their traditional customer-service model has limited economies of scale and adapts poorly. Therefore, banks are embracing chatbots or "automated personality". These can help deliver on-demand, automated help, such as dealing with frequently-asked questions; perform account services; and assist with financial requests.

b. Underwriting

Credit is the master of all payment methods. According to a recent survey, 77 percent of consumers preferred paying with debit or credit card, compared to only 12 percent who favoured cash. Yet loans have always been a major source of credit risk. Banks have long relied on heavy historical credit data to delicately determine an applicant's credit worthiness, repayment ability, and lending risk. These factors ultimately determine their lending decisions. However, legacy credit-risk modelling using traditional data sources to facilitate lending decisions is increasingly associated with diminishing margins, an incomplete view of risks, data management issues, a loss of corporate knowledge, and slow credit decisions. Nonbank lenders, such as AI-powered fintech players, are making the financial industry ever more competitive. So, banks have an urgent need to resolve these inefficiencies and optimize their underwriting and loan-application processes.

c. Relationship Manager Augmentation

Cross-selling or prospecting initiatives have been a major source of revenue growth for banks. More often than not they target existing customers, for whom the banks already have information on attributes such as financial standing, historical spending behaviour, and portfolios. However, the disconnect – and AI opportunity – lies in the ability of banks to accurately and promptly anticipate these customers' unaddressed needs. To interest customers through digital campaigns, digital marketing teams will first conduct product level exclusions and then leverage customer relationship management (CRM) lists to find the next best product for those customers. This implies finding a logical way to group customers and audiences based on testing to find out their needs and/or wants. Many customers qualify for multiple products, making it challenging for the relationship managers – while in their roles as financial advisors rather than sales personnel – to decide which products to recommend and how and when to recommend them.

d. Fraud Detection

In financial year 2018-2019, a record number of complaints about banking fraud and scams were reported to the UK Financial Ombudsman Service. More than 12,000 complaints about financial fraud were logged, an increase of 40 percent on the previous year and more than double the volume received three years previously. Fraud mitigation is increasingly

a top priority for banks. However, traditional methods of fraud identification – such as the use of rules engines written by humans – capture only a small percentage of fraud cases and produce a significantly high percentage of false positives. The large pool of false positives required significant manpower and money to investigate what might still turn out to be dead ends. Therefore, banks are turning to AI to improve their predictions, identify a higher percentage of actual cases, and reduce false alarms. In fact, fraud detection has been identified as the most valuable application of AI in banking. According to a 2019 study by the Association of Certified Fraud Examiners, the world's largest anti-fraud organisation, 13 percent of 1,000 companies have already used AI to tackle financial crime. A further 25 percent plan to do so in the coming year. Twenty-six percent currently use biometrics as part of their anti-fraud programmes, and another 16 percent expect to deploy biometrics by 2021.

Financial institutions have been early adopters of AI for fraud detection. The FinCEN Artificial Intelligence System (FAIS) was already used to predict potential money laundering in the 1990s. In a survey conducted by the Bank of England and the Financial Conduct Authority in 2019, 57 percent of respondents reported that they were using AI applications for risk management and compliance, including anti-fraud and anti-money laundering applications. Some regulators are attempting to use AI to detect misconduct. For example, the Australian Securities and Investments Commission is using AI to supervise equity and futures markets, and it is sponsoring research into the use of natural language processing technology to detect misconduct. Machine-learning algorithms have the potential to analyse millions of data points to detect fraudulent transactions that would likely go unnoticed by humans. They improve the precision of real-time approvals and reduce false positive results.

e. Algorithmic Trading

Financial institutions, especially hedge funds and proprietary trading houses, have been using algorithmic trading over the past decade. Benefits can include faster execution at the best prices, which will benefit the firm and clients; increased accuracy and fewer mistakes; the ability to automatically check multiple market conditions simultaneously; and fewer errors with psychological or emotional causes.

f. Fraud Detection and Anti-Money Laundering (AML) Management

Banks have traditionally used a rules-based approach to manage the risks of fraud, money laundering, and sanctions. This rules-based approach is also referred to as a risk-based or risk-scoring approach: Companies undertake a formal money-laundering risk assessment and then document the risk scenarios they are exposed to, based on their customers, products, and business lines. Companies submit pre-determined scenarios to the regulators for approval and the AML process must follow the approved processes. The traditional risk-based approach could be costly, as simple pre-determined scenarios could give rise to false positives or negatives. For example, if a scenario is to red flag politically exposed persons (PEPs) from a high-risk country, all PEPs from that country would be subject to further scrutiny and documentation even though there are no other transaction or activity-based

data that support such a risk assessment.

With the help of AI, banks can run two approaches in parallel: one based on an intelligence-based approach using big data and another that uses AI's capabilities to recognise patterns. The data is usually based on transactions and also features detailed information on the customers and their business or personal activities – so each bank prefers to use its own dataset. Block-chain, a distributed ledger system that allows the anonymization of transaction-level information, could enable banks to maintain their competitive positions and protect customer data privacy while also contributing to industry-wide efforts to combat fraud and money laundering.

4. AI Applications by Leading Commercial Banks in India

a. State Bank of India (SBI)

SBI the largest public-sector bank with 420 million customers has embarked on using AI by launching "Code for Bank" for focusing on technologies such as predictive analytics, fintech/ block chain, digital payments, IoT, AI, machine learning, BOTS and robotic process automation. SBI has also launched SIA, an AI-powered chat assistant that addresses customer enquiries instantly and helps them with everyday banking tasks just like a bank representative.

b. HDFC Bank

HDFC Bank has developed an AI-based chatbot, "Eva", (which stands Electronic Virtual Assistant) Eva can assimilate knowledge from thousands of sources and provide simple answers in less than 0.4 seconds. By using Eva, a customer can get information on its products and services instantaneously. It removes the need to search, browse or call. HDFC is also experimenting with in-store robotic applications. HDFC's IRA (stands for "Intelligent Robotic Assistant") robot.

c. ICICI Bank

ICICI Bank, India's second-largest private sector bank has deployed a software robotics (robotic software) a kind of software generally focused on automating office work. The bank is the first in the country to deploy the technology, which emulates human actions to automate and perform repetitive, high-volume and time-consuming business tasks. It has also enabled the bank's employees to focus more on value-added and customer-related functions. ICICI Bank has also launched an AI-based chatbot, named iPal (chatbot) which has interacted with 3.1 million customers, has answered about 6 million queries, with a 90 percent accuracy rate. The bank is also considering the process of integrating iPal with existing voice assistants such as Cortana, Siri and Assistant.

d. Axis Bank

Axis Bank, India's third-largest private sector bank, launched an AI & NLP (Natural

Language Processing) enabled app, Conversational Banking, to help consumers with financial and nonfinancial transactions, answer FAQs and get in touch with the bank for loan other products. Currently available on Face book and the Axis Bank website, it will soon be extended to mobile banking channels as well.

5. Research Methodology & Data Analysis

To understand the perception of bank employees towards the application of AI in banking services, a study was undertaken by collecting data from 120 bank employees in leading commercial banks using a questionnaire. The questionnaire had questions on demographic details, the services for which AI is currently applied in the respondents' banks and their perception regarding the performance of banks with AI application.

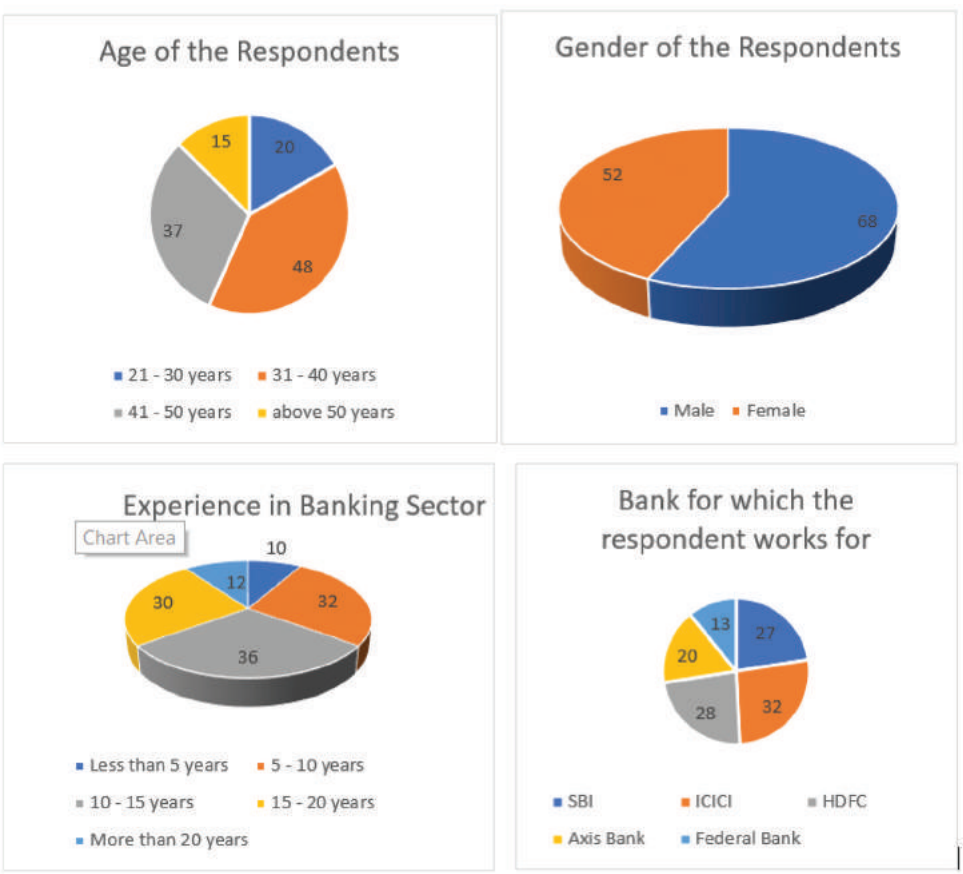

Figure 1: Demographic Profile of the Respondents

All the respondents in this survey were aware about the application of AI in banking and finance sector. 89% of all the 120 respondents admitted that artificial intelligence systems are implemented at least in some functions of their banks, 45 % of the respondents said that their banks are in pilot testing phase for expanding the application of AI systems into other functional areas also. The figure below shows the areas in which AI is predominantly used in the respondents' banks.

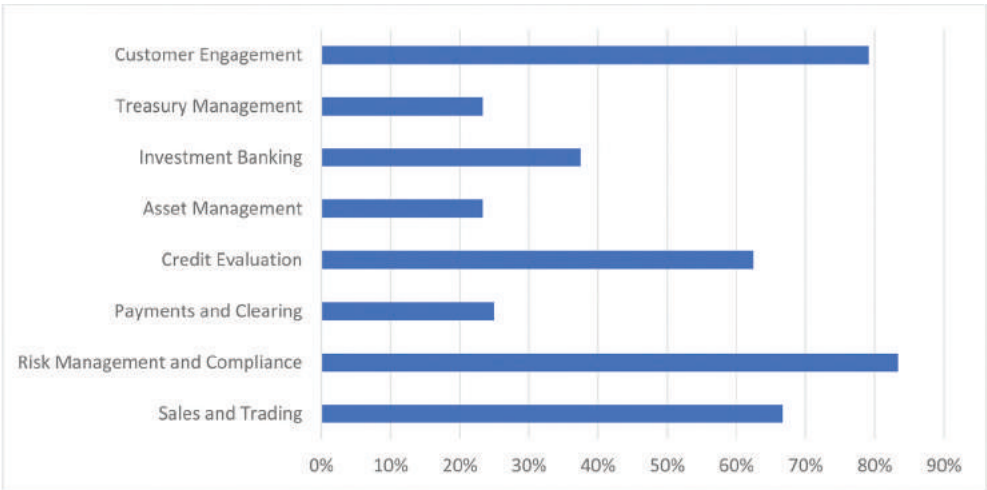

Figure 2: Areas where artificial intelligence is used in respondents' banks

From figure 2, we can see that majority of the respondents said that their banks use AI in risk management and compliance, followed by customer engagement activities, sales and trading activities and credit evaluation activities. The questionnaire also had a question on the perception of respondents on the improvement in the activities of their banks after the application of artificial intelligence in the said activities. The activities identified were compliance & risk management activities, advisory & customer relationship activities, model development activities and cost savings activities. The figure below (fig.3) shows the perception of employees regarding the activities which are benefitted through AI applications.

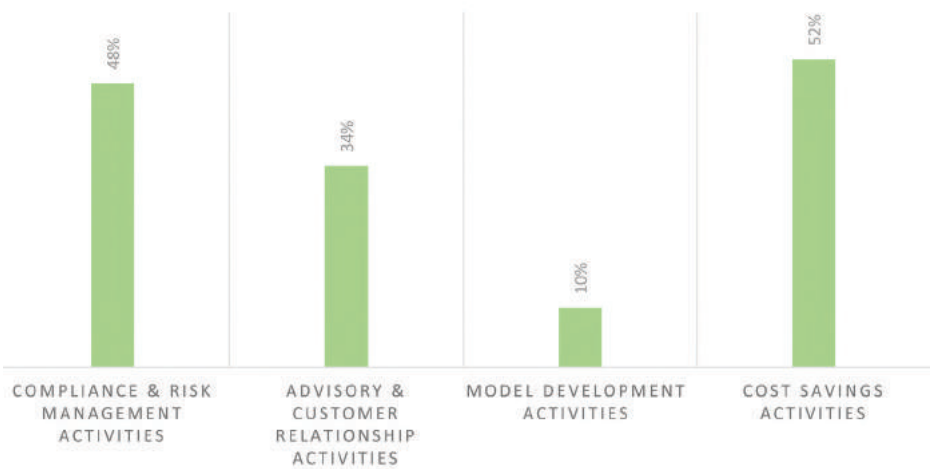

Figure 3: Activities benefitted mostly by the application of Artificial Intelligence

The employees of various banks felt that banks mostly benefitted by saving cost associated with human resources by applying artificial intelligence, followed by compliance and risk management, customer relationship activities and model development activities.

6. Findings

From the analysis, we found that bank employees perceive the various benefits by implementing artificial intelligence in banking services. The most prominent one is in terms of reduction in costs by shifting tasks from humans to AI. In highly demanding work environment, AI implementation have benefitted bank employees by bots handling basic authentication and information requests before handing off to a live representative and shifting common inquiries to bots. This process moves rote tasks from humans to RPA which will help bank to enhance the productivity and efficiency of its employees. Employees feel that AI augments human resources, through speeding up response times with NLP-driven queries that respond to the employee, allowing customer self-service using NLP, with humans as fallback and keep humans apprised of latest regulatory changes. AI also saves time by preparing the first draft of reports with less typos.

Risk mitigation is the next major activity wherein AI application has immensely benefitted the banks. AI is helpful in performing comprehensive market risk analysis and to run liquidity / stress testing scenario. It helps in detecting suspicious pattern of financial activities, prevent financial frauds and improve compliance and control. Bank employees also feel that implementation of AI may increase the revenue of the banks and improve customer experience.

7. Conclusion

Artificial Intelligence has the ability to change the way in which Indian banking sector is currently functioning. But there a few challenges in this path. This includes non-availability of manpower with required data analytics skills, non-availability of standardised data, lack of coordination in enforcement approaches, differing levels of digital literacy of the customers in Indian market, diversity of Indian languages and issues related to data security and privacy. In order to successfully adopt disruptive technologies, banks should have a clear vision on what they want this technology to achieve and their internal dynamics. Along with this, banks will have to make huge investments to ensure data privacy and security on a regular basis. In a country like India, where majority of population is in rural areas, banks should take adequate measures to ensure that introduction of disruptive models to improve efficiency will have inclusive nature rather than creating biases.

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Ethical Dilemma During Digital Transformation: A Case Analysis Of Britannia Industries

Nidhina Sunny

Abstract

Digital transformation has a huge impact on the business environment by creating many challenges as well as opportunities. As a result, many organizations have adopted the latest technologies and have developed software to ease operations and to increase productivity and also to reduce the cost incurred in business processes. An ethical dilemma can be a moral situation where a decision is to be made between two or more equally undesirable alternatives. Dilemmas can arise due to various influential factors like behavior or attitude of a person, flaws in a person's character or sometimes when there is a conflict between personal goals and organizational goals or social and moral values. The dilemma in business arises when a decision-maker encounters a situation to make choices between two or more options that may have various impacts on the organization itself by means of its profitability or growth or also impact its stakeholders. Ethical dilemmas are situations that frequently arise in the corporate world, especially in workplaces. This study is to analyze one such situation where a person in a managerial position overcomes an ethical dilemma he/she has encountered. The various factors that affect decision-making and the consequences of the decisions taken while in a dilemma are also looked upon. It also reflects on the key element of how adopting a software to record the pricing for the products affects a business. It helps in making a huge decision which helps avoid unethical practices.

1.Parties involved in the Case Analysis

Geopal G Nath

Mr Geopal G Nath has about seven years of working experience as managerial personnel in the corporate world. He holds an MBA degree from Symbiosis Institute of Management. After his MBA, he joined Mars India Private Limited as a sales management trainee. After a year, he was promoted to Assistant Manager and continued to work with them for the next three years. His next job stint was with Britannia Industries, where he worked as an Area Sales Manager in the Ernakulam branch.

Britannia Industries

Britannia Industries, formerly known as Britannia Biscuit Company Limited, is one of the major FMCG (Fast Moving Consumer Goods) companies and one of India's oldest companies,

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headquartered in Kolkata West Bengal. The company was founded about 128 years ago in Calcutta in the year 1892. Britannia's principal business activity includes manufacturing and selling bakery products that include biscuits, bread, cakes and rusks, and dairy products. Britannia is estimated to have a market share of 38% with 90% of its annual revenue of Rs. 22 billion raised from biscuits alone.

All Kerala Distributors Association (AKDA)

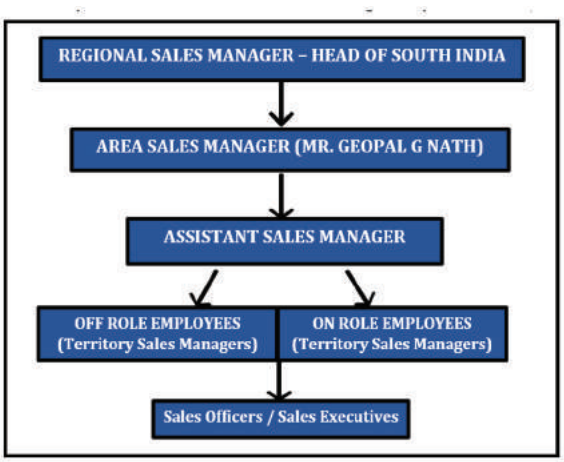
All Kerala Distributors Association (AKDA) is an organization for distributors in Kerala that mainly seeks and works to better the distributors and acts in full uniqueness and provides a helping hand for all distributors' services.

Distributor's Qualities

The distributor's name is kept anonymous.

- Britannia's favors this distributor as it is one of the fast-moving distributors in Kerala.
- The distributor has excellent geographical coverage and market coverage accounting for up to 3600 – 3800 outlets in number.
- This distributor carried out nearly 2-2.50 crores of monthly business sales for Britannia and thereby, it earns about 7-8 lakhs monthly income after expenses.
- It operates by providing a market credit of 7 days (which is bill to bill), where the retailers enjoy 7-day credit period which provides higher volume for the distributors and the company.
- Furthermore, it offers a huge Investment capacity to Britannia in terms of distribution
- Provides Infrastructure benefits to Britannia like inventory storage capacity, space, vehicle, staffing which were an added advantage to the company.
- Receives a double-digit growth year on year basis accounting for 27%.
- Other major companies that they carry out distribution include Colgate (monthly sale of 1-1.5 crores), GSK (monthly sale of 1-1.5 crores).

Hierarchical Structure



2. Objectives

- To analyze the ethical dilemma faced by the company taken for analysis.
- To study the criteria upon which decisions are taken when companies face an ethical dilemma
- To analyze how digital transformation has triggered or led to unethical practices
- To analyze the impact of the technology up-gradation conducted within organization in relation to ethical practices followed.

3. Methods

The methodology used for conducting this study analysis was purely based on primary data and information directly collected by the key personnel of Britannia Industries discussed in this study. The technique used for extracting data was by conducting an interview. The case was examined by conducting a telephonic interview with the Area Sales Manager of the Ernakulam branch of Britannia Industries.

Questions asked during interview:

1. How many years of managerial experience do you have?
2. How many people do you manage?
3. What are the various ethical dilemmas faced by you?
4. How did you identify this issue?
5. Did you have to analyze them on your own?
6. Were you the only person to decide for the same?
7. Did you consult or seek anyone's help in making the decision?
8. What were the factors that were to be analyzed while making a decision?
9. Who were the people that could be affected by the decision?
10. What was the decision/action taken?
11. On what basis was the decision taken?
12. What was the outcome of the decision taken? (negative or positive)?
13. How would you tackle the situation if someone from your team or a senior person you report to raised a concern about an unfair solution?
14. Do you think that the outcomes would have been different if the other alternatives were chosen? Why?

4. Discussion

Working: Britannia follows General Trade, the company's sale platform where it sells its products to the distributors who in turn retail them to the end customers. The retailers and the distributors follow Bill to Bill method of payment based on credit period.

Billing Software: Britannia uses a carry forward unit for billing the distributors via a

software called “Botree” which the area distributors use. The promotional scheme is discussed upon and fixed by the company before a month of its bulk order.

The promotional scheme is generally provided for distributors that buy the actual amount of order stated for the promotion. The distributors punch in the order details into Company software called “Udaan” that helps the company in generating the bill for the distributor based on the promotional scheme. Distributors basically use Udaan to bill their retailers/customers under the name of Britannia.

Policy: Britannia follows a profit-sharing promotional scheme to boost their sales, including predetermined and confirmed orders placed by their distributors. These orders used for the promotional scheme are placed a month before the actual delivery by sales officers who handle distributors. Sales executives are appointed to take in orders for the promotional scheme from them. Britannia communicates the scheme to the distributors, and them in turn bill it in their software.

Issue

In 2018, under the Ernakulam district, Kerala, one of the main distributors of Britannia had used an alternative local software which produced two different billing, one on the distributor's software and the other on Britannia's software called Udaan.

Under Udaan the distributor showed pricing with a promotional scheme while under the distributor's local software, they priced the retailers without the promotional scheme, that is, even the free products received from the company were sold at a price and not free to retailers, thereby making additional profits.

Britannia was unaware of this unethical practice of the distributor and continued to receive payments from the distributor as per the pricing shown in Udaan and offered the promotional scheme as well which added to the additional cost of the company.

What was done?

One of the sales executives while cross checking the billings done by the company and the distributor, found that the promotional scheme was not given this particular distributor as per the alternative software billing.

The distributor was using the money from the promotional scheme which was supposed to be given to the retailers.

Eventually the sales executive started approaching the retailers and collected their bills and found out that none of the retailers under this distributor was given this company’s promotional scheme.

Sales executive reported this to his manager Mr. Geo Pal.

Distributor blames Sales Officer (SO)

Distributor blames the sales officer stated that this differential pricing was done with the knowledge of the sales officer and a percentage of the profits was shared with the sales

office as well.

Sales Officer stated that had he could produce all this bank transactions and balances as a proof and all stated by distributor was false. And also he stated that had he really intended to share this profit with the distributor he would have brought this issue to light and continued with it.

AKDA and Britannia

AKDA mentioned that Britannia has to retain this distributor no matter what and had put a lot of pressure on the management to remove the distributor. Also, some random promotional scheme was offered to the management to retain this distributor as well. However, the final decision was with the management of Britannia

Dilemma

- Whether to retain the distributor because of the benefits that the company has been receiving from this distributor?
- Whether to terminate the distributor form its channels?

Decision taken

The manager and the main stakeholders had taken the stand to terminate the distributor from the company's distribution channel mainly focusing on following the ethical business practices.

Britannia decided to appoint another distributor with immediate effect and also ensure that the new distributor was briefed upon the company policy and norms.

5.Results

Challenges when appointing a new distributor

- Britannia would lose on its added benefits of infrastructure and the growth offered by the existing distributor.
- The newly appointed distributor should familiarize with the market which takes time.
- Retailers and Distributors should familiarize themselves and mutually agree to the credit payment terms.
- The new distributor should be on good terms with the company and retailers and follow bill to bill method of payment

What happened to Britannia after removal of the distributor?

- The profit margin of Britannia was badly hit and also, they had lost sales for almost close to 22 days.
- The management sought an alternative of parting the Ernakulam area distribution to distributors from nearby areas, which was given more manpower as subsidy, until a new

distributor was appointed for Ernakulam.

Though the main distributor was removed from Britannia's channel of distribution, the company was quite confident that sales would increase in less than a month since it is a Fast-Moving Consumer Good (FMCG) in a company in the market. They can easily meet the high demand of the consumers. Moreover, the management believes in working ethically even if it leads to making losses for the company. As of 2020, Britannia makes monthly sales close to 3-3.8crores.

Positive outcome of the decision later in the future

- Sales increased at a later stage with promotional scheme
- Retailers became more loyal to Britannia and its products
- With the promotional scheme introduced, more investment was made for different product lines
- Udaan became the only software used by Britannia and its distributors and thereby helped get accurate data.

What would distributor loose?

- Profit margin crashed – from a monthly business of 2 crore the distributor earned nearly 10 lakhs every month
- Reputational damage
- Lost sales distribution from many other FMCG companies due to trust issues

6. Recommendations

- Companies can establish guidelines that abide by the policies stating the software and inbuilt tools they allow for their day to day working operations, thereby limiting and protecting any fraudulent practices.
- Be it any stakeholder – employees, direct dealers, distributors, etc, companies can adopt data monitoring techniques to ensure there is no breach and data is not tampered with.
- The company should foster more ethical behavior and promote ethical practices. Create awareness among the personnel of the organization about the pros and cons of using updated technology and system software used within the organization.
- Awareness must be created within the company about the seriousness of cyber security threat that may arise upon accepting/receiving anonymous hazardous emails or notifications.
- Company policy needs to include pre-determined proactive measures that can be taken in case of data breech.
- Develop more stringent business processes and financial controls to remain with limited personnel, and follow practices where employees need to seek permission to access confidential data or use/install any software.
- Any software used by the dealers/distributors needs to be authenticated and informed prior to the company to promote transparency.

7. Conclusion

The effective use of the technology happens only when the organization put it into use in the "right way". Digital transformation helps in improving efficiency and also gives a hand to spread transparency in the right manner. Therefore, organizations need to ensure that they use the technology available only for business operations that always stand to be ethical.

Organizations generally adhere to their policies and have their framework of code of conduct and ethical standards. This makes almost all business fields to a ground that can tackle the ethical dilemma.

An optimal solution for any such dilemma in a corporate world can result in various consequences that have positive or negative impacts. In order to such ethical dilemmas, it is required that every business form of the organization develop and adhere to strict ethical standards to be followed by the stakeholders. In addition, ethical training concerning the usage of upgraded technology can also be included in an organization that can highlight the importance of working ethically, following ethical values, and acting with integrity.

An organization guided by a spirit of transparency forces itself and the stakeholders to operate with the spirit of ethics. Success is attained by simplifying and solving complex issues, addressing difficulties that arise and being fully truthful and transparent.

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Financial Inclusion through Digital Payments in India

Angeline Poorani Therese B, Kezia Faith Samuel and Minu Paul V

Abstract

This paper has collected information on the extent of digital payments in India, majorly in the rural sector, using the financial inclusion index and empirical study on financial inclusion in India. For the past few years, financial inclusion and digital payments in India have been studied to identify the relationship between financial inclusion and digital payments growth. As a result, fintech companies can concentrate on building trust and gaining more usage from the rural sector of India, which will improve financial inclusion in India. Furthermore, bridging the gender gap and educating the rural sector in financial literacy will pave a massive role in improving financial inclusion in India.

Keywords: *Financial Inclusion, Empirical Study, India*

1. Introduction

In recent years, technology has been evolving rapidly, and the world is also adapting to this advancement at the same rate. There has been a huge focus around the term "cashless economy". A cashless economy makes almost all transactions using digital payment methods such as internet banking, UPI payments, app-based payments, AEPS, mobile wallets, and micro-ATMs. India is racing e towards a cashless economy. Digital payment push started back in the 1990s through electronic fund transfer methods such as RTGS, NEFT, and ECS payments. On July 1, 2015, the Honorable Prime Minister of India, Mr Narendra Modi, launched the Digital India campaign to provide government services on digital platforms, improve digital infrastructure, and increase digital literacy.

Nevertheless, the real impetus for digital payment apps came through the government's demonetization policy in 2016. Digital payments apps such as PhonePe, GooglePay, PayTM, etc., took off during this period. UPI-based payments, as well as app-based payments, pushed boundaries in digital payment methods. In the financial year 2021, digital payments in India reached a total of over 53 billion INR. This is an increase of 156% as compared to digital payments in 2018. Therefore, India has become increasingly open to digital payments in the last five years. As per reports, digital payments in India are set to account for 71.7% of all payments by volume by the year 2025.

One of the government's intentions behind the digital India campaign was to encourage financial inclusion in India. For this purpose, the RBI conceptualized a framework called Financial Inclusion Index (FI-index)) to measure the extent of financial inclusion across

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the country. Financial inclusion refers to the level of awareness, the extent of usage and accessibility of financial products and services that people in a country, across all classes, have. Furthermore, according to RBI reports, the FI index in March 2021 was 53.9, which is a good improvement compared to March 2017, when the FI index was 43.4. This implies that banking and other financial services have become more accessible to the underbanked and weaker society.

Several factors such as implementation of JAM (Jan-Aadhaar-Mobile) trinity, issue of Kisan Credit Cards (KCC), Aadhaar enabled bank account (AEBA). The promotion of Unified Payment Interface (UPI) by the National Payments Council of India (NPCI), etc., has helped improve financial inclusion in the country. Post demonetization, there was a boom in the digital payments sector. In FY 2021, the value of digital payments was 41,036 billion rupees, while in FY 2017, it was 69.5 billion rupees. The COVID-19 pandemic has also assisted this boom in digital payments and other financial services. There has been a phenomenal shift in consumers' preferences about payments, banking, and other financial services. Contactless transactions and having access to financial services at the touch of a finger have become the trend and, in some ways, a necessity too.

Digital payments apps and fintech services companies have made a mark in recent years with a CAGR of 19.4% and 22%, respectively. This case study dives into the impact of this industry on financial inclusion in India.

2. Aim

Through this paper, an attempt has been made to study the following:

- Growth of digital payments in India
- Financial Inclusion in India in the past few years
- Relationship between financial inclusion and digital payment growth

3. Methods

The study is descriptive. Available secondary data from Reserve Bank of India reports, rating agencies such as CRISIL, and research reports were extensively used for the study. Different news articles, authorized internet resources, and research studies were used. A simple percentage method was used to analyze secondary data to show trends and status over the past years.

4. Results

The growth in digital financial services (DFS) in India can be understood via three phases of growth. The first phase was from early 2014 to August 2016, which saw a growth of 2% per month in transaction volumes on the major digital platforms. It was after demonetization in November 2016, the second phase of growth in DFS happened. This period saw increased transactions through pre-paid instruments (PPI) like Paytm and Mobikwik. However, the growth in these pre-paid instruments was overruled by Unified

Payments Interface (UPI). UPI had started evolving into prominence since mid-2017 by subsiding the use of PPI and Debit cards, which were earlier the primary vehicle of digital transactions. Viewing the statistics of 2018 of digital payments about their impact on financial inclusion, it is to be noted that 35% per cent of adults have ever made or received digital payments. This accounts for almost two-thirds of adults who are not yet part of India's digital finance ecosystem. This also suggests that the increased number of transactions in UPI is not done by adding new users into the digital system but by the already existing users.

The Reserve Bank of India has constructed a digital payments index (DPI) to capture the extent of digitization of payments. The RBI DPI, which releases a semi-annual basis, measures the deepening and penetration of digital payments in the country via five parameters, payment enablers, payment's infrastructure- demand-side and supply-side factors, payment performance, and consumer centricity. Being set in March 2018 as the base period, the DPI score is set as 100. However, it increased to 153.47 in March 2019; the growth has been progressive. By March 2021, the DPI index was 270.59 as against March 2020, where the DPI index value was 207.84.

Crisil Inclusix measures the financial inclusion of banks, insurers, and microfinance institutions on four dimensions like the number of branches, credit, deposit, and insurance. As part of this report, it is known that banks started focusing more on digital channels and that the new branch openings have dropped in the fiscal year 2016.

In order to provide a digital push in rural India, the Ministry of Electronics and IT(MeitY) launched the Digital Finance for Rural India, creating awareness and access through Common Service Centers (CSCs)Scheme. CSCs aimed to spread awareness regarding government policies and digital finance options available for rural citizens. The government has invested Rs.65.625 crores in popularizing different digital financial services such as IMPS, UPI, Bank PoS machines, etc. This scheme aimed to connect 2,50,000 Indian Gram Panchayats and offer 100 Mbps connectivity to achieve the same.

The reasons identified for the low usage of digital payment systems are listed as follows. However, the transaction cost is zero in almost all the digital payment apps; there is no certainty of good network connections in rural areas. Moreover, people have to own a smartphone to make digital transactions. Looking at the economically weaker sections of society, many women do not have the provision to use smartphones to make transactions. As part of research conducted in knowing awareness of digital payments in rural areas, it was identified that awareness, digital literacy, adequate infrastructure, and rate of customer involvement in cashless transactions were found to have a strong relationship with digital payments technique of transactions. Another reason is, digital payments apps are used by Gen Y and Gen Z generations at a more comfortable level than the older generations because of lack of knowledge in using the app and lack of trust in digital systems, and also more out of fear from the news they hear about hackers.

Though the Covid pandemic showed an upsurge in digital transactions, according to Mckinsey reports, the expansion of digital platforms to rural India was hammered by Covid surges and restrictions.

5. Discussion

Post demonetization, there was a paradigm shift in the payments method in India. The mammoth growth in the number of digital payments and the introduction of banking/financial services in India is an interesting case to understand how technology and digitization are helping in increasing awareness, accessibility, and usage of financial services in India, especially in rural areas of the country. Greater financial inclusion is a sign of progress and improvement in the financial literacy of a population. Making banking and financial services to people across all classes empowers them to make wiser financial choices and thus, leads to a better standard of living.

Financial inclusion and digital payments, and financial services have been the research subject in the past few years. From the existing literature, we understood that the growth of digitization in financial services happened after the launch of the Digital India campaign and gained momentum in 2016 after demonetization. UPI-based payments increased exponentially, and the availability of banking and other financial services at the tap of a finger led to the growth of the FinTech companies (e.g. GooglePay, PayTM, PhonePe,). As a result, the RBI conceptualized a framework called DPI to capture the extent of usage of digital payments in India. Data released by the RBI suggest that DPI has seen an upward trend since March 2018. Another index that helps to understand financial inclusion in the country is the financial inclusion index introduced by CRISIL (Inclusix). Inclusix measures the inclusion of bankers, insurance companies, and other financial institutions. The report on Inclusix suggests that the digital wave in financial services has led to fewer branch openings. The Government of India has also taken several steps to improve financial inclusion and literacy in India. The common Service Centers (CSC) scheme by the government has helped connect with 2,50,000 Gram Panchayats in an effort to popularize digital financial services by offering a 100 Mbps internet connection.

In conclusion, it can be said that though digitization in the financial sector has increased financial inclusion, especially amongst the rural population, there is still a long way to go for digital payments apps and other FinTech companies. Moreover, challenges such as poor infrastructure, lack of internet connection, lack of trust regarding security issues, and reluctance to adopt digital services by senior citizens have to be tackled wisely by digital payments apps and Fintech Companies.

Exhaustive primary research could also study the impact of digital payments and financial services on financial inclusion. Reasons behind the adoption of digital and services, the extent of usage (both in rural and urban geography), demographic details of people using digital financial services, and the challenges faced making them reluctant to use these services. Such research would give a comprehensive insight into the perception of people regarding digital financial services. It would help FinTech companies bridge the gap and have wider acceptance for their products.

6. Recommendation

A lot of the onus for increasing financial inclusion lies in the government's policies, but there is a lot that the fintech companies can do for the same.

Focus on rural penetration:

India ranks second in the online users 'market with 622 million internet users, and amongst them, the rural internet users were 299 million (Print). This means that half of the population in India has access to the Internet. Therefore, Fintech companies and digital payments apps need to focus on reaching the rural population in India. This will lead to greater awareness and accessibility of financial services amongst the rural population.

Digital Financial literacy campaign as part of CSR

Through the government's thought of increasing bank accounts among unbanked adults by Pradhan Mantri Jan Dhan Yojana (PMJDY), the number of deposit accounts opened in economically weaker sections of the society has increased in the last three years. However, the number of active accounts in transactions is low compared to those that were opened. Therefore, it would be beneficial if financial inclusion initiatives aimed at providing the economically weaker sections of the social trust in using their savings accounts via digital payments apps for transactions.

Bridging the gender gap

As part of CSR activities, financial and non-financial institutions take part in encouraging women entrepreneurship among women in rural areas. Additional attempts in making them use digital payments apps for their business would aid in reaching a more comprehensive section of society shortly.

Tailor-made product offerings for rural consumers:

Trust has always been a priority when it comes to using digital applications. When it involves money, the various scams due to OTP hackers are continuously circulated through social media. Digital payments apps should attempt to build trust among their users, especially among the economically weaker society. Customized products that aim to easily use digital payments apps for people with not much knowledge about smartphones will be a good start.

Providing good network connections to the rural sector

The essential requirement to use digital payments is to have a good network connection and have a smartphone. The smartphone market has extended its roots to all sections of society, unlike good and consistent network connections. A good network connection and seeing the money successfully transacted message will be a huge trust-raising factor among the public.

Educating students at school

There are much first time high schoolers from families of economically weaker sections of the society. Educating them in using digital apps and enlightening them towards financial

inclusion will help build trust among the public. This will also pave the way for regular usage of deposit accounts and initiate interest among people using digital payments apps.

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Does employee engagement lead to employer branding?

Rony Shiela S and Akanksha Jaiswal

Abstract

Employer branding is the effort expended by an organization to build and promote its brand within and outside the organization. Through employer branding, an organization not only makes itself desirable as an employer to attract new talent but also retains existing employees. While there are several reasons for employees to leave organizations, in recent times, lack of employee engagement has become a key concern. Talent disengagement and employee exit are critical losses for an organization. , Tthus, employee engagement and employer branding become key concepts demanding further exploration. As the relationship between employee engagement and employer branding is less researched, the present study intended to examine the impact of employee engagement on employer branding. Further, we aimed to examine the differences in employee engagement and employer branding basis demographic variables (age and gender) and occupational variables (such as work experience, preference of work mode, and department of work). 108 full-time employees from large information technology companies in India participated in this survey-based study. We found that employee engagement and employer branding differed based on the department the respondent was working in. Further, regression results revealed a significant positive impact of employee engagement on employer branding. We conclude with the practical implications of the study and the scope for future research.

Keywords: *Employee engagement, employer branding, work experience, preference*

1. Introduction:

The discourse around employee investment, leisure-stress ratio, time turnover, and employee engagement, is increasing among the top management since the past decade. The talent pool has become ultra-competitive in recent times. Girding this up with the availability of superior job-discovery tools and social spaces such as LinkedIn, the race to be identified as a ‘great place to work’ remains the top-most priority of organizational leaders. Though the dawn of the internet has revamped recruitment methods, it has simultaneously opened up a Pandora's box of misleading opportunities and short-lived employee promises. In other words, it has become even more difficult to zero down on perfect candidates and retain the finest-performing workforce.

The vehemence of the term ‘employer branding’ is being increasingly conveyed by

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organizations across the globe. Contemporary companies leave no stones unturned in their quest to elevate their employer branding by rolling out diverse activities and initiatives in an effort to accelerate employee satisfaction and the overall happiness index of the organization. An organization with a strong employer brand sets it apart from its competitors and tends to attract potential employees alongside retaining the current employees, giving them a competitive edge. Organizations across business spectrums have employed various methods to enrich their employer branding which is the extent of appeal a firm builds among potential candidates.

In this unique setup, the nascent ideation of employee engagement seems to attract the bulk of the attention. This is often stratified with another crucial criterion named employer branding. A hardworking, highly skilled employee, satisfied with the abundance of career growth ladders and engagement activities will probably adore the organization with greater respect. Additionally, a company with strong employer branding will attract good candidates who match neck-to-neck with the requirements of the available roles. The business environment of the Information Technology (IT) sector is highly dynamic and is observing a rapid proliferation of start-ups. Thus, the battle for hiring and retaining talented employees is intense. This deems employee engagement a significant factor to enhance the productivity of employees and to mitigate attrition among the IT working professionals.

Thus, the present study was driven by the key research question i.e., Does employee engagement impact employer branding?

We also explored any differences in engagement and branding based on different demographic and occupational factors. Finally, we highlight the study findings and the key areas for further research.

2. Literature review:

Employer branding:

Employer Branding (EB) has emerged as a tool immensely used by companies to allure and retain skilled employees. The evolution of EB traces back to the disciplines of corporate identity, cultural values, branding, communication processes, and reputation. (Sivertzen et al., 2013). Since the last decade, organizations all over the world have been working to improve their reputation by strengthening the employee hiring and retention process. Employer branding can be thus described as "the sum total of a company's efforts to communicate to existing and prospective staff that it is a desirable place to work" (Lloyd, 2002). It defines an organization's identity and culture, thus enhancing employees' loyalty and productivity (Backhaus and Tikoo, 2004). In this highly competitive era, being a potential organization to work for will necessitate manifesting a good employer brand by the company. An effective brand has the potential to attract talents and retain them for a long time.

Several organizational factors aid in enhancing an employer's branding. An employee's conduct and performance are highly correlated with employer branding. CSR, motivation, and willingness to stay were positively correlated with employer branding of their organization (Jain, 2013). It also has a direct relationship with employee expectations and employee satisfaction. When employees are extremely satisfied with their work and

organization, they tend to exhibit incredible performance and help achieve success. This assists managers to be increasingly successful and efficient, which in turn escalates their self-efficacy. Literature has revealed that self-efficacy is correlated positively with work performance, (i.e.), people with higher self-efficacy are highly proactive in initiating tasks and showing continuous grit and effort in an attempt to complete it, despite the hurdles encountered (Luthans and Peterson, 2002).

Employee engagement:

Employee engagement is becoming a widely used term in recent years. W.D. Kahn is credited for his extensive research in this field. Employee engagement is the harnessing of organization members' selves to their work roles. In other words, people employ and express themselves physically, cognitively, and emotionally during role performances when engaged with their job (Kahn, 1990). Employees, when engaged and involved with their work and their organization perform well and achieve success, while those who are less engaged shall be a setback for the company (Luthans and Peterson, 2002). Thus, keeping their employees happy and engaged is a massive task for organizational managers and leaders (McBain, 2007).

Employee engagement greatly influences safety, customer satisfaction, managerial effectiveness, and employee turnover (Harter et.al, 2002) and is facilitated by many factors, such as the design of work, social assistance and tutoring, leadership, and training programmes (Gruman and Saks, 2011). It also shares a strong connection with the leadership, psychological contract, and organisational image and support. A good organisational image leads to higher engagement, enhanced well-being, and improved performance of employees with the organisation (Biswas et.al, 2013; Dhir and Shukla, 2019; Jaiswal and Dyaram, 2020; Xu and Thomas, 2011). Among the many factors affecting employee engagement, working environment and relationships with colleagues, co-workers and managers had the greatest impact on it (Anitha, 2014). Communication and effective leadership foster employee engagement. Effective communication is crucial to keep employees engaged in an organisation, failing to do so, results in employees being disengaged as they would be unaware of the happenings in the organisation. Leadership, more specifically, transformational leadership is most effective for employee engagement. Having a good work-life balance is also vital to have effective employee engagement at the workplace (Bedarkar and Pandita, 2014; Welch, 2011).

While the extant literature separately throws light on the importance of employee engagement and employer branding, there is a dearth of studies examining the relationship between employee engagement and employer branding. Thus, the current research attempts to examine this research gap between employer branding and employee engagement, by proposing the following hypothesis:

Hypothesis 1: There is a significant impact of employee engagement on employer branding.

Demographic factors:

Negative stereotypes of older employees showing poor job performances and being less engaged are not uncommon. Despite such discernments, studies have revealed

contrasting results that employees above 50 years showed higher levels of engagement at work, while the level of involvement was showing a downtrend among the freshers. Employees with a sense of oneness with their organization demonstrated cognitive and emotional engagement that encourages employees to make their best contribution to the organization's success. This escalated level of employee engagement may lead to older employees rejuvenated to acquire new skills and optimism towards future career progress (Saks, 2006).

On the other end, gender was found to exhibit a moderating effect on the relationship between employer branding and job satisfaction (Tanwar and Prasad, 2016). Differing opinions on the extent of employee engagement and employer branding being affected by men and women are becoming a matter of considerable significance nowadays. Women are as competent as their male counterparts at work. However, they are highly underrepresented in higher organizational cadres, and they share different opinions on these organizational practices of building a brand and engaging its employees.

Thus, we explore whether the demographic factors of age and gender impact employee engagement and employer branding. Thus, it is hypothesized that:

Hypothesis 2: There is a significant difference in employee engagement and employer branding basis gender and age.

Occupational Factors:

Occupational factors such as work experience, department, and mode of work are significant, yet less-recognized factors that trigger a company's employer branding and its strategies for effective employee engagement. Research has proven the well prevalent notion that people with higher years of work experience are more devoted to their job and company than those who have newly joined. Their portrayal of the organization is far more gratifying and appealing, which is clear evidence of their job satisfaction and company loyalty. The culture of a work-from-home scenario, though prevalent a few years ago, had reached its peak during the COVID-19 pandemic. Employees have contrasting preferences on their work mode, whether to work from home or within office premises. However, the effect of an employee's department of work and their preferred mode of work on employer branding and employee engagement is quite unknown. Thus, we hypothesize that:

Hypothesis 3: There is a significant difference in employee engagement and employer branding basis occupational factors such as work experience, department, and mode of work.

3. Method:

The present study is applied in nature as it aims to address an issue that impacts individuals and organizations. We collected data from 108 professionals working in the IT industry in India. Respondents had a minimum of six months of work experience. Table 1 elaborates on the profile of the respondents.

Data collection was primary in nature, conducted through a Google form. The survey

method was used as it is a fast and easy way to gather data, especially amidst the COVID-19 pandemic. The measures for employee engagement and employer branding were taken from existing academic literature. The Gallup Q12 questionnaire was deployed for collecting data on employee engagement while employer branding was measured using 15 items adapted from Jain (2013).

Table 1: Profile of Respondents

		NO. OF RESPONDENTS	PERCENTAGE
GENDER	Male	59	54.6
	Female	49	45.4
AGE	Below 30 years	87	80.6
	Above 30 years	21	19.4
CITY OF RESIDENCE	Urban and Semi-urban	99	91.6
	Rural	9	8.4

The respondents belonged to the Information Technology (IT) sector cutting across different departments. A large proportion of the respondents were marketing and sales professionals, followed by employees working in the analytics and IT departments of the company. 59.3% of the survey respondents had an experience of less than 2 years, while 2.8% of the respondents had greater than 15 years of work experience.

4. Results and Discussion:

IBM SPSS Statistics version 26 was used to perform the data analysis. The reliability of the data was tested using Cronbach's alpha. We conducted ANOVA, t-test, and linear regression to test the hypothesized relationships.

Regression analysis revealed that employee engagement had an impact on employer branding. The model was found to be statistically significant, indicating that there is a significant positive relationship between employer branding and employee engagement. The adjusted R-square value was 0.327, so, the model accounts for approximately 32.7% of the variance of employer branding (i.e., the dependant variable). Significance F has a value lesser than 0.05. Therefore, the model is statistically significant and the hypothesis is accepted (i.e.,) there is a significant relationship between employer branding and employee engagement. The standardized coefficient (Beta) for employee engagement having a value of +0.577, indicates that employer branding shall increase if employee engagement increases. The more employees are engaged with their job, the more they will be satisfied and happy about working in the company, which is the basis for building a successful employer brand.

ANOVA results show that the department an employee is working in has a significant effect on employee engagement and employer branding. Employees from different departments of the same company may have varying engagement levels. For instance, an employee from the IT division of the company may be constantly stressed to spend long hours in front of the screen,

whereas an HR professional may not feel the same. The HR personnel will be more engaged and perceive their company as a wonderful brand to work in, while the IT professional may not feel that way.

We conducted t-tests to assess differences in employee engagement and employer branding based on gender and preferred mode of work. Further, we conducted ANOVA to assess differences in employee engagement and employer branding based on employee's age and work experience. We did not find a significant impact of gender, age, the preferred mode of work, and work experience on both employee engagement and employer branding. Despite previous research showing that employee's gender, work experience, and age significantly affect their engagement and employer branding, the results of this study have shown contrasting results. This may be due to the uneven distribution of age and work experience among the respondents. The majority of the respondents were of the age group less than 30 years and had less than two years of work experience. Since the IT industry has a good gender balance, we did not find any gender-related differences. Further, the study is specific to employees of the IT industry for whom the mode of work, whether remote or in the office, is likely to be the same i.e., most of their time is spent in front of the computer screen. COVID-19 may also have been a contributing factor to this because those who have newly joined the company may not have been exposed to the office environment.

Furthermore, to gain an understanding of the perceptions of employees on the employer branding and employee engagement strategies of the company they work in, qualitative analysis was employed. It was inferred that different companies employ different strategies for employer branding and to keep their employees engaged. Among the many factors, four were identified to significantly contribute to employer branding and employee engagement. They were 'being a great team', 'providing flexibility of work', 'company's culture', and 'peer relationship'.

Practical implications:

The study findings have key practical implications. Job security and excellent pay are the most popular reasons that inflict a positive affinity towards one's job. Supportive work culture nurtures flexibility and creativity, while cordial relationships with peers and paid holidays also seemed to play a vital role in employee engagement and employer branding. Further, work autonomy and authority would enhance employee's perception of branding and engagement. Contrary to these, unrealistic deadlines, long working hours, constant scrutiny, the lack of career advancement, and the monotonous nature of the job led to low levels of engagement. Office bureaucracy and the domination of inefficient leaders collectively repel employer branding.

To sum up, organizational leaders and managers need to stick to the basics: make sure that the work environment is welcoming, employees are treated with dignity and respect, and the work itself is creative and motivating.

Limitations and scope for future work:

This study has not considered the impact of the COVID-19 pandemic on individuals

and organizations. Future work must account for the psychological state of employees and employers during the pandemic.

Further, the study was conducted among IT professionals. Thus, future research can explore the relationship between employee engagement and employer branding in other sectoral contexts.

5. Conclusion:

Academic literature has shown escalating attention towards employer branding and employee engagement in recent years. Thus, this study was aimed at unearthing whether employee engagement led to employer branding. Study outcomes demonstrate that employee engagement exhibited a notable positive relationship with employer branding. An engaged employee can contribute significantly to positive individual and organizational outcomes and improve the company's brand. Our study underscores the significance of employee engagement and suggests that employee engagement strategies should be at the forefront of all employers' management strategies.

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Prominent role of IoT in the field of telemedicine; the case for technology adaptation

Varun R.Mirlay

Abstract:

The Internet of Things (IoT)refers to the billions of devices used in all industries including the telemedicine industry (the Internet of Health Things). All the devices constituting the Internet of Health Things are connected through information systems which form the backbone of telemedicine. This very tele medicine industry is likely to reach a magnitude of US$185.66billion by 2026 and the global IoT to reach a magnitude of US$188.2 billion by 2025. The information systems /technology connecting the devices used for remote patient monitoring are highly critical, and therefore need to be adapted on a timely basis. Therefore, with the current situation caused globally by the Covid pandemic, tremendous change is happening in practically every industry particularly medical practice and tele medicine is becoming the new normal of the same. With the requirement of change management to be integrated with technology for the information systems/technology connecting the various devices forming part of the Internet of Health Things, this study thematically analyzed two main themes which are in prominence in IoT in the field of telemedicine and the importance of constant adaptation in the field of healthcare information systems/technology and ontologically linked the analyzed data using the co-efficient of progressive adaptation.

Keywords: Adaptation, Artificial Intelligence, IoHT, IoT, Real Time Health Systems

1. Introduction

The Internet of Things, in the broadest sense, encompasses everything that the internet is connected to. IoT is a composition of several devices which range widely from simple sensors to smart phones and wearables that are connected. Billions of physical devices are connected via the internet. Due to the advent of technology a device as small as a microchip to as colossal as an aero plane can be a component of the IoT. Digital intelligence enriches the presence of new sensors that are implemented into these devices.

Private communication via devices is possible via the internet and various networks that are connected. This thereby enables much more communication making the entire world more compact and more of a “global village.” IoT increases responsiveness and makes it easier to merge the physical and digital universes (Burgess, 2018; Ranger, 2020).

Using automation systems to connect IoT devices in Telemedicine enables health care providers to remotely provide the service and patients to benefit without the requirement of being physically present for the consultation (Ahmad, 2011). This paper seeks to answer

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the question about the way in which automation and adaption enhance the use of IoT in telemedicine. To answer this question, and explore the influence of automation and adaptation, this paper seeks to determine the applicability of the co-efficient of progressive adaptation to health care information systems in telemedicine.

IoT in the health care sector has increased at a very rapid rate during the Covid-19 pandemic, due to the focus on remote monitoring and tele monitoring. Globally, IoT in the healthcare market is growing at a compound annual growth rate of 21% and is likely to reach US$188.2 billion by 2025 from US$72.5 billion in 2020 (Business Wire, 2020). This growth points to possibility of a new normal emerging in the health care sector, a trend that needs further study. Several possibilities in the healthcare sector have appeared recently due to the advent of digitisation. Health care providers can collect required data through a variety of online sources. The Internet of Medical Things (IoMT) is a connected infrastructure of software applications as well as medical devices. Service quality may be improved by the combination of the IoMT/IoHT and health care, thereby providing a way to optimize quality and efficiency. Within the scope of this emerging digital transformation of health care, much more advanced and integrated health care information systems that integrate and enhance IoT enabled eHealth need to be used in remote health monitoring. This is especially the case, for example, in personal health care, robotics and Real-Time health systems (RTHS).

Real-Time Health Systems (RTHS) are likely to become key to IoT in the health care sector. This may be attributed to the use of Big Data Analytical tools and procedures for evaluating dynamic data and statistical data as part of comprehensive health care systems improvement plans. For example, as health-related data is collected and is also increasing in terms of availability in real-time, it gets integrated with electronic health records (EHR) (i-Scoop, n.d.). With the large amount of data present in the healthcare facilities, the solution to optimum data analysis relies on the interconnection of medical devices and the use of a distribution platform (Covetus, 2020).

Information and communication systems are the backbone of the healthcare delivery system (NCBI, n.d.). Since IoT devices are connected using health information systems, constant adaptation of the information systems is essential. Adaptation is essential since any information system, including the information systems that form the healthcare information systems, need to be adapted from time to time to cope with new situations. Adaptation can include a combination of automation, artificial intelligence, new additional features to face larger volumes, integration to newer devices and other technological advancements. Any information system used today in the healthcare sector will have to be adapted internally, through internal engineering, to complete tasks when the workload increases. This requires a greater bandwidth as well as more technology integration especially in relation to the adaptation of IoT and the devices used in the IoT.

Within this connected healthcare and eHealth context, the search for integrated benefits and approaches has given rise to what is known as the Internet of Health care Things (IoHT) or Internet of Medical Things (i-scoop, n.d.). The studied benefits of health care information systems include organised and coordinated treatment processes, improved patient safety, betterment in terms of patient care, transfiguration in clinical procedures, circumvention of medical errors, instant and seamless accessibility of the patients' details, minimised operational expenses, saving of time, improved patient satisfaction, remote patient monitoring, and master patient index (Sinhasane, 2019).

In addition to the benefits, the factors contributing to the increase of IoT adoption in the health care domain are increased adoption of wearables and smart devices, requirement for electronic health records to optimise work force, increasing interest in self-health measurement, and the requirement of health care in remote locations (MPO, 2019). However, one aspect of tele-medicine that is yet unexplored is the optimal efficiency of the systems at the heart of tele-medicine. This study aims to put forward the argument that because of the prominent role of IoT in telemedicine, the coefficient of progressive adaptation – a way to consider and measure the optimal efficiency of a concerned information system – is applicable to the tele-medicine industry. Specific focus should be on Real-Time Health Systems (RTHS) because RTHS are likely to become key to IoT in the healthcare sector. This may be attributed to the use of Big Data Analytical tools and procedures for evaluating dynamic data and statistical data as part of comprehensive health care systems improvement plans. For example, as health-related data is collected and is also increasing in terms of availability in real-time, it gets integrated with electronic health records (EHR) (i-Scoop, n.d.).

Several possibilities in the healthcare sector have appeared recently due to the advent of digitization. Healthcare providers can collect required data through a variety of online sources. The Internet of Medical Things (IoMT) is a connected infrastructure of software applications as well as medical devices. Service quality may be improved by the combination of the IoMT/IoHT and health care, thereby providing a way to optimize quality and efficiency. With the large amount of data present in the healthcare facilities, the solution to optimum data analysis relies on the interconnection of medical devices and the use of a distribution platform (Covetus, 2020).

2. Literature Review:

IoT in the healthcare sector has increased at a very rapid rate during the Covid-19 pandemic, due to the focus on remote monitoring and tele- monitoring. Global IoT in the healthcare market is growing at a compound annual growth rate of 21%, thereby likely to reach a magnitude of US$188.2 billion by 2025 from US$72.5 billion in 2020 (Business Wire, 2020).

Within the scope of digital transformation of healthcare, much more advanced and integrated healthcare information systems/technologies that integrate and enhance IoT enabled eHealth need to be used in remote health monitoring. This is especially the case where the role of IoT is increasing, for example in cases of personal health care, robotics and Real-Time health systems (RTHS).

Within this connected healthcare and eHealth context, more integrated benefits and approaches are sought after giving rise to what is known as the Internet of Health care Things (IoHT) or Internet of Medical Things with mobile health being the most preferred (i-scoop, n.d.; Shiferaw, 2021). Factors contributing to the increase of IoT adoption in the health care domain are increased adoption of wearables and smart devices, requirement for electronic health records to optimize work force, increasing interest in self-health measurement, and the requirement of healthcare in remote locations (MPO, 2019).

Information and communication systems is the backbone of the healthcare delivery system (NCBI, n.d.). Benefits of the healthcare information systems include organized and coordinated treatment process, improved patient safety, betterment in terms of patient care, transfiguration in clinical procedures, circumvention of medical errors, instant and seamless

accessibility of the patients' details, minimized operational expenses, saving of time, improved patient satisfaction, remote patient monitoring, and master patient index (Sinhasane, 2019). Since IoT devices are connected using health information systems, constant adaptation of the information systems is essential.

3. Adaptation

Adaptation is essential since any information system, including the information systems that form the healthcare information systems, need to be adapted from time to time in order to face new situations. Adaptation can include a combination of automation, artificial intelligence, new additional features to face larger volumes, integration to newer devices and other technological advancements. Any information system used today for any purpose, which in this case, is one used in the healthcare sector will have to be adapted internally through internal engineering in order to complete the tasks when the workload increases requiring a greater bandwidth as well as more technology integration with regard to adaptation to the IoT and the devices used in the IoT. This paves ways for the application of the coefficient of progressive adaptation in the field of healthcare information systems (Mirlay, 2019).

The co-efficient of progressive adaptation states that the rate of change of progressive adaptation of the concerned information system is directly proportional to the efficiency of the information system at a given point in time (Mirlay, 2019). Not adapting the information system at constant time intervals will reduce the efficiency of the information system and increase the room for errors. This is because the information system, with the increasing workload, will have to process larger amounts of information in a lesser time interval due to the growth of the organization's consumers, as well as the requirement to adapt to the recent technological advances which keep changing at constant time intervals. IoT devices that are used in the healthcare information systems for example, are now required to process large amounts of patient data and even require access to cloud storage. Therefore, only the information systems that adapt themselves internally to integrate with the technological advancements can succeed with optimum efficiency. The coefficient of progressive adaptation may be represented as:

Optimum efficiency (Oe) = Present methods (Pm) * □ - Eradicated steps (Es).

□ is the main co-efficient or the adaptation that has to be done in the field of the concerned information systems. When this adaptation is applied, the process of the information system itself changes. The present method, represented as (Pm), reduces in the number of steps that are required to complete the procedure. This drastically reduces any room for errors, thereby increasing not just the efficiency of the information system but increases the speed as well.

Through this adaptation, the information system gains prominence and potentially a competitive advantage. The coefficient of progressive adaptation has been applied to the use of automation in the field of information systems (Mirlay, 2019). In this paper, coefficient of progressive adaptation is conceptually extended to the telemedicine sector and the use of technology, specifically healthcare information systems.

The capacity to adapt the Information Systems of an organisation to the changing business environment is widely acknowledged to serve as an enabler of competitive advantage (Salwe, 2010; Schilling, 2017). One of the prevailing disciplines in this is systematic planning along with steering of the Information Systems Architecture. Information Systems Architecture is an aspect that changes on a continuous basis as the organisational aspects are aligned with the

changing technological aspects (Yellin, 2006). Interlinking the technological aspects and the organisational aspects can be done by the process of re-configuration (Newman, 2008). Hence, the process of continuous maintenance and redesign of architecture plays a role in achieving flexibility and efficiency.

Prior research states that Information Systems Architecture tend to be constantly adapted to changes in the organisational environment as well as the technological environment (Merali, 2006). In addition, due the Information Systems Architecture's adaptive way of functioning, as well as the co-evolution of the technological and the organisational aspects Complex Adaptive Systems (CAS) realise expected outcomes (Schilling, 2017).

The focus of technology accuracy is on data management, the right information to the right person at the right time. In the case of health care information systems, this means the information of the right patient, comprising of all the relevant and required information, to the right doctor/s on a timely basis. The patient information is arguably the most important (Buchnowska, 2011) which contains the previous records of the patient, current complaints and specifics, specific treatment course and information confidentiality. Automation is a form of adaptation and in the field of healthcare information systems leads to benefits such as saving labour costs, improvements in quality and consistency, reduction of waste, increased predictability of outcomes, higher throughput and data driven insights (Dias, 2014). Other benefits of intelligent automation are technological re-imaging of health care, streamlining digitisation, accelerating progress, greater diagnostic precision, enhanced patient experience and increasing efficiency, which would otherwise not be possible (MDX, 2020).

Adaptation is essential since any information system, including the information systems that form the healthcare information systems, need to be adapted from time to time to face new situations. Adaptation can include a combination of automation, artificial intelligence, new additional features to face larger volumes, integration to newer devices and other technological advancements. Information systems used in the health care sector will have to be adapted internally through internal engineering to complete the tasks when the workload increases requiring a greater bandwidth as well as more technology integration regarding adaptation to the IoT and the devices used in the IoT.

Adaptation to the new situation is an essential requirement as technology alone is not sufficient to solve problems; it will have to be integrated with change management (Pilarczyk, 2016; Ngelechei, 2016). Optimal integration (and efficiency) of information systems is of paramount importance and involves the integration of health care information systems used to connect the various devices that are part of the Internet of Health Things (IoHT) (Ngelechei, 2016; Kehinde, 2012). Therefore, with the growing magnitude of IoT in the healthcare, adaptability and automation of health care information systems play a crucial role, i.e., adaptability of the information systems that are used as the medium.

Prior research on information systems in telemedicine have so far stated that telemedicine has become the preference of people during the health emergency of international concern caused by the Covid pandemic as in person consultations with the doctor appears to be risky. As medical visits can be reduced with the help of medicine through video conferencing, or other virtual technologies such as smart phones and web cam enabled computers, tele medicine does pose to be a fortune thereby enabling the patients as well as the health care provider to save on the cost of treatment as well as time saved while still having the consultation remotely. Furthermore the work flow of hospitals and clinics can be

streamlined, and the advent of disruptive technology would increase the effectiveness and ease of monitoring the health care recovery of patients who have been discharged thereby creating a win-win situation . Papers in this line state how tele medicine enables doctors to diagnose diseases of patients in rural areas using apps and technology .The important role played by tele medicine during the pandemic can be stated as minimizing the spread of the virus, effective use of the health care professionals' time as well as alleviating mental health issues .Telemedicine can also enable triaging and reducing the burden of emergency departments of hospitals and does include the need to modify instruments further for taking pictures that can be examined. Integration of digital technology into healthcare is also a noteworthy point. File management , data security , data privacy, cloud integration, data protection and payment gateways to be included in the same as part of the telemedicine and the fact that diagnosis includes physical examination through technology add strength to the point mentioned , and also state that tele medicine is not a substitute for physical examination though is supplements the same (Haleem, 2021; Kadir, 2020; Leite, 2020; Rezaei, 2020; Elkubli, 2021; Manchanda, 2020; Yu, 2021). Articles on the study of IoT in the field of tele medicine state that it is very challenging to define how the IoT features are integrated into the architecture of tele medicine (Albahri, 2021). As several articles on the topic of IoT in the field of tele medicine reviewed examined several factors such as 5G integration in telemedicine, Data Management, Data Security , Virus Disease Control Model , legislation and regulation policies in the field of tele medicine, triaging in mHealth , automation of IoT in the field of tele medicine, and decision making for medical information systems, the articles have not specified upon the precision of the information systems that connect these various IoT devices which are the backbone of health care delivery. Further on , the need of constant adaptation of the these information systems which are the health care information systems is an area that requires exploration as done by this particular paper as the same is noted as the present gap paving room for research exploration (Keikhosrokiani, 2021; Albahri, 2021; Degerli, 2021; Sim, 2021; Lin, 2021; Hameed, 2021; Yu, 2021; Constant, 2021).

The co-efficient of progressive adaptation states that the rate of change of progressive adaptation of the concerned information system is directly proportional to the efficiency of the information system at a given point in time (Mirlay, 2019). Not adapting the information system at constant time intervals will reduce the efficiency of the information system and increase the room for errors. This is because the information system, with the increasing workload, will have to process larger amounts of information in a lesser time interval due to the growth of the organisation's consumers, as well as the requirement to adapt to technological advances which keep changing at constant time intervals. IoT devices that are used in the health care information systems for example are now required to process large amounts of patient data and even require access to cloud storage. Therefore, only the information systems that are adapted internally to integrate with the technological advancements can succeed with optimum efficiency. The coefficient of progressive adaptation may be represented as:

Optimum efficiency (Oe) is a function of Present methods (Pm), □ and Eradicated steps (Es).

□ is the main co-efficient or the adaptation that must be done to the concerned information system. When this adaptation is applied, the process of the information system itself changes. The present method, represented as (Pm), reduces in the number of steps that are required to complete the procedure. This drastically reduces any room for errors, thereby increasing not

just the efficiency of the information system but the speed as well.

Through this adaptation, the information system gains prominence and potentially a competitive advantage. The coefficient of progressive adaptation has been applied to the use of automation in the field of information systems (Mirlay, 2019). In this paper, coefficient of progressive adaptation is conceptually extended to the telemedicine sector and the use of technology, specifically health care information systems.

Healthcare information systems could benefit from the application of the co-efficient of progressive adaptation due to the large-scale implementation of information systems. This could potentially include a reduction in errors, increased efficiency and speed of the information system which could lead to a competitive advantage. As studies so far do not refer to this point, this paper aims to explore the application of the co-efficient of progressive adaptation to healthcare information systems that form the medium of the Internet of Health Things (IoHT).

4. Methodology

This study used an analysis of existing literature as well as internet articles to examine the role of IoT in the field of telemedicine focusing on technology adaptation. The main themes analysed were the prominence of IoT in the field of telemedicine and the importance of constant adaptation in the field of healthcare information systems/technology. These two main themes were analysed by exploring how they could be related and combined to theorize the prominence of IoT in the field of medicine and ontologically link to the importance of progressive adaptation.

The sources used in the analysis were chosen based on their relevance to the two themes, which are prominence of IoT in the field of telemedicine as well as constant adaptation in the field of healthcare systems/technology. A variety of journals as well as online sources were considered. The main criteria for selecting a particular paper or source were its relevance to the themes as well as its contribution to the body of knowledge.

Regarding the prominence of IoT in the field of telemedicine, in addition to the various journal articles and other online articles contribution to knowledge, only sources published after 2019 were considered. This was because telemedicine gained prominence during the Covid-19 pandemic. A lack of accessibility to the healthcare facilities prompted the telemedicine sector, on a global scale, to adapt to new and current technologies. These technologies enabled the telemedicine sector to optimize its services by allowing communication between the doctor and the patient through the various IoT devices such as smart phones, iPads, smart medical devices and tele monitoring medical devices.

The findings from the analysis of the themes, the prominence of IoT in the field of telemedicine and the importance of constant adaptation in the field of healthcare information systems/technology were then ontologically linked by applying the co-efficient of progressive adaptation as represented in the relation Optimum efficiency (Oe) is a function of Present methods (Pm), □ and Eradicated steps (Es). This concept focuses on the importance of constant adaptation in the field of information systems and explains how efficiency can be maximized with the process of constantly adapting information with specific focus on management information systems. To present the ontological link required examining the way information systems and communications (Present methods

(Pm)) used in the global IoT of healthcare are required to be adapted (Eradicated steps (Es)) at constant time intervals. This also required examining the benefits of intelligent automation in the field of healthcare information systems.

5. Analysis

Prominence of IoT in the field of telemedicine

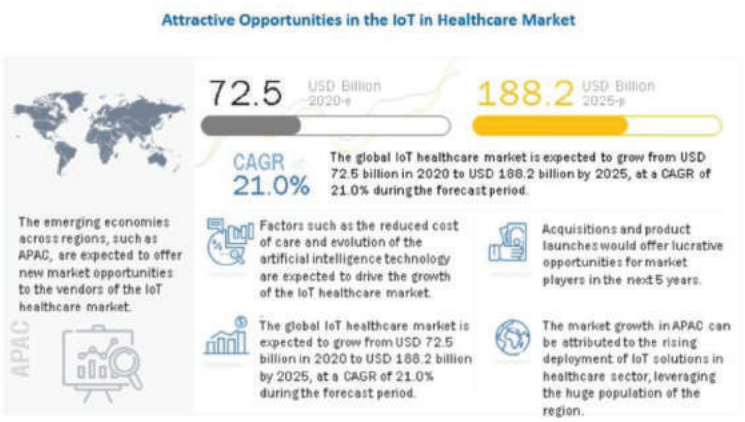
Telemedicine on a global prior to 2020 Covid 19 Pandemic was in a very different situation than it is during the advent of the pandemic at present. Patients for several decades had to go to the health care facility, and the health care facility had to be located in a location that was eligible. Now the patients can enable the services from their houses. A study done by McKinsey and Company found that the use of tele health has increased 38X times than during the pandemic and also noted that in April of 2020 , the overall tele health visits for the outpatient care was 78 times higher than what it was in February 2020 which is a very significant point to note. This study progressed with survey with respondents which stated that 40% of the consumers surveyed stated that they are of the opinion that they are going to adopt telemedicine as an approach going forward. As this point was noted during the advent of the pandemic, the same shows an immense increase in comparison to the same survey done prior to the pandemic which noted that only 11% of the consumers surveyed said that they will use tele health going forward. With regard to health care practitioners, 58% of the physicians view tele health in a more favourable manner during the pandemic than they did prior to the pandemic (McKinsey, 2021) (Showalter, caravanhealth.com, 2020).

A global survey conducted by Aruba (a Hewlett Packard Enterprise company) in 2017 sheds light on prominence of IoT in the field of telemedicine prior to the Covid-19 pandemic. Seventy-six per cent (76%) of the respondents in the survey believed IoT would transform the healthcare industry (i-Scoop, n.d.; Arubane, n.d.). This belief probably rest on the findings that the healthcare sector benefited from 80% innovation (related to IoT) and resultant cost savings of around 73% (Arubane, n.d.). There was also a 76% increase in visibility across concerned organizations, i.e. an increased clarity of the functioning activities of the organization that can be viewed centrally via the information systems. The study further revealed that IoT increased utility in maintenance and monitoring of assets and was set to increase workforce efficiency, the creation of new business models and improved collaborations with colleagues and patients (Arubane, n.d.).

In 2017, the most common IoT technologies in healthcare were patient monitors, energy meters and x-ray imaging (Arubane, n.d.). In addition, healthcare IoT was being used for monitoring and maintenance, remote operation and control and for location-based services. However, hospitals have the potential to leverage IoT in combinations of technology applications such as robotics, artificial intelligence and big data (i-Scoop, n.d.).

A global survey done by Markets and Markets states that the key factors driving the growth of IoT in the health care sector are the increased focus on patient engagement and a patient-centric approach. Furthermore, IoT in the healthcare market is growing at a compound annual growth rate of 21% and likely to reach a magnitude of US$ 188.2 billion by 2025 (MarketsandMarkets, n.d.) (Figure 1).

Figure 1

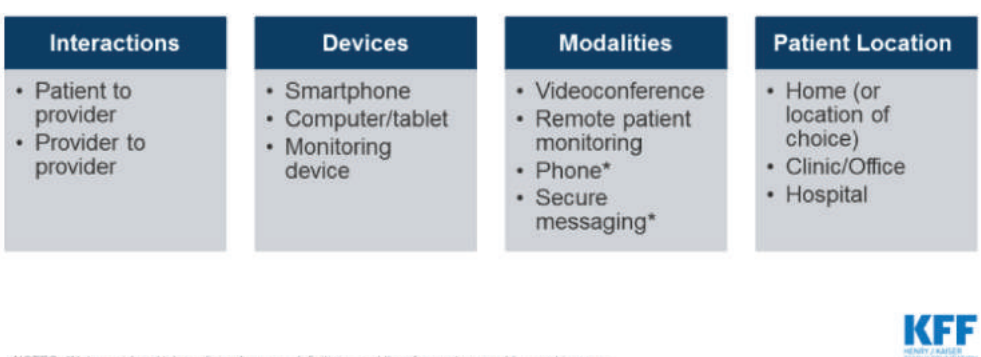


(MarketsandMarkets)

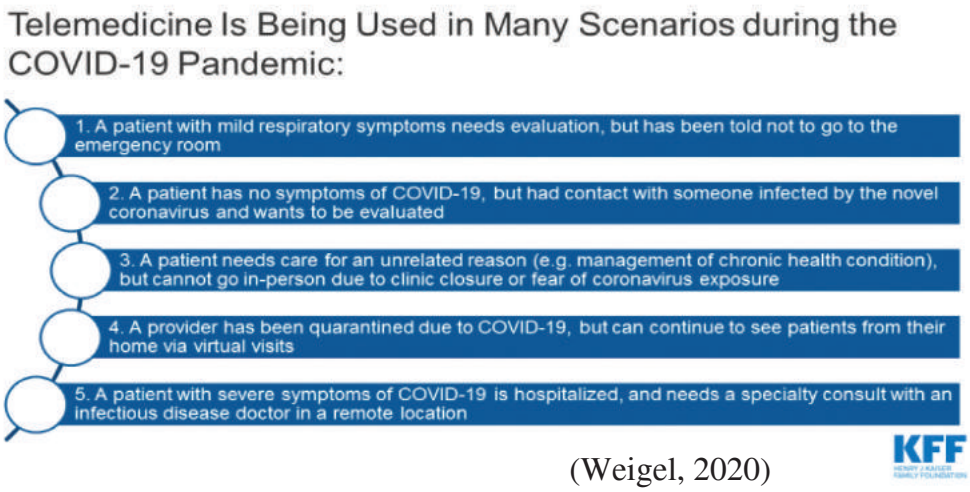
Telemedicine from 2020 during the Covid 19 Pandemic

During the present Covid-19 pandemic, telemedicine is a new normal of health care with a beneficiary count approximating 36 million. Consequently, IoT is prominent in the field of telehealth, particularly in remote monitoring. This is evidenced by a ten-fold rise in telemedicine reported in the U.S market (Dash, 2020) (Showalter G. , caravanhealth.com, 2020). The World Health Organization (WHO) notes that there is a need, on a global scale, to reduce face-to face interactions between doctors and patients without compromising the quality of the healthcare service (World Health Organization, 2020) . The healthcare industry has been encouraged to adapt new technologies in the field of telemedicine, highlighted by the rapid implementation of telemedicine during the Covid-19 pandemic. Adapting telemedicine involves adapting guiding principles such as patient centricity, multi sector and multi-disciplinary approaches, strong digital governance and implementation strategies, on-site planning and implementation, health system integration, digital user friendliness and system performance monitoring with improvement (or adaptations) (Anthony, 2020).

The figures below represent the situation of telemedicine during the pandemic.



(Weigel, 2020)

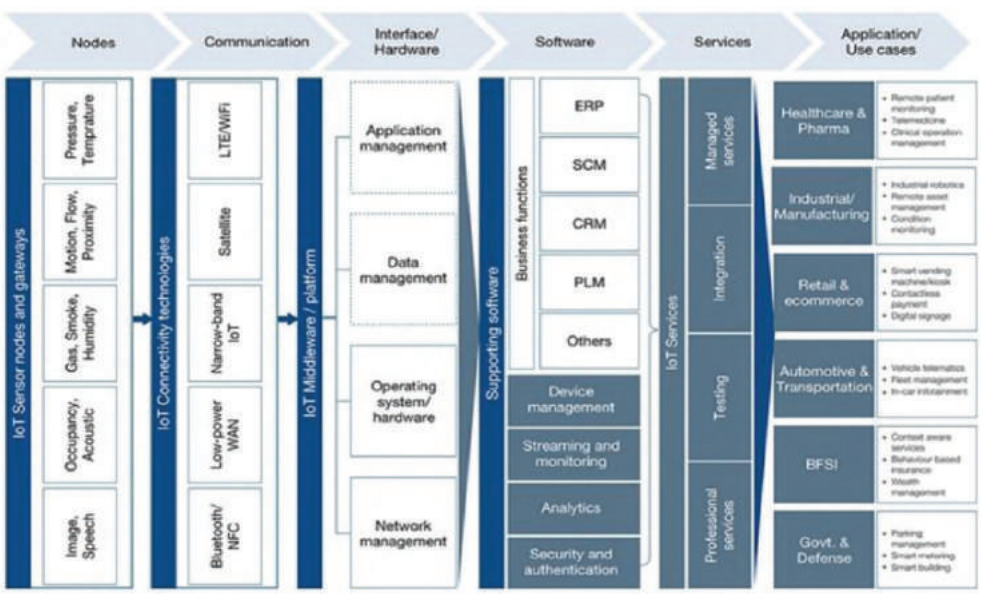


(Weigel, 2020)

Since the pandemic is disrupting the traditional medical practice, telemedicine is expected to continue to drastically increase as the Covid-19 pandemic persist (FROST & SULLIVAN, 2020). In the current situation, the opportunity for telehealth products and services to become a standard is growing; the challenge is to scale up in order to face this unprecedented demand even beyond the Covid-19 pandemic. This may be achieved by using technological adaptations such as big data, cyber security, remote diagnostic solutions, artificial intelligence, and virtual assistants (ITN, 2020). Telemedicine is likely persist even after the Covid-19 pandemic to a much larger magnitude than it was before the onset of the pandemic (Marin, 2020; Ahmed, 2020).

6. Importance of constant adaptation

Information systems/technologies require constant adaptation on a timely basis according to market dynamics. This point is illustrated in the figure adapted from Markets and Markets (Figure 2).



(Marketsand Markets)

Constant adaptation in the field of healthcare information systems/technology is highlighted in the following table.

Table 1: literature sources of constant adaptation is in the field of information systems particularly in the healthcare domain.

Evidence	Source
Technology is to be integrated with change management as the combination is essential for the purpose of facing the new situation. Internal technological changes in order to face the external environment. Just technology will not be adequate for the purpose. Therefore, it has to be the accurate combination of technology to the change management strategies.	(Pilarczyk, 2016; Ngelechei, 2016)
Optimal integration of information systems will be of paramount benefit to yield the desired competitive advantage in the changing environment with competitive factors.	(Kehinde, 2012; Ngelechei, 2016)
The capacity to adapt the Information Systems of an organization to the changing business environment is widely acknowledged to serve as an enabler of competitive advantage.	(Schilling, 2017; Salwe, 2010)
One of the prevailing disciplines in this is systematic planning along with the steering of the Information Systems Architecture. Information Systems Architecture is considered to be an aspect that changes on a continuous basis in the organizational aspects that are aligned with the changing technological aspects.	(Yellin, 2006)
Interlinking the technological aspects and the organizational aspects can be done by re-configuring the information systems technologies at the given point of time in order to face the external situation	(Newman, 2008)
Information Systems Architecture will tend to constantly adapt to changes in the organizational environment as well as the technological environment.	(Merali, 2016).
A study that utilized Complex Adaptive Systems (CAS) proposed a model that showed how the expected outcomes of Information Systems Architecture could be achieved, via the Information Systems Architecture's adaptive way of functioning, as well as the co-evolution of the technological and the organizational aspects.	(Schilling, 2017)
With specific focus on the role of automation in the field of health care information systems, some of the benefits are specified as saving labour costs, improvisation of quality and consistency, reduction of wastes, increased predictability of outcomes, higher throughput and data driven insights.	(Dias, 2014)
Benefits of intelligent automation in the concerned field are technological re-imaging of health care, streamlining digitization, accelerating progress, greater diagnostic precision, enhanced patient experience and increasing efficiency which would otherwise not be possible.	(MDX, 2020)
Adaptation of attrition control measures, rewards and recognitions, are a part of successful knowledge management.	(Bairi, 2011; Covetus, 2020; Ho, 2008)

The co-efficient of progressive adaptation

A key argument advanced in this paper is that since the communication of information and data occurs through the healthcare information systems constant adaptation is required for optimum efficiency. Considering this argument, the themes constant adaptation in the field of health care information systems and prominence of IoT in the field of telemedicine are linked and presented in the table below.

Table 2: Examples of the existence of the co-efficient of progressive adaptation in the field of healthcare information systems by the use of automation and adaptation

Present methods (Pm) of the information and communication systems:	Automation/ adaptation:	Benefits of the automation and adap tation-Optimum efficiency (Oe):	Eradicated Steps:
Remote monitoring procedure with several steps.	Robotics and Real-Time Health systems.	Increased efficiency of the systems, data accuracy, reduced turnaround time, reduced error rates, increased user satisfaction.	Steps that have been automated or assisted by robots.
The procedure formed the information and communications system with special focus on patient information.	Automation.	Saving labor costs, improvisa tion of quality and consistency, reduction of waste, increased predictability of outcomes, higher throughput and data driven insights.	Steps in the procedure that were increasing the labor costs and wastes and also reducing the quality, consistency of the health care information systems.
Previous method used in the particular health care information system.	Intelligent automation.	Technological re-imaging, streamlining digitization, accele rating progress, greater diagnostic precision, enhanced patient experi ence and increased efficiency.	Steps that have become redundant and reduced the efficiency, progress speed, diagnostic precision and patient experience.
The procedure used to consult the doctor online via phone/ skype or portals.	Internal changes of the procedure using artificial intelligence, automation, patient details and records, confidentiality coding and access to the remote monitoring devices.	Easier for the patient to access any doctor in any location with minimal waiting time, increased efficiency of the tele consultation service, diagnostic precision, access to patient information, optimal integration of knowledge management principles thereby leading to optimum efficiency and maximized patient satisfaction.	Steps that were no longer required and/ or did not make it possible for the accurate remote monitoring with optimum efficiency.

7. Discussion:

The telemedicine industry is growing in a humongous manner on a global scale as well as the healthcare information systems/technology that connects the service providers and beneficiaries. Data management is the most important point of focus. This is patient data relating to previous records and current health situation. This data must go to the doctor for diagnosis and analysis whilst maintaining the required confidentiality. Automating healthcare information systems used to connect various devices is likely to be advantageous

in terms of collecting and analysing patient data/information. That is why health care providers that utilize IoT in the field of telemedicine can have a competitive advantage provided by the various other benefits of the IoT. These include enhanced capabilities in the field of preventive medicine, increased mobility alert of hospital staff, acceleration in the patient data process and higher quality of management with drug administration. Additionally, there is reduced error risk and secure data, increased revenue, increase in the flexibility of working, cost effectiveness, wider access to experts and healthier staff with less direct exposure to patients (Digiteum, 2020; Mobisoft, 2020).

Telemedicine uses IoT devices and other technological adaptations such as artificial intelligence, big data, cyber security, remote diagnostic solutions and virtual assistants that are connected by healthcare information systems/technologies (information systems and communication is the backbone of health care delivery system). Constant adaptation is therefore required in operating the information systems.

The evidence presented above reveals that the optimal integration of information systems will be of paramount benefit to yield the desired competitive advantage in the competitive changing environment. The capacity to adapt the Information Systems of an organization to the changing business environment is widely acknowledged to serve as an enabler of competitive advantage. This can be done by internal re-configuration of the concerned information systems, using Complex Adaptive Systems (CAS) to achieve the outcomes of the information systems architecture. Automation is included as an example for maximizing efficiency through the internal changes of the information systems. This is because some of the benefits of intelligent automation are technological re-imaging of health care, streamlining digitization, accelerating progress, greater diagnostic precision, enhanced patient experience and increasing efficiency which would otherwise not be possible with the IoT in tele medicine.

Patient monitoring is a very crucial focus along with artificial intelligence, real-time health systems, electronic health records and remote diagnosis. The healthcare information systems/Technologies that are utilized for these purposes must be constantly adapted from time to time according to the requirements of the healthcare environment.

The rate of accurate and timely adaptation of a management information system software is directly proportional to the efficiency of the information system (Mirlay, 2019). Consequently, adaptation is essential for the field of healthcare information systems/ technology utilized to connect the various devices that are part of the Internet of Health Things (IoHT).

Coming back to the point of the Co-efficient of progressive adaptation which is to be applied in the health care information systems forming part of the global IoHT (Internet of Health Things), the table mentioned above uses specific examples of progressive adaptation in information systems which thereby strengthen this point further with practical evidence. This very point can now state that the co-efficient of progressive adaptation is applicable to information and communication systems which form the backbone of healthcare delivery systems. These information and communication systems connect to the global IoT by linking various medical devices, smart phones, and remote monitoring devices. That is why the information systems and communication need to be adapted at constant time intervals, both in order to maximize efficiency and sustain in the ever-changing environment with technological advances.

8. Conclusion:

With the global IoT in the health care market likely to growth tremendously to reach a magnitude of US$188.2 billion, data management is the most important point of focus. This is patient data relating to previous records and current health situation. This data must go to the doctor for diagnosis and analysis whilst maintaining the required confidentiality. Information systems is the backbone of the healthcare delivery system. The global IoT in the health care market linking the doctors to their patients uses various remote monitoring solutions such as smart medical devices, biosensors, patient monitors, energy meters and X-Ray imaging. Other trends include monitoring, maintenance, location-based services, remote operation and control, and connection of IoT devices using Wi-Fi which are to provide numerous benefits which include increased innovation, cost savings, increasing work force productivity, increase of visibility across the organization, creating new business models and improved collaboration with colleagues. Other areas in the field of telemedicine where the IoT is increasing utility are maintenance and monitoring of assets. Hospitals may also leverage IoT in combinations of technology applications such as robotics, artificial intelligence and big data and automation used in the information and communication systems that form the healthcare information systems which link the various devices part of the global IoT in the field of telemedicine.

Given this backdrop, the current study has shown that the co-efficient of progressive adaptation does exist and is applicable to information systems which link IoT devices that are part of the health care market. According to the co-efficient of progressive adaptation, the rate of change of progressive adaptation of the concerned information system at a given point of time is directly proportional to the efficiency of the information system, and vice versa; not adapting the information systems can reduce the efficiency as well as increase room for errors over time.

Information and communication systems that form the health care information systems need to be adapted constantly at regular time intervals for the purpose of optimising efficiency, maintaining sustainability and a competitive advantage in the external environment. The adaptations relate to the internal changes; some examples of the internal changes include automation of the health care information systems, implementation of chat bots, robotics, artificial intelligence in the health care information systems, and access to cloud and storage solutions when large amount of data is present and needs to available at short time intervals. This study provides a way to calculate optimum efficiency of the information systems used by using the co-efficient of progressive adaptation.

Limitations: This particular study used a limited number of sources for literature review. Most of the data which could be shortlisted into the strata to be used for the study had to be chosen after the advent of the Covid pandemic in order to prepare an accurate analysis of the present situation as well as the possible future of the global health care market after the pandemic. Precisely, the articles short listed for the strata used in this study for the mentioned analysis was from the year 2020 itself after the situation caused by Covid 19 was declared as a pandemic.

IoT in health care and telemedicine is an emerging situation, as such the study is limited by the number of web sources and journal articles used. More information would be needed to create a holistic view. One way would be collecting information directly by observing the practical implementation of global IoT in the health care market and explore

the results further in greater detail.

Future Research: This study in the near future aims to explore the role of IoT in the health care industry on a global scale with practical implementation of IoT devices used in tele medicine. As these IoT devices used in tele medicine are connected with information systems as the backbone of delivery, the efficiency of these health care information systems is to be evaluated before and after adaptation on a case by case basis using the heat engine efficiency measurement method for the mentioned purpose.

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A Study on Impact of Self Help Groups on Socio-Economic Development in India

(With special reference to rural areas of Puducherry region)

Muthukumaran T and Sharmila Devi S

Abstract

This paper is an attempt to examine the impact of Self-help Group (SHG) in socio-economic development of India. SHGs have been playing considerable role in training , infrastructure development, marketing and technology support, communication level of members, self confidence among members, change in family violence, frequency of communication with outsiders, change in the redeemable pattern of SHG members, achieving social agreement, attaining social justice, association in community action, maintainable quality and answerability, equity within SHGs, evasions and retrievals, and sustainability - financial value. The present study examines the SHGs members' socio economic empowerment through the SHGs. The study is conducted in rural areas of Puducherry region. Primary data were collected through structured interview schedule from 200 respondents; Percentage, descriptive statistics and ANOVA are used in order to find out the effect of economic empowerment of members of the SHG. The study proves that the SHGs played a significant role in improving the rural areas of Puducherry region.

Keywords: *Microfinance, Self-Help Group, Women Empowerment, Covid-19, ANOVA*

1. Introduction

India, being a democratic and a welfare oriented country has recognized that social mobilization of the women with limited means to form Self-Help Groups (SHG) is one of the best ways to tackle poverty. Therefore the government has widely promoted self-help approach in women's development and empowerment initiatives. SHGs had primarily been formed in India as a micro credit groups that can empower women and the weaker sections of the society economically. In India, Micro finance and Self Help Group (SHG) intervention have brought tremendous change in the life of women at the grass root level by empowering women. In poverty alleviation of rural areas SHGs plays a major role. It is conveyed that the SHGs have a role in accelerating country's economic development as a charitable association to form a group. It consists of only less than twenty members as informal and homogenous group as any collection having more than twenty members has to be registered under Indian legal system. It is because of this SHG is to be informal to keep them away from bureaucracy, fraud, needless organizational expenditure and profit motive.

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It is designed as a home grown model for poverty decline which concurrently works to authorize and shape the lives of its members in a better way. For free participation of members groups are expected to be homogenous so that the members do not have conflicting interest. SHGs movement has generated off a silent revolution in the rural credit distribution system in India. SHGs have proved as an effective medium for delivering credit to rural poor for their socio economic empowerment by promoting small savings among its members. SHG is a small charitable association of poor people, preferably from the same socio-economic background. SHGs have now evolved as a movement. Mainly, members of the SHGs are women. Accordingly, country's women participation in the economic development is increasing. This small group plays a significant role in enriching the economic status of their families. Women's development must be given more importance to eradicate poverty, increase the economic growth and for better standard of living. Keeping in view the importance and also to examine whether the Self-help Groups has helped in the pursuit of economic empowerment or not, an endeavor has been made to study the activities undertaken by SHGs members and socio - economic development of women in Puducherry region.

2. Statement of the Problem

Remarkable changes in the living conditions of the poor economically and socially paved the way for SHGs. Also, it is broadly said that SHGs have showed positive impact on both poverty and standards of living of the poor people and mainly on the economic empowerment of women. In today's world more women are involved in income producing activates as NGO and financial institutions started providing micro finance to poor women for the purpose of their empowerment. They behave that a women in the small credit risk and often benefits the whole family. As per the 2011 census, Puducherry is the only Union Territory where the number of women outnumbered the population of men. The UT has 1,037 women per 1000 men as against the national average of 943 women per 1,000 men. There are 2804 SHGs in Pondicherry and most of them are managed by women. So, it is essential to study their socio economic development, It is with this perceptional background that this detailed study has been undertaken to find out the Impact of SHGs in Socio-Economic development in rural areas of Puducherry region.

3. Objectives of the Study

The main objectives of the study are:

1. To study SHG role in developing rural women socio economic status.
2. To examine the factors motivated in the formation of SHGs.
3. To examine the impact of SHGs on women empowerment

4. Methodology

A Qualitative study design was adopted to explore the women's perceptions of their improvement in different domains. These domains were our major parameters for the

study; Economic Security, Credit and Loan Facility, recognition in Society, Working in Co-operation, Savings, Starting Enterprises etc.

Sampling Design

The study was undertaken in rural areas of Puducherry region. .The study was conducted in four self-help groups promoted by NGO in rural areas of Puducherry. Areas covered under the study are; Suthukani, Thirukanur, Solainagar, and Chettipet. Five women SHGs were selected from each block, thus forming 20 women SHGs. Totally 20 SHGs, which have been functioning for the past five years, 10 each from the selected four blocks have been selected for the study and totally 200 SHG members are selected and are interviewed.

Source of Data

Both primary and secondary data were used for the study. The Primary data were collected through structured interview schedule in the selected area. Whereas Secondary data were collected from NGO's report and Pondicherry Municipality.

Analysis of Data

Percentage, descriptive statistics and ANOVA have been used to analyze and interpret the data.

5. Review of Literature

Kamaraj and Muralidaran (2004) studied about self-Help Groups potential in creating socio-economic revolution in country's rural area and proved that they could definitely bring about a change in the outlook of very conventional and traditional bound uneducated in rural areas.

Tripathy(2004) examined about the development of SHGs under various programmes providing better scope for coming together of the programmes / activities of various Ministries, Departments and organizations and suggested to look on the way to the SHGs for pointing their programmes, which eventually would help in refining the quality of life in rural areas.

M. Anjugam (2007) found SHGs participation comes more from socially backward, landless and marginal farm households. Livestock custody and consumer goods possession by the member has been found preventing the group to join.

Gladis Mary John (2008) found that for the success of women in day to day affairs membership of self-help group gave a great assurance with a Positive change in the attitude of relatives and friends towards them in self-help groups.

Venkatesh, J., and K. Kala (2010), have analyzed the economic empowerment of women in the South Tamil Nadu and found that after joining the SHGs the income of the women members have augmented and their household expenditure has also been up raised and victorious to extend women empowerment.

Mahender, Reddy and M. S. Bhat (2011), studied the role of SHGs for women empowerment in Mahabubnagar district of Andhra Pradesh and found that there was an increase in purchasing

power of the women members along with the income and savings level.

Uma Narang (2012), has examined the women empowerment through SHGs and explained the position of women empowerment in India and found that the SHGs have been more successful in the improvement of their living conditions by changing their poverty level.

Vanita Khobarkar, D.N. Ingole and G.V. Nage (2016) Self-Help Groups (SHGs) emerged as a strategy for empowering women and alleviating poverty. The study revealed that SHGs has an average earning of 14528/year to each member through dairy enterprise and 19600 thorough goats rearing and also concluded that members participation in SHGs has achieved various levels of empowerment of Personal, social, economic and financial due to micro financing.

However, the findings from the extant literature cannot be generalized with regard to the poorer regions of the country. Moreover, very few researchers have placed importance on analyzing the factors that influence the formation and participation of women in SHGs. The present study therefore aims to identify the factors that lead to the formation of women in SHGs and also examines the importance of formation in SHGs with regard to women empowerment

Origin of SHGs

Self Help Groups (SHGs) is the discovery of Grameen Bank,founded by Prof. Mohammed Yunus in 1975, as a new approach to rural credit in Bangladesh. Grameen loans were given without any collateral or any paper work. In India NABARD introduced this group in the year 1986-87 but the actual effort was taken after 1991-92 from the linkage of SHGs with the banks. Approximately, 25 million households have gained entrée to standard banking system through SHG-bank association programme and 90% of these groups are only women groups (NABARD 2005). NABARD announced that more than 400 women join the SHG movement for every hour and an NGO the Micro-Finance Programme every day.

The NABARD launch 7th pilot phase by associating 255 SHGs with banks in February 1992 could be considered as a landmark developed in the annual by banking with poor. As on March 2013, 7.42 million SHGs was bank linked programme has been managed. Its participation involved of diverse stakeholders consisting of 768 banks and parted with over 4800 NGOs from different part of India .SHG bank linkage programme has new become the largest community based microfinance initiative with 85.77 lakh SHGs as on 31 March 2017 covering more than a hundred million rural household. The SHG Bank Linkage Programme is the principal micro-finance programme in the world with a total membership of 100.14 lakh groups (covering nearly 12 crore households) across India and having stretched collateral-free loans of ₹87,098 crore to 50.77 lakh SHGs as on March 31, 2019. It is an interesting fact that 90 per cent of the SHG members are women. As on 31 March 2021 the SHG BLP programme has reached many a milestone with a total membership of about 112.23 lakh SHGs covering 13.8 crore households across India. In the year 2020-21 the number of SHGs increased by 9.80 lakh with a corresponding increase in the savings by 11325.56 crore. The savings outstanding of SHG with Banks as on 31 March 2021 has reached an all-time high of 37477.61 crore. In the year 2020- 21 the banks have disbursed loans of 58070.68 crore.

Functions of Self Help Groups

- SHGs hold meetings weekly or fortnightly.
- Promote thrift habit among members.
- Build common-fund slowly and systematically.
- Establish network with financial institutions and various government departments.
- Provide alternative regular credit delivery system.
- Act as transmitter of development of credit.

Role of Self Help Group

- Develop strong, cohesive, among women, through inculcation of the spirit of Mutual Help, Self Help and team spirit.
- Reduce vulnerability to crisis by inculcating habit of regular savings.
- Getting out of money-lender's clutches by savings and internal Rotation of savings
- Increased access and control over resources at household level through income generating activities and access to credit
- Building self-confidence and improving communication skills through training increased mobility, exposure and collective action among women.
- Increasing social awareness, through motivation, intermingling, networking exposure and participation in social action and reformation programs.
- Improving status of women in the family and society, through access to credit, increased control over resources, improved skills and collective action.
- Getting out hidden endowments by constant inspiration and providing opportunities.
- Awareness of legal rights and legal aids access, through networking and training
- Development of business competence, through entrepreneurship Training, facilitating participation in exhibitions, collective Negotiation/bargaining, facilitate emergence of structures like marketing Unions and dissemination of information on markets.
- Greater participation and decision-making in local democratic Institutions like panchayats through participation in graamasabhas.

Role of SHG on Covid-19

` The Covid-19 Pandemic has caused an exceptional crisis worldwide. The pandemic and the subsequent lockdown have had a substantial effect on people's socio-economic status, disproportionately affecting populations that are already vulnerable and disadvantaged. During this pandemic situation, these SHGs have contributed economic and

social needs. Indian women conquered self-help groups have been combined their efforts to work on issues like social distancing, use of masks, quarantine and psycho-social issues of migrants, care of elderly population, mental health, and well-being, amongst others. Awareness in the communities by means of telephone calls, wall writings, pamphlets, social media, etc. is created by women's of SHGs. It has also initiated work related to rations provision or cooked food to poor and weak families using the Vulnerability Reduction Fund or with support from state governments and the local administration. Nearly 37,000 women get benefited from the Puducherry government's offer to provide special bank loan of 10,000 each to every member of 2,803 SHGs. Under the State Rural Livelihood Mission, the District Rural Development Agency to provide facilitates loans to SHG members as a measure to alleviate their suffering because of lockdown.

6. Analysis and Interpretation

In analyzing the data percentage analysis has been used to find out the reason for forming SHG

Table: 1

Motivating Factors for Forming SHG

Factors	Suthukani		Thirukanur		Solai Nagar		chettipet	
	Fqy	%	Fqy	%	Fqy	%	Fqy	%
Economic Security	18	36	20	40	16	32	15	30
Credit and Loan Facility	02	04	04	08	02	04	05	10
Spell recognition in Society	04	08	05	10	04	08	03	06
Working in Co-operation	06	12	04	08	07	14	09	18
Inculcate Savings	12	24	11	22	13	26	14	28
Starting Enterprises	08	16	06	12	08	16	04	08
Total	50	100	50	100	50	100	50	100

Source: Primary Data, (Fqy-Frequency)

Table 1 shows the percentage analysis in respect of motive for forming SHGs. In order to find out the factors that motivated the rural women for group formation a number of parameters such as economic security, credit and loaning facility, special recognition in society, working in cooperation, inculcate saving habit and starting enterprise were taken into account. Out of these six factors, economic security was expressed as a motivating factor by highest percentage (40 %) of members of SHGs, followed by inculcating saving habit (28 %) and Equal percentage (16 %) of members expressed starting enterprise and working in groups (18%) and special recognition in society (10%) as the motivating factors for group formation whereas (10 %) expressed getting opportunity for credit and loaning facility. As formation in SHGs leads toward the empowerment of women, government agencies and NGOs must provide help to SHGs to make them sustainable. They must extend financial support, guidance and extension services, so these activities can be converted into income generation ventures, which would obviously empower women financially as well as socially. These motivating factors of the SHGs indirectly relate the socio-economic development of the society as well as the country.

Table: 2

Impact of SHGs on enhancing the socio economic status of rural women			
Particular	Mean	Std.Dev	Rank
General Income	2.72	0.950	5
Facilitates Loaning	2.93	0.972	1
Income Generating Activities	2.63	0.932	8
Solves Problems	2.76	0.894	4
Develops Independent Decisions	2.87	0.902	3
Training and knowledge	2.74	0.810	6
Helps to go outside the home	2.20	0.392	9
Increases self confidence	2.90	0.908	2
Increase team spirit	2.69	0.799	7
Exposes to social contacts	2.17	0.872	10

Source: Primary Data

Table 2 shows the mean score in respect impact of SHG on enhancing socioeconomic status of rural women in Puducherry region, which revealed higher mean scores for statements such as loaning facility (Rank as 1), increases self-confidence (Rank as 2), develops independent decision (Rank as 3) and so on., the lowest mean score for statements such as income generating activity (Rank as 8), helps to go outside home (Rank as 98), and social contacts (Rank as 10). The study shows that SHGs had played very important role in empowering women by strengthening their earning ability, boosting their self-confidence and promoting regular savings.

Table: 3

Literacy Levels and Reason for Forming SHG

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	147.784	15	9.852	149.931	.000
Within Groups	12.091	184	0.66		
Total	159.875	199			

Source: Primary Data

Ho: There is no significant relationship between reasons for joining SHG and literacy level of women

The above table shows that there is a significant and effective relationship between the literacy levels of the women and the reason for forming Self Help Group. The P value is equal to .000 ($p<0.05$) level for the seven conditions like to Economic Security, Credit and Loan Facility, Spell recognition in Society, Working in Co-operation, Inculcate Savings, Starting Enterprises are associated between the dependent and the independent variables are statistically significant [$F(15,184) = 149.931$, $p=0.000$], the P-value is equal to .000, which is less than .05. Then the result is statistically significant. Therefore the null hypothesis is rejected establishing a relationship between the analyzed factors. The government and NGOs who are working in

the area and emphasizing the formation of SHGs to improve living and working conditions for women must focus on increasing the women's educational level. The improved education system in rural areas will automatically lead towards increased participation in SHGs.

7. Findings

- The economic empowerment of women has increased significantly after joining the SHG in respect of all the selected economic variables.
- Most of them joined the SHGs to avail themselves of economic activity and to meet their financial needs.
- SHGs are a way to raise the income level and improve the living standards and economic independence of the rural women.

8. Suggestions

- SHG banking may be permitted to function as core banking activity without any external interference like target fixing, interest cap, loan size, etc.
- Quality SHGs through village/ cluster level; sub-district/ block level and district level federations may be promoted by government.
- To help SHG come out of poverty Govt. should provide no interest /subsidized loan.

9. Conclusion

Nowadays, empowering women is an issue in a developing country like India. The role of women in the development of a nation is very important and hence women should be respected both in the family as well as in the society. The SHG model plays a pivotal role for the economic empowerment of women. From this study, it may be observed that majority SHGs were of small and medium size and linked with bank. Large number of the rural women formed SHG for obtaining economic security and inculcating saving habit in them generating income, obtaining loan, increasing their social contact, exposed to various trainings, increased team spirit thus leading to increase in self-confidence which on the other hand resulted in empowerment of members. Non-members of SHGs must be motivated for their efforts toward becoming members of SHG and awareness must be spread amongst the non-members. Therefore, it is concluded that the SHGs enhance the socio-economic status in Puducherry region.

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Impact of AI in Entrepreneurship

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Abstract:

Artificial Intelligence (AI) is the greatest invention of human being in this generation," said Elon Musk. The skyrocketing investments on Artificial intelligence points to potential of AI. AI transforming our lives and disrupting business. AI has made our lives easier, comfortable and convenient. The paper investigates how the new age technology such as AI, Automation, block chain, 3D printing, Robotics, AI-bots transform business models and processes creating value for customers and better opportunities and revenues for owners. Particularly how predictive intelligence, recommender engines and business analytics would catalyse the growth e-commerce, content marketing, and user economy will continue to ride on the crest of profit boom. While pointing out to the dangers of AI, the paper throws light on how AI can be used to develop new skills. In sum, the acid test is whether humanity is prepared to use AI technology responsibly and ethically for common good. What is desirable is more important than what is possible?

Keywords: *Artificial Intelligence, Entrepreneurship, Predictive intelligence, Recommender engines, Data capturing*

1. Introduction

"Artificial Intelligence (AI) is the greatest invention of human being in this generation," said Elon Musk. Artificial intelligence is transforming our lives and disrupting business. Recall the experience of Bhavina Patel, the first table Tennis player, who won silver medal in Tokyo Paralympics 2020. She credited her success to the TT Robot (Butterfly - Amicus Prime) and an Ottobock Wheelchair:

I got a robot through SAI TOPS (Target Olympic Podium Scheme) which is an advanced robot. It has many advanced features like you can get strokes from different angles. So, I got good variations from it in my game. It improved my game a lot," told Bhavina, who was afflicted with polio as a toddler in her interview. "Made in Hungary, Amicus Prime claims to be the best ping pong robot available with 21 pre-saved drills and ball frequency of up to 120 per minute. (The Hindu, Sept 07, 2021).

AI has made our lives easier, comfortable and convenient. AI has unleashed more opportunities, facilities and accessibilities. For example, using google maps and GPS enabled navigation one can travel anywhere. You may recollect your experience of using Ola or Uber. You just choose, book, wait and ride comfortably and safely. While you book, you prediction of price estimation, estimated time of arrival and details of driver and his experience. You get recommendation to take the shortest route and alternate route in case of traffic congestion. During the journey, you and others can track your progress with the map. On destination you get bill and forced to give feedback from both sides.

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Everything happens on mobile. Everything made with a 'click'. App based cabs are indeed an incredible innovation that has made commuting affordable, easier and enjoyable. Moreover, it has dislodged social status of owning car, highlighted it redundant, and paying the driver unnecessary. Growth of app-based cars dismantled running travel business. AI is transforming and gripping our lives

AI in daily lives:

Dominic et al identified healthcare, cybersecurity, core AI, business intelligence and marketing & sales are the industries, which have maximum uses of AI.

Nonetheless, our home is saturated with AI technology: AI is seeping into our everyday life with wearables that track heart rate, skin temperatures etc., and fitness products that track out steps and many other household items. Smartphones with many apps play irreplaceable role in our lives from connecting us to social network to advising us on finances. We interact with Voice Assistants of our smartphones. We interact with customer care services and Robots to solve issues related to products and services. We applaud the role of Alexa and Amazon's virtual Assistants. People get used to Amazon Go and Cashier-less supermarkets and man-less security/passport checks in the airports.

AI is transforming Hospitality and tourism industries. Booking of hotels, travelling-train, flight, bus done from anywhere with dynamic pricing. Medical services, Fintech services, banking services, mobile banking are extensively using AI. Stock markets is gyrating with use of AI and stockbrokers book profits in millions at the fraction of seconds.

The fast growing AI infused education technology apps and MOOCS have thrown open worldwide learning possible during corona pandemic. Similarly, firms use AI-tools for learning and development of their workforce reducing costs. In fact, edu-technolgy unlocked the transformed BYJU's owner Raveendran from a schoolteacher to India's newest billionaire (TOI, Sept 03, 2021).

Industrial uses of AI & Robots: Uber self-driving cars transport passengers and Tesla's auto pilot cars reduced 45% human error. AI technology reduce the cost of warehouse logistics and shipping. Security guard- knight gape security Robots man Uber parking lot and mall patrol. Robots builders construct house in 2 days. Dominos use Robots and drones for pizza delivery. "Burger chain employed Robot to 'flip' its burger. AI monkey Robotics bot make nearly 2,000 different types of meals. Robots lawyers, teachers and players like Deep blue, Alpha zero are prevalent today.

Investments in AI

KPMG reports shows, "Investments in AI, machine learning and robotic process automation (RPA) technology are set to reach $232 billion (roughly £176 billion) by 2025. The study forecasts the current global investment on AI technologies of $12.4 billion (around £9.40 billion), will skyrocket in the next three years." The growing investments point to transformative potential of AI systems.

AIM: This paper investigates the impact of AI in Entrepreneurship with special focus e-commerce industries.

2. Methodology

The author has collated information from the focus group discussion with AI experts and collected information using secondary sources like articles, newspapers and books.

The genesis of AI

AI emerged as an organized field of research from the famous Dartmouth Summer Research Project on Artificial Intelligence in 1956 (Ertel & Black, 2018). Following this, there was a chequered growth of expansion and retrenchment. Presently, since 2010s, there has been a phenomenal surge of interest in AI. (Brock & von Wangenheim, 2019).

What is AI? Oxford dictionary (2019) defines thus: "AI is the theory and development of computer systems able to perform tasks normally requiring human intelligence, such as visual perception, speech recognition, decision-making, and translation of languages." Kaplan & Haenlein, (2019, p. 17) defines AI as "a system's ability to interpret external data correctly, to learn from such data, and to use those learnings to achieve specific goals and tasks through flexible adaptation". AI is used like an umbrella term "to describe a range of advanced technologies...including machine learning, autonomous robotics and vehicles, computer vision, language processing, virtual agents, and neural networks" (Furman & Seamans, 2019, p. 186). An AI system can "ingest human-level knowledge (e.g., via machine reading and computer vision) and use this information to automate and accelerate tasks that were previously only performed by humans" (Taddy, 2018, p. 62). AI driven Fourth Industrial Revolution (4IR) or Industry 4.0 differs from earlier technology. Firstly, rate of change and rate of AI diffusion compared to other eras of technological disruption (Schwab, 2017). Secondly, labour costs are decoupling from economic outputs. For example, messaging application WhatsApp had only 55 employees but over 450 million users when it sold to Facebook in 2014 for $19b. Owning not even a room, new age entrepreneurs set to become millionaires with the investment on lab top, software and hi-speed internet connections like the owners of zomato.

AI in Entrepreneurship:

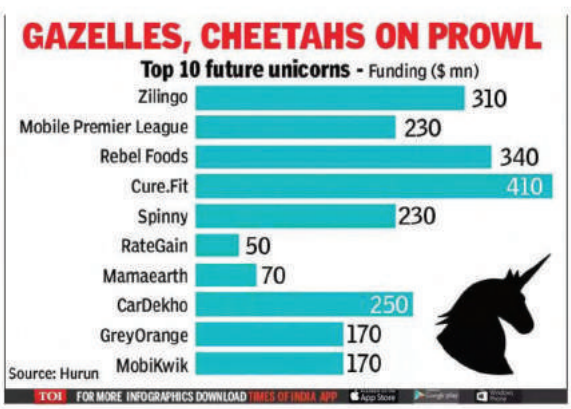
Townsend et al (2018) says AI does not actually brings intelligence but instead a critical component of intelligence- prediction. Better prediction reduces uncertainty. AI has become a new tool to augment entrepreneurial action, judgment and decision-making.

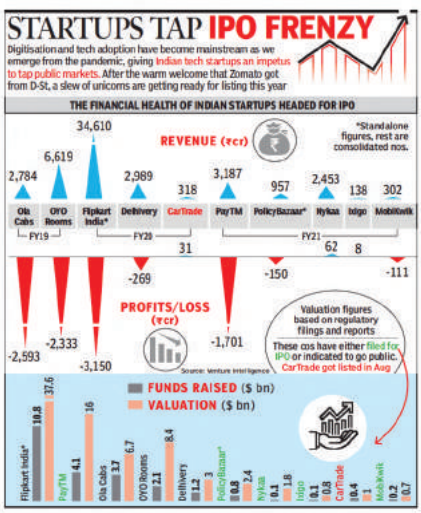
Agrawal et al., (2019) says entrepreneurs will use AI to search for technical solutions across complex combinatorial problem spaces at a relatively low cost. Secondly to study social sentiment analysis (Gaspar et al., 2016). For example, entrepreneurs may be able to scan online customer forums for a product or service category they hope to disrupt and to identify an untapped need or look for broader enabling trends (Davidson et al., 2018). Finally, entrepreneurial firms can test assumptions with a high level of confidence. Using AI systems, perhaps they can better predict how customers react to a feature or pricing change.

Indian startup Scenario

India has become the 3rd largest start up ecosytem in the world with 51 unicorns next US 396 unicorns and China 277. In the last year India without any signs of slow down is adding adding 3 unicorns every month with a total valuation of $168b.

Hurun India data states gazelles and Zeetahs - the future unicorns, are growing exponentially. Founded after 2000, Gazelles valuation range from $500m to $ 1bm whereas Zeetahs valuation from $200 to $500 m.





Source: Times of India

Reasons to succeed as entrepreneur

Analysing more than 100 successful companies, Bill Gross, pins down five key factors of success. They are namely Ideas 2. Team 3. Business model 4. Funding 5. Timing. Among these, timing is the most important factor of success. It contributes 42% to success. (Source: You tube)

Timing 42%

Team/execution 32%

Idea "truth" outlier 28%

Business mode 24 %

Funding 14%

Bill Gross states companies such as Airbnb, Instagram, Uber, YouTube, and LinkedIn exploited the right time and grew exponentially. For instance Uber. During global recession in 2007 when the drivers look for extra money, Uber came into existence and exploited the timing. Similarly, YouTube ride on the waves of broad penetration and the success of adobe flash.

3. How to face AI challenges

Develop human's soft and hard skills:

Using AI tools of machine learning augment employee's soft and hard skills. Develop soft skills such as "Creativity, complex reasoning, social and emotional intelligence empathy, context sensing, creativity and ability to collaborate."

R.Edward Freeman and James R.Freeland exhort to become referees, regulators, redistributors in the age of AI. They advise to become a nation of experimenters and lifelong learners making progress with evidence based scalable results. They make a clarion call to become world of Entrepreneurs unleashing entrepreneurial spirit.

Human machine interwork:

Murray (2018) says by 2023, 35% of workers will start working with bots or other forms of AI, requiring company leaders to redesign operational processes, performance metrics, and recruitment strategies. In the AI fuelled future, humans and machines work together to generate great value. This will boost demand for high skilled talent pool with socio-emotional skills, AI professional competencies, abilities to learn and adapt to AI environment with new working styles. Companies must invest in creating AI infrastructure and workforce learning and develop four types of intelligences namely mechanical, analytical, intuitive and emotional. Like Wipro, companies must crowd source ideas and encourage digital inquisitiveness of employees. Mapping available skills, companies must prepare high skilled workforce, either through skilling (teaching new skills) or reskilling (raising levels of existing skills) taking either through 'in-house training' or partnership with universities using AI.

4. Powered by Data

According to Satya Nadella, CEO, Microsoft "The core currency of any business will be the ability to convert their data into AI that drives competitive advantage." Anirudh kala says conversation, images, polls, feedback-likes and dislikes, opinions, reviews, recommendations and search on social media all become measurable and decipherable new data. Data- visual, textual, speech- captured through different sources, sensors, detectors, global positioning system (GPS) unit and other external sources, directories etc., can be continuously collected and stored for eternity. With this data, IA can be trained to extract correlations, detect similarities, extract features, and discover good representation from multiple sources of data; predict the outcome and recommend actions. New data would then allow prediction to replace judgment. To learn judgment, the machines need examples of judgment. Ajay Agrawal et al inform machines can observe environments and learn to mimic it. "Machine teaching, one of the biggest exponential trends in AI" says Prof. Hod Lipson, Columbia University

AI & Entrepreneurship:

Soni et al identified the impact of AI on the business contexts such as Customer Interaction,

Sales Platform, and Employee Skill Set.

Customer interaction: Usually customers enquire about the products and services to fulfil their need. "Every single interaction is another opportunity for the company to satisfy customers and retain them." Now AI drives interactions from 'human-to-human' to 'human-to-machine', and "virtual assistants". For example, Google duplex is a successfully implemented 'Chabot' that makes real world calls. "AI agents have great advantages of "reduced response time, reduced labour, fewer follow up calls, greater customer satisfaction or combination of outcomes." No mood swings. Nirale (2018) states AI will power 95% of customer interactions by 2025 in Servion, a global solution provider.

Prediction & Recommender engines: One of the salient outcomes of machine learning is Prediction and recommendation. With the enormous power of data analytics and 100% efficiency, AI analyse our preferences, likes and choices, online behaviour and transform them into data. Predictive algorithms and recommender engines make online business highly competitive. Sophisticated discovery engine, complex Predictive algorithms, recommender engines are the strategies used by e-tailer wants to win the battle and eagerly wait for other's downfall.

AI in E-commerce:

November 11, 2017 was the world's biggest shopping event in the annals of e-commerce. On this day Alibaba, scripted history with $25.4 billion online sales- event notes Forces.

In India e-commerce began in 1990 and took two decades until 2017 to reach 10% mark of e tailing. AI drives not only FAANG economy (Facebook, Apple, Amazon, Netflix, Google, and Microsoft) but other start-ups too. Increasing penetration of internet and smartphones made possible by digital India Initiatives, changing demographics in India after 25 years of liberalisation and increasing middle class with disposable income spending online are factors contribute to the growth Indian e-commerce

However, customer loyalty- acquiring, engaging, retaining new customers, through compelling content are uphill and challenging tasks. Aligning e-commerce with social platform, finding compelling reasons for people to spend more time online, some of the leading e-commerce players in India stand to gain profits. The following are the leaders in Indian ecommerce.

Best sellers: Flipkart, Snapdeal, Amazon India

Fashion forward: Myntra, Jabong, Amazon Fashion

Classified rule: OLX, QUIKR, EBAY INDIA

THE FOODIES: ZOMATO, FOODPANDA, TINYOWL, SWIGGY

AI provides tools for online business. Customisation, response time, delivery schedules, product option, product features, customer engagement are the differentiators of e-commerce. Deep discounts, deep understanding of customers and use of social media networks such as Facebook, twitter, Instagram, LinkedIn, Pinterest, Stumbleupon for promotion and personalised advertising are possible only through the power of AI. I have tabulated some of the strategies of big-giants. (Source: Click)

S.No	Detail	Amazon	Flipkart	Snap deal
1	Innovation	Diwali sales from 2015 Robust logistics & supply chain Last mile delivery	Cash on Delivery	Deeper customer engagement with suppliers facilitating loans
2	Customer interaction & support solution	Quickest to respond, Customer loyalty	24X7 Customer support yet mixed up delivery	
3	Use of AI	Use of data science to perfection Predictive analytics in Business. Pricing when, time, how low	Use of Machine Learning to analyse consumer behaviour, (preferences, usages, pattern, important conditions that individuals purchase, product behaviour, supply chain, data gathering from Vendors	Data analytics to study selling traffic, time, when, at time of the day
4	Key drivers /differentiators (pricing, product features, deeper information about the product)	Deep discounting image built – -better products Lower prices, "Prime" offers (Decimate competition) Subscription fees -25 m Offers- Free shipping/free streaming - Other facilities- pay with Amazon, Easy ship, fulfilled by amazon -"sunk cost fallacy" Subscribers tend to spend more than 150%	Discounts-	Better customer experience, Seller satisfaction, Neutralise cost effectiveness, low cash burn

5. Three major dangers:

AI automation and ethical questions.

"Develop AI safely. AI is far more dangerous," says Elon Musk. McKinney Global institute's 2017 report says 375 million workers would lose jobs. 14% global workforce will be affected. In US 20 to 25 % jobs would become redundant or irrelevant by 2030. UK study estimates about 47% jobs will be automated. "Foxconn, a supplier for apple phones, has replaced 60,000 workers at china factories" "says Volker Hirsch in his ted talk "AI & the future of work".

AI an automation would lead to mass unemployment and increasing levels of inequality in the near future. Further, as Dominic et al (p.18) points that it would widen AI divide between AI capable countries "might seriously impact education, income, living standards and businesses. Hence Government, communities, companies, and individuals should take initiatives to remain technologically independent and compete in the AI race."

Moreover, AI and automation will increase abundance of production at cheaper cost and make the workers useless. The future workforce may not be interested work, when they do not find meaning from their work. Further, constant use of Digital tools such smart phones and communication devices may lead brain dysfunction and online addictions. Morozov, (2019) states Tech companies have shifted from "predicting behaviour to engineering it" which is a clear misuse of AI.

AI in snooping: The monsoon session 2021 of Indian Parliament was washed out due to

Pegasus expose by international media. The contention is that Govt of India using Pegasus software (only sold to States from Israel) snooped more than 300 persons including politicians, intellectuals, journalists and other citizens. How can Government snoop its own citizen under the pretext of national security? A lead article (Times of India Aug8, 2021. P.16) point to the following:

It is estimated that every email and phone call is monitored by at least a hundred invisible entities, of whom 52% are private actors and 48% are state actors (of more than one county). Privacy was already an illusion long before Pegasus arrived….70% websites are compromised. Daily checks are no defence: it can take 240 days for experts to detect a hack. Viruses are growing by 66% per year, some aiming to watch and record, others aiming to destroy systems. They can see every financial transaction, every compromising revelations in emails and phone calls, every movement of you and your family. The state has no monopoly on snooping. Rather states themselves are hacked"

AI can do surveillance of not only individuals and cities but also over an entire country. . Can technology control human freedom and privacy? Moreover, Zuboff (2019) points to a form of surveillance capitalism may lead to online fraud misusing the ever-growing pool of data. Many corporate scandals stems from systemic abuse of personal information (Isaak & Hanna, 2018), partly owing to weak or inadequate regulation.

The Big four will control the world: In the age of AI, owner of data become more powerful. Google is a clear example. With more power, erupts desire to control and manipulate. Remember the case of Facebook manipulating state elections such as Russia and India. No wonder US Govt states it is too difficult to regulate tech giants like google, Facebook. For example, storing humongous data on AADHAR card, Government of India and other private players can do anything with Citizens.

AI in warfare: The world is battling with raging corona virus. Many fear that it is a biological warfare. In a world of shifting power balance, countries competing in arms race, Jay Tuck, in his ted talk, "AI will kill us", points to the destructive possibility of using AI warfare tools such as drones, unmanned vehicles, missiles, Rogue Robots etc.

6. Conclusion:

Artificial Intelligence (AI) is the greatest invention of human being in this generation. New age technology such as AI, Automation, block chain, 3D printing, Robotics, AI-bots transform business models and processes creating value for customers and revenues for owners. Integrating these technologies and using predictive intelligence and recommender engines, e-commerce, content marketing, and user economy will continue to ride on the crest of profit boom.

As Kurz weil, a futurologist said, "AI will unleash faster computing, innovation and faster solution. All the hard problems such as diseases, hunger, energy crisis will be solved. AI will bring immortality and hence bodies will become obsolete. People will become minds… Eventually one interconnected mind would exist across humand kind". The acid test is whether humanity is prepared to use the technology responsibly and ethically for common good. What is desirable is more important than what is possible? Is n't it?

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