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ARTIFICIAL INTELLIGENCE GROWTH AND OPPORTUNITIES - INDIAN SCENARIO

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Abstract:

The major purpose intends to review the growth and opportunities of artificial intelligence (AI) in potential Indian sectors. This paper highlights the major AI aspirations specifically in healthcare, hospitality, travel & tourism and education sectors. The paper is primed by synthesizing the views of the academician by a reviewing of latest statistical data and reports, research articles and other appropriate articles. The findings of the paper ascertains the impact of developments in the field of AI on the major sectors from Indian perspective. The application of AI in managing the certain process of specified sectors will lead to obtain efficiency as well as subjective gains for economic development in India. This paper provides deeper knowledge to understand the potential developments of AI in major sectors and presents practical notions of understanding the implementation of AI in Indian sectors. This article defines the role and developments of AI and its implementation for building value for Indian sectors. It also paves better insights for experts and researchers by emphasizing the AI developments in major Indian sectors in precise and effective way.

Key Words: Artificial intelligence, Healthcare, Hospitality, Travel and tourism and Education, Indian sectors.

Introduction:

Research on artificial intelligence (AI) in latest 2 decades has increased prominently and ascertain greater performance in various sectors in India. In this 21st century AI has captured a significant place in various fields. AI refers to "the recreation of human intelligences process by machines; where the processes include, learning (the acquisition of knowledge and rules for using the obtained information), reasoning (learn to identify and focus on definite conclusions) and self- improvement" (Chassignol et al., 2018). AI helps individuals and organizations in various business purposes and in multiple platforms. Every sector is now using AI into a number of applications. As it can speed up the process of doing work and helps to get an accurate result, even daily lives is also changed by AI usage in a day to day services as to reduce human effort. The introduction of AI was an idea to begin an error free world. For instant bank uses AI for mainly financial operations; in medical science AI helps to create virtual personal healthcare assistant; in heavy industries AI is mostly in the production unit; and in transport systems AI performs different functions. Factories producing components for personal computers and tablets are also becoming highly automated. On the other side, the reports BBC (2015) stated that FoxConn has replaced 60000 of its workers with robots. A January 2016 Oxford University study claims that 47% of US jobs could be lost to automation, along with 69% of jobs in India, 77% in China and 57% worldwide. The late physicist Stephen Hawking highlighted that "artificial intelligence could spell the end of the human race". The Russian Direct Investment Fund (RDIF) has raised $2 Billion from foreign investors to support domestic companies developing AI solutions. The RDIF said it has screened 100 Russian AI projects and narrowed then down to 20 that are now being negotiated. The RBC news website has reported that the agenda of the mitting includes introducing AI into Russian economy, systems of state governance, industry and agriculture. The world's biggest tech organizations including Google, Facebook, and Microsoft pay a large number of dollars to AI specialist. AI is already helping businesses transform their hiring operations and processes. Thus in a nutshell, AI presents chances to enhance the mode people live and work, and also on its dark side it is poised to mess up the world. Hence at present there is a need for a research to explore a holistic literature survey in the field of artificial intelligence. This paper reports the state-of-the-art on artificial intelligence in an integrated, concise, and elegantly distilled manner to show the experiences in the field. In particular, this paper provides a broad review of recent developments within the field of artificial intelligence (AI), its applications, and challenges of adoption in Indian sectors.

Evolution and Opportunities of AI in India:

AI is the technology that empower machines to act with advanced levels of intelligence that imitate human intelligence and abilities such as sensing, realizing and act accordingly. AI could recently be the absolute biggest organization transformation for our live times. AI is not an added phenomenon, but rather found in the technological underpinnings over 70 years.

The Figure 1, depicts the evolution of AI to till date with the pace of fast growing economy, India being the 2nd largest population in the world, possess mark able stakes in AI. AI technology improvement and applications are evolving rapidly with most important implications for economies and societies. It is observed by EY and NASCCOM that by way of 2022, around 46% of the personnel could be engaged in completely new jobs that don't exist nowadays, or may be deployed in jobs that have substantially modified skill units. If a few international locations decide to anticipate some years to establish an AI method and installed region the principles for developing the AI environment, it appears unlikely that they could be capable of attain and fit as much as the contemporary momentum inside the unexpectedly converting socio-economic environment. Therefore, the need of the hour is to develop a policy framework so one can help installation an effective AI ecosystem in India.

AI is considered to be a rising as a brand new component of production, augmenting the traditional factors 201of manufacturing such as hard work, capital and innovation and technological adjustments captured in overall issues of productivity. AI has the ability to triumph over the physical obstacles of capital and labor, and open up new resources of cost and growth. From an monetary impact attitude, AI has the capability to force increase thru enabling: (a) smart automation i.e. ability to automate

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complicated physical global obligations that require adaptability and agility throughout industries, (b) labor and capital augmentation: permitting humans to focus on components in their function that upload the maximum price, complementing human capabilities and improving capital performance, and (c) innovation diffusion i.e. Propelling innovations because it diffuses through the economic system.

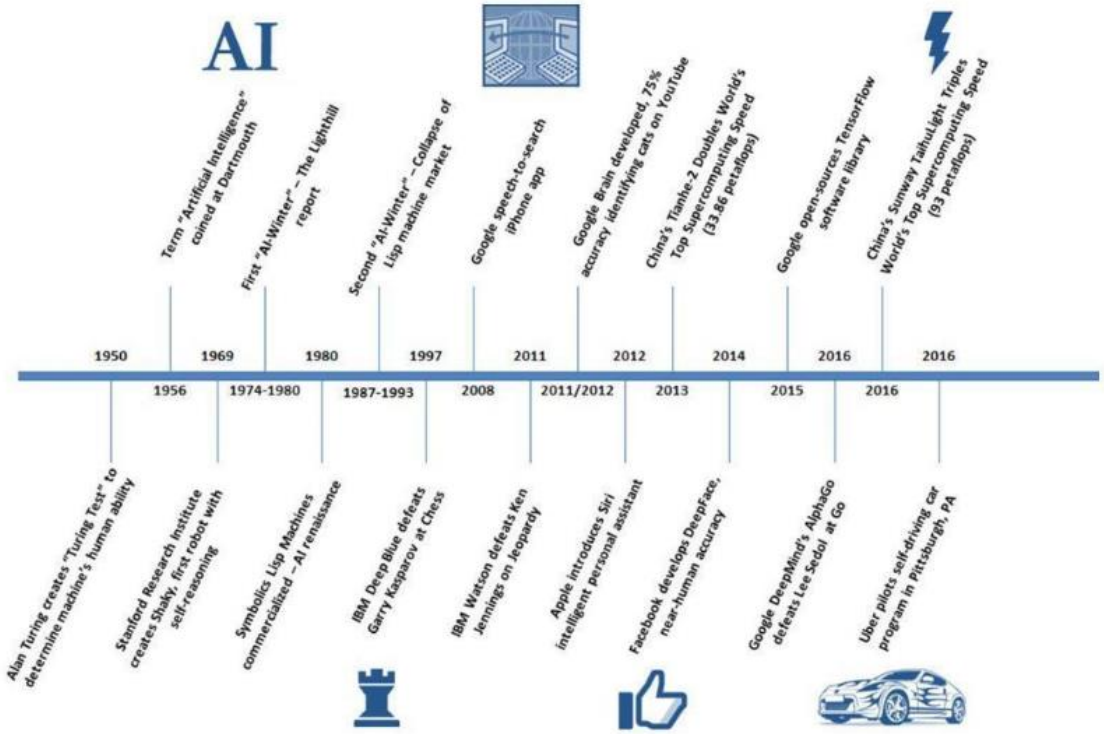

Figure 1: Evolution of AI

Source: Goldman Sachs Global Investment Research

AI innovations in one quarter can have superb consequences in any other, as industry sectors are interdependent based totally on cost chain. Economic price is expected to be comprised of the brand new items, services and improvements that AI will enable. Further Accenture, in its latest AI research reports gives a framework for comparing the financial effect of AI for pick out G20 international locations and estimates AI to reinforce India's annual increase of growth rate in 2035 by 1.3 percentage points. Thus AI system seems to be an inevitable tool to support the effective outcome in Indian sectors (Komorowski and Celi, 2017).

Major Areas for AI Intervention in Indian Sectors:

AI Intervention in Healthcare:

AI is bringing a paradigm shift to health care now a days by increasing availability of data and increased progress in analytics techniques (Atkinson et al., 2007). Despite the apparent economic potential, the healthcare in India stays complex and multi-layered and is ripe for disruption from evolving technology at more than one levels. Adoption of AI for healthcare programs is predicted to look an exponential growth in following couple of years. The remarking growth of AI in healthcare sets to possess CAGR of 40% in 2021. Thus this paves a way for India in solving the potential challenges of providing requires healthcare by combining robotics and Internet of Medical Things (IoMT) to its largest population.(Chandel and Sood, 2014). It is also reported there has been an exponential increase in the use of AI in medical situations in ongoing years (Diprose and Buist, 2016). Prior the application of AI in healthcare encounters difficulties for providing medical care which can be only done by clinicians. But with its latest advancement at present the AI applications spreads its wings to provide even medical care. That is, the AI is applied in all the three major process of diagnosis, projection and giving needed therapy and widely in diagnosis phase (Szolovitz, 1988; Farrugia et al., 2013). For instance the AI application replicates the diagnosis cycle, which includes the observation, information, assessment and therapy thereby assist the clinician for further process to proceed. Few such systems that replicates the process are expert system, clinician's decision support system and QMR systems. All such mentioned systems found to be operated by predictive models and data mining formulated with collection of huge volume of patients' information.

Next major advancement of AI in healthcare is addressed by the adoption of mobile health popularly termed as mHealth (Mohammadzadeh and Safdari, 2014), as this mHealth applications were notably increased in several areas such as care support, awareness education, monitoring, diagnosing, patient record tracking and maintenance (Alnosayan et al., 2014; Barton, 2010; Minutolo et al.,2010). Along with the wider application of AI via mobile device, it is further extended to smart devices, which creates efficient cyber-physical network known as Internet of Things widely termed as IoT (Da et al., 2014; Islam et al., 2015). As IoT serves several purpose includes prediction and monitoring of natural calamities, it also used in healthcare for providing assistance service of care support to patients at homes. Thus it supports to fulfill the medical needs of senior citizens at home. Along with all the applications of AI in healthcare AI is widely operated in healthcare for predicting major diseases includes different kinds of cancer (Diporse and Buist, 2016). In a nutshell AI application in healthcare is enormous and majorily includes

diagnosis, prediction, therapy, monitoring and maintaining patient's record, decision support system and providing in-house patients care.

Artificial Intelligence in Hospitality & Tourism:

At present the estimation of travel, tourism and hospitality sectors are around $1.6 trillion (Deloitte, 2017). On the whole with the activities related to economic contribution it is accounted over 10.4% on world's GDP. Studies also reported that the 50% of retail travel population were likely to travel than that of other generations. In such a demanding environment AI hits greater development in the form of robots includes chabot's, delivery robots, where it reaches its usage around 40% of millennials in present scenario. AI applications in travel and tourism industry focuses more towards customer services by utilizing chatbots which seems to have greater front-end services than that of back-end services includes B2B engagement via machine learning. Thus the application of AI in tourism, travel and hospiltality industry are still developing stage. In line to this previous literatures in AI applications claims the financial and non-financial benefits of the adoption of AI along with the cost of adoption and concluded that and cost are very diverse and managers need to critically consider before implementation (Stanislav et al., 2017) similarly a research study by Oscar et al. (2014), described various artificial neural network models and identified that implementation of alternative AI techniques possibly improves the forecasting performance of neural network.

Artificial Intelligence in Education:

AI movement can also be found from late 1950's and early 1960's. Since latest by 1960's, computers have been employed to achieve a variety of educational goals for students and teachers. Shvetsova (2017), described the advantages and disadvantages of smart classes and he did the comparison study also between traditional class and smart class. At the current era of digitalization, education is one among the sectors which strives to face several challenges in learning as well as teaching. In regard to this line of interest AI achieves most significant part in education. For instance, the application of AI makes human-machine interaction as a possible solution to assist the differently abled students or individuals all around the world. AI in other way triggers the motivation of teachers and knowledge seekers to get involved in the process of effective learning (Heffernal et al., 2016). This transformation of collaboration of machine with human activities act as major turning point in the field of learning. A study done by MIT students reported that the education faces certain technological changes after 2007, with the implementation of new technology by iPhone that assisted to get required information. Such advancements not only improves the application of AI but also helps to provide better way of doing complex tasks in the learning area. That is this interface of AI helps the individual to achieve greater level of memory and the cognition process. But few studies claimed that though the AI helps in cognition and memory, but it is still an unresolved question on the precise time bound to achieve it.

Tuncay and Sevindik (2010) has shown the academic related success with the effective use of digitalized learning among nursing students. The research mainly focused with some nursing students, mid wife students as an experimental study. And the results of the study suggested that the teaching via smart classrooms engaged more of students' participation which in turn helps to concentrate more and leads to greater achievement's in academics.A knowledge feedback loop was proposed in a smart classroom based on LA tasks to improve the learning process (Hernandez-orallo, 2017). They have defined a smart classroom based on the multiagents paradigm. Further Xei et al., (2001) reported multiple examples of underlying technologies in smart classrooms like software platform, multimodal processing, virtual mouse, flexible speech recognition framework, tele education supporting system etc.

AI techniques are studied and examined even on instructional and intellectual aspects of e-learning settings (Yousif et al., 2011). Luan (2002) and Timms (2016) discussed potential applications of data mining in higher education and revealed that the learners would require voluminous data or a human to robot interfaces. In relation to the artificial intelligence techniques can be very helpful as they can develop and imitate the process of human reasoning and decision making in designing the learning-teaching framework. Researchers also examine the role of business intelligence and it's advantageous for human resources in education sector in varied ways. In this research article, a researcher investigated the leading business intelligence vendor to look into the business intelligence and data analytics features amalgamated in human resource management segments. Researcher has examine the role of business intelligence and benefits for human resource management. In this research article, a researcher investigated the leading business intelligence vendor to analyze into the business intelligence modules and data analytics module incorporated in human resource management practices on the education sector.(Kapoor, 2010).

According to recent research, Jain (2018) identified the role of artificial intelligence in human resource management. The researcher has quoted that most of the companies has been adopting modern technology in various HR process like recruitment process, performance appraisal process, cloud-based HR systems even in education sectors. Dirican, (2015) has studied that use of Robotics and Artificial intelligence in business may have negative impact on the overall functions of an organization like production, performance management, sale, strategic planning, customer relationship management, banking system, coaching, training, taxes etc., and this can be even applicable to service sectors. Buzko, et al., (2016) explained, AI interfaced technologies in development of human resources in educational institutions. The researchers, ponder on hurdles of AI technologies in human resource area where authors noted that AI not able to identify the effectiveness of training costs. In the research paper authors noted that artificial intelligence technologies facilitate the prompt analysis of data by human. Also Artificial intelligence helps in screening the candidates, auto-generated messages to candidates, employee's relations, scheduling the interviews etc. (R&D, 2018). Jarrahi (2018) discussed about the usefulness of AI for human. Artificial intelligence has been supporting in decision making, dealing with uncertainty, and especially equivocality of decision-making in a service organization. Still in an industry the role of human is essential and technologies have to depend on human when subconscious decisions are essential to evaluate and facilitate the outcomes of decisions (Sato and Kameya, 2001). The theory and practice of intellectual in artificial intelligence has

extensive records (Atkinson and Bench-Capon, 2007). And we can see that there are many opportunities exists with current artificial intelligence in education sector.

Discussions and Conclusion:

"Artificial Intelligence' the crucial term widely implemented in various sectors, because of its ability to pile up and process the massive amount of data accurately for decision making. In this study the healthcare; education; and travel, tourism and hospitality sectors which claims as a booming sectors in India for the application of AI is reviewed.

When it comes to the healthcare sector the reviews stated that AI is not the ultimate solution for all the challenges healthcare facing today. Although, in many areas, its use is inevitable and advantageous in supporting caregivers' job (Mesko, 2018). Also of all the effectiveness gained by the application of AI in this sector being explored, mainly the AI applications driven by robotics played a key role. As this robotics seems to have greater potential for medical automation, diagnosis of major areas of treatment. The medical literature also reported that already the robotic technology are in process of conducting surgeries , medication and proving patient care services (Warwick, 2012; Szolovitz, 1988; Cyranoski, 2018).

The review on the existence of past literature of AI in travel, tourism and hospitality industry claims that still the implementation of it is in infancy stage. And it is also notable that the application of AI in this industry is not only restricted to provide service to the customers, but also in future it can be extended more to obtain customer data which in turn can be utilized for framing strategies to attract and retain the customers and also to frame effective pricing methods. Thus among all other sector this industry of travel, tourism and hospitality paves more way to implement and develop AI in future.

With respect to education sector, it is inevitable to note that the education goes hand in hand with the applications of AI. The utilization of AI in education simplifies the administrative works, to provide smart content of lecture sessions which also includes live chats with educational experts, video conferencing, webminars, video lecturing etc.,(As a new development AI spread in its wings to digitalizing the textbooks and new platform of digitalized personal learning and examinations are taken place. Digitalized personal learning is a method which "tailors educational content to be unique needs of individual students". It is also notable that this personalized learning followed a new method of combining some gamification to enhance learning and quality of education. (Khon, 2016; Linert and Kopacek, 2016)With the immense growth in AI in education sector it is found that it is not late to see robotics to teach in classrooms.

At the current phase of digital era, the technology plays a crucial part in everyday life. This transformation made to look every information in different aspects and it even guides how to communicate and behave. And also it is important to note that this changes applies to all most all the sectors. Specifically, the sectors such as healthcare, education, travel, tourism and hospitality are in booming stage in India, which gives more opportunity and development in forthcoming years. Thus the literatures reviewed in this article focused on major three areas of AI development in Indian sectors. Also the literatures reviewed provides a clear picture of how the AI reshapes the Indian sector. From the review it is concluded that AI as an effective tool which can be implemented to the major areas of process in healthcare, education , travel and tourism, hospitality in India. Though there are more advantageous of AI applications, it gives effective solutions only when not fully replaced by traditional social techniques in all the sectors.

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