Artificial Intelligence –A Panoramic Management Perspective

Dr. B. Kalpana Sai and Dr. S. Anthony Raj

***Abstract*:**

Many of the real-world problems can be solved by incredibly powerful machine learning-based techniques like Artificial Intelligence (AI), machine learning and robotics. Machines learn from experience, adapt to new inputs and perform human-like tasks due to the evolution of artificial intelligence. The most common AI patterns like super-computers playing chess, driverless cars depend heavily on machine learning and natural language processing. This article presents the applications of AI in different fields like medicine, agriculture, finance, education, e-commerce, tourism, transportation and smart home devices,

Keywords: *(AI) Artificial Intelligence, Fear of job loss to automation, AI in medicine, AI in agriculture, AI in finance, AI in education, AI in e-commerce, AI in tourism, AI in transportation and AI in smart home devices*

I. INTRODUCTION

One of the early explorers of Artificial Intelligence (AI), John McCarthy, defined AI as the machines that behave as though they were intelligent. Encyclopaedia Britannica defined AI as the ability of digital computers or robots to solve problems by learning the higher intellectual processing capabilities of humans.

It is believed in the modern era that great evils like boredom, vice and need were thrown out by the AI concepts, which add meaning or value to mankind. Majority of the people understand work means having a job and are equally scared of AI as they believe it will soon replace many of their jobs. A considerable amount of societal turbulence may be caused by unemployment in the nations. AI is predicted to generate 9.5 million jobs. Williams Grut (2016) in his article expressed that most of these job avenues will only open to the IT literates. Is there a proper justification available for such fear of loss of jobs due to automation? The future of employment will be phenomenally changed by the new wave of technological innovation. While majority of the people believe in a jobless future, few of them argue that new jobs will eventually be created, that will be a redesigned version.

Worldwide spending on AI and related technologies is predicted to reach $57.6 billion in 2021. AI will greatly impact the growth of all the core sectors in countries like India. One of the finest technologies that boosted core sectors and accelerates digitization is artificial intelligence technology.

The aim of this research is two-fold

i) Whether fear of loss of jobs due to AI is a myth or reality
ii) To look at the application of AI in different sectors.

II. FEAR OF LOSS OF JOBS DUE TO AI – A MYTH OR A REALITY

What is a true lie? The evolution of AI, machine learning and robotics will leave the people unemployed. The above statement is a true lie. Let's look into some expert's opinion.

ISSN: 2233-7857 IJFGCN

Hal Varian, Chief economist of the Google Inc opined that most jobs could be more complex than many people realize. Most jobs are made up of unlimited number of tasks and they cannot be easily automated. Automation eliminates dull, monotonous, tedious, and repetitive tasks, but will not eliminate jobs in the industry.

Gardener has a lot of tasks like, mowing, watering lawn, pruning rose bushes, raking leaves, eradicating pests, and a variety of other chores. Mowing and watering are easy tasks to automate, but then automating other chores would either cost a lot of money or would be beyond the capabilities of the machines. Hence the job of gardeners will still be in demand.

Repetitive tasks alone will be eliminated. In 1950s, the United States' Census Bureau listed 250 separate jobs. Based on the references only the lift operator jobs were eliminated because of AI involvement. Other than that few of the tasks which was vested to the lift operator like greeting lift users and directing them to the right office, have been disseminated to the receptionists and the security guards in the respective offices or complexes.

As much as fifty percent of all the robots in the industry are used by automobile industry, which has agreed and acknowledged the fact that mechanization or automation is confined. The founder and CEO of Tesla Motors Elon Musk confessed and admitted that the biggest mistake happened at Tesla was underrating Human Potentials and allowing massive automation in the operations.

Bank Tellers job was redefined after the introduction of ATM's. Now both co-exist with new responsibilities defined for teller. ATMs created more jobs in the backend in the form of call centers.

Creation of more matrimonial sites should have to ideal matches. Has it? Creation of more job search or employment sites online should have eliminated unemployment. Has it happened? Neither an ideal match is not made nor is unemployment eliminated.

One hand there is fear of loss of existing jobs due to new technologies. On the other hand, new technologies create a lot of new jobs.

We also read the amusing news about a hotel in Nagasaki Japan which fired its incompetent robot receptionist and room attendants.

III. MCKINSEY'S FOUR FUNDAMENTALS OF WORK PLACE AUTOMATION

A. *The automation of activities*

From different occupations, roughly 2000 distinct individual work activities were assessed for 18 different capabilities. Research suggested that only 45 percent could be mechanized using existing technology. When technologies to decipher natural language, reaches the break-even level of human performance, an extra 13 percent of the tasks could be automated. For example, the fleet of Kiva robots used in Amazon fulfil warehouse orders almost four times faster than the company's preceding systems. These robots use automation technologies that help them to plan, move and coordinate among individual robots.

B. *A twist in the definition of jobs and business process*

Among all the existing occupations in the world only 5% of the occupation can be entirely automated using existing technology and 30% activities of the 60% occupations can be automated. The impact of

ISSN: 2233-7857 IJFGCN

automation is likely to be felt across a vast majority of occupations; there is an absolute necessity for redefining of job and alteration of business process. For example, Lawyers have to read through the voluminous pages in documents that were collected during their discovery. Text-mining techniques will help the lawyers for this purpose.

C. *The influence of high-wage occupation*

Traditional understanding suggested that less-skilled, low-salary activities are the most vulnerable to automation. But research suggested that 20% of the high-wage occupation can also be automated. For example, in the occupation of a CEO, the following things can be automated like analysing reports, data required to notify functional-decisions, tasks assignments to staff and reviewing their status reports.

D. *The future of creativity and meaning*

Creativity and emotional sensing are core to human experience and are difficult to automate or mechanise. Research suggested that only 4% of work performances across the globe require creativity at break-even level of human performance. And that only 29% of work activities require break-even level of human performance in emotional sensing. This reflects the malnourished nature of our work lives. For example, the time interior designers spend in measuring, bringing visual prototypes and ordering and procuring materials is more than the time developing innovative concepts based on client's desires. With AI, the time spent on activities can be reversed.

IV. ARTIFICIAL INTELLIGENCE IN DIFFERENT SECTORS

A. *AI in healthcare/medicine*

In May 2017, McKinsey predicted that 50% of the activities currently carried out by workers can be automated. With AI, doctors can spend less time on triage and diagnosis as that can be effectively automated and spend more time on the most acute or unusual cases with accuracy. AI not only reduces the repetitive tasks and frees-up physician's time, but also helps in increasing the efficiency and productivity. It also pushes us towards 'Precision-Medicine'.

Bertalan Mesko in his LinkedIn summed up that Artificial intelligence will shift healthcare from traditional 'one-size-fits-all' medical solutions, towards personalized curing and drug management with unique composition.

The two most important impact of AI in medicine is improving treatment outcomes and in reducing costs.

Areas of application of AI in medicine

1. Robot Assisted Surgery:

A type of AI-assisted robots could analyse the data from pre-operational medical records and provide much needed information. They are capable of guiding the surgeon's instrument physically during real-time surgery. They can also collect data from actual surgical procedures in order to suggest fresh surgical methods to the surgeons. A Robotic surgery assisted by AI created by Mazor Robotics resulted in five times accuracy with reduced surgical complications, against the physical surgery performed by surgeons. This was found during a study conducted with 379 Orthopaedic patients from nine surgical locations. The patients' post surgery stay in the hospital was found to be reduced by 21%, when surgeons are assisted by AI based robots.

2. Virtual Nurses:

There is a huge potential for virtual nursing assistants powered by Artificial Intelligence in assisting patients in the hospitals. For instance, Molly is a AI powered virtual nurse developed by Sensely's which asks the patients, diagnoses the patients about their health through a set of questions, evaluates their

ISSN: 2233-7857 IJFGCN

disease signs and directs them to the most efficient methods. This result in saving of 20 percent of the time of physical nurses spends on the patient's maintenance tasks.

3. Dosage Errors:

Giving wrong dosage of drugs to patients contributes to about 37 percent of all avoidable medical mistakes and it is a costly problem. In traditional methods, dosage of drugs was decided based on guidelines and educated guess work. In 2016 A trailblazing researches in California in 2016 developed a mathematical formula using AI to correctly determine the accurate dose of immunosuppressant drugs to be administered to organ patients. The correct dosage of drugs is very important as this ensure that the graft is not rejected and correctly fits the patient, after an organ transplant.

4. Administrative workflow:

Over half of nurse's workload of 51% and 16% of physician's activity has nothing to do with patient care. The activities that contribute to the non-patient-care activities are scripting notes, maintaining prescriptions, and instructing tests. An AI-based technology could assist in Voice-to-text transcription and reduce the work burden and the average time consumed, and AI-based technology can solve many back-office problems and inefficiencies in the administrative workflows.

5. Drug Creation:

Creation or development of drugs through clinical trials consume more than 10 years and cost a fortune. AI based technologies help in bringing this process faster and cheaper and this could change perspective of the world.

During the process of drug creation, there was a need to find a compound that interacted with the identified target molecule in a desired way. This involved screening many millions of potential compounds for their effect on the target (affinity), along with their side-effects (toxicity). These compounds could be natural, synthetic, or bioengineered.

As the current software is inaccurate and produces a lot of false suggestions, it takes a very long time to narrow it down to the best drug candidates (known as leads).

Machine Learning algorithms can be programmed to forecast the suitability of a molecule based on structural fingerprints and molecular descriptors by feeding the rules and knowledge. Then they scan through millions of potential molecules and filter them the best options including those that have minimal side effects. Hence this helps in saving a lot of time in drug design.

In the middle of the Ebola virus pandemic situation, a program powered by AI was administered to scan existing medication that could be redesigned to fight the disease.

The program found two medicines that reduced Ebola contagions in one day, a distinction that could mean saving several lives.

6. Managing medical records:

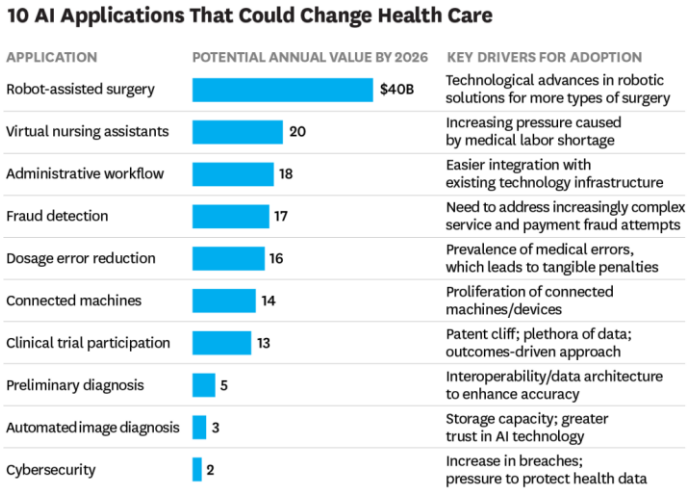
Managing medical data through DBMS is one of the most commonly used applications of AI. Compiling past medical history and records and analysing information is the most important aspect of AI.

7. Health Monitoring:

Fitbit, Apple and Garmin are some of the health trackers when worn by humans, can monitor heart-rate and activity levels. They can alert the users on over exercising or under-exercising. They can also send this kind of important information to the physicians and AI systems and seek advice on suggestions to improve the lifestyle habits of patients.

ISSN: 2233-7857 IJFGCN

Apart from all these applications, they are also used in precision medicine, medication management, digital consultation and doing repetitive jobs.



Source; Accenture

B. *AI in Agriculture*

In the age of technological revolution, farming industry is on the apex. Artificial Intelligence based technologies enabled this revolution. The next phase of 'ultra-precision' farming is set to revolutionise the future of agricultural sector.

The global population is expected to reach 9.2 billion by 2050 as per the reports of the UN Food and Agricultural Organisation (FAO). This implies the global agricultural sector has to feed an additional 2 billion mouths within next 30 years. The available acreage can manage only an additional 4%. Hence planting more crop fields or breeding more cattle is not the solution. Therefore, within current farming methods, the farmers will be required to 'do more with less'. AI technologies can help. Let's see how.

Areas of application of AI in Agriculture

1. Precision Farming:
AI has enabled precision farming. AI in agriculture has unlocked the power of precision farming. The goal of precision farming is to produce more output with less input.
Artificial Intelligence is providing solutions towards improved agricultural productivity.

2. Sowing the seeds:
Variable-rate planting equipment not only sowing the seed into the soil, but also collects data about the place a seed shall produce best, favorable soil conditions, etc. All these are agricultural big data which will make farming much more efficient.

3. Harvest Technologies
Machine vision and sensor fusion are all AI based technologies which can be used to harvest mature apples from trees precisely. This is again a part of artificial intelligence which mimics human cognition and directs the corresponding action. Harvest robotics is a real landmark in the very rapid development of the farming community.

4. Satellite Intelligence:
The general difficulties of farming like stunted crops, signs of pest, weed damage, dryness can all be sensed by drones fitted with precision sensors to run the fields and get the needed data. With all this big data on hand, farmers can improve their production models as well as their strategies to decrease waste.

ISSN: 2233-7857 IJFGCN

5. Pest and weed control:
Windstorms and grasshoppers were scaring yesterday's farmers. Today, farmers are quickly adopting new innovative high-tech ways to protect plants against weeds and pests. Greenhouses are the most amazing farming technologies.
Computers can now 'see' like humans can. Hence AI technologies with computer vision can be deployed by farmers to find weeds and eradicate them rather than blanket spraying an entire crop. This has the advantages of clean food, savings in money, time and effort. This has a dramatic impact on yields.

Besides these, there are:

- Smart tractors that has a smart attachment to determine different treatment for each plant based on its health.
- Chatbots for farmers to provide right answers and analytics information.
- Smart phone helper, "Alexa" which can communicate with farmers to help them figure out solutions for their tough problems.

The world has to produce 50 percentages more food by 2050 and it is possible through artificial intelligence using resources more sustainably.

C. *AI in Finance*

Finance industry and artificial intelligence combination is a perfect match. In finance industry, real-time reporting, accuracy of information and processing of large volumes of quantitative data is very critical to make crucial decisions. All these are made possible through AI-enabled technologies.

Areas of application of AI in Finance

1. Portfolio Management:
In financial landscape, Robo-Advisor (RA) is a common name given. RAs are basically algorithms that are built to rein a financial portfolio to the objectives and threat tolerance of the user.
The advisor then distributes investment according to the user's goal and risk tolerance across asset classes and financial instruments.

2. Algorithmic Trading:
Algorithmic trading or automated trading systems originated in the 1970's and were also called, makes use of intricate AI technologies to decide extremely faster dealings and trade transactions.
High -frequency trading (HFT) often makes crores of trades in a day and is a subset of algorithmic trading. Machine learning and deep learning are performing a vital role in enumerating business and trade decisions in real life.

3. Security 2.0:
User names, pass codes/passwords, and security questions will no longer be the used for user protection. Options like Face-Recognition, Voice-Recognition, or other biometric data will be the future security measures.

D. *AI in Smart home devices*

A considerable number of smart home appliances use AI and make people's experience as frictionless as possible, by learning people's behaviour and adjusting their settings accordingly.
Some examples are:

- smart voice assistants,

ISSN: 2233-7857 IJFGCN

- smart lights that can automatically change the intensity and colour depending on daytime or night time,
- thermostats that can automatically adjust the temperature based on user preference among others.

E. *AI in E-commerce*

All online stores offer different forms of innovative customer friendly support other than the traditional support channels like email or phone.

AI systems provide more intelligent and creative support whereas traditional methods cost a large investment and wastage of HR. Customers can get to know the status of business orders through AI-facilitated customer assistants. They can also answer simple business queries on finding a product based on description and the approximate costs and discounts based on customers' description and desire of purchases.

The online store will be provided with information like the customer's location, browser, device used and the time the user spends on each page through Google Analytics.

Online shopping experience is enhanced by the use of chatbots as they increase user intention by sending reminders and notifications, offering instant answers to human assistants, showing dynamic content that modifies according to user's demand, change currency, send notifications about discounts on best-selling products and offer time limits on desirable items.

F. *AI in Education*

According to a study carried out by Stanford University, education will be the sector that will undergo the most change between now and 2030. The main factor in this transformation will be the ability to personalize education for each student and adapt teaching to their needs and capabilities.

The study underscores that the applications of this technology in the educational field will be mainly in virtual reality, educational robotics, intelligent tutoring systems and learning analytics.

In times of crisis and pandemic situation all over the world due to corona virus, we can still see schools and colleges classes taken through google classrooms and meetings through Zoom or skype.

G. *AI in Tourism and transportation*

In both travel and tourism industries, AI is helping both the service providers as well as the customers. AI technologies help customers right from suggesting efficient routes to a particular place and making accommodation arrangements, vehicle type selection arrangements. Travel companies are also capitalizing the usage of smart devices.

Before travelling, majority of the users look for travel reviews about the mode of travel, hotels to stay, activities to look forward, important places to see and local landmarks. Customers also book trips on these smart devices, with the help of AI-powered travel assistants. Chatbots provide human-like interaction with customers for travel recommendations, economical booking of hotel rooms, activities to look forward and fantastic dining choices.

In transportation industry, consider Google Maps as the cusp. It can scan road information and provides algorithms to identify the optimal route to take. Al is omni-present, be it in business, education or event space etc.

ISSN: 2233-7857 IJFGCN

V. CONCLUSION

The twin-fold objectives are met in this discussion

I. Whether fear of loss of jobs due to AI is a myth or reality?

It is a myth as there may be some job losses for repetitive jobs but again innovative new jobs will be created. For this there will be a need for skill training.

II. To look at the application of AI in different fields.

Looking into the applications of AI in medicine, agriculture, finance, education, e-commerce, tourism, transportation and smart home devices, we may conclude the potential for the growth and impact of AI is huge in innumerable fields.

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ISSN: 2233-7857 IJFGCN