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FUTURE ASPECTS OF CRITICAL THINKING AND AI

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Abstract - Artificial Intelligence or AI is vast area of computer science which emphasizes the generation of the intelligent machines which can react and operate like the human beings. Some of the operation that are operated by the artificial intelligent systems are such as decision making, problem solving, designing, learning, analyzing and speech recognition. Artificial Intelligence is the technology and science which is based on the computer science, Engineering, Linguistics, Biology, Mathematics, Psychology and even Arts. Some applications of AI are Expert Systems, vision systems, natural language processing and so on. It is the term usually used to referred to the ability to apply and acquire various knowledge and skills for solving a provided issue. The intelligence of the system is integrated using various cognitive function like perception, planning, memory, attention and language which is mainly the critical thinking skills. In these recent days the AI has the ability to imitate the human intelligence which are performing various operations which needs special ability of learning and thinking. The most progressing application of AI nowadays is the robotic and machines that has some high-performance capabilities. The recent attention towards showcasing the AI in robotic is increased and dependency on the human alternatively increases. The technology highly relies on the human characteristics(Brighton, 2015). The outputs or the results generated from the intelligent system simply depends on the programmed codes and other characteristics of the human, since AI enrich the critical thinking skills by the factor that it causes a complexity of data which leads to the development of the cognitive skills. Thus, the impact of AI is increasing day by day on the society and the critical thinking factor also helps the AI to develop in this rapid way. The key areas of the knowledge are developing day by day and with these developments the applications of the artificial Intelligence are also developing by acquiring all those knowledges. This particular research focuses on the future aspects of the artificial Intelligence and the importance of the critical thinking. The research basically describes and highlights the future applications of the artificial intelligence and also showcased some of the obstacles that can be faced by the artificial intelligence due to the critical thinking in future.

I. DISCUSSION

The benefits of artificial intelligence that include reduction in error and ease in exploration are in support of its future applications. The technology has replaced the human factors in various fields and in days to come is expected to aid humans in many more spheres. The main six spheres in which Artificial Intelligence can prove its potential in future are as follows:

1) Automated Transportation-In the transportation industry, artificial intelligence has already spread its roots by effectively predicting and detecting traffic accidents and associated conditions. The technology finds its application in controlling as well as optimizing various problems related to traffic conditions. Autonomous trucks are one of the leading AI driven vehicles and are already in use in many parts of the world. It is effective in collecting data related to the real-time traffic conditions thereby reducing congestion as well as bringing in improvements in the scheduling of public transport. The future of AI in this sector will help in streamlining traffic patterns, developing smarter traffic algorithms and enhancing real-time tracking conditions that will be effective in controlling the traffic patterns. In days to come artificial intelligence can help in predicting as well as preventing traffic jams by tracking the real-time traffic conditions. Safety during transportation is a vital concern and artificial intelligence can help in improvising public safety (Krittanawong, 2018). The safety of the citizens travelling by public transport can be ensured by tracing the crime data in real-time thereby aiding the police in increasing their efficiency by patrolling. Artificial Intelligence can also help in traffic management along with decision making systems enhancing streamline nature of traffic thereby making the roads smarter. The traffic management system aided by Artificial Intelligence can track the physical as well as the environmental conditions that can help predict heavy traffic flow and congestion in the streets. The AI aided transportation systems will be effective in suggesting alternate routes to save the users from the congested roads. It can be that the automated vehicles change their routes automatically and choose the less congested road. Artificial intelligence can be made use of to design optimal networks for a specific community by developing optimized work plan for the maintenance and rehabilitation of pavement networks. At the same time, it can optimize the timing plan for traffic signals. Artificial intelligence can be made use of to identify specific classes of drivers on the basis of the behavior of the drivers. The technology can be made use of for decision support systems that are related to transportation planning(Jarrahi, 2018). Artificial intelligence can be made use of in signal controlling systems at main junctions such as road intersections, dynamic route guidance, train control in rail roads and ramp metering on freeways. Artificial intelligence will aid in automatic incident detection and can be used in various fields related to the traffic

data and transportation structure settlement and production

2) Cyborg Technology - Cyborg refers to cybernetic organism that in the sphere of information technology is defined to be an organism having biological as well as technological components. This technology aided with artificial intelligence has the potential to be the part of real life rather than being in the science fictions(Jackson, 2019). There have been ongoing experiments on the real-life cyborgs and these are to transform as partly human and partly machine in practical life.

3) Taking over certain dangerous jobs-Buildings set on fire is difficult to navigate by the fire fighters and in this case artificial intelligence can save them from the risky work. There has been a recent development which can help out the firefighters in this case. The development named SmokeBot can be sent inside flaming structures (Kolbjørnsrud, Amico & Thomas, 2016). This technology aided by artificial intelligence is effective in monitoring the progression of fires and damage endured. In future it will happen that these types of instruments will be able to create interior maps that can be made use of to find navigation routes around the building. The technology is supported by thermal cameras and gas sensors. There have been instances where firefighting robots have already been used such as in U.S. Navy. The U.S. Navy uses firefighting robots which are made used for extinguishing flames on ships. The robots cannot fully be the substitute for the human counterparts, but they can be a medium through which the fire fighters can get to know about the burning buildings in details. Nuclear sites are prone to mishaps and cleaning of these sites is risky. Employing robots with embedded AI techniques to clean the nuclear sites can save the human counterparts from risking their life(Huang & Rust, 2018). The techniques of Artificial Intelligence can help in gathering real-time data from the nuclear sites. Welding requires working in environments with high temperatures which involves life risk. Humans are exposed to hazardous fumes which can cause ultraviolet keratitis. Making use of robots in this place can provide humans with provision of staying in safe places and keep a check on the work.

4) Solving the climate changes- Climate change is a serious threat to humanity in the recent years which can be handled through the aid of technology to some extent. Research by some of the best thinkers suggests that machine learning can help in the prevention of human destruction.There are various suggestions which include the application of Artificial Intelligence and satellite images for monitoring deforestation, development of replacement for cement and steel since these products contribute to 9 percent of the emissions of greenhouse gases(Garrison, 2015).Despite the variety of suggestions, research focuses on the usage of machine learning in monitoring the environment and analyzing the information to find out the industries which have the most contribution to emission of the harmful gases. It also deals in utilizing AI to design such systems which can help mankind to prepare better for future changes(Aghion, Jones & Jones, 2017).The availability of technology has been for years now, but it depends on the adoption by the society. Hoping that ML proves to be useful in cost reduction related to climate action, society should also decide to collaborate. In the following ways AI can help mitigate issues related to climate change:

a) Create efficient electricity systems: ML and Artificial Intelligence can help in forecasting the generation of electricity and its demand. Through this the suppliers can integrate sustainable resources to national grids thus helping in waste reduction.

b) Monitoring of deforestation & agricultural emissions: Global warming gases are not only emitted from industries and power plants but also from deforestation since the plants and tress capture the carbon from the surroundings through photosynthesis process over billions of years. This gets released back to the surroundings, but by using satellite imagery it can be detected and stopped.

c) Creation of new Low carbon materials: Reports suggest that 9 percent of the emissions are from steel and concrete production(Brundage et al., 2018). Scientists use AI for the discovery of alternatives to these materials and redesign their properties to get low carbon compounds.

d) Prediction of extreme weather: The changes observed in rainfall pattern, ice sheet dynamics, and cloud cover drive the greatest effects of climate change. Re-designing these changes will be helping scientists in extreme weather prediction like hurricanes, droughts thus government can take precautionary measures.

e) Reduction of wasted energy: This refers to the energy which is consumed in the buildings. Since buildings stay for a greater period of time they are rarely modified with installation of new technology(Fogel &Kvedar, 2018). Addition of smart sensors for monitoring air, water temperature and energy consumption can reduce the energy wastage and contribute in combating climatic change issues.

f) Reduction of carbon footprint by individuals: Humans can help in a significant way in tackling climate changes by using AI. Machine learning helps to calculate a person's carbon footprint and thus awareness can be created for its reduction (Makridakis, 2017). Some of the ways are by using public transport mostly, purchasing less meat or sustainable usage of electricity in the house.

All the above-mentioned points help in solving the climate change issues to a greater extent and Artificial Intelligence is considered to be the greatest supporter of it.

5) Make robots the friends of humans-The robots were previously expected to follow orders and worked on the set definite programming they were built up with. With the advancements in the technology of machine vision aligned with the progress in the IoT domains have provide the machines with the ability to process instructions as well as images without waiting for commands from the humans and think about the next steps. The technology will allow the robots to "see" thereby enabling them to augment their ability so that they can apply logic to things and learn on their own(Ashrafian, 2015). The robots that are integrated with artificial intelligence will be able to perform various manufacturing and production tasks. These robots can do mundane as well as repetitive tasks which involve life risk and are not suitable for humans.

6) Healthcare- The potential of AI to imitate human cognitive functions is considered to be a standard shift in the healthcare sector. At present, the technology has brought in revolution in the health sectors in ways that include improving patient outcomes at low costs, allowing easy access and effectiveness.Recent developments in this field have given rise to discussions of the possibility for human doctors to be taking over by AI doctors. The idea or the particular concept of replacing the human doctors may sound absurd but Artificial Intelligence can obviously help human physicians in taking better decisions. There are some fields of healthcare such as radiology where human judgment can be replaced by AI(Lu, Li, Chen, Kim &Serikawa, 2018).In addition, Artificial intelligence makes use of sophisticated algorithms that helps in learning features from volumes of data. It is equipped with self-correcting techniques along with learning abilities which can increase the accuracy of the medical devices considering the feedbacks received. AI systems can assist physicians in clinical decision making as they contain a lot of information's helping in reducing diagnostic and therapeutic errors.

7) Customer service- There are three important areas where Artificial Intelligence will have an influence on customer service. Customers will have a better control on their experience because they can avoid reading through the FAQs, community answers and other articles. Instead they can just enquire about their doubts or seek for support using their own phrases which includes typos, slang, emoji. It also helps the customers to switch between topics freely without having to start all over again for a new topic related enquiry. Manual identification of priority cases will not be required since the tools will alert the support team as to where and they should be focusing (Russell, Dewey & Tegmark, 2015). This will bring a dynamic experience. Moreover, the tools will observe the activities of a customer and make self-improvements, thus helping the support team to do more productive and strategized work rather than working monotonously(Hare & Coghill, 2016).There will be a substantial increase in the percentage of customer interaction with the business which will lead to the increase in the probability of customer engagement with the organization. Hence the increase in customer information will have a good impact on the support role in the organization.

Some ongoing experiments are being done which would facilitate a few more things as follows:

i) The problem solving will be increased to 20-30 percent without any human interference and this will be a big advantage for both the customer and business.

ii) It will live upto the expectations of the customers by confirming them of the availability of an agent from the support team (Chatfield, 2017).

iii) Companies will be made aware of the benefits of the self-service content so that they get an idea of the amount of time the support agents have been saved and will lead to motivating the companies to make investments for it.

iv) When customers interact with the support representatives, they have all the required information of the customer for looking into the issue closely and being able to help them efficiently. Application of AI to these information sources will spin up new abilities for knowing the customer's emotions and prediction of possible answers(Pan, 2016). Every organization can profit from customer satisfaction and the careful application of AI will make the work easier and more effective.

v) When support representative gets readily available answers, they can invest the saved time for getting some extra profit for the organizations.

Thus, Artificial Intelligence and machine learning preserves the distinctive abilities of support executives for the works in which they are really required rather than utilizing them for the repetitive tasks or discussions which are negotiable.AI and machine learning will have many contributions, but they can best apply to elevate people in having more sophisticated conversations.

II. USE OF CRITICAL THINKING IN AI

Critical thinking refers to analyzing ideas skillfully thereafter applying them to a certain useful project. In order to think critically an individual should have the potential to observe, reflect, synthesize as well as imagine the concepts so that they can be communicated well. There is always a discussion on critical thinking and artificial intelligence as to which has the ability to outperform the other. Artificial intelligence is seen to make interruption to few jobs in the future, causing some to be vanished or replaced, and is believed to have the potential to outperform human thinking. For example, AI makes it easy to gather and analyze data in the first stages of

diagnosis and is believed that in near future AI will surpass human doctors. However, in spite of all such functionalities of AI, researchers are of the opinion that AI cannot outperform human thinking owing to subjective, individuality and ever-changing nature of majority of the scenarios. The point where artificial intelligence fails are competing with learning process unlike individuals who are gaining more and more knowledge by updating their personal databases(Scherer, 2015). Artificial intelligence does not have the ability to independently discard the old concepts and develop new concepts like the humans thus can be said to dependent on humans. The importance of critical thinking in all spheres proves that in days to come there would not be "science-fiction-style robot takeover" rather it will be a proportionate combination of critical thinking and artificial intelligence. There have been researches which prove that AI will enhance decision making by acting as a firm support of critical thinking(van Gelder, 2015). Artificial intelligence can assist people in tasks but cannot replace them fully because there are spheres where machines cannot be the alternative for humans. For example, in sales a machine cannot convince a customer as it is programmed to do a certain task, but humans aren't. Similarly, counseling in any arena will be far beyond any narrowly focused machine because an AI assistant can only answer factual questions(Strong, 2016). AI can be a help to teachers but cannot replace them as machines cannot give good advices or any purposeful listening. It should be remembered that humans created machines and the technology being discussed above therefore it is unlikely that AI will outperform critical thinking. Thus, it can be winded up that critical thinking and artificial intelligence can together form a strong system.

III. RELATED REFLECTIONS IN IMPLEMENTING THE CRITICAL THINKING IN AI

Intelligent machines have transformed our lives for the better. But there are certain issues which may result due to the implication of AI. Those are as follows:

1) Unemployment: Invention of various methods for job automation would need people to adhere to more complex assignments, transforming from physical labor to more of intellectual and strategized work. Thus, majority of the tasks will be accomplished by the machines which used to be done manually and this would create a situation where many people will be losing their jobs.

2) Inequality in wealth distribution: The dependency of our economic system for the contribution is assessed an hourly wage. Most of the companies are still inclined towards hourly work but by the usage of AI, an organization can exponentially reduce manual workforce which means that the profit will be shared by fewer number of people (Müller & Bostrom, 2016). As a result of this the people having ownership in AI driven enterprises will make money.

3) Guarding against Artificial Stupidity: When a system is fully trained it is put in the test phase where it comes across various examples to prove its performance, but the training cannot include all the scenarios of the real world. Machines can always be overpowered by humans for example dots put in the mandatory field boxes is considered as some data and this can cause security breaches.

4) Robots can be racist: In spite of AI having the capability of faster speed and processing as compared to humans, it cannot always be relied upon. AI in Google is used for people identification and it can go wrong if camera missed the focus or if a software used to foretell future criminals shows some kind of bias against the blacks(Li & Du, 2017). After all AI system has been created by humans so it can be judgmental.

5) Security issues with AI: The advancement in technology also poses serious threats. This not only applies to robots which are a replacement to human soldiers and the various weapons but also to the AI systems which can caused destruction if used in a negative way. Due to this cybersecurity will be very significant in the forthcoming years.

6) Protection against Unintentional consequences: This refers to a situation where the machine fails to understand the context and executes the operation which may cause terrible consequences. Suppose AI is asked to remove cancer across the globe and it starts killing everyone to bring cancer to an end (Lee & Trimi, 2018). In such a scenario the goal is achieved but not in the way or for the way humans had wished it to happen.

7) Having a control on the complex intellectual system: The dominating nature of humans is due to their intelligence. But someday a sufficiently advanced system may be able to anticipate pulling the plug and starts defending it (Krittanawong, 2018). This is called singularity, which signifies that moment when humans will no longer be the most intelligent on this planet.

IV. CONCLUSION

AI is mainly applicable to the potential aspects or operations performed by the computer handled systems or robots. These operations are quite similar to those that are operated by the human being. The result or the outcome can alter slightly as the task are performed by a human being and a machine. All operations are becoming autonomous to provide ease to the common people of the society, but the critical thinking factor always considered as significant character in the field of the AI technology because numerous robots comprise of various human characteristics, learnings and behaviors which allow

the robots to feel and sense their surroundings. The deficiency in the machine emotion can result to the destructive result for any business. In addition, AI depends on many skills that originally integrated from the critical thinking practices. Thus, the critical thinking factor goes parallel with the artificial intelligence and thus a proper usage of the critical thinking is a more critical part with respect to the AI. The robotic technology is a trending and essential technology in these recent days. This technology becomes popular in various fields such as military, gaming, music, education and quantum science. The critical thinking ability goes parallel with the AI such that the intelligent system can operate seamlessly.

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