

IMPACT OF ARTIFICIAL INTELLIGENCE ON SOCIETY: RISK AND CHALLENGES

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ABSTRACT

Artificial Intelligence (AI) refers to the simulation of human intelligence in machines that are programmed to think and act like humans. These machines are designed to perform tasks that typically require human intelligence, such as visual perception, speech recognition, decision-making, and language translation. AI technologies include machine learning, which enables computers to learn from experience and improve their performance over time without being explicitly programmed, and deep learning, which uses neural networks to process complex patterns and data. AI has applications in various fields, including healthcare, defence, transportation, education, and labour market, and its development has raised ethical, social, educational, and economic implications. The main objective of the study is to explore the literature on the artificial intelligence, its impact on society as well as challenges and risks posed by AI. Recently AI has been utilized in various fields. To cover various societal aspects, literature has been reviewed from various disciplines where AI is applied. These areas include healthcare, automobiles, education, labour market, defence, entertainment, computation, and security. These articles are retrieved from peer-reviewed sources based on the keywords suggesting the role of AI, forecasting & assessment of impact, behavioural & ecological aspects of AI, and AI's relation to employment. In this study it has been concluded that application of Artificial Intelligence has transformed the conventional ways of almost every area of modern society by bringing the significant changes in the industry, commerce, defence, education, labour market and healthcare services. But it has raised certain concerns also such as automation leads to job displacement and economic inequality concentrating revenue among fewer individuals. AI supported Autonomous Weapons to kill could cause

mass casualties if misused. Hence the idea is both devastating and exciting and the application of AI should be carefully monitored.

1. INTRODUCTION

Artificial Intelligence (AI) refers to the simulation of human intelligence in machines that are programmed to think and act like humans. These machines are designed to perform tasks that typically require human intelligence, such as visual perception, speech recognition, decision-making, and language translation. AI technologies include machine learning, which enables computers to learn from experience and improve their performance over time without being explicitly programmed, and deep learning, which uses neural networks to process complex patterns and data. AI has applications in various fields, including healthcare, defence, transportation, education, and labour market, and its development has raised ethical, social, educational, and economic implications. “Artificial Intelligence is making a machine behave in ways that would be called intelligent if a human were so behaving”, by John McCarthy who coined the term ‘Artificial Intelligence’ in 1955. “It is the science of making machines do things that would require intelligence if done by men”, by A.I.pioneer Marvin Minsky in 1968. “It is the science of making machines smart”, by Demis Hassabis, CEO

and founder of DeepMind, now part of Google. “Artificial intelligence is a transformative technology, which works in the field of computer science and emphasizes on the creation of an intelligent machine that works such as speech recognition, learning, planning and problem solving, robots, games, modelling”, Firschein et al., 1973. AI makes machines smarter so that they can think, and perform humanly task effectively. AI can be applied to perform various tasks ranging from playing chess on the computer to self-driving cars, which relies on deep learning and natural learning process. With the increased data volumes, advanced algorithm and improvement in computing power and storage, AI is becoming more and more popular. Therefore, people in business are increasingly looking for ways and means to make their products and services more intelligent through AI. Google’s search algorithms are a glaring example of an AI-driven tool. Amazon’s Alexa, another social media platform, also rely heavily on AI. The current evolution of AI technologies is not that scary – or quite that smart. Instead, we keep reading for modern examples of artificial intelligence in health care, retail and more. Keeping in mind the AI’s impact

on societal benefits, researches are undertaken in many areas, from economics and law to technical topics such as verification, validity, security and control. Though AI's application has impacted society a lot in positive way, it has some side effects also. It has posed certain risks and challenges that are most likely to happen in future. Like unemployment, because the labour society is concerned primarily with automation as we have invented ways to automate jobs. Automation has created opportunities for more complex roles but it may lead to job displacement. Inequality of our economic system is based on compensation, where the contribution to the economy is often assessed using hourly wages. The majority of companies are still dependent on hourly work when it comes to products and services.

However, AI-driven companies may reduce reliance on human labour, concentrating revenues among fewer individuals. Thus, creating inequality in the society. Autonomous weapons are artificial intelligence systems that are programmed to kill. These weapons could easily cause mass casualties. Moreover, an AI arms race could inadvertently lead to an AI war that also results in mass casualties if misused. Security threat is another concern with AI

becomes more powerful as it can be used for an outrageous reason. This applies not only to robots that are invented to replace human soldiers but also to AI systems that can cause damage if used maliciously. This study aims to understand and provide an overview of the impact of Artificial Intelligence on society.

Key Words: Artificial Intelligence, Machine learning, Deep Learning, Automation, Job Displacement, Maliciously, AWS, Algorithms, Amazon Alexas.

2. METHODOLOGY

The main objective of the study is to explore the literature on the artificial intelligence, its impact on society as well as challenges and risks posed by AI. Recently AI has been utilized in various fields. To cover various societal aspects, literature has been reviewed from various disciplines where AI is applied. These areas include healthcare, automobiles, education, labour market, defence, entertainment, computation, and security.

These articles are retrieved from peer-reviewed sources based on the keywords suggesting the role of AI, forecasting & assessment of impact, behavioural & ecological aspects of AI, and AI's relation to

employment. Various reports from governments or their agencies are also retrieved and reviewed to put forward their opinions, studies, and measures to strengthen their position in AI-led futures.

3. IMPACT OF ARTIFICIAL INTELLIGENCE ON LABOUR MARKET

Concerns are there regarding the impact of Artificial Intelligence on the labour market. According to a Research Survey conducted by Pew Research Centre in 2014, 48% experts responded that AI will displace more jobs than it is going to create and 52% experts expect that technology will create more jobs than it displaces by 2025. (Smith & Anderson). This group also commented that the new jobs that are going to be created would need more skill as compared to the current jobs. There are certain jobs which are difficult to automatize still requires human intervention. “While talking about Occupations, Tech jobs such as software engineers and data analysts are on the increase in most sectors and across all areas, along with technical abilities such as cloud computing, mobile application development, software testing and AI”, Perisic,2018. However, the top 10 employment in extremely automated sector, that has seen the most significant employment share,

declined in the last five years. These jobs include administrative assistants, representatives of customer services, accountants and electrical/mechanical engineers, many of whom are dependent on more repetitive tasks. It is estimated that by 2025, the amount of work done by machines will jump from 29% to over 50% but that new requirements will accompany this fast change on the labour market I.e. from manual worker to skilled employees and which may result in increased employment rather than decrease. Countries with the highest penetration of AI skills are the United States, China, India, Israel and Germany. Source (Perisic, 2018)

4. IMPACT OF ARTIFICIAL INTELLIGENCE ON ECONOMY

AI has the potential to significantly impact the economy by automating tasks, leading to job displacement in certain sectors while creating new job opportunities in AI development and related fields. It can also enhance productivity and efficiency in industries such as healthcare, finance, manufacturing, and transportation. With the adoption of AI in industry, the revenue set to reach almost \$90 billion by 2025. The advancements in AI have been made possible due to three different developments

(Ernst et al., 2018). A phenomenal drop in computing costs has resulted to an explosion in installed computing power and storage capacity. Simple smartphones today are significantly more powerful than the computer that brought the first man to the moon. The costs for producing an iPhone 7, for instance, currently stands at around US\$220; in the 1980s it would have been around US\$1.2 million in today's terms to pay for the memory capacity of such a phone. Second development is widespread adoption of the Internet and other forms of digital communication that has led to a significant increase in the supply and storage of digital information, including in central locations (cloud computing), which allow the comparison and analysis of substantial amounts of data for statistical purposes that are necessary to develop tools based on AI principles. Finally, the drop in capital costs for digital technologies has significantly lowered barriers of entry for start-ups, making it less necessary than in the past to mobilize massive amounts of capital before starting a new venture while at the same time offering substantial first-mover advantages. A paradoxical consequence of the digital nature of latest innovations is that the lower barriers to entry have allowed new players to uproot incumbents while at the same time quickly leading to new forms of

industry concentration (Bessen, 2017). The current wave of technological change based on advancements in (AI) has created widespread fear of job losses and further rises in inequality large opportunities in terms of increases in productivity can ensue, including for developing countries, given the vastly reduced costs of capital that some applications have demonstrated and the potential for productivity increases, especially among the low skilled. At the same time, risks in the form of further increases in inequality need to be addressed if the benefits from AI-based technological progress are to be broadly shared.

For this, skills policy are necessary but not sufficient. Also, new forms of regulating the digital economy are called for that prevent further rises in market concentration, ensure proper data protection and privacy and help share the benefits of productivity growth through a combination of profit-sharing, (digital) capital taxation and a reduction in working time. The paper calls for a moderately optimistic outlook on the opportunities and risks from artificial intelligence provided policymakers, and social partners take the particular characteristics of these new technologies into account. (Méda, 2016). Most observers are not reassured, however. Many analysts

are warning that advances in both robotics and artificial intelligence over the next few decades could lead to significant job losses or job polarization and hence widen income and wealth disparities (Korinek&Stiglitz, 2017). A recent report by Bank of America Merrill Lynch in 2015 pointed to the potential for a rise in inequality as a result of increased automation. The report cited research by Oxford University, which found that up to 35 per cent of all workers in the United Kingdom, and 47 per cent of those in the United States, are at risk of being displaced by technology over the next 20 years (Frey and Osborne, 2017). According to the World Bank (2016), in developing countries many more jobs are at risk: 69 per cent in India, 72 per cent in Thailand, 77 per cent in China and a massive 85 per cent in Ethiopia.

5. IMPACT OF ARTIFICIAL INTELLIGENCE ON AGRICULTURE

The population of world as a whole is increasing very rapidly. But the agricultural land is not growing at that speed. Thus the existing agricultural land won't be enough to feed the entire population. Thus, to deal with such critical worldly problem of underproduction, it is high time to modernise the agriculture. AI may be applied in the field of agricultural

modernization. AI technology can be used on numerous occasions like harvesting, airborne surveillance, remote sensing, proximity sensing, pest and weed control and advisory services etc. Currently, Microsoft is working to provide advisory services regarding sowing seeds, usage of fertilizer, and so on. This initiative has led to a 30% high yield per hectare on an average when compared to the previous year. Harvest technologies like Harvest Croo have developed an independent berry picking machine through which AI mimics human cognition. The Israeli start-up Prospera found in 2014 has developed a cloud-based solution which correlates between data labels and makes predictions through this information. There are a plethora of such examples where AI technology is helping in making farming smart and changing the world. AI technology is playing a crucial role in raising the agricultural production but still much needs to be done in this field.

6. IMPACT OF ARTIFICIAL INTELLIGENCE ON EDUCATION

AI technologies are transforming education through personalized learning, adaptive learning platforms, and AI tutors. These tools can cater to individual learning styles and pace, making education more accessible

and effective. As we have discussed earlier, experts think that by 2025, Artificial intelligence will create more jobs than it displaces, but the new jobs created will need more skills as compared to old jobs. As new skills emerge, governments, educational institutions and employers should consider how they can most effectively develop learning programmes that equip people with the skills they will need to keep up with the modern economy (Perisic, 2018). Hence, the educational institutions needs to be modernised to train the students for taking up the new jobs that are going to be created due to application of AI technology. Business disciplines, such as accounting, auditing, finance, and marketing, may be challenged. Those disciplines that have fixed and codable rules, policies, and processes can be automated (Siau,2017). Once artificial general intelligence (or strong AI) starts to emerge, students in higher education may be pursuing their interests and robots now staff hobbies (e.g., arts, history, music, philosophy, political science) since many of the jobs that the students are training for! Also, there is a need for focus further research on the new role of teachers on new teaching paths, with a new set of graduate attributes, with a focus on imagination, creativity, and innovation; the set of abilities and skills that can hardly be

ever replicated by machines. (Popenici& Kerr, 2017).

7. IMPACT OF ARTIFICIAL INTELLIGENCE ON MILITARY AND DEFENCE

Artificial Intelligence (AI) is playing a significant role in defence also. As compared with conventional systems, AI equipped military systems are capable of handling larger volumes of data. Due to its inherent computing, decision-making capabilities, It can improve self-control, self-regulation, and self-actuation of combat systems AI is deployed in almost every military application, and increased research and development funding from military research agencies to develop new and advanced forms of artificial intelligence is projected to drive the increased adoption of AI-driven systems in the military sector. Existing capabilities in AI have significant potential for national security. For example, current machine learning technology could enable high degrees of automation in labour-intensive activities such as satellite imagery analysis and cyber defence (Allen & Chan, 2017). The US DoD overall spent USD 7.4 billion on artificial intelligence, Big Data, and cloud in the fiscal year 2017, while China is betting on AI to enhance its defence

capabilities and is expected to become the world leader in this field by 2030. Future progress in AI has the potential to be transformative national security technology, on a par with nuclear weapons, aircraft, computers and biotech. An analysis by Markets and Markets indicates that the market size of artificial intelligence in the military is expected to reach USD 18.82 billion by 2025, at a CAGR of 14.75% from 2017 to 2025. AWS or autonomous weapon systems, another revolution in military operations. While Civil Society and the international community is concerned with the systems, military planners and researchers see the potential utility in autonomous systems, expecting them to perform tasks in ways and contexts that humans cannot or that they may help in to save costs or reduce military capabilities (Roff & Moyes, 2016).

8. IMPACT OF ARTIFICIAL INTELLIGENCE IN HEALTHCARE AND MEDICINE

Role of AI technology in healthcare and medicine in helping clinicians is also very crucial. It plays numerous roles such as collecting information from patients through testing and interviewing them, processing and analysing and subsequently helps in diagnosis and treatment of diseases. AI also

helps in the treatment of cancer, neurology and cardiology. The first application of AI technology in this field dates back to 1976 when Gunn used computer analysis in the diagnosis of acute abdominal pain. (Ramesh et al., 2004). The startup named Sensely has created a virtual nurse Molly who helps monitor the patients and their doctor visits (Novatio, 2019). In 2016, an app Alexa for Amazon was developed by Boston Children's hospital that provides health information and suggestions to the parents of sick children. The national institutes of health have developed the *AI Cure* app to supervise the use of medication by the patients. These examples compel us to believe that AI will play a vital role in future and impact the society to a great extent.

9. CONCLUSION

The application of Artificial intelligence has transformed the conventional ways of almost every area of modern society. It is bringing a significant transformation in the industry, commerce, defence, education and healthcare services. The idea is both devastating and exciting. This concept of machines with human-level competence is emerging and should be carefully monitored. Artificial intelligence and machine learning are becoming more and more deeply rooted. Hence, the extent of their interaction and

involvement will be a topic of research in the nearest future. However, in some cases, there are still concerns about, to what extent the application of autonomy is safe. As automation leads to job displacement. It has created economic inequality concentrating revenue among fewer individuals. AI supported Autonomous Weapons to kill could cause mass casualties if misused. Hence there are discussion on putting parameters on the utility of autonomy. This technology, even in communication & market systems threatens privacy. The impact of AI on society is subject to its application. To conclude everything. Artificial Intelligence has been a revolution in every field but depends on its application.

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