

Artificial Intelligence and its Global Intercept: Issues and Challenges

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Abstract

Artificial intelligence has changed the very concept of information technology. The way we communicate and gather information is totally different from people some years ago. Infact,our thoughts, actions, and behaviours are all guided by Artificial intelligence. It has opened up opportunities that seemed impossible just a few years back. Industry, agriculture, medicines, education have been totally revolutionized and finance and economy has been enhanced. But, as no good things come without certain issues and challenges AI also has certain ethical, moral, and economic concern that needs to be addressed. The question of accountability and the threat of superseding humans in thought and action must be explored. Turing question “Can Machine think?” poses a serious concern which needs to be explored and addressed with genuine concern. The present article is based on the issues of AI and its social intercept on various aspects of human life. It examines the prospect of Artificial intelligence in the 21st century by reviewing different articles and tries to understand its challenges.

Keywords: Artificial Intelligence, Social, Intercept and Challenges

Introduction

Artificial intelligence has occupied a vital place in today’s social scenario by securing its position in academics as well as in other professional field. It seems normal to us to communicate with Siri and google or to interact or ask questions to chat bots. (Vázquez-Cano,2021). Smart technologies have revolutionized our life and workplace from business to social life, from health to education, it not only interacts and helps us to perform better but it is also emerging as the “next disruptive innovation” (Lawler and Rushby, 2013). It is the

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main driving force behind the fourth industrial revolution and it is believed to be the game changer of education. AI has been defined differently by different writers according to its interdisciplinary nature and to confine it with a single definition would not do justice to the term as the premise of AI keeps on changing. Its adaptive and customized characteristic has led it to fit it in different discipline. AI was defined as “making a machine behave in ways that would be called intelligent if a human were so behaving” (McCarthy et al., in 1955). The history of AI can be traced back to philosophy, fiction and imagination where Poets and philosophers used “mechanical Tripods” and “Mechanical man” as metaphors to describe human. Instances of mechanical reasoning devices, calculating machines to mechanized arithmetic, Mechanical animals and dolls and statues filled with nuggets of knowledge etc gave evidence enough to prove that humans were preparing the way for an intelligent system that would enhance and augment the task of human. Even Science fiction have been using intelligent machine to show that impossible task can be done by non-human. (Buchanan, 2005).

Before knowing the prospect of AI in the 21st century we must understand the global trend of AI. Digital economy and society index 2020 (DESI) while monitoring the European countries confirmed that the most significant digital transformation is noted in Ireland followed by Netherlands, Malta and Spain. (Felice et al., 2022). However The International Digital economy and Society Index (I-DESI) highlighted that although the EU countries surpasses other countries in digital skills yet lag far behind in digitization of public services leading to below average performance as compared to USA, Japan, Canada, South Korea and China. (Para et al 2021.). The digital economy and society index 2022 (ESO, 2022) reports that while member states are making progress in their digital transformation digital transformation in business and finance remains low. Digital skills, innovative services and their applications need to be geared up to meet the desired goals. India secures the 44th rank in the World digital competitiveness rankings 2019 as the country has made tremendous progress with regard to knowledge and future readiness to adopt and explore digital technologies. (The economic times). There is no doubt that countries are adopting individual national plans beyond their specific policies for the development of AI which has become a central theme. Alongside China, USA, Japan, South Korea and Canada even India has adopted a national policy on AI (Felice et al, 2022). In 2018, NITI Ayog released the national strategy on artificial intelligence focussing mainly on the mantra of “AI for all”. The strategy also ensures the safe and responsible use of AI and focusses on identifying principles for designing, deploying and developing of AI for maximizing its benefits and mitigating its risk. It stresses on the seven principles of “safety and reliability”, “inclusivity and non-discrimination”, “equality, privacy and security”, “transparency, accountability and protection”, and “re enforcement of positive human values”. (NITI Ayog 2022). Artificial intelligence has played a vital role on all productive, economic and social factors but studies show that medical, financial and manufacturing sector have had greater impact so far.

Artificial Intelligence in Medical and Health Sector

AI in medical sector has a vast potential. It is used from the diagnostic phase to giving personalized care to patients, from predicting and preventing diseases and epidemics to analysing the clinical history of patients. AI does it all. (Piccialli et al, 2021. Bhargava and Bansal, 2021). Large data discovery and analysis of data to understand the clinical history of patients have worked as a boon in medical science. AI has the potential of making a good medical practitioner a great medical practitioner. It not only provides a second pair of reliable eyes to them but also provides accurate and reliable data to take prompt decision. (Chakraborty, 2020) personalised treatment to patients and the prompt and tireless responses of virtual assistants and virtual nurses to help ease the patients are all the boons of AI. Cognitive system like IBM Watson helps in taking prompt decision by inter relating the patients' medical history with history of medical literature and IBM's Watson for oncology is a perfect example of providing diagnostic and treatment options for various forms of cancer. (Chakraborty, 2020). Covid 19 saw AI at its peak from detecting to diagnosing the disease, from monitoring to treating patients, from contact tracing to projecting mortality cases, from developing drugs and vaccines to preventing diseases and last but not the least reducing the work load of health workers. (Vaishya, 2020) The Automatic deep neural network technology was used for the prediction of patients with deteriorated risk of corona virus. (Shamout et al, 2021). India too is accelerating its implementation of AI in medical sector through certain flagship programs like Ayushman Bharat, Forus health, 3 Nethra and certain other e-health projects.

Researchers point out that AI plays the role of both a reliable diagnosis and an accurate prognosis.

Artificial Intelligence in Manufacturing Sector

AI technologies are viewed as the crucial drivers in manufacturing sector. according to a report of The World Economic Forum (WEF) AI has the potential of having a positive impact on the economy and industrial automation of a country. As per its study, more than 20% of existing jobs in the United Kingdom is directly impacted by AI driven technologies (Vinuesa et al., 2020) and in developing countries like India and China, the overall impact of AI assessed is more than 26% in the manufacturing sector. In India, by the end of 2022, 1.33 million jobs were expected to be created through the manufacturing sector. (Sharma et al, 2022). The economic times confirms the growth of employment to 36.9% in March 2023 from 36.6% in December 2022 (Sharma, 2023) The manufacturing sector is one of the most promising sectors in India for implementing AI technologies. (Jaiswal, Arun, & Varma, 2021) they are accelerating their economic growth with the 'Make in India' policy, A flagship program of the Indian government for promoting local products. (NITI Aayog, 2018). As

per the report of NITI Ayog AI can bring huge opportunities and economic growth which can boost India's annual growth rate by 1.3 percentage points by 2035 (Charabarty, 2020). The report also claims that India could provide a perfect playground for enterprises and industries globally to develop "scalable solution" and this solved in India models could push India forward in **Artificial** Intelligence as a service (AIaaS). Also, the government is targeting the contribution of manufacturing output to 25% of GDP by 2025 (Rizvi et al, 2021). With its national manufacturing policy India stands as the largest manufacturing nation with the objective of creating 100 jobs and holding the sixth position in the world.

Artificial Intelligence in Finance Sector

AI technologies like neural networks and fuzzy logics are used for "stock prediction, sales forecasting and market segmentation problems". (Tiwari et al 2020). AI has the potential of dealing with big data, and this attribute of AI makes it highly relevant in financial services as finance services deals with big and diverse data which are delivered worldwide, Global bank for example deals with millions of equity exchange and international transaction, and it is only AI which can handle such big data. (Veloso, 2021) India has also implemented certain IT policies to upgrade banking and finance, "Chat automation, fraud detection technique and virtual assistant" are some of the AI based application used in the banking sector in India (Mallalai and Gopalakrishnan, 2020). India with a population of 1.3 billion is a promising market for fintech and over the last three years it has grown tremendously. Over half a billion of dollars flows for investments and start-ups in India. To support AI startups financially and to spread awareness of AI National AI market place (NAIM) and Data Market (Chowdhury, 2020) place have been established. Apart from start-ups and investment, the corporate sectors and government regulatory bodies have come up with certain innovative solutions for easy finance like the UPI- Universal payment interface.

Artificial Intelligence in Education

Artificial intelligence opens up new possibilities to augment human capabilities in teaching and learning. It is accelerating at a tremendous pace overhauling the traditional method of teaching and learning. Intelligent and interactive tutoring sectors create smart content to promote interactivity. Content technologies inc (CTI) customizes educational content. Microsoft's help in predicting drop outs and Pearson's write to learn software uses NLP technology to provide personalized feedback to students to improve their writing skills (Chowdhury, 2020). Education no longer remains only a human endeavour rather it has become a technological solution with intelligent tutoring system, natural language processing system, machine learning, deep learning, learning analytics etc enhancing teaching and learning (Popenicini and Kerr, 2017). Devices like IBM's super computer Watson are available the whole 365 days to advice students on academic issues in Deakin university, Australia (Deakin university 2014),

Cobots (colleague robots) are used to perform routine task like spelling and pronunciation. (Chen and Chen,2020). Similarly other web based and on-line education platform adapt intelligent behaviour to adjust according to the learner's behaviour in order to provide enriched experiences to the learner. (Devedzic, 2004. Chassignol et al 2018. Kahraman et al, 2010, Peredo, 2011). AI is not just used in teaching and learning but also in administration and assessment. The digitalization of educational resources, gamification, and personalized learning experiences, are some of the many opportunities where AI can be applied to education (Zhai et al 2021.)

Scope of Artificial Intelligence in Education

Utility of AI for the learners

1. It can provide personalized learning.
2. It can provide intelligent support system and collaborative learning.
3. It can provide virtual learning environment.
4. It can provide flexible learning pace and environment.

Utility of AI for the teachers

1. Provides autonomy from routine and mundane task.
2. Develop research skills among teachers.
3. Helpful in gaining technological literacy and upgrading technological skills.
4. Develops management skills and team work attitude as they would be working both with human colleagues and AI assistants (Lukin, 2016)

Challenges with Artificial Intelligence

AI though a promising field has many technological issues that needs to be addressed with utmost sincerity. Challenges like data quality, data privacy, insufficient knowledge of cognitive technology, lack of a skilled workforce, Expensive technology etc reduces the implementation of Artificial intelligence in public sector (Sharma, 2022). Challenges in AI can be seen in almost all the public sectors like health, Finance, Transport etc. Coding AI to take the right decision is becoming a mammoth's task. An autonomous vehicle might not take the right decision when choosing between two situations whether driving the car on a wall or crashing it over the passers-by or whether putting risk of pedestrians lives and saving the passengers or vice versa. Coding it to take altruistic decision might lead to a loss to the automobile companies and to the buyers (Perc, 2019). Social bots which are automated communicators on social media perform many harmful actions like proving mis information, intensifying argument, committing scams and exploiting the stock market. (Hajli, 2022). Some of the major challenges of AI in Education (Haderer and Ciolaca 2022)

- Development of an inclusive public policy on AI.
- Producing techno savvy teachers who could use AI skilfully for sustainable solutions.
- Transparency and ethics in data collection, data utilization and data dissemination.

Legal and Ethical issues with AI: Holding responsibility is the foremost legal issue. Who to hold responsible for an unavoidable accident, the technology, the manufacturer or the owner of the vehicle. The legal issue runs deeper with the situation when the technology is capable of taking its own decision, against the will of its creator. The system that is made to work through instructions suddenly taking an unpredictable move is beyond any legal premises. The questions like

1. which actions are permissible from legal point of view?
2. Who is to be held responsible?
3. What are the legal principles for a particular choice? (Karliuk, 2018).

Privacy and transparency are the major ethical issues regarding AI. Maintaining integrity while collecting, preserving, analysing and dissipating data has become a matter of concern in today's world. (Felice, 2022).

Conclusion

In conclusion it can be said that AI is just a means to reach to an end. It is a man-made machine that simulates human brain and although it has been there for decades its potential has gained momentum recently and it has also opened up a great future prospect. But along with all the good things AI has come up with some risks. It is high time that we talk of these risks and prepare our next generation for an AI integrated world. Global policies need to be strengthened to create space for both humans and AI so that a cordial co-existence takes place. Regulatory norms and laws need to be defined appropriately and ethical codes should form an important part of political agenda. Debates and discussions on privacy, ethics, security, accountability and appropriate use of technology should be conducted at global level so that the future generation becomes aware and sensitized to the use of technology.

References

- Bhargava, A., & Bansal, A. (2021). Novel coronavirus (COVID-19) diagnosis using computer vision and artificial intelligence techniques: A review. *Multimedia Tools and Applications*, 80, 19931-19946.
- Buchanan, B. G. (2005). A (very) brief history of artificial intelligence. *AI Magazine*, 26(4), 53-53.
- Chassignol, M., Khoroshavin, A., Klimova, A. & Bilyatdinova, A. (2018). Artificial intelligence trends in education: A narrative review. *Procedia comput.sci*, 136, 16-24.

- Chen, L., Chen, P., & Lin, Z. (2020). Artificial intelligence in education: A review. *Ieee Access*, 8, 75264-75278.
- De Felice, F., Petrillo, A., De Luca, C., & Baffo, I. (2022). Artificial Intelligence or Augmented Intelligence? Impact on our lives, rights and ethics. *Procedia Computer Science*, 200, 1846-1856
- Devedžić, V. (2004). Web intelligence and artificial intelligence in education. *Journal of Educational Technology & Society*, 7(4), 29-39.
- Haderer, B., & Ciolacu, M. (2022). Education 4.0: Artificial intelligence assisted task-and time planning system. *Procedia Computer Science*, 200, 1328-1337.
- Hajli, N., Saeed, U., Tajvidi, M., & Shirazi, F. (2022). Social bots and the spread of disinformation in social media: The challenges of artificial intelligence. *British Journal of Management*, 33(3), 1238-1253.
- Jaiswal, A., Arun, C. J., & Varma, A. (2022). Rebooting employees: Upskilling for artificial intelligence in multinational corporations. *The International Journal of Human Resource Management*, 33(6), 1179-1208.
- Kahraman, H. T., Sagioglu, S., & Colak, I. (2010, October). Development of adaptive and intelligent web-based educational systems. In *2010 4th international conference on application of information and communication technologies* (pp. 1-5). IEEE.
- Karliuk, M. (2018). Ethical and legal issues in artificial intelligence. *International and Social Impacts of Artificial Intelligence Technologies, Working Paper*, (44).
- Luckin, R.; Holmes, W.; Griffiths, M., & Forcier, L. B. (2016). Intelligence unleashed: An argument for AI in education. Pearson Education, London.
- Malali, A. B., & Gopalakrishnan, S. (2020). Application of artificial intelligence and its powered technologies in the Indian banking and financial industry: An overview. *IOSR Journal of Humanities and Social Science*, 25(4), 55-60.
- McCarthy, J., Minsky, M. L., Rochester, N. and Shannon, C. E. (2006). A proposal for the Dartmouth summer research project on artificial intelligence, August 31, 1955.
- Para, W., Bhat, S., Guerrero, P., Kelly, T., Mitra, N., Guibas, L. J., & Wonka, P. (2021). Sketchgen: Generating constrained cad sketches. *Advances in Neural Information Processing Systems*, 34, 5077-5088.
- Perc, M., Ozer, M., & Hojnik, J. (2019). Social and juristic challenges of artificial intelligence. *Palgrave Communications*, 5(1).
- Peredo, R., Canales, A., Menchaca, A., & Peredo, I. (2011). Intelligent web-based education system for adaptive learning. *Expert Systems with Applications*, 38(12), 14690-14702.
- Piccialli, F., Di Cola, V. S., Giampaolo, F., & Cuomo, S. (2021). The role of artificial intelligence in fighting the COVID-19 pandemic. *Information Systems Frontiers*, 23(6), 1467-1497.

- Popenici, S. A., & Kerr, S. (2017). Exploring the impact of artificial intelligence on teaching and learning in higher education. *Research and Practice in Technology Enhanced Learning*, 12(1), 1-13.
- R.W.Lawler & Rushby, N. (2013). An interview with Robert Lawler. *British Journal of Educational Technology*, 44(1), 20-30.
- Rizvi, A. T., Haleem, A., Bahl, S., & Javaid, M. (2021). Artificial intelligence (AI) and its applications in Indian manufacturing: A review. *Current Advances in Mechanical Engineering: Select Proceedings of ICRAMERD 2020*,
- Shamout, F. E., Shen, Y., Wu, N., Kaku, A., Park, J., Makino, T., ... & Geras, K. J. (2021). An artificial intelligence system for predicting the deterioration of COVID-19 patients in the emergency department. *NPJ Digital Medicine*, 4(1), 80.
- Sharma, M., Luthra, S., Joshi, S., & Kumar, A. (2022). Implementing challenges of artificial intelligence: Evidence from public manufacturing sector of an emerging economy. *Government Information Quarterly*, 39(4), 101624.
- Tiwari, R., Dhama, K., Sharun, K., Iqbal Yatoo, M., Malik, Y. S., Singh, R., ... & Rodriguez-Morales, A. J. (2020). COVID-19: Animals, veterinary and zoonotic links. *Veterinary Quarterly*, 40(1), 169-182.
- Vaishya, R., Javaid, M., Khan, I. H., & Haleem, A. (2020). Artificial Intelligence (AI) applications for COVID-19 pandemic. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews*, 14(4), 337-339.
- Vázquez-Cano, E. (2021). Artificial intelligence and education: A pedagogical challenge for the 21st century. *Educational Process: International Journal*, 10(3): 7-12.
- Veloso, M., Balch, T., Borrajo, D., Reddy, P., & Shah, S. (2021). Artificial intelligence research in finance: Discussion and examples. *Oxford Review of Economic Policy*, 37(3), 564-584.
- Vinuesa, R., Azizpour, H., Leite, I., Balaam, M., Dignum, V., Domisch, S., ... & Fuso Nerini, F. (2020). The role of artificial intelligence in achieving the sustainable development goals. *Nature Communications*, 11(1), 233.
- Zhai, X., Chu, X., Chai, C. S., Jong, M. S. Y., Istenic, A., Spector, M., ... & Li, Y. (2021). A review of artificial intelligence (ai) in education from 2010 to 2020. *Complexity*, 2021, 1-18.