

The Impact of Artificial Intelligence on Society

Shivam Kumar Gupta¹, Mohit Kumar Singh², Rajendra Kumar³, Saurabh Kumar⁴, Divy Manghwani⁵

Dr. Dileep Gupta⁶

^{1,2,3}B.TECH (CSE), Vivekananda Global University Jaipur, Rajasthan

⁴BPT (AHCS) – Vivekananda Global University Jaipur, Rajasthan

⁵BBA ENTREPRENEURSHIP (GCEC)– Vivekananda Global University Jaipur, Rajasthan

⁶Associate Professor, Vivekananda Global University Jaipur, Rajasthan

*Corresponding Author: Mohit Kumar Singh

Email: mohitkumarsingh912280@gmail.com

Abstract: *Artificial Intelligence is transforming the social landscape with remarkable speed, influencing diverse sectors such as economics, healthcare, education, governance, and ethics. This research paper delivers an in-depth evaluation regarding AI's transformative impact on these domains, exploring its capacity to fuel innovation simultaneously addressing the obstacles it presents. The assimilation of AI into societal systems offers avenues to enhance operational performance, productivity, and strategic decision-making. Conversely, it introduces complex moral and social dilemmas which require resolution to ensure equitable development & use. In the economic realm, AI-driven automation has revolutionized industries by optimizing workflows, enhancing productivity, and cultivating the creation of novel business models. Innovations including machine learning and natural language processing empower organizations to analyse large datasets, predict trends, and improve strategic choices. Nevertheless, such accelerated technological progress sparks significant apprehension about workforce displacement, job polarization, and the exacerbation of income inequality. These challenges necessitate policies to support reskilling initiatives, create new job opportunities, and implement equitable economic systems that address the risks of automation.*

In healthcare, AI applications are enhancing diagnostics, accelerating drug development, and enabling personalized treatment plans. For instance, AI-powered tools are detecting diseases earlier and improving patient outcomes. Education is another sector undergoing profound transformation due to AI. Personalized learning platforms and AI-driven tools are revolutionizing how student access and engage with knowledge. Ultimately, this research "Conclusively, this study underscores the double-edged character of AI, functioning simultaneously as a catalyst for evolution and a potential driver of social upheaval. To ensure a sustainable and equitable future, it is vital to synchronize technological progress with community accountability, moral standards, and long-term human welfare. This paper contributes to the prevailing discourse concerning the societal footprint of artificial intelligence, providing perspectives and guidelines for its responsible and inclusive integration into the human ecosystem."

Keywords: Artificial Intelligence, Machine Learning, Automation, Economic Impact, Healthcare, Education, Ethics, Social Impact, Education Technology, Personalized Learning, AI Ethics, Social Impact, Governance, Decision- Making

I. INTRODUCTION

Artificial Intelligence has emerged as one of the most impactful technologies of the 21st century, fundamentally changing the way society's function and develop.

It simulates human intelligence by employing techniques such as machine learning, data analysis, and natural language processing. AI has permeated nearly every sector, from healthcare and education to economics and governance. Its applications are diverse, ranging from automating mundane tasks to resolving complex issues in ways previously



unimaginable. However, this transformative capability carries profound consequences for the fabric of society, encompassing opportunities, challenges, and moral dilemmas.

Economically, AI is revitalizing industries by boosting efficiency and fostering innovation. From predictive analytics in manufacturing to autonomous systems in retail, AI is enabling businesses to optimize operations and create new products and services. Nonetheless, these same advancements pose a threat to traditional jobs, redefine labour markets, and exacerbate income disparities. These dynamics raise critical questions about the future of work, economic stability, and the need to ensure equitable access to the benefits of AI advancements.

In healthcare, AI is pioneering new developments with applications that improve diagnostics, enhance the customization of treatment, and optimize patient care. For instance, AI algorithms can accurately analyse medical imagery, while forecasting tools help pinpoint potential health risks. Yet, these developments raise ethical issues, such as patient data confidentiality, algorithmic biases, and accountability in clinical decision-making. Integrating innovation with ethical foresight is crucial for cultivating trust in AI-driven healthcare systems.

AI's effect on education is equally revolutionary. Adaptive learning platforms and smart tutoring systems are delivering tailored educational experiences customized to individual needs. However, accessibility to these technologies remains unequal, potentially worsening existing educational inequities. Similarly, in governance, AI is driving innovations in public administration and policymaking, but it also raises significant concerns about surveillance, data misuse, and fairness in processes of decision-making.

Perhaps the most urgent concern surrounding AI is its ethical ramifications. Questions regarding bias, transparency, accountability, and the unforeseen consequences of independent systems challenge societal norms and necessitate a robust regulatory and moral framework. As AI becomes more integrated into daily life, ensuring its development aligns with fundamental human values and societal welfare is vital.

To ensure AI's impact is managed responsibly, it is essential to implement comprehensive measures to control its effect. These include strong regulatory guidelines, ethical criteria, and transparency within AI systems. Empowering individuals with digital literacy, fostering global cooperation, and promoting fair access to AI's advantages are also key. Balancing progress with responsibility allows us to minimize risks while maximizing AI's potential for positive change. A proactive, all-inclusive approach is necessary for aligning AI's path with the broader objectives of societal well-being.

II. LITERATURE REVIEW

The available literature on the societal impact of AI encompasses a broad scope of disciplines, covering ethics, law, psychology, economics, and education. Artificial Intelligence affects society, the economy, job opportunities, healthcare, and communication, while also improving efficiency.

Given AI's capability in managing global connection and problem-solving, its societal implications necessitate careful regulation, transparency, and accountability concerning ethics, privacy, job displacement, and inequality.

1. Economic Impact

Economic Impact: AI is widely regarded as having a transformative influence on the global economy, exhibiting the potential to increase productivity and efficiency across various sectors.

Job Displacement and Creation: AI has resulted in the loss of a significant number of jobs, particularly in sectors like manufacturing, retail, and administrative roles. However, others contend that AI will generate new jobs and roles, especially in technology, humanities, AI maintenance, and data analytics.

Economic Inequality: Research indicates that AI could worsen income inequality, as new technologies benefit higher-skilled workers and may lead to wage loss for lower-skilled employees. This dynamic further solidifies concerns regarding future job displacement.

2. Ethical and Moral Considerations

As AI becomes increasingly integrated into our lives, critical ethical and moral considerations have arisen concerning its usage, particularly regarding autonomy, privacy, and fairness.



Bias and Discrimination: Several studies point out that AI systems can perpetuate biases inherent in their training data, potentially leading to discriminatory outcomes in areas like hiring, lending, and law enforcement. The challenge lies in guaranteeing fairness and transparency in AI models.

Autonomy and Accountability: An ongoing debate surrounds the ethical use of AI in contexts involving autonomous vehicles and military systems. The question of who should be held responsible if an error occurs is critical. Understanding the moral responsibilities of AI developers and users is also paramount.

3. Social and Cultural Impact

AI also plays a role in reshaping social and cultural dynamics.

Changes in Human Interaction: AI has transformed communication through virtual assistants, chatbots, and recommendation algorithms. While some argue that AI improves accessibility and convenience, others worry that it may contribute to a decline in face-to-face interactions and social abilities.

4. Legal and Regulatory Issues

The swift advancement of AI technologies has prompted progress in the creation of appropriate regulatory frameworks, raising concerns about privacy, security, and accountability.

Privacy and Surveillance: AI systems are capable of processing vast quantities of personal data, often in ways that users are not fully aware of. The use of AI in surveillance technologies has sparked debates about the balance between security and individual freedoms.

AI Regulation: Governmental and international bodies have begun working on AI governance. Efforts like the European Union's General Data Protection Regulation (GDPR) and the proposed AI Act are examples of attempts to regulate AI. AI, however, presents challenges to global coordination and enforcement.

5. Impact on Governance and Democracy

AI is also influencing political structures and democratic processes.

Disinformation and Manipulation: Algorithmic systems can spread misinformation and manipulate public opinion through deepfakes and targeted political advertisements. This has raised alarms regarding the integrity of democratic systems.

AI in Governance: AI is increasingly utilized for purposes like predictive policing, public service delivery, and smart cities. While these technologies promise efficiency, they also raise concerns about surveillance, a lack of transparency, and the centralization of power in the hands of a few tech companies or governments.

6. Technological Singularity and Future Societal Shapes

A number of futurists and scholars have speculated about the potential for AI to lead to a "technological singularity," where machines surpass human intelligence, resulting in profound societal changes. Utopian and Dystopian Views exist: Some envision a future where AI helps solve global challenges like poverty, disease, and climate change. Others warn of a dystopian future marked by mass unemployment, social unrest, or even existential threats to humanity.

7. Impact on Education

AI is increasingly being incorporated into educational environments to personalize learning, automate administrative duties, and improve student performance. However, there are concerns about the widening digital divide and the possibility for AI to substitute human educators in specific contexts.

Social Transformations

Artificial Intelligence (AI) is driving significant social change, reshaping how individuals interact, work, and access resources. AI-powered platforms are enabling smarter personalization, enhanced workplaces, and increased connectivity. Automation is redefining job roles, creating demand for new skills while displacing traditional ones. Education is becoming more inclusive through AI-driven tools, though disparities still exist. In governance, AI supports data-driven policymaking but raises concerns about surveillance and privacy. This transformation also challenges societal norms, ethics, and values, requiring proactive measures to ensure AI is utilized equitably, ethically, and in ways that promote social inclusion.



Does Society Really Need Artificial Intelligence?

The question of whether society truly needs Artificial Intelligence (AI) is a complex and nuanced one. On one hand, AI presents a transformative tool capable of addressing some of humanity's most pressing issues. From advancing medical diagnostics and accelerating scientific discovery to mitigating climate change and enhancing global connectivity, AI has the potential to elevate the quality of life significantly. For instance, AI-powered systems are revolutionizing healthcare by enabling early disease detection, personalized treatment plans, and efficient management of resources.

In critical areas such as transportation, AI boosts safety and efficiency through innovations like autonomous vehicles and intelligent traffic systems. Similarly, in agriculture, AI optimizes crop yields and resource management, contributing to global food security. AI also plays a pivotal role in addressing large-scale issues such as urban planning, disaster response, and sustainable energy management, offering data-driven solutions that were previously unavailable.

KEYWORDS: Technological Singularity, Predictive Policing, Deepfakes, Digital Divide, Human-Machine Collaboration, Surveillance Systems, Autonomous Systems, Disinformation, Algorithmic Governance, Smart Cities, Data Security, Cyber Ethics, Intelligent Automation, Human Augmentation, Digital Economy, AI Accountability, Privacy Protection, Future of Work, Socio-Technical Systems, Global Connectivity

III. THE IMPACT OF ARTIFICIAL INTELLIGENCE ON SOCIETY

Artificial intelligence is transforming nearly every facet of human life, from business operations and governance to how individuals engage with technology and one another. The integration of AI into daily existence yields both advantageous and disadvantageous results. We will examine both the positive and detrimental consequences of AI on society. The existing scholarly discussion on AI's societal influence covers a wide array of fields, including ethics, jurisprudence, psychology, economics, and education.

Positive Contributions of Artificial Intelligence to Society

1. **Enhanced Productivity and Efficiency:** AI enables automation, which substantially improves productivity across numerous industries. Tasks that are repetitive and time-consuming, such as data entry, manufacturing processes, and customer service, can be automated by AI systems, thereby freeing up human workers to concentrate on more complex and creative activities.
2. **Progress in Healthcare:** AI is revolutionizing medical treatment by enhancing diagnostic precision, enabling personalized care strategies, and facilitating proactive health risk prediction. Machine learning algorithms can analyse clinical data and identify patterns that may not be apparent to human doctors, leading to earlier detection of serious conditions such as cancer, heart disease, and neurological disorders.
3. **Improved Accessibility:** AI has the potential to make the world more accessible for people with disabilities. Technologies utilizing speech recognition, visual identification, and natural language processing are examples of assistive tools that help individuals with disabilities to interact more effectively with the environment.
4. **Personalized Experiences:** AI enables highly customized experiences, particularly in entertainment, education, and retail. Machine learning algorithms analyse user behaviour to provide tailored content, suggestions, and services.
5. **Environmental Impact:** AI is also being leveraged to address ecological challenges by optimizing energy consumption, improving waste management, and advancing climate change research.

Negative Consequences of Artificial Intelligence on Society

1. **Job Displacement and Economic Inequality:** The most discussed negative impact of AI is its potential to eliminate millions of jobs, particularly in low-skilled industries. Automation and AI-driven processes can replace human roles in manufacturing, transportation, retail, and even certain aspects of education and medicine. Research suggests that AI could worsen socioeconomic disparities, as new technologies disproportionately benefit high-skilled professionals. This trend further exacerbates concerns over potential future job displacement.



2. **Bias and Discrimination:** AI systems are only as fair as the data they are trained on. If the training data contains inherent biases, AI systems can perpetuate and even amplify these prejudices, potentially leading to discriminatory outcomes. This is especially concerning in domains like hiring, criminal justice, and credit lending. The challenge lies in guaranteeing equitable and non-discriminatory results from AI models.
3. **Privacy Invasion and Surveillance:** AI technologies, particularly facial recognition, data analytics, and machine learning, can jeopardize personal privacy. The deployment of AI-powered surveillance tools by governments and private entities raises significant worries about the erosion of civil liberties and individual privacy rights.
4. **Loss of Human Connection and Social Isolation:** As AI becomes more integrated into communication and social media platforms, it may lead to diminished face-to-face interaction and social isolation. Individuals may increasingly rely on virtual assistants, AI-driven social networks, and digital interactions, potentially leading to a decrease in direct human communication and the weakening of social bonds.
5. **Ethical Concerns in Autonomous Systems:** AI's involvement in independent systems, such as self-driving vehicles and military weaponry, raises serious ethical questions regarding accountability, decision-making, and the potential for unintended harm. These systems could make decisions with life-or-death implications, and it is unclear who would bear responsibility in the event of an accident or failure. Understanding the moral obligations of AI creators and users is also crucial.

KEYWORDS: Automation Impact, Assistive Technology, Speech Recognition, Facial Recognition, Climate Analytics, Energy Optimization, Human Dependency on Technology, Social Isolation, Digital Interaction, Algorithmic Decision-Making, Workforce Transformation, Socioeconomic Disparities, Ethical AI Systems, Civil Liberties, Data Surveillance, Intelligent Systems, Human-Centered AI, Behavioral Analytics, Virtual Assistants, Responsible Innovation

IV. SECTOR-WISE DISTRIBUTION OF AI'S OVERALL SOCIETAL IMPACT
Relative Impact (%)

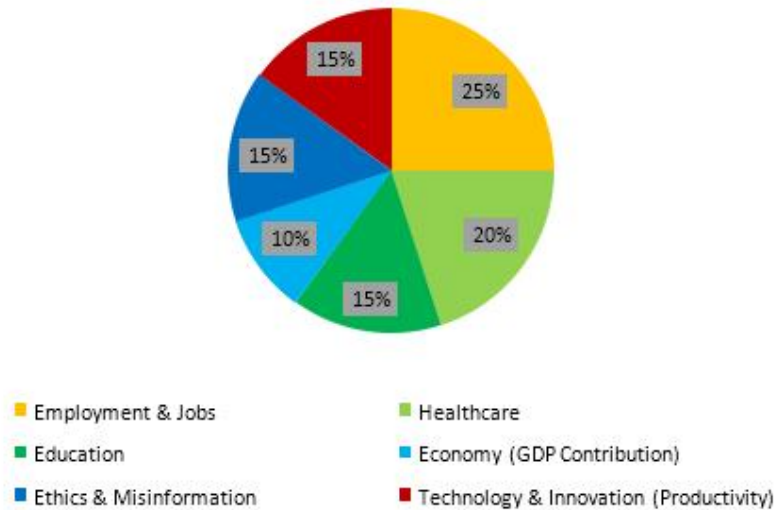


Figure 1: This distribution is an estimation to present AI'S broad societal impact out 100% useful for pie chart.



STATEMENT OF PROBLEM

The rapid proliferation of (AI) technologies has significantly impacted society, presenting both opportunities and challenges. Despite its potential to enhance efficiency, drive innovation, and address global issues, AI raises critical concerns that require thorough investigation. Key problems include:

1. **Ethical and Privacy Concerns:** AI systems often lack transparency, leading to biases, ethical dilemmas, and threats to data privacy.
2. **Workforce Displacement:** The automation of jobs through AI is causing economic disruptions and increasing unemployment risks in certain sectors.
3. **Inequality and Accessibility:** The uneven distribution of AI technologies exacerbates social and economic inequalities, limiting benefits for underrepresented communities.
4. **Regulatory Challenges:** A lack of comprehensive global governance and ethical frameworks hinders the responsible development of AI.
5. **Security Risks:** Misuse of AI, including cyberattacks and misinformation, poses significant threats to societal stability.

REVIEW SUMMARY

The societal impact of Artificial Intelligence (AI) is both extensive and complex. AI serves to boost efficiency, streamline organizational workflows, and propel advancement across fields such as healthcare, education, and commerce. It has fundamentally revolutionized how problems are solved and decisions are made, helping to tackle intricate global issues.

Nevertheless, the widespread adoption of AI also introduces considerable challenges. These concerns encompass moral dilemmas, data security risks, the displacement of human labour, and the potential for aggravating social inequities.

Academics stress the imperative for strong administrative oversight, openness, and high ethical standards to alleviate these inherent dangers. Collaborative actions involving governmental bodies, industries, and educational institutions are crucial for

V. METHODOLOGY

Methodology for Studying To fully comprehend how Artificial Intelligence (AI) affects society, a systematic, comprehensive, and interdisciplinary research approach is essential. This methodological design utilizes a combination of qualitative and quantitative techniques to delve into the beneficial and detrimental consequences of AI across diverse spheres of human existence, specifically including the economic, social, ethical, and environmental domains.

1. Research Design

A multi-methodological strategy is employed to secure in-depth, well-rounded perspectives on the societal repercussions of AI.

guaranteeing the fair and accountable deployment of AI systems. Furthermore, public literacy and awareness initiatives are vital to empower citizens to grasp AI's influence.

In essence, while AI provides extraordinary opportunities for transformation, its successful integration into society hinges on achieving equilibrium between promoting innovation and upholding moral obligations to foster progress that is both sustainable and inclusive.

The influence of AI on society is twofold, offering enormous potential for betterment while simultaneously presenting significant obstacles. To adequately manage the benefits against the associated risks necessitates thoughtful regulatory frameworks, strict ethical guidelines, and cooperation on a global scale. As AI technology progresses, its role in society will be determined by proactive measures aimed at ensuring its conscientious and equitable development.

Qualitative Procedures: This involves employing literature reviews, interviews, and detailed case studies to gain an understanding of the subtle social ramifications of AI.



Quantitative Procedures: Utilizes data analysis, broad surveys, and specific statistical models to quantify the effect of AI on concrete metrics like employment rates, business productivity, and information privacy.

2. Data Gathering

a) Primary Data

Surveys and Questionnaires: Disseminated among individuals and various institutions to gauge their perceptions and direct experiences with emerging AI technologies.

Interviews: Conducted with knowledgeable AI experts, leading policy influencers, and individuals who are directly impacted by AI-driven technologies (e.g., general workers, specialized healthcare personnel).

Focus Groups: Arranged to collect a range of viewpoints on the ways AI is reshaping specific sectors, such as public education, medical services, or governmental oversight.

b). Secondary Data

Literature Review: Analyzing academic articles, reports, and white papers on AI's impact.

Case Studies: Examining real-world implementations of AI in industries such as healthcare (e.g., diagnostic tools), manufacturing (e.g., automation), and governance (e.g., surveillance systems).

Public Data: Leveraging publicly available data, such as economic reports, labor statistics, and AI-related policies.

3. Analysis Methods

a). Qualitative Analysis

Thematic Analysis: Identifying recurring themes, patterns, and societal trends in qualitative data.

Content Analysis: Analyzing texts and reports to understand public discourse and ethical concerns about AI.

b). Quantitative Analysis

Statistical Techniques: Employing regression analysis and trend forecasting to measure AI's economic impact (e.g., job displacement or productivity growth).

Social Network Analysis: Exploring AI's role in influencing social media behavior and polarization.

Machine Learning: Using AI itself to analyze large datasets related to societal trends and behavior.

4. Ethical Considerations

Informed Consent: Ensuring participants in surveys or interviews are informed about the purpose of the research.

Data Privacy: Protecting the confidentiality of personal and organizational data collected during the study.

Bias Mitigation: Addressing potential researcher bias by employing diverse datasets and ensuring objectivity in data interpretation.

5. Validation

Cross-Validation: Comparing results from different methods (e.g., qualitative findings with quantitative trends) to ensure consistency.

Peer Review: Sharing findings with experts and stakeholders to validate conclusions and identify gaps.

6. Limitations

Data Gaps: Difficulty in obtaining data on certain sectors or regions where AI adoption is limited.

Rapid Evolution: AI technologies evolve quickly, potentially making findings less relevant over time.

Subjectivity: Qualitative methods may introduce subjective interpretations, requiring careful triangulation with quantitative data.

7. outputs

The methodology will produce:



Comprehensive Reports: Highlighting the economic, social, ethical, and environmental impacts of AI.

Policy Recommendations: Proposals for managing AI's societal effects, including frameworks for regulation and ethical use.

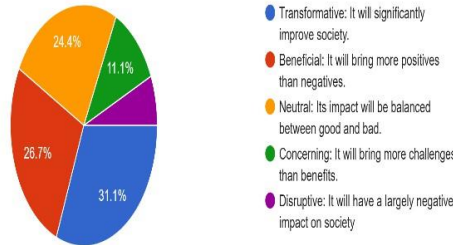
Future Research Directions: Identifying gaps in knowledge and areas for further study.

This methodology ensures a robust, interdisciplinary approach to understanding and addressing the complex impact of AI on society.

VI. RESULTS & SURVEY

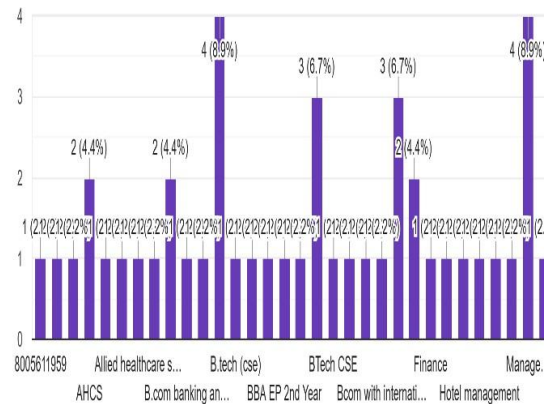
How do you think AI will affect society over the next decade?

45 responses



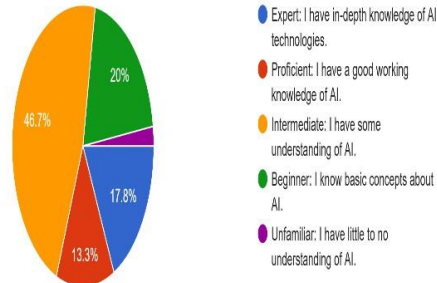
Department

45 responses



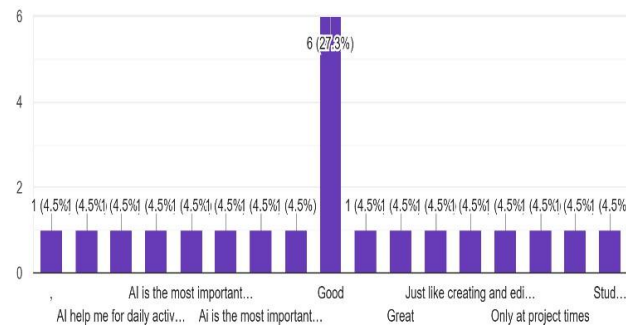
How familiar are you with Artificial Intelligence (AI)?

45 responses



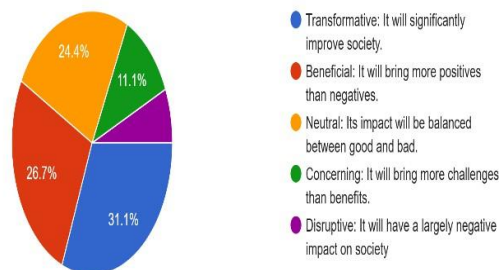
How valuable is Ai for you ? (optional)

22 responses



How do you think AI will affect society over the next decade?

45 responses



NEED FOR THE SOCIETY

The rapid growth of Artificial Intelligence represents a profound technological shift in society, necessitating an immediate requirement for regulation to manage its far-reaching consequences. AI enhances productivity, operational efficiency, and successfully addresses complex problems, but it is also accompanied by inherent risks. These concerns include ethical dilemmas, job displacement, and data security breaches.



1. Fair Access (Equitable Access): Society must take measures to guarantee that AI is equally accessible to all, thereby minimizing the digital divide and preventing the marginalization of underserved populations.
2. Ethical AI Development: It is fundamental to prioritize moral guidelines in the development of AI to prevent issues like systemic biases, discrimination, and unjust outcomes in decision-making.
3. Regulatory Frameworks: Governments and institutions must establish robust policies that oversee the advantages, risks, and moral ramifications of AI. Transparency and accountability are essential to ensure AI is utilized responsibly and openly.
4. Public Awareness: Educating citizens about AI's ethical dimensions and impacts is crucial for fostering informed discourse and sound judgments.
5. Inclusivity and Ethical Considerations: It is vital to implement strategies in AI development that incorporate the diverse perspectives and experiences of a wide range of societal groups. Investments in workforce adaptability and professional retraining are necessary to mitigate the impact on the broad social and occupational spectrum affected by AI technologies.
6. Global Cooperation: Collaboration among international governing bodies, industries, academia, and civil society is key to reducing global AI threats and ensuring that AI ultimately advances the well-being of humanity.
7. Preventing Misuse: Society must implement prudent safeguards to avert malicious applications of AI, such as misinformation campaigns and cybersecurity vulnerabilities.
8. Sustainability: - AI should be primarily directed toward meeting major social requirements, such as climate action and disease prevention, aligning technological progress with broader societal goals.

VII. CONCLUSION

The influence of artificial intelligence (AI) on modern society is both profound and multifaceted, fundamentally altering the methods by which people live, work, and interact. AI has dramatically transformed various sectors, enhanced operational efficiency, and facilitated breakthroughs in fields such as healthcare, academic institutions, financial services, and telecommunications. It has led to better informed decision-making, automated routine processes, and provided avenues to tackle significant global issues, including climate change and the management of epidemics. However, this rapid advancement also introduces substantial and unavoidable difficulties.

Core issues encompass moral dilemmas, such as prejudice and a lack of accountability in AI systems, which can lead to biased results. Confidentiality and data protection concerns, primarily stemming from AI's reliance on vast datasets, bring into question individual rights and the potential misuse of personal information. Furthermore, the automation of various occupations poses a threat of worker displacement, potentially increasing unemployment and widening socioeconomic divides. Unequal access to AI innovations further exacerbates disparities among different population groups.

To guarantee that AI benefits humanity constructively, it is crucial to adopt a balanced and cautious approach. The development of strong governance structures, comprehensive ethical principles, and increased public awareness are essential to mitigate these risks. Investing in educational programs and professional retraining for the workforce can help alleviate the impact of job losses, while promoting equal opportunity ensures that the advantages of AI are distributed fairly. Collaboration among governments, industries, and academic institutions is vital for cultivating a future where AI genuinely elevates societal prosperity.

Ultimately, the incorporation of AI into society should be driven by a dedication to ethical stewardship, forward-thinking development, and long-term viability, ensuring that its revolutionary capabilities contribute to a more equitable and improved world for everyone.

REFERENCES

- [1]. C.S. Lee, A.J. Tyring, Y. Wu, S. Xiao, A.S. Rokem, N.P. DeRuyter, Q. Zhang, A. Tufail, R.K. Wang and A.Y. Lee, *Sci. Rep.-UK*, 9(1) (2019) 1-11.



- [2]. Kaplan A, Haenlein M. Siri, Siri, in my hand: Who's the fairest in the land? On the interpretations, illustrations, and implications of artificial intelligence. *Business Horizons*. 2019;62:15–25. [Google Scholar]
- [3]. Russell SJ, Norvig P. *Artificial Intelligence: A Modern Approach*. Upper Saddle River, New Jersey: Prentice Hall; 2009. [Google Scholar]
- [4]. Roger C. Schank. Where's the AI. *AI Magazine*. 1991;12:38. [Google Scholar]
- [5]. Jerry K. *Artificial Intelligence – what everyone needs to know*. New York: Oxford University Press; 2016. [Google Scholar]
- [6]. Nilsson JN. *Principles of artificial intelligence*. Palo California: Morgan Kaufmann Publishers; 1980. [Google Scholar]
- [7]. S. O'Sullivan, H. Heinsen, L.T. Grinberg, L. Chimelli, E. Amaro Jr., P.H. do Nascimento Saldiva, F. Jeanquartier, C. Jean-Quartier, M. da Graça Morais Martin, M.I. Sajid and A. Holzinger, *Brain Informatics*, 6(1) (2019) 1-12.
- [8]. Y. Kurita, T. Kuwahara, K. Hara, N. Mizuno, N. Okuno, S. Matsumoto, M. Obata, H. Koda, M. Tajika, Y. Shimizu, A. Nakajima, K. Kubota and Y. Niwa, *Sci. Rep.- UK*, 9(1) (2019) 6893.
- [9]. S. Das, M.K. Sanyal and D. Datta, *Stud. Comp. Intell.*, 784(2020) (2019) 21-42.
- [10]. V. Kumar and A. Kumar, *Innovative Infrastructure Solutions*, 4(1) (2019) 1.
- [11]. E. Kamal and L. Adouane, *Lecture Notes in Electrical Engineering*, 495 (2020):150- 173.
- [12]. Scoping study on the emerging use of Artificial Intelligence (AI) and robotics in social care published by Skills for Care. [Last accessed on 2019 Aug 15]. Available from: www.skillsforcare.org.uk.
- [13]. Beth Kindig, a Technology Analyst published in *Beth. Tehnology*. 2020. [Last accessed on 30 Mar 2020]. Available from: <https://www.forbes.com/sites/bethkindig/2020/01/31/5-soon-to-be-trends-in-artificial-intelligence-and-deep-learning/>
- [14]. *Nature News*, 24 January 2020. The battle for ethical AI at the world's biggest machine- learning conference by Elizabeth Gibney. [Last accessed on 2020 Apr 11]. Available from: <https://www.nature.com/articles/d41586-020-00160-y>. [DOI] [PubMed]
- [15]. Prof Stephen Hawking, one of Britain's pre- eminent scientists, has said that efforts to create thinking machines pose a threat to our very existence. Interview on BBC on Dec 2, 2014. Noted by Rory CellanJones. [Google Scholar]

