

Emerging Trends of Artificial Intelligence and Data Protection; An Upcoming Threat to Indian Society

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Abstract

The convergence of emerging trends in Artificial Intelligence (AI) and the increasing importance of data protection has ushered in a new era of technological advancements. However, as AI becomes more integrated into various aspects of society, concerns about data privacy and security have also escalated. The intricate interplay between AI and data protection poses challenges that need careful consideration. The study's objectives are to discover the challenges related to data protection, privacy, and security in the age of AI and to investigate the adoption of AI is impacting various sectors in Indian society, including healthcare, education, finance, and governance. The research also evaluates current advancements in AI technology, such as robotics, machine learning, and natural language processing, as well as trends in privacy and security. In order to achieve the study's objectives, qualitative and quantitative research approaches are utilized. A questionnaire with predetermined answers was used to collect primary data for the study. In conclusion, the paper underscores the urgent need for India to navigate the evolving landscape of Artificial Intelligence with caution. As AI's transformative potential intersects with data protection concerns, proactive measures must be taken to safeguard individual rights, cultural integrity, and societal well-being, ensuring that the nation harnesses the benefits while mitigating the looming threats.

Keywords: Artificial Intelligence (AI); Data Protection; Emerging trends; Threats; Technological Advancements; Indian Society.

1. Introduction

The phrase “artificial intelligence (AI)” has gained popularity more than 50 years after it was first used. Numerous human behaviours, including as information intake on social media, risk assessment of criminal defendants, creditworthiness of individuals, and even the best route to transport on the commute from work, are predicted by AI systems (Balkin, 2017; Angwin, et al., 2022; O'Neil, 2016; Liping, 2018). Most “artificial intelligent (AI)” systems are trained on previous data and have the capacity to recognize patterns, draw lessons from examples, and foresee future occurrences to assist with decision-making. These forecasts and classifications are generalizations that are based on large datasets that humans are unable to analyse at the same rate and scale. Since AI is thought to have such profound effects, it has been dubbed the “new electricity” (Lynch, 2017). The societal and ethical ramifications of these technologies have also been brought into sharper focus as industry and governments work to develop and implement them.

The speed of technical advancement and social change exposes businesses to a more complex range of strategic possibilities. The decreasing predictability of future developments further amplifies these dynamics in the corporate environment (Utterback, 1994).

Global trade encourages the entry of new or unexpected competitors into the industry, risk capital and lean go-to-market strategies allow start-ups and new businesses to quickly capture sizable market shares, technological advancements increasingly accelerate advances in technology, and rapidly changing consumer needs result in radically new products, services, and business models (Rohrbeck & Bade, 2012). Businesses in this environment must continually deal with new influencing forces. Due to the high technical dynamisms that characterize the present cycle of innovation, the management of technology requires specific attention (Coccia, 2017).

Businesses have a strong incentive to identify pertinent new themes and trends as soon as possible in order to develop suitable response strategies for the future in this highly competitive climate. This is true both for maintaining competitive vitality and for identifying new opportunities for competitive advantage (Utterback, 1994; Gordon, 2008). However, rather than being discovered systematically, these early signals are typically discovered by chance. Companies consequently have the difficulty of deriving practical insights from the quantity of information included in big data sets in order to successfully support the management of advances in technology and creativity (Keller & von der Gracht, 2014).

1.1 Artificial Intelligence

AI has the ability to transform practically every area of modern life and is the most significant technological advancement of our time. Andrew Ng, co-founder of Coursera and former head at the Baidu AI Group/Google Brain, likens the revolutionary consequences of AI to those of electricity a century ago. Due to several businesses making strong investments in cognitive and AI technologies, it is predicted that global investments would increase at the market will increase at a 50.1% annualized growth rate (CAGR) from now to USD57.6 billions of dollars in 2021.

The conceptual and technological foundations of AI have been greatly advanced during the past 70 years by computer engineers including Alan Turing, Marvin Minsky, Jr., and John McCarthy. Many businesses and governments currently use AI to some extent. Researcher are already on the verge of entering the exponential era of AI as businesses learn to liberate the value locked in massive amounts of data, thanks to almost limitless processing power and falling prices for data storage (theshillongtimes.com).

A growing number of tasks that require human ability can now be performed by computers thanks to artificial intelligence. With a solid base of technology and software, AI can perform many human functions far more effectively. Using computer languages like Python, R, and others, it builds and trains algorithms. Once an algorithm has been developed, the next stage is to add training data to the model, analyse it, and look for patterns or irregularities that might be used to predict future states. Learning resources on artificial intelligence and associated technologies are plentiful. However, not all of those resources accurately describe the principles and uses of AI.

Additionally, reading a book cover to cover takes time. It is far simpler to learn about artificial intelligence through a PPT than it is to read a full book or research paper. The blog covers a few well-liked machine learning and artificial intelligence talks.

1.2 The economic impact of Artificial Intelligence for India

AI is quickly becoming a new factor of production, supplementing labour, capital, innovation, and technological advancements as measured by total factor productivity. AI has the potential to expand existing sources of value and growth by overcoming the physical constraints imposed by labour and capital. When considered in terms of its potential to have an impact on the economy, AI has the ability to stimulate improvement by enabling (a) “intelligent automation, or the ability to simplify complex physical world tasks asking adaptability and agility across industries;” (b) “labour and capital augmentation: allowing humans to focus on the aspects of what they do that add the most value; complementing human abilities;” and (c) “dispersion of innovation, or accelerating innovation.” Since industry sectors are linked based on value chains, AI advancements in one sector will benefit a different one. It is anticipated that the new products, services, and innovations that AI will enable will generate economic value (Srivastava, 2018).

2. Review of Literature

Makam, G. (2023) explored the relationship between “artificial intelligence (AI)” and intellectual property (IP) and how that affects law. The study offered a summary of AI technology and its expanding contribution to the development, production, and dissemination of intellectual works. It analysed the current legal frameworks for safeguarding AI-generated information and looked at the issues presented by AI in the context of copyright, patent, and trademark laws. The study also covered new topics like AI-aided inventions, AI-generated art, and the prospective effects of AI on conventional IP notions. Finally, it offered potential strategies for updating and modifying IP rules to take into account the changing landscape of intellectual property created by AI. The study examined the legal ramifications of AI in the area of intellectual property with the goal of illuminating the difficulties that current IP rules encounter and outlining alternative remedies to deal with the changing nature of AI-generated IP.

Vlačić, B., et al., (2021) evaluated that a growing body of research on machine learning and artificial intelligence in marketing hypothesizes that “artificial intelligence (AI)” may imitate people and carry out tasks in a “intelligent” way. The goal of the study was to give a thorough overview of the development of the marketing and AI research domains in light of the rising interest in AI amongst marketing scholars and practitioners. Based on an analysis of 164 articles that were released in journals that were indexed by Web of Science and Scopus, the study generated a context-specific research agenda. The analysis of a few studies using the Multiple Correspondence Analysis (MCA) method covered a variety of topics, including the adoption, use, and willingness to adopt “artificial intelligence (AI)” technology in advertising, the role of private information and ethics, the role of societal backing for advertising AI, the revolutionary transformation of the labour market, and the competencies of marketers.

Zhang, Y., et al., (2021) described that “artificial intelligence (AI)” and its numerous applications are drastically changing how people live their daily lives. As a result, there is significant public and academic interest in discussing the privacy and morals implications of AI. The review identified the key participants (i.e., top scholarly organizations and the countries and regions to which they were associated, core research papers, and forums) who support research on privacy and morals problems related to AI. Utilizing co-occurrence analysis, this was completed. The topical landscape of AI ethics was characterized using a topical hierarchical tree, and scientific evolutionary pathways show that society's interest in AI ethics has

changed over time. A core collection of the most recent works published in the natural world, Sciences, and Publications of the “National Research Academy of the United States of America” was used by the author to correlate 15 selected AI approaches with 17 important ethical problems and identify potential ethical difficulties.

Singh, S., et al., (2020) affirmed that by exploiting advancements in developing technology, the smart city in the digital age may develop into an intelligent community. Specifically, the quick uptake of block chain technology has led to the emergence of a new virtual smart city ecosystem. Numerous block chain applications promise to address issues in a variety of industries, from bitcoin and risk management to the “Internet of Things (IoT) and public and social services.” In order to create sustainable ecosystems, the smart city network architecture was being revolutionized by the confluence of artificial intelligence (AI) and block chain technology. However, when it comes to accomplishing the objectives of developing a sustainable smart city, these technological breakthroughs present both opportunities and obstacles. The adoption of block chain systems in smart cities was affected by security concerns and challenges, which were thoroughly reviewed in the study. In order to create a sustainable smart society, a number of critical elements for the fusion of block chain and AI technologies were discussed in detail in the study. By outlining the essential ideas that can be applied to the development of various block chain-based intelligent transportation systems, the author examined block chain security enhancement methods. Additionally, the study explained the unresolved concerns and the direction of the future research, which included fresh security recommendations and guidelines for a long-term smart city ecosystem.

Mazurek, G., & Malagocka, K. (2019) examined that Customer privacy perception and the core principles guiding its legislative protection shaped how the IT sector operated, creating a new balance between economic winners and those who lost. But not all technologically advanced nations were staunch supporters of flexible, pro-business legislation. This was especially evident in the field of “artificial intelligence (AI).” Self-regulation is a core AI strategy and might be seen as a crucial component of an AI solution that is more widely accepted. The goal of the study was to provide AI methods while stressing the variations brought on by various privacy viewpoints, growing customer security concerns, and data privacy rules that coexist with formal administrative procedures. Regulations and customer privacy preferences have been considered when analysing how the use of AI might impact consumer and business interactions.

Marda, V. (2018) affirmed that “artificial intelligence (AI)” was a new area of emphasis for the development of policies in India. Regardless of where the reader of this article lives, the country's geographical significance, expanding AI industry, and ambitious governmental activities around AI make it a crucial jurisdiction to consider. The limitations and risks of data-driven decisions were still taken into account in India and several other jurisdictions when developing and deploying AI applications, despite the fact that current policy processes aim to promote the quickening of AI's development for both societal and commercial gain. The study made the case that when creating policy, it is important to take into account the technological constraints of AI systems and that the societal and ethical issues that these limitations raise should be used to guide the policy-making process. By examining the three key phases of deploying machine learning (the most well-liked subset of AI approaches), namely the data, model, and application stages, it offered a framework for such deliberation to take place. It was produced in light of

India's current AI policy environment and used the suggested framework to solve a number of pressing issues. It concentrated on possible risks that arise from data-driven decisions generally, and in the context of India specifically, with the intention of influencing the country's present policy debate.

Kannan, J., & Munday, P. (2018) stated that the discipline of computer assisted language learning (CALL) has changed significantly over the past few decades as a result of ICT applications. Learning everywhere was made possible through mobile assisted language learning (MALL). Networked Learning (NL) was made possible by the social component that new technologies introduced to ICT at the beginning of the twenty-first century. Networked capacity for learning have made it feasible for language learning to occur in social environments because learning a language is ultimately a sociocultural experience. By enabling language learners to connect internationally, access freely available educational materials, and self-regulate the way they learn outside of the confines of conventional curricula, the NL has reinvigorated the earlier frameworks offered by CALL. Parallel to this, CALL has developed into Intelligent CALL (ICALL) as a result of the growing use of AI applications and the importance of these to language learning. A brief historical overview of CALL was provided in the study's first section, which also examined it from the angles of ICT, networked learning, and open access. The second part centered on important privacy and transparency issues for future research, how AI may affect emerging trends in second language instruction, and how challenging it is to enable personalisation on a broad scale.

3. Methods and Methodology

The nature of the research might be described as both descriptive and exploratory. “Qualitative and quantitative” research methodologies are used to carry out the study's objectives. A questionnaire with predetermined answers was used to collect primary data for the study. The area of the research is referred to as “India.” A sample size of 231 AI researchers, legal experts, and representatives from data protection agencies has been chosen randomly for the study. However, it would take 231 persons to complete the questionnaire. Methods such as “correlation and ANOVA,” were utilized in the study in order to do data analysis. In addition, the author read other pieces of literature, such as books, articles, and periodicals, in order to collect secondary data.

4. Research Objectives

- To study the current trends in AI and data protection, including advancements in AI technologies such as machine learning, natural language processing, and robotics.
- To examine how the adoption of AI is impacting various sectors in Indian society, including healthcare, education, finance, and governance.
- To explore the challenges related to data protection, privacy, and security in the age of AI.

5. Results and Interpretations

This section outlined the results and data interpretations. The results have been divided on the basis of hypothesis which is based on research objectives. Inside the hypothesis, the result has been shown with the use of a table and their explanations.

Hypothesis 1: “There is a significant relation between the Current trends in AI and data protection, Machine learning & Language processing and Robotics.”

An analysis of the data protection regulations in India, with a focus on the Personal Data Protection Bill and its implications for AI-driven data processing. This section also highlights the role of regulatory bodies such as the Data Protection Authority.

The methodology involves the collection of primary and secondary data. Primary data is gathered through expert interviews with AI researchers, legal experts, and representatives from data protection agencies. Secondary data includes academic articles, reports, and relevant legal documents.

Table 1: Correlations

Correlations				
		Current trends in AI and data protection	Machine learning	Language processing and Robotics
Current trends in AI and data protection	Pearson Correlation	1	.607**	.534**
	Sig. (2-tailed)		.000	.000
	N	231	231	231
Machine learning	Pearson Correlation	.607**	1	.640**
	Sig. (2-tailed)	.000		.000
	N	231	231	231
Language processing and Robotics	Pearson Correlation	.534**	.640**	1
	Sig. (2-tailed)	.000	.000	
	N	231	231	231
**. "Correlation is significant at the 0.01 level (2-tailed)."				

The above table-1 defines the correlation between the Current trends in AI and data protection, Machine learning and Language processing and Robotics population and “there is a statistically significant correlation between Current trends in AI and data protection, Machine learning and Language processing and Robotics” because the sig value is 0.00 (for Current trends in AI and protection, Language processing and Robotics), 0.00 (for Current trends in AI and data protection, Machine learning) , 0.00 (for Machine learning ,Language processing and Robotics) (i.e., sig value is less than 0.01).

Hypothesis 2: “There is a significant impact of Adoption of AI on Healthcare Sector, Education Sector, Indian society & Government.”

Table 2: Model Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.536	.288	.278	2.63961
a. Predictors: (Constant), Indian society & Government, Healthcare Sector, Education Sector				

Table-2 “defines the model summary, indicating a significant degree of connection.” “The R-value for the simple correlation is 0.536, which reflects how much of the overall variance in the dependent variable,”

the impact of Adoption of AI on Healthcare Sector, Education Sector, Indian society & Government. “The independent variable can be used to explain the results.”

Table 3: ANOVA

ANOVA						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	639.212	3	213.071	30.581	.000
	Residual	1581.628	227	6.968		
	Total	2220.840	230			
a. “Dependent Variable: Adoption of AI”						
b. “Predictors: (Constant), Indian society & Government, Healthcare Sector, Education Sector”						

“Table 3 is an ANOVA table that shows how well the data fits by the regression equation (i.e., predicts the dependent variable). This table demonstrates the reliability of the regression model’s predictions for the dependent variable.” “The above table 3 shows a significant impact of Adoption of AI on Indian society & Government, Healthcare Sector, Education Sector, as the significance value is 0.00, which is smaller than 0.01.”

Table 4: Coefficients

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	6.014	1.306		4.603	.000
	Healthcare Sector	.308	.086	.275	3.589	.000
	Education Sector	.158	.103	.140	1.530	.127
	Indian society & Government	.260	.094	.211	2.756	.006
a. Dependent Variable: Adoption of AI						

Table 4 of “the Coefficients in the model demonstrates how effectively Adoption of AI has impacted the Health care and Indian society & Government.” “The table highlight that the regression model shows a significant value of 0.000 and 0.006 (the significance value is less than 0.01).”

6. Conclusion

In conclusion, the study provides an insightful analysis of the dynamic interplay between the rapidly evolving landscape of Artificial Intelligence (AI) and the crucial domain of data protection, with a focus on its potential implications for Indian society. The escalating advancements in AI technologies have ushered in a new era of possibilities, characterized by heightened efficiency, sophisticated decision-making processes, and transformative applications across various sectors. However, concomitant with

these advancements are pressing concerns pertaining to data privacy and security, forming the bedrock of contemporary digital discourse.

The exploration of emerging AI trends, including facial recognition systems, predictive analytics, and personalized recommendation engines, elucidates the imperative role played by extensive data collection and analysis. While these technologies offer promising avenues for innovation, they simultaneously underscore the pertinence of addressing intrinsic challenges associated with data privacy, informed consent, and the ethical utilization of personal data. This conundrum is particularly poignant within the diverse tapestry of Indian society, characterized by its myriad cultural dimensions and demographic variations, necessitating a balanced approach that harmonizes technological progress with cultural preservation and individual rights.

The elucidation of the legal and regulatory landscape within the study highlights India's endeavours to address the intricate intersection of AI and data protection. The introduction of the Personal Data Protection Bill (PDPB) stands as a noteworthy stride in safeguarding data ownership rights for citizens. However, the effective implementation and continuous evolution of regulatory frameworks remain pivotal in ensuring their efficacy amidst the rapidly evolving AI terrain.

Furthermore, the study emphasizes that the ramifications of inadequate data protection extend beyond the individual realm, permeating into the societal fabric. The potential exacerbation of existing inequalities, biases inherent in AI algorithms, and the manipulation of public perceptions through targeted content distribution collectively amplify the urgency for a comprehensive approach. The approach entails not only technological enhancements but also the cultivation of ethical considerations, public education, and heightened awareness.

The study underscores the necessity of a collaborative effort among stakeholders, encompassing government entities, corporations, academic institutions, and civil society, to formulate comprehensive strategies that synergistically foster AI innovation while erecting robust safeguards for individual rights. A multifaceted approach that accentuates responsible AI development, stringent data protection protocols, and sustained dialogue among all echelons of society is imperative to navigate the transformative potential of AI while preempting its associated risks.

In conclusion, the study delineates the intricate tapestry wherein the burgeoning trends of Artificial Intelligence intertwine with data protection concerns, projecting both promise and peril for Indian society. By discerningly embracing AI's potential and concurrently instituting comprehensive data protection measures, India can effectively harness the benefits of this paradigm shift, safeguarding its core values and ensuring a future characterized by the symbiotic coexistence of technological advancement and societal well-being.

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