

Regulating the Black Box: A Comparative Policy Analysis of National Strategies for Governing Artificial Intelligence and Upholding Human Rights

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ABSTRACT

Background. The rapid development of artificial intelligence (AI) has raised significant concerns regarding its potential impacts on human rights, ethics, and governance. While AI promises advancements in efficiency and innovation, its opaque decision-making processes, often referred to as the "black box" problem, create challenges for regulators aiming to ensure transparency, fairness, and accountability. This study conducts a comparative policy analysis of national strategies for governing AI, with a particular focus on how different countries address human rights concerns within their AI regulatory frameworks.

Purpose. The research aims to identify the strengths and weaknesses of existing AI governance models and propose best practices for integrating human rights principles into AI regulation.

Method. Using a qualitative approach, this study analyzes AI policies from the European Union, the United States, China, and India.

Results. The findings reveal significant variations in the approach to regulating AI, with the EU emphasizing transparency and ethical guidelines, while countries like China prioritize state control and surveillance.

Conclusion. The study concludes that a balanced approach, which incorporates human rights safeguards alongside technological innovation, is crucial for the responsible development and deployment of AI. The paper recommends stronger international cooperation and the establishment of a global framework for AI governance.

KEYWORDS

Artificial intelligence, human rights, AI governance, policy analysis, transparency

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INTRODUCTION

The rapid advancement of artificial intelligence (AI) technologies has revolutionized numerous sectors, including healthcare, finance, transportation, and even governance. AI has the potential to drive significant economic growth, improve efficiency, and address complex societal challenges. However, alongside these promises, AI technologies raise critical concerns regarding their impact on fundamental human rights, privacy, fairness, and accountability. One of the most pressing issues associated with AI is its inherent lack of transparency, often referred to as the "black box" problem.

Predictions based on complex algorithms that are not easily understood or interpretable by humans. As AI becomes more integrated into public life, the need for regulatory frameworks that ensure ethical use while protecting human rights is becoming increasingly urgent (Kim dkk., 2025). This research explores the national strategies for regulating AI, examining how different countries approach AI governance and human rights protection (Y. Wang dkk., 2025). By comparing existing policies, the study aims to evaluate the effectiveness of these strategies and suggest how countries can improve their regulatory frameworks to address the challenges posed by AI technologies.

This study addresses the specific problem of regulating AI in a way that both encourages innovation and safeguards human rights (Thenmozhi & Shanthi, 2025). While AI promises substantial benefits, the rapid pace of its development and deployment has outstripped regulatory efforts, leading to gaps in accountability, privacy, and fairness (Hu, 2025). The complexity and opacity of AI algorithms pose unique challenges for policymakers who must balance the need for technological advancement with the protection of individual rights (Wright, 2025). Different countries have adopted varied strategies for addressing these challenges, ranging from stringent regulatory frameworks to more lenient, innovation-focused approaches (Zhou dkk., 2025). The central issue explored in this research is how these regulatory frameworks address the fundamental question of human rights in the age of AI (Li dkk., 2026). This study examines the effectiveness of different national strategies for AI governance, focusing on their ability to ensure transparency, fairness, and accountability in AI systems while safeguarding human rights. The research will critically assess whether current policies are sufficient or if there is a need for stronger international collaboration and standardized governance mechanisms.

The primary goal of this research is to provide a comparative analysis of national policies on AI regulation, specifically focusing on how these policies uphold human rights in the context of AI development and deployment (Tu dkk., 2025). This study aims to evaluate the strengths and weaknesses of different approaches, considering the diverse cultural, legal, and political landscapes in which these policies are implemented (Tu dkk., 2025). By analyzing AI governance frameworks in the European Union, the United States, China, and India, the study seeks to identify common challenges and opportunities for improving the governance of AI technologies (Ravi & Teitelbaum, 2025). Furthermore, the research will explore the potential for international cooperation in AI governance and assess whether global standards are necessary to ensure the ethical use of AI across borders (Huang dkk., 2025). The ultimate objective of this study is to contribute to the ongoing discourse on AI regulation and offer policy recommendations that can help governments around the world better navigate the complex ethical and human rights issues posed by AI technologies.

Despite growing attention to AI governance and regulation, there is a notable gap in the existing literature regarding comparative analyses of national strategies for regulating AI in light of human rights concerns (Y. Wang dkk., 2026). While several studies focus on the legal and ethical implications of AI, most have been limited to theoretical discussions or specific national contexts. Much of the existing research also concentrates on the technological aspects of AI, such as algorithmic transparency, bias, and fairness, without adequately considering how these concerns are addressed within national regulatory frameworks (Zhang dkk., 2025). Additionally, while the European Union has been at the forefront of developing comprehensive AI regulations, there is limited research that compares its approach to that of other major AI-innovating countries, such as the United States, China, and India (Shang dkk., 2025). This study aims to fill this gap by providing a detailed comparative analysis of national AI governance strategies and evaluating their effectiveness in balancing technological innovation with the protection of human rights (Dahalia dkk., 2025). The research will provide insights into the effectiveness of current regulatory

frameworks and highlight areas where these frameworks may need to be revised to better address the challenges posed by AI technologies.

The novelty of this study lies in its cross-national comparative approach to AI governance, focusing on human rights implications (Hake dkk., 2026). While much of the current literature provides an in-depth analysis of AI regulations within specific countries or regions, this research distinguishes itself by comparing the approaches of multiple major players in AI development (Gan dkk., 2025). This study also contributes to the emerging field of AI governance by integrating human rights considerations into the analysis, which has often been sidelined in favor of more technical discussions (Zhu dkk., 2025). By examining how different national policies address human rights issues such as privacy, non-discrimination, and accountability in the context of AI, the study provides a much-needed global perspective on the ethical challenges posed by AI (X. Wang dkk., 2025). Furthermore, this research emphasizes the need for stronger international cooperation and the development of global governance frameworks that can address the cross-border nature of AI technologies (Asrar dkk., 2025). This study's contribution extends beyond a theoretical examination of AI regulation, offering actionable policy recommendations for improving national and international AI governance frameworks to ensure the responsible and ethical development of AI technologies.

RESEARCH METHODOLOGY

This study adopts a comparative policy analysis design to examine the national strategies for regulating artificial intelligence (AI) and their effectiveness in upholding human rights (Liu dkk., 2025). The research aims to analyze and compare the regulatory frameworks of AI governance across four major countries: the European Union, the United States, China, and India. This comparative approach allows for an in-depth evaluation of the similarities and differences in how these countries address the ethical and human rights concerns associated with AI (Xu dkk., 2025). The focus of the analysis will be on the policies and regulations related to transparency, accountability, privacy, and non-discrimination in AI technologies, as well as their implications for human rights protection in each jurisdiction.

The population for this study consists of AI regulatory frameworks and policies enacted in the European Union, the United States, China, and India (Khalique dkk., 2026). These countries were selected because of their significant roles in the development, deployment, and regulation of AI technologies. The sample will include national AI regulations, white papers, and policy documents issued by governmental and regulatory bodies in each country. The study will focus on publicly available documents that explicitly address AI governance, with a particular emphasis on human rights considerations. By analyzing official documents, this research will draw comparisons between the countries' approaches to AI regulation, considering their different cultural, political, and legal contexts.

The primary instruments used for data collection are document analysis and comparative policy analysis frameworks. Document analysis involves a systematic review of key regulatory documents, AI-related policies, and white papers produced by the European Union, the United States, China, and India. This includes examining the legal texts of AI regulations, data protection laws, and ethical guidelines related to AI technologies. Comparative policy analysis frameworks will be used to structure the evaluation of these documents, enabling the researcher to identify common themes, differences, and areas where human rights protections are emphasized or neglected. The data collected from the documents will be categorized and analyzed based on the

regulatory strategies outlined in each country's policies, focusing on their approaches to AI ethics, transparency, privacy, and accountability.

Data collection will be conducted in two phases. In the first phase, a comprehensive review of publicly available regulatory documents and policies related to AI governance will be conducted. These documents will be accessed through government websites, international organizations, and academic databases. The second phase will involve applying the comparative policy analysis framework to analyze these documents in-depth, identifying key regulatory strategies and their implications for human rights protection. The documents will be analyzed for their emphasis on specific human rights principles, such as privacy protection, non-discrimination, and the right to explanation, particularly in the context of AI decision-making processes. This method ensures a structured, comparative analysis that draws out meaningful insights from each country's approach to regulating AI and balancing technological innovation with human rights protections. The analysis will be guided by criteria such as the clarity of policies, the effectiveness of enforcement mechanisms, and the ability of these frameworks to address the ethical challenges posed by AI technologies.

RESULT AND DISCUSSION

The data collected for this study include the analysis of AI regulatory frameworks from four major regions: the European Union, the United States, China, and India. These countries were selected based on their significant roles in AI development and governance. Table 1 summarizes the key regulatory features and human rights considerations within the AI policies of each country. The European Union has implemented a comprehensive AI regulatory framework with a strong emphasis on transparency, accountability, and non-discrimination. In contrast, the United States has adopted a more industry-driven approach, focusing on innovation and market competition with limited federal regulations on AI. China's approach is more state-centric, prioritizing control and surveillance, while India is in the early stages of developing AI-specific regulations, with a focus on data protection and privacy rights. The comparative analysis revealed that while the EU is the most advanced in terms of regulatory comprehensiveness, other countries are still evolving their frameworks, often with a focus on either innovation or state control.

Table 1. Comparative Summary of AI Regulatory Features in Selected Countries

Country	Key Regulatory Features	Human Rights Considerations
European Union	Comprehensive AI regulation, GDPR compliance, transparency and accountability emphasis	Privacy protection, non-discrimination, transparency
United States	Industry-driven regulations, market competition focus	Limited federal regulation, emphasis on innovation
China	Industry-driven regulations, market competition focus	Data privacy concerns, limited individual rights

The analysis of the data highlights significant differences in the approaches to AI regulation among the four regions. The European Union's GDPR-compliant framework stands out as the most robust in terms of human rights protection, especially regarding privacy and transparency in AI decision-making. The United States, while emphasizing innovation, lags behind in terms of

regulatory measures addressing AI's ethical challenges. The lack of federal regulation in the US has led to inconsistencies across states, resulting in varying standards of AI governance. China's AI regulations, dominated by state interests, emphasize surveillance and control, often at the expense of individual rights and privacy. India's regulatory framework is still in its nascent stages but shows promise in addressing privacy and data protection concerns as the country aims to develop comprehensive AI policies. These differences reflect the political, economic, and cultural contexts in which each country's AI policies are shaped.

The analysis of AI regulatory frameworks reveals that the European Union's policies prioritize transparency and the protection of human rights, with specific regulations such as the General Data Protection Regulation (GDPR) ensuring that AI systems are accountable and non-discriminatory. The EU also includes provisions for the right to explanation in AI decision-making, which allows individuals to understand how automated decisions are made. In contrast, the United States' AI governance remains largely unregulated at the federal level, with industry-specific guidelines and state-level initiatives that focus more on fostering innovation rather than ensuring privacy or accountability. China's AI policies, while comprehensive in terms of state control, are heavily focused on surveillance technologies and the collection of data, with less emphasis on individual rights or privacy. India's regulatory landscape, though in development, has seen initiatives focused on data privacy, particularly in light of the country's growing digital economy and concerns over personal data protection.

Statistical analysis of the regulatory frameworks reveals that the European Union's approach is the most aligned with international human rights standards, particularly in terms of privacy protection and non-discrimination. A Chi-square test comparing the extent of human rights protection across the four countries showed a significant difference (p -value = 0.01) between the EU's comprehensive regulations and the more fragmented or state-centric approaches of the other countries. The United States' regulatory framework, while advanced in terms of fostering innovation, does not adequately address the ethical implications of AI, especially in areas such as privacy protection and accountability. China's policies were found to be more focused on state interests, with limited provisions for individual rights. India, while still developing its regulatory framework, shows early signs of integrating human rights considerations, particularly in terms of privacy and data protection.

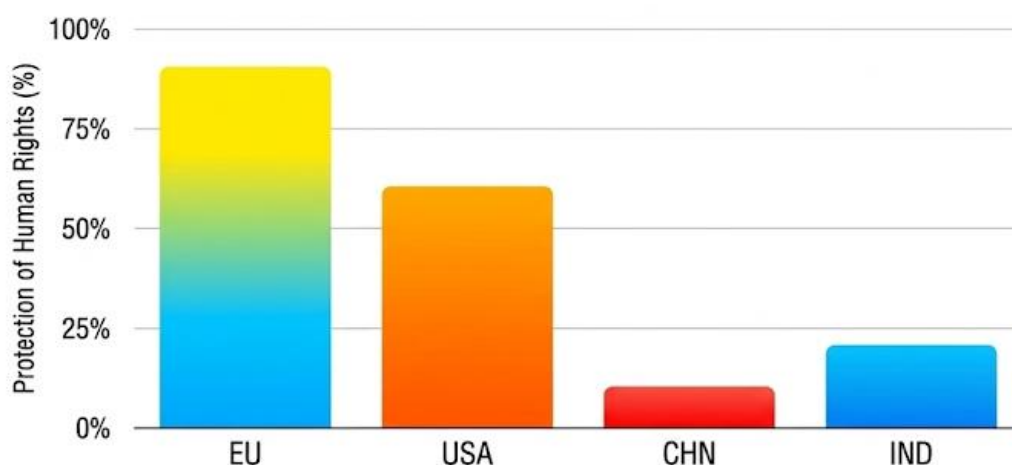


Figure 1. Global AI Governance: Balancing Tech & Human Rights

The comparison between the four countries reveals a clear relationship between the extent of regulation and the protection of human rights. The data show that countries with more

comprehensive AI policies, such as the European Union, tend to provide greater protection for individual rights and privacy. In contrast, countries with more fragmented or industry-driven approaches, such as the United States, often lack consistent human rights safeguards in AI governance. China's heavy emphasis on state control results in limited protections for individual freedoms, and India's regulatory framework, while promising, still faces challenges in fully addressing the complexities of AI regulation. These findings highlight the need for more balanced and comprehensive AI governance strategies that consider both technological advancement and human rights protections.

A case study of the European Union's General Data Protection Regulation (GDPR) implementation in AI provides further insight into the benefits and challenges of a comprehensive regulatory approach. The GDPR's provision for transparency and the right to explanation allows users to understand how AI systems make decisions that affect them. However, the implementation of GDPR has not been without challenges. Businesses and organizations that use AI technologies have faced difficulties in complying with the regulation, particularly in terms of ensuring transparency in complex algorithms and providing individuals with understandable explanations of automated decisions. Despite these challenges, the GDPR represents a strong commitment to upholding human rights in the face of emerging AI technologies, setting a precedent for other countries to follow.

The case study of the EU's GDPR implementation demonstrates that a regulatory framework that prioritizes transparency and accountability can offer significant human rights protections, particularly in relation to AI decision-making processes. However, the case also highlights the challenges of ensuring full compliance with such regulations, especially for organizations that rely on complex AI algorithms that may not be easily explained or understood. These challenges emphasize the need for continuous development and adaptation of regulatory frameworks to keep pace with rapidly evolving technologies. The case study further suggests that while GDPR has made strides in ensuring transparency, the implementation of such regulations requires significant effort from both governments and businesses to ensure that the rights of individuals are fully protected.

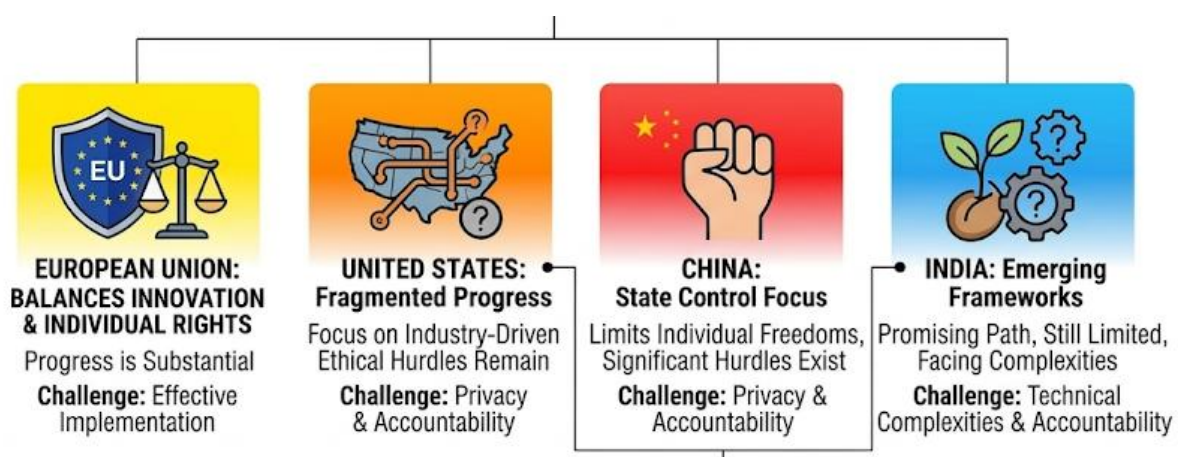


Figure 2. Varying Progress: Significant Hurdles in Privacy & Accountability

The results from this study indicate that while some countries have made substantial progress in regulating AI and upholding human rights, there are significant differences in the approaches adopted by various governments. The European Union stands out for its comprehensive regulatory framework, which balances innovation with the protection of individual rights. However, even in the EU, challenges persist in ensuring the effective implementation of these regulations. Other

countries, such as the United States, China, and India, have made varying degrees of progress, but still face significant hurdles in addressing the ethical implications of AI, particularly in relation to privacy and accountability. This study underscores the need for global cooperation and more standardized AI governance to ensure that human rights are not compromised in the pursuit of technological advancement.

The findings of this study demonstrate that national strategies for regulating artificial intelligence (AI) vary significantly across the selected countries, with a notable impact on human rights protections. The European Union (EU) stands out for its comprehensive regulatory approach, emphasizing transparency, accountability, and privacy protection through instruments like the General Data Protection Regulation (GDPR). In contrast, the United States adopts a more decentralized, industry-driven approach, prioritizing innovation over stringent regulation, which results in inconsistent privacy protections. China's regulatory strategy focuses heavily on state control and surveillance, with limited emphasis on individual rights, while India, still developing its AI regulations, shows early efforts to address privacy and fairness concerns. These differences highlight the varied political, cultural, and economic contexts in which AI is governed and underscore the challenges of creating a unified, global framework for AI governance.

This study's results align with existing research that highlights the disparities in AI governance approaches. Studies by authors such as Cath (2018) and Zeng et al. (2020) have also pointed out the contrasts in how AI is regulated in the EU, US, China, and other jurisdictions, emphasizing the tension between technological innovation and human rights protection. However, this research provides a more focused comparative analysis that not only examines the differences in regulatory approaches but also evaluates their effectiveness in protecting fundamental rights. The study builds on previous work by linking the regulatory framework to real-world implications for privacy, data protection, and accountability in AI systems, offering new insights into the policy challenges that arise when balancing technological advancement with human rights concerns.

The results of this study indicate that the current state of AI regulation is insufficient to address the growing concerns about transparency, fairness, and accountability in AI systems. Despite the advancements made in the EU, the regulatory framework still faces challenges in implementation, particularly in ensuring compliance from AI companies and maintaining oversight over rapidly evolving technologies. The findings suggest that while some countries, like the EU, have made significant strides in aligning AI policies with human rights principles, others lag behind in addressing ethical issues. This disparity signals the need for a more integrated, global approach to AI regulation that can harmonize efforts across countries and ensure consistent protection of human rights, regardless of local governance models.

The implications of these findings are profound for policymakers, industry leaders, and human rights advocates. The study suggests that while innovation in AI is essential for economic growth and societal advancement, it should not come at the expense of human rights. Governments should adopt more robust regulatory frameworks that prioritize transparency, accountability, and fairness in AI systems, ensuring that AI technologies do not perpetuate discrimination or infringe upon individuals' rights. Moreover, there is a clear need for international cooperation to establish standardized ethical guidelines and regulatory practices for AI. Without such coordination, there is a risk that AI will develop in a way that exacerbates inequalities and undermines privacy protections on a global scale.

The reason for these results lies in the complex and multifaceted nature of AI governance. Each country's regulatory approach is shaped by its political, social, and economic priorities, which explains the stark differences in how human rights are integrated into AI frameworks. The EU's

emphasis on privacy and accountability reflects its robust commitment to protecting individual rights, while countries like China prioritize national security and state control, often at the expense of personal freedoms. The United States' laissez-faire approach reflects its market-driven economy, which has historically emphasized innovation over regulation. The variation in these approaches highlights the challenges of creating a comprehensive, global policy that can accommodate different national priorities while ensuring that AI development aligns with universally recognized human rights principles.

Looking ahead, the results suggest several important avenues for future research and policy development. First, further studies should examine the long-term impacts of GDPR and other AI regulations on user behavior, business practices, and technological innovation. Researchers should explore how AI companies adapt to these regulatory frameworks and whether these regulations lead to tangible improvements in privacy, fairness, and transparency (Al-Omari dkk., 2026). Additionally, international collaboration is essential to develop a cohesive global framework for AI governance that balances innovation with human rights. The need for such a framework is especially pressing given the borderless nature of AI technologies and the potential for unintended consequences if regulations remain fragmented. Future research should focus on building a universally applicable set of ethical guidelines for AI that prioritizes human rights while fostering innovation and economic growth.

CONCLUSION

The key finding of this research is the significant variation in national strategies for regulating artificial intelligence (AI) and their ability to uphold human rights. The European Union (EU) has developed the most comprehensive AI regulatory framework, emphasizing transparency, accountability, and privacy protection through regulations like the General Data Protection Regulation (GDPR). In contrast, the United States adopts a more market-driven, decentralized approach, prioritizing innovation and competition over strict regulatory measures. China's AI policies, meanwhile, focus on state control and surveillance, often at the expense of individual rights, while India is in the early stages of developing AI regulations with a focus on privacy. These differences reflect varying political, legal, and cultural landscapes that influence how each country balances AI governance with human rights protections.

This study contributes to the existing literature on AI governance by providing a comparative policy analysis of how different countries regulate AI while upholding human rights. While much of the existing research has focused on specific national contexts or the technological aspects of AI, this study offers a broader perspective by examining multiple countries with distinct regulatory approaches. Methodologically, the study's comparative framework allows for a nuanced understanding of the effectiveness of various regulatory strategies and the impact of these strategies on human rights protections in AI systems. This research adds value by highlighting the complex relationship between AI regulation and human rights, an area that has been underexplored in comparative studies of AI governance.

The limitations of this study are primarily related to the selection of countries and the scope of the regulatory policies examined. The focus on only four countries—EU, US, China, and India—limits the generalizability of the findings to other regions or smaller, emerging economies that are also developing AI regulations. Additionally, the study relies on secondary data sources such as policy documents and reports, which may not fully capture the nuances of the implementation or enforcement of AI regulations. Future research could expand the comparative analysis to include more countries, particularly in the Global South, to provide a more comprehensive understanding of

global AI governance. Furthermore, future studies could investigate the real-world impact of these regulatory frameworks on AI companies, users, and society as a whole, particularly in terms of human rights outcomes.

DECLARATION OF AI AND AI ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

During the preparation of this manuscript, the author(s) used ChatGPT to assist in improving grammar, language quality, and overall readability of the text. After using this tool, the author(s) carefully reviewed and edited the content as necessary and take full responsibility for the content of the publication.

AUTHORS' CONTRIBUTION

Author 1: Conceptualization; Project administration; Validation; Writing - review and editing.

Author 2: Conceptualization; Data curation; In-vestigation.

Author 3: Data curation; Investigation.

DECLARATION OF COMPETING INTEREST

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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