

## Should the Government Regulate Artificial Intelligence and Its Dangers in Society?

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### ABSTRACT

The rapid advancement of Artificial Intelligence (AI) has transformed various sectors, necessitating regulation to balance innovation and ethical concerns. This study examines the necessity of AI governance, evaluates its societal risks and benefits, and provides policy recommendations. The research reviews academic literature, government policies, and international regulations using a qualitative approach with descriptive analysis. Findings highlight three regulatory models: the EU's human rights-based approach, the US's market-driven strategy, and China's state-controlled oversight. Key challenges include algorithmic bias, privacy violations, and cybersecurity threats. Effective AI policies should prioritize transparency, accountability, and public engagement while fostering innovation. This study recommends a risk-based regulatory approach, ensuring human oversight in high-risk AI applications. By implementing comprehensive governance, policymakers can maximize AI's benefits while mitigating risks and ensuring equitable technological advancement.

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## INTRODUCTION

The rapid advancement of artificial intelligence (AI) has emerged as a hallmark of contemporary society, pervading a wide range of sectors, including healthcare, finance, education, manufacturing, and government. The transformative potential of AI lies in its ability to process large amounts of data, automate complex operations, and improve decision-making processes. As AI technology continues to evolve, its integration into various industries has led to significant shifts in operational efficiency, service delivery, and the overall structure of society. The increasing ubiquity of AI underscores the need for rigorous academic investigation into its positive and negative implications. The impact of AI extends across industries, revolutionizing traditional business models and operational frameworks, thereby reshaping the global economic and social landscape (Williams et al., 2015).

The rapid development of AI requires excellent attention. As AI systems become increasingly embedded in critical decision-making processes, concerns regarding transparency, accountability, and algorithmic bias are surfacing. Highlighting the urgency of ethical guidelines in the face of the complexity of AI applications, especially in the aspects of justice, privacy, and human surveillance (Jobin & Ienca, 2019). Ethical considerations are an academic exercise and a fundamental necessity to ensure AI's responsible and fair application. The risks associated with AI, such as privacy violations and algorithmic discrimination, require a framework that aligns technological innovation with ethical principles to foster public trust and ensure society's benefits.

In addition, the role of AI in sustainable development presents both opportunities and challenges. The dual impact of AI on the United Nations (UN) Sustainable Development Goals (SDGs) illustrates how AI can facilitate progress in areas such as healthcare, environmental management, and education while simultaneously exacerbating existing inequalities and posing risks to social equality (Vinueza et al., 2020). This paradox underscores the need for a deeper examination of the social implications of AI. The application of AI in critical sectors such as education and healthcare offers

promising improvements but raises pressing questions of accessibility and equity, especially for marginalized communities. Addressing these issues requires comprehensive policy measures that balance innovation with inclusivity and equity.

The rapid integration of AI into the workforce necessitates the emergence of new professional roles centered on AI governance, oversight, and ethical management. Ensuring the responsible application of AI demands a balanced approach that prioritizes ongoing skills development, workforce retraining, and regulatory standard-setting (Mensah, 2024). The emergence of AI-specific job roles highlights the evolving nature of the labor market and the importance of regulatory intervention to mitigate potential disruptions. In addition, a structured framework for AI oversight can be essential in minimizing unintended consequences and ensuring the responsible use of AI across different domains.

The influence of AI on the creative industries is increasingly showing its transformative impact, especially in reshaping artistic and innovative processes. These developments raise profound questions about intellectual property rights, ethical considerations, and the evolving nature of creativity (Lee, 2024). AI's ability to generate original content challenges traditional notions of authorship and originality, necessitating a re-evaluation of copyright laws and regulatory policies governing creative output. Addressing this challenge requires an interdisciplinary approach incorporating legal, technological, and ethical perspectives.

Public trust in AI systems is key to successful adoption and integration into society. In this regard, the taxonomy of challenges associated with trustworthy AI highlights the importance of ethical considerations in the design and implementation of such technologies (Akbar et al., 2023). Transparency and fairness in algorithmic decision-making are critical, given the far-reaching implications of biased AI outcomes on individuals and society. Establishing robust mechanisms to ensure AI fairness, accountability, and ethical governance is critical to fostering public trust in these technologies.

The social impact of AI extends into governance and public administration, posing complex regulatory challenges. In this context, the Threat of Artificial Intelligence (TAI) Scale was used to assess public perceptions of AI risks in various sectors, such as healthcare, employment, and security (Kieslich et al., 2021). Understanding public sentiment is crucial for policymakers navigating the complicated task of regulating AI technologies. Empirical assessments of public attitudes toward AI can inform the development of regulatory frameworks that address societal concerns while enabling technological advancement.

In the European context, the influence of AI on political decision-making and governance structures is becoming increasingly apparent. AI plays a role in shaping political processes in the European Union, with the potential to improve the efficiency of governance while posing the risk of reinforcing existing power imbalances (Reis et al., 2020). This duality underscores the need for comprehensive AI governance policies that consider socio-political implications and protect democratic institutions from undue technological influence.

In addition, the procurement and implementation of AI systems by public entities presents unique challenges that require careful oversight, especially regarding the risks of AI adoption in the public sector and the importance of strong procurement guidelines and continuous monitoring (Hickok, 2022). The absence of a clear regulatory framework for AI procurement can lead to unintended ethical, legal, and operational impacts, reinforcing the need for transparent and accountable governance structures.

As AI continues to shape the global economy, its impact on education and workforce development is increasingly evident. The challenges and opportunities of integrating AI technologies into the education system emphasize the need for educators to adapt their pedagogical approaches to the changing technological landscape (Grassini, 2023). Integrating AI into education is not just limited to instructional tools; it requires a re-examination of curricula to equip students with the necessary skills to thrive in an AI-driven future.

Finally, the intersection of AI and global ethics demands ongoing scientific research and regulatory adjustments. Various pressing ethical issues, such as privacy violations, discrimination, and labor replacement, are the main focus of this study (Huang et al., 2023). Addressing these ethical challenges as AI becomes more entrenched in society's infrastructure is critical to fostering responsible innovation and mitigating unintended social harms.

Several key research questions emerged based on this discussion: Does the government need to regulate AI? What are the potential harms of AI to society? What is the ideal form of AI regulation? These questions form the basis for a critical examination of AI governance. Therefore, this research aims to analyze the importance of AI regulation, identify the positive and negative impacts of AI on society, and provide policy recommendations for AI regulation. Through a comprehensive investigation of these aspects, this research seeks to contribute to the broader discourse on the responsible and equitable deployment of AI technologies in modern society.

## Literature Review

### Basic Concepts, Typologies, and Applications of Artificial Intelligence

Artificial Intelligence (AI) represents a paradigm shift in computing technology, characterized by developing systems capable of simulating human intelligence. The theoretical foundation of AI includes core subfields such as machine learning, natural language processing, and robotics, which collectively contribute to advancing AI cognitive capabilities, including knowledge, reasoning, and problem-solving. Historically, AI has been categorized into narrow AI, which is designed for specific tasks, and general AI, which aspires to mimic human-level cognition across a wide range of intellectual tasks. This classification serves as an essential framework for assessing the capabilities and limitations of AI in applied contexts across different sectors.

The application of AI in healthcare has yielded transformative results, especially in diagnostics and treatment optimization. Machine learning algorithms have shown remarkable efficacy in predicting disease progression and identifying complications in conditions such as liver disease, offering superior analytical capacity compared to conventional methodologies (Ahn et al., 2021). Similarly, AI-assisted diagnostic tools in endoscopic procedures have significantly increased the detection rate of esophageal neoplasia, surpassing the accuracy of less experienced human examiners (Liu, 2021). Such advances underscore the potential of AI to improve clinical decision-making, streamline healthcare processes, and improve patient outcomes, thereby transforming modern medical practice.

In education, AI has been instrumental in personalizing learning experiences and fostering computational thinking skills. AI-driven pedagogical interventions have been shown to improve spoken English proficiency, reinforcing the idea that AI-mediated instruction can meet individual learning needs and optimize educational outcomes (Xu, 2024). Moreover, the integration of AI into STEAM education is crucial in developing computational reasoning, an essential skill in an increasingly technology-driven society (Huang & Qiao, 2022). These developments suggest that AI facilitates knowledge acquisition and encourages critical thinking and problem-solving, thus equipping students with competencies essential for the future career landscape.

The industrial sector has also benefited from AI integration, especially in manufacturing, supply chain management, and predictive maintenance. AI-based solutions improve operational efficiency by identifying mechanical breakdowns early, reducing downtime and associated costs. The application of AI in supply chain logistics has further optimized resource allocation, minimized inefficiencies, and contributed to cost-effectiveness. This empirical evidence strengthens the argument that AI catalyzes industrial innovation and productivity improvement.

Similarly, AI has been at the forefront of security innovations, especially in cybersecurity and judicial decision-making. AI-driven algorithms have been used in anomaly detection systems to identify security breaches early, strengthening an organization's cybersecurity measures. Additionally, AI applications in the judicial context have facilitated data-driven decision-making, streamlined legal processes, and improved procedural accuracy (Zhu & Zheng, 2021).

Beyond its technical applications, the anthropomorphism of AI in consumer-facing technologies has attracted significant scholarly attention. The increasing sophistication of AI-human interactions has led to behavioral shifts among consumers, with research showing that users can form emotional attachments with AI assistants, which affects their purchasing behavior and brand loyalty (Hermann, 2021). This phenomenon highlights the importance of integrating affective computing and user experience research into AI development to ensure positive and ethical consumer engagement.

Despite this progress, AI adoption is not without its challenges. Data privacy, ethical governance, and regulatory frameworks remain key topics in academic and policy debates. Concerns over patient data security in AI applications in healthcare illustrate the urgent need for robust data

protection mechanisms (Bates et al., 2022). Moreover, the ethical ramifications of algorithmic decision-making require rigorous oversight to ensure fairness, accountability, and transparency. As AI continues to evolve, addressing these challenges is critical to foster trust and provide the responsible application of AI.

The emergence of generative AI presents a new frontier in AI research, with profound implications for fields such as media, entertainment, and creative industries. Generative AI systems leverage pre-existing data sets to generate new content, thus revolutionizing the creation and automation of digital content (Liu, 2023). While these advancements open up new creative possibilities, they raise concerns regarding authenticity, copyright infringement, and misinformation. As AI-generated content evolves, regulatory frameworks must evolve to address these technologies' ethical and legal complexities.

In summary, AI's theoretical underpinnings and applications span multiple domains, each characterized by significant technological advancements and accompanying ethical considerations. As AI continues to permeate various sectors, it is incumbent upon policymakers, researchers, and industry stakeholders to collaboratively navigate its integration, ensuring that AI-based innovations are aligned with ethical imperatives and societal well-being.

### Principles of Technology Regulation and Ethical Considerations in AI Development

The regulatory governance of AI has become an increasingly prominent issue as technological advancements outpace existing legal and ethical frameworks. The theoretical underpinnings of technology regulation are based on principles such as transparency, accountability, fairness, and protection of individual rights, which are fundamental to fostering public trust in AI systems and ensuring ethical implementation.

Ethical guidelines are an essential component of AI regulation. A comprehensive review of AI ethical guidelines underscores the heterogeneity of existing frameworks, indicating inconsistencies in ethical principles and governance approaches (Jobin & Ienca, 2019). The absence of a unified and standardized regulatory framework exacerbates the risk of ethical violations and public distrust, necessitating a more comprehensive and universally applicable set of regulatory principles.

In healthcare AI, regulatory interventions have been implemented to improve transparency and reliability. The CONSORT-AI and SPIRIT-AI extensions provide a standardized reporting framework for clinical trials involving AI, ensuring rigorous validation of AI-driven medical interventions. These reporting guidelines contribute to the establishment of ethical standards in medical research, reinforcing the need for transparent and reproducible AI methodologies in clinical applications.

Philosophical perspectives on ethics provide further insight into the formulation of AI regulations. Utilitarianism advocates maximizing overall societal benefits, a perspective that policymakers can use when assessing the trade-offs associated with AI applications. In contrast, deontological ethics emphasizes moral obligations and rights, which serve as the basis for regulations that prioritize data privacy and individual autonomy (Perrier et al., 2022). Virtue ethics, which focuses on the moral character of AI developers and stakeholders, underscores the importance of ethical responsibility in AI innovation.

Interactions between state and non-state actors also influence AI governance. Research shows that civil society organizations, industry stakeholders, and multinational corporations play an important role in shaping AI regulations, especially in the European Union (Tallberg, 2024). This underscores the need for multi-stakeholder collaboration in AI governance to ensure that diverse perspectives and expertise inform regulatory policy.

Public perceptions of AI regulation further influence policy design. Studies show that cultural and psychological factors shape individuals' acceptance of AI technologies, with regulatory expectations varying across different socio-political contexts (Barneck et al., 2023; Sindermann et al., 2022). In regions where government-led AI initiatives are prevalent, public trust in AI tends to be higher, whereas in societies with high privacy concerns, skepticism towards AI governance is more pronounced.

In the domain of mental healthcare, AI ethics have been analyzed through the lens of ethics of care, which emphasizes the relational aspects of AI interactions (Tavory, 2024). This perspective

advocates for regulatory frameworks that consider the impact of AI on human relationships and caregiving dynamics rather than focusing solely on accountability and liability.

The evolution of AI regulation varies across geopolitical landscapes. In China, for example, AI commercialization has been aggressive, raising concerns about the balance between technological efficiency and social stability (Liu, 2024). In contrast, privacy-centered governance models prioritize data protection and algorithmic fairness in Western regulatory frameworks. This difference highlights the need for globally harmonized AI regulations to reduce regulatory fragmentation.

In conclusion, AI governance is a complex and dynamic endeavor that requires an interdisciplinary approach, integrating ethical theory, legal oversight, and community engagement. As AI continues to shape the global industry, building a robust and adaptable regulatory framework will be critical in protecting human rights, ensuring fairness, and fostering trust in AI technologies. The discourse on AI ethics and regulation will undoubtedly remain central to the future trajectory of AI governance.

## RESEARCH METHOD

This study employs a qualitative approach with a descriptive-exploratory design to examine the regulation of artificial intelligence (AI) and its social implications. This method is chosen because it enables an in-depth understanding of complex and dynamic phenomena, particularly in relation to policies, ethical dilemmas, and the social consequences arising from the implementation of AI in various sectors (Creswell & Poth, 2018).

The data in this study are derived from secondary sources, including official documents, accredited scientific literature, government policies, and reports from international organizations related to AI governance. Data collection was conducted through a systematic literature review, by searching for academic journals, monographs, cross-country case studies, and relevant regulatory documents (Bowen, 2009; Snyder, 2019). The systematic search process ensures the completeness and relevance of the data, thereby providing a comprehensive overview of the dynamics of AI regulation and its relationship with public policy and human rights.

Data analysis was carried out using content analysis techniques and a comparative approach to regulatory frameworks across various jurisdictions. The analytical steps included the categorization of AI regulatory models, assessment of ethical and social aspects, comparative analysis of policy frameworks, as well as the identification of major challenges and policy recommendations (Bowen, 2009; Mayring, 2015). Through this approach, the study evaluates AI governance structures within various regulatory paradigms—human rights-based, market mechanisms, and state-controlled models.

With this methodological framework, the research is expected to make a significant contribution to the discourse on AI governance through a critical and evidence-based analysis, thus serving as a reference for policymakers, academics, and industry stakeholders (Creswell & Poth, 2018).

## RESULT AND ANALYSS

### AI Regulation in the European Union

The European Union (EU) has positioned itself as a global leader in the governance of artificial intelligence, underpinned by a strong commitment to ethical considerations, the protection of human rights, and the promotion of responsible technological innovation. Recognizing the transformative potential of AI, the EU has sought to establish a regulatory framework that effectively mitigates risks while fostering an ecosystem conducive to innovation and economic growth. This regulatory approach is exemplified by the Artificial Intelligence Act (AI Act), an important legislative initiative that aims to ensure that AI systems deployed in the EU adhere to safety, transparency, accountability, and human-centered development principles. Given the rapid evolution of AI technology and its transnational implications, EU regulatory efforts not only seek to address domestic challenges but also aspire to shape international AI governance norms. This analysis explores the key components of the AI Act, the ethical framework underlying AI regulation, governance challenges, and broader implications for policy and industry.

#### *The AI Act: Scope and Framework*

The Artificial Intelligence Act, first proposed by the European Commission in April 2021, is a significant milestone in AI regulation, adopting a risk-based classification system to delineate the

different levels of oversight required for AI applications. The law categorizes AI systems into four levels of risk: unacceptable risk, high risk, limited risk, and minimal risk. AI systems are deemed unacceptable as those used for social assessment or manipulative behavioral techniques are banned outright due to potential human rights violations (Hasan, 2024). In contrast, high-risk AI systems, such as those used in critical infrastructure, law enforcement, and healthcare, are subject to strict regulatory oversight, requiring adherence to standards of transparency, human oversight, and accountability (Gasser, 2023). AI applications classified as limited risk, such as chatbots or recommendation algorithms, must ensure transparency in their operation, while AI applications with minimal risk—such as AI-powered spam filters—face little to no regulatory interference.

A distinguishing feature of the AI Act is its proactive regulatory stance, which requires compliance with ethical standards and data governance requirements throughout the lifecycle of AI systems. Central to this approach are provisions related to algorithmic transparency, bias mitigation, and human-in-the-loop oversight mechanisms, ensuring that AI technologies used in the EU align with fundamental rights and democratic values (Gasser, 2023). By incorporating these requirements into the legislative framework, the EU seeks to balance innovation with risk mitigation, positioning itself as a global standard-setter in AI governance.

#### *Ethical Principles and AI Governance Framework*

The EU's regulatory strategy is firmly rooted in ethical AI governance, drawing on well-established transparency, accountability, fairness, and human rights protection principles. A comparative analysis of global AI ethical guidelines shows that the EU has been at the forefront of developing normative frameworks, with 19 key policy documents released, rivaling the 20 policy documents produced by the United States (Jobin & Ienca, 2019). These ethical frameworks serve as the foundation for AI regulation, ensuring that AI systems are evaluated in terms of efficiency and accuracy and their broader social impacts.

The High-Level Expert Group on Artificial Intelligence, established by the European Commission, has played an essential role in shaping the ethical contours of AI regulation. The group advocates for a human-centered AI paradigm, emphasizing the importance of stakeholder engagement, inclusivity, and the reduction of systemic bias in AI development (Giarmoleo et al., 2024). The prioritization of algorithmic fairness and non-discrimination is critical given the growing body of empirical evidence showing that AI systems can unintentionally perpetuate social biases through skewed training data (Caliskan et al., 2017). The integration of ethics-in-design principles into AI development is, therefore, an essential regulatory objective to ensure that AI technologies enhance, rather than undermine, public trust and the integrity of democracy.

#### *Institutional Governance and Oversight*

The governance architecture around AI regulation in the European Union is characterized by a multilevel regulatory approach involving national governments, industry stakeholders, and civil society organizations. This co-regulatory model reflects a pragmatic recognition of the evolving nature of AI, which requires governance structures that can adapt to rapid technological advances while safeguarding ethical and legal principles (Liebig et al., 2024). The AI Law underscores the importance of intergovernmental and cross-sectoral collaboration, advocating for establishing an independent oversight body tasked with monitoring AI compliance, conducting audits, and enforcing accountability measures.

In addition, the AI Law highlights the need for international regulatory alignment, given that AI technologies are inherently transnational in scope. As AI applications transcend national borders, the EU has sought to position itself as a global leader in AI governance, influencing multilateral discussions on AI ethics, risk management, and policy harmonization (Hasan, 2024). The EU's proactive engagement with international organizations, including the United Nations, OECD, and G7, signals its commitment to setting global AI governance standards that reflect democratic values and the protection of human rights.

#### *Challenges and Criticisms of AI Regulation in the European Union*

Despite the ambitious goals of the AI Act, its implementation and enforcement present several critical challenges. One major concern is the potential stifling of innovation, especially for small and medium-sized enterprises (SMEs) that may not have the financial and technical capacity to comply with

stringent regulatory requirements (Gilbert et al., 2023). Compliance costs associated with data governance, bias audits, and algorithmic transparency may disproportionately burden smaller AI developers, potentially consolidating market power in larger technology companies with the resources to meet regulatory demands.

In addition, concerns regarding regulatory fragmentation have been raised, as different EU member states may adopt different interpretations and enforcement mechanisms, potentially leading to inconsistencies in AI governance (Walter, 2024). This issue is particularly relevant given the need for harmonized implementation to ensure that AI Laws are effectively enforced across the EU single market.

Another challenge relates to mitigating bias and discrimination in AI systems. Although the AI Act mandates bias mitigation strategies, existing research suggests that algorithmic biases are often deeply embedded in training data (Caliskan et al., 2017). The effectiveness of regulatory interventions in eradicating systemic bias remains an open question, requiring continuous refinement of audit methodologies and oversight mechanisms.

## AI Regulation in the United States

Artificial intelligence (AI) governance in the United States represents a diverse and evolving landscape shaped by the confluence of federal policy initiatives, state-level legislative actions, and industry-led regulatory frameworks. Unlike the EU's comprehensive and centralized approach to AI regulation, the US model is decentralized, favoring market-driven solutions, voluntary guidelines, and sectoral oversight mechanisms. This approach reflects the country's long-standing emphasis on technological innovation and economic competitiveness while grappling with pressing concerns regarding AI ethics, accountability, and social impact. Given the rapid development of AI capabilities and its pervasive influence across industries, the regulatory discourse in the United States remains in flux, characterized by ongoing efforts to balance technological advances with ethical imperatives. This analysis critically reviews AI regulation in the United States, examining federal initiatives, state-level interventions, ethical considerations, regulatory challenges, and the role of public engagement in shaping AI governance.

### *Federal Initiatives and Regulatory Frameworks*

In recognition of the transformative potential of AI and the risks associated with its unchecked application, the U.S. federal government has taken incremental steps to establish a cohesive regulatory framework. The National AI Initiative Act of 2020 laid the foundation for coordinating AI research, development, and policy implementation across multiple federal agencies, with a particular focus on maintaining U.S. global leadership in AI innovation (Jobin & Ienca, 2019). This legislative effort underscores the administration's commitment to fostering collaboration between academia, industry, and public agencies, facilitating technological advancement and regulatory oversight.

The White House Office of Science and Technology Policy (OSTP) has played an essential role in shaping AI governance at the federal level. In 2022, OSTP introduced the Blueprint for an AI Bill of Rights, a policy document that articulates a set of guiding principles aimed at protecting individuals from the potential harms of AI technologies (Vinuesa et al., 2020). The AI Bill of Rights emphasizes core values such as transparency, fairness, accountability, and protection of civil rights, advocating for an AI system that is interpretable, non-discriminatory, and aligned with fundamental human rights. While not legally binding, this framework is a normative reference point for organizations developing and deploying AI technologies, setting expectations for ethical AI practices across sectors.

### *State-Level Regulation and Policy Fragmentation*

Individual states have taken proactive steps to address specific AI-related issues without a comprehensive federal AI regulatory framework. States such as California, Illinois, and Massachusetts have pioneered targeted legislation to regulate the use of AI in areas such as facial recognition, data privacy, and autonomous vehicle use. For example, the California Consumer Privacy Act (CCPA), one of the most significant state-level data protection laws, directly impacts AI-driven data processing and algorithmic decision-making by giving consumers greater control over their personal information (Law et al., 2025). Such initiatives highlight the growing recognition of the implications of AI on individual privacy and data security, necessitating legal protections to prevent misuse and exploitation.

In addition, some states have imposed moratoriums on the use of AI-based facial recognition technology by law enforcement agencies, citing concerns related to racial bias, civil liberties, and surveillance ethics (Hasan, 2024). These state-level interventions exemplify a bottom-up regulatory approach, where individual jurisdictions develop AI oversight mechanisms in response to public advocacy, ethical considerations, and emerging risks. However, the resulting regulatory heterogeneity raises concerns regarding policy fragmentation, as businesses operating in different states must navigate a patchwork of AI regulations, potentially creating inconsistencies in governance and compliance standards.

### *Ethical Considerations and Industry Self-Regulation*

The ethical dimensions of AI deployment have emerged as a significant concern in regulatory discussions in the US. A comparative analysis of AI ethical frameworks reveals that the United States has produced a large number of ethical guidelines, surpassing many other jurisdictions (Jobin & Ienca, 2019). These guidelines underscore fundamental principles such as algorithmic fairness, bias mitigation, and human-centered AI design, reflecting a broader societal push towards responsible AI innovation.

Industry stakeholders have played an essential role in shaping AI governance through self-regulatory initiatives and voluntary compliance mechanisms. The Partnership on AI, a multi-stakeholder consortium comprising major technology companies, research institutions, and civil society organizations, has established best practices for ethical AI development, advocating for transparent and accountable AI governance structures (Du, 2023). Similarly, corporate AI ethics boards at leading technology companies have been tasked with evaluating the social impact of AI applications, although concerns regarding conflicts of interest and regulatory capture remain.

While these industry-led efforts contribute to a more structured approach to AI governance, they remain non-binding and subject to voluntary enforcement, raising questions about their effectiveness in preventing AI-related harms. Without a legally enforceable regulatory framework, reliance on corporate self-regulation may result in inconsistent adherence to ethical standards, leaving marginalized individuals and communities vulnerable to algorithmic bias and unfair decision-making processes.

### *Challenges in AI Regulation*

Despite the gradual progress that has been made in AI regulation, several challenges remain. One major concern is the fragmented nature of AI governance, where initiatives led by federal, state, and industry governments operate in parallel without a unified regulatory framework (Wirtz et al., 2018). This lack of coherence creates regulatory gaps and inconsistencies, hindering the development of standardized approaches to AI surveillance.

Another critical challenge is the rapid pace of AI innovation, which often outpaces the ability of regulatory bodies to develop timely and effective oversight mechanisms (Schiff et al., 2024). The dynamic nature of AI technology requires adaptive regulatory approaches, but policymakers often struggle to anticipate and address emerging risks. Balancing regulatory stringency with the need to maintain the United States competitive advantage in AI development remains an ongoing dilemma.

In addition, there is growing concern that existing AI regulations do not adequately address systemic biases embedded in AI models. Research has shown that AI systems trained with historically biased data sets can unintentionally perpetuate discrimination, especially in sectors such as hiring, lending, and criminal justice (Kazim & Koshiyama, 2021). Overcoming these biases requires intense regulatory interventions, independent audits, and standardized fairness assessments, which are currently lacking in AI governance structures in the United States.

### *Public Engagement & the Future of AI Regulation*

Public participation in AI regulation is increasingly recognized as essential in shaping fair and socially responsible policies. OSTP's AI Bill of Rights emphasizes the need for broad stakeholder engagement, ensuring that AI regulations reflect the interests and concerns of diverse communities, especially those disproportionately affected by AI systems (Vinuesa et al., 2020).

Advocacy groups and civil society organizations have played an important role in demanding greater transparency and accountability in AI governance, calling for legislative measures prioritizing public welfare over corporate interests. This growing demand for public oversight suggests that AI

regulation in the US may continue to evolve in response to societal expectations, legal challenges, and ethical imperatives.

### **AI Regulation in China: A Model of Strict Supervision and State Control**

China's regulatory approach to artificial intelligence (AI) reflects the complex interplay between technological advancement, state control, and socio-economic goals. As the Chinese government strives to establish itself as a global leader in AI development, its regulatory framework is uniquely designed to encourage innovation while maintaining strict oversight of AI applications. Unlike the market-driven and fragmented approach in the United States or the rights-based regulatory model in the European Union (EU), China's AI governance is characterized by a centralized, state-led strategy that aligns AI development with national security, political stability, and economic priorities.

This case study examines the motivations underlying China's AI regulations, the specific legal measures enacted to regulate AI systems, and the broader implications for domestic and international AI governance. As AI technologies increasingly become geopolitical assets, China's regulatory strategies shape domestic AI innovation and influence global AI governance and international regulatory competition.

#### *China's Dual-Track Regulatory Approach to AI Governance*

China has adopted a dual-track regulatory approach integrating restrictive and facilitative measures to regulate AI technology. On the one hand, the government imposes strict controls on AI applications that may threaten political stability or disrupt social order. On the other hand, the government actively encourages AI innovation through state-led initiatives designed to position China at the forefront of AI-driven economic growth.

China's Party-Government apparatus utilizes AI policy as a strategic tool to achieve broader technological development goals as well as regime security, reflecting a form of authoritarian legality that prioritizes state interests over individual freedom (Liu, 2024). This perspective is further strengthened by the comparison between China's state-controlled AI governance model and the European Union's human rights-based regulatory framework, which highlights Beijing's utilization of AI as a mechanism for digital governance and mass surveillance (Nanni, 2024).

#### *Key Legislative and Regulatory Measures*

The rapid expansion of AI technologies in China has necessitated the introduction of targeted regulatory measures to address emerging risks. In 2022 and 2023, China enacted several necessary AI regulations to regulate generative AI, algorithmic recommendation systems, and data security.

A particularly important regulation is the Interim Measures for the Management of Generative Artificial Intelligence Services, which establishes compliance obligations for AI service providers and mandates a dual registration system for AI models and algorithms (Yang, 2024). This framework ensures that AI-generated content remains aligned with state-sanctioned narratives, effectively preventing AI systems from generating politically sensitive or disruptive content.

In addition, algorithmic recommendation regulations in China impose strict scrutiny on AI-driven content curation, especially on social media, search engines, and news dissemination. These measures reflect broader government efforts to control the flow of information and reduce algorithmic manipulation, ensuring that AI systems serve as tools for governance, not as sources of dissent (Franks, 2024).

#### *Geopolitical Implications and Global AI Governance*

AI regulation in China is also influenced by geopolitical considerations, particularly in response to Western regulatory frameworks and technological restraint strategies. As the European Union and the United States develop their own AI governance models, China has sought to assert itself as a leader in terms of regulation, shaping international AI policy to align with its state-driven governance philosophy (Mokry, 2024).

This regulatory assertiveness is evident in China's engagement with global AI standard-setting bodies, where it has advocated for an AI governance model that prioritizes sovereign control and digital security over Western human rights-based approaches. China's strategy of balancing AI innovation with strengthened political oversight makes it a formidable player in global AI competition (Ma, 2024).

In addition, the differences between China's AI regulatory model and the EU's regulatory model have triggered regulatory competition, raising concerns about the fragmentation of global AI standards. As more countries seek to align their AI policies with China's centralized governance model or the EU's ethical oversight framework, the global regulatory landscape for AI has the potential to become increasingly polarized (Xia, 2024).

#### *AI Innovation and Economic Development Under State Control*

Despite the strict regulatory environment, China has also implemented policies to accelerate AI-driven innovation and economic growth. The New Generation Artificial Intelligence Development Plan (2017) serves as the cornerstone of China's AI strategy, which outlines a long-term vision for AI leadership that emphasizes technological independence, industrial automation, and digital sovereignty (Bhatia, 2024).

This state-led AI strategy is designed to support China's AI industry by (1) providing state subsidies and research funds for AI startups and companies, (2) developing AI-powered industrial automation to improve manufacturing productivity, and (3) encouraging AI adoption in strategic sectors, such as finance, defense, and infrastructure.

By aligning economic policy with AI governance, China's centralized system allows for rapid enforcement of regulations, ensuring that AI innovation proceeds in a manner consistent with national interests (Tang, 2024).

#### *Ethical Considerations in AI Regulation in China*

Contrary to the assumption that ethics are sidelined in China's AI governance model, recent regulatory developments suggest that ethical considerations play a central role in shaping AI policy. The Chinese government has initiated discussions on AI ethics, aiming to establish a new normative framework that reflects broader goals in terms of digitization, automation, and governance efficiency (Papagiannas, 2023).

This ethics-based approach balances AI development with public trust and social stability, ensuring that AI adoption does not trigger public resistance or exacerbate socio-economic disparities. However, critics argue that China's state-centered AI ethics framework remains fundamentally different from Western AI ethics paradigms, as it prioritizes collective stability over individual autonomy (Zeng, 2020).

#### *Regulatory Adaptation & Future AI Governance Trends*

China's AI regulatory framework is highly adaptive, constantly evolving in response to technological breakthroughs and emerging risks. As AI capabilities evolve, the government is expected to refine its regulatory mechanisms further to address challenges associated with autonomous decision-making, generative AI, and AI-enhanced cybersecurity threats (Filipova, 2024).

This regulatory agility allows China to maintain its competitive edge in AI innovation, ensuring that AI technologies remain aligned with the country's goals while minimizing disruptive risks. Moreover, as global AI competition intensifies, China's regulatory approach may influence international debates on AI governance, driving discussions on the trade-offs between state control, technological sovereignty, and digital rights.

### **AI Regulation in Indonesia: Existing Frameworks and Challenges in Governance**

The governance of artificial intelligence (AI) in Indonesia is a new and evolving domain shaped by the country's socio-political landscape, technological aspirations, and economic development strategy. As AI technology increasingly penetrates various sectors, the Indonesian government has a dual responsibility to encourage innovation while ensuring strong legal and ethical protections. Unlike more mature AI regulatory environments in regions such as the European Union and China, Indonesia's approach remains fragmented, reactive, and largely sectoral, primarily addressing data protection and digital security rather than AI-specific risks and opportunities.

This analysis examines the current state of AI regulation in Indonesia, the challenges inherent in its implementation, and the broader implications for governance, public trust, and international alignment. Given AI's profound impact on economic productivity, public administration, and individual rights, the absence of a cohesive AI governance framework poses a critical regulatory gap and requires urgent policy intervention.

### *Existing AI Regulatory Framework in Indonesia*

The AI regulatory landscape in Indonesia is still in its infancy, with no comprehensive legislation specifically addressing AI governance. Instead, existing legal and policy instruments focus on data privacy, cybersecurity, and digital transformation, so AI governance is scattered across various regulations and institutional mandates.

A key component of Indonesia's digital regulatory framework is the Personal Data Protection Law (PDP Law), enacted in 2022, which provides a legal basis for data privacy protection. However, while the PDP Law introduces important provisions for user consent, data security, and cross-border data transfers, it does not explicitly address the nuances of AI technologies (Adytia, 2024). This omission is critical, as AI systems are inherently data-intensive, relying on large-scale data processing, machine learning algorithms, and predictive analytics activities that pose unique risks to privacy, user rights, and algorithmic transparency (Keith, 2024).

Beyond data protection, AI applications in Indonesia are still governed by sectoral policies, such as AI applications in public administration, healthcare, and financial services. However, the absence of clear and uniform guidelines has resulted in inconsistencies in regulatory interpretation and compliance enforcement (Kurhayadi, 2022). This regulatory fragmentation creates uncertainty among stakeholders, especially private companies, AI developers, and public institutions, who struggle to navigate various legal obligations and ethical considerations (Chairani, 2022).

### *Challenges in AI Regulation in Indonesia*

#### 1. Absence of a Unified Regulatory Framework

A significant barrier to effective AI governance in Indonesia is the lack of a cohesive legal framework. Unlike jurisdictions like the European Union, which has introduced an Artificial Intelligence Law, or China, which enacted strict AI compliance regulations, Indonesia lacks a specific legislative framework addressing AI-specific risks and governance mechanisms. This regulatory void creates legal ambiguity regarding AI's role in decision-making, responsibility, and accountability, hindering responsible AI adoption and innovation.

The current sectoral and reactive approach to AI regulation leads to inconsistent enforcement, especially on high-risk applications such as facial recognition, automated decision-making, and algorithmic profiling. Without legal certainty, businesses and policymakers lack clear guidelines on compliance, potentially stifling AI-based innovation and exacerbating regulatory uncertainty (Wirtz et al., 2018).

#### 2. Balancing Innovation with Ethical and Legal Compliance

Indonesia's AI development strategy is closely linked to the broader digital transformation agenda, which emphasizes the role of AI in improving public services, economic growth, and administrative efficiency. However, achieving this vision requires a regulatory environment that encourages innovation while ensuring ethical safeguards.

A key challenge is preventing AI-induced bias, promoting transparency, and upholding accountability. AI systems, especially in automated decision-making, predictive policies, and credit scoring, risk reinforcing existing social inequalities if used without adequate oversight and fairness mechanisms (Wirtz et al., 2018). The challenge for regulators in Indonesia is to design policies that encourage the adoption of AI without compromising fairness, human rights, or democratic accountability.

#### 3. Limited Regulatory and Institutional Capacity

AI regulation requires specialized legal and technical expertise, yet regulatory institutions in Indonesia lack the capacity and expertise needed to oversee AI development and implementation effectively. The legal education system, for example, remains largely traditional, with limited emphasis on emerging technologies, AI ethics, and digital law (Arianto, 2024).

In addition, regulators and policymakers lack the technical ability to critically assess AI systems, leading to potential regulatory blind spots in risk evaluation and enforcement. The absence of AI-specific regulatory bodies further exacerbates institutional inefficiencies, making it challenging to develop adaptive and responsive governance mechanisms (Ravizki & Yudhantaka, 2022).

#### 4. Public Trust, AI Ethics, and Public Concerns

As AI increasingly integrates into everyday life, public concerns regarding privacy, surveillance, and algorithmic bias are growing. The lack of transparency in AI decision-making, especially in

automated administrative processes and law enforcement, raises concerns about due process, fairness, and potential discrimination.

The Indonesian government should actively engage in public dialog to address these challenges, promoting AI literacy and transparency. Public trust in AI governance depends on ensuring that AI systems are not only legally compliant but also ethically sound (Huang et al., 2023). This requires clear public communication, independent oversight, and mechanisms for AI accountability and redress.

#### 5. International Alignment and Regulatory Harmonization

Regional and global regulatory trends also shape AI governance in Indonesia. AI governance in Southeast Asia, including Indonesia, is influenced by international standards, which require policymakers to align AI regulations with global best practices (Keith, 2024). As AI technology transcends national borders, Indonesia should actively participate in international AI policy discussions, ensuring its regulatory framework is aligned with evolving global standards.

Through participation in ASEAN-led AI initiatives and global AI governance forums, Indonesia can tap into international expertise, adopt best practices in AI risk management, and improve its competitiveness in the global AI market.

#### *The Way Forward: Recommendations for AI Regulation in Indonesia*

To address these challenges and build a more structured and effective AI regulatory environment, Indonesia should undertake the following key policy reforms:

1. Develop a comprehensive AI Governance framework: Introduce AI-specific regulations that define AI risks, set compliance standards, and establish oversight mechanisms.
2. Strengthen institutional capacity: establish specialized AI regulatory bodies to oversee AI applications, conduct audits, and enforce compliance.
3. Enhance public and private sector collaboration: Foster public-private partnerships to develop AI regulations that balance economic growth with ethical AI practices.
4. Promote AI legal education and training: Integrate AI ethics, data governance, and digital law into law curricula and policymaking to ensure regulators and legal professionals can navigate AI-related complexities.
5. Engage in international AI Governance initiatives: Align AI regulations with ASEAN, OECD, and other international frameworks to ensure global interoperability and compliance with evolving AI standards.

#### The Transformative Role of Artificial Intelligence in Modern Society

The integration of Artificial Intelligence (AI) in various sectors has driven significant transformations, especially in improving work efficiency, driving automation, driving innovation in healthcare, transportation, and communications, and contributing to the expansion of the digital economy. This analysis systematically examines these developments, supported by a comprehensive review of the scientific literature.

##### *Increasing Work Efficiency and Automation*

AI technologies have fundamentally changed workplace dynamics by automating routine and repetitive tasks and optimizing efficiency and productivity. AI-facilitated automation minimizes the time allocated to monotonous activities, allowing human employees to shift their focus to complex problem-solving and creative endeavors. For example, AI-driven automation streamlines administrative processes such as scheduling, data entry, and document management, which have traditionally burdened employees with significant time. Empirical studies show that these improvements not only boost productivity but also contribute to increased job satisfaction, as employees engage in tasks that require higher cognitive input (Bhagat, 2024; Kumar et al., 2022).

In addition, AI's ability to analyze very large data sets with precision drives data-driven decision-making. In sectors such as finance and logistics, AI algorithms facilitate predictive analysis, trend forecasting, and supply chain optimization, resulting in substantial cost reduction and service improvement (Apell & Eriksson, 2021; Kumar et al., 2022). The application of AI in these domains has shown significant improvements in operational efficiency, error reduction, and adaptability to market fluctuations (Palaniappan, 2024).

The healthcare sector has also benefited from AI-driven advancements, especially in predictive analytics and automated diagnostic systems. AI applications analyze patient data to identify potential health risks, thereby improving preventive care and reducing the burden on healthcare professionals (Kelly et al., 2019; Secinaro et al., 2021). In addition, the integration of AI in imaging technologies has significantly improved diagnostic accuracy and response time, which is crucial in emergency medical contexts (Esteva et al., 2021; Shi et al., 2021).

#### *Catalyzing Innovation in Healthcare, Transportation, and Communications*

AI is a key driver of innovation in various industries, with particularly important contributions in healthcare, transportation, and communications. In healthcare, AI-powered technologies enhance diagnostic accuracy, facilitate personalized treatment plans, and optimize administrative workflows. For example, AI-assisted imaging analysis improves radiology diagnostics by identifying anomalies with higher precision than conventional methods, ultimately speeding up the treatment process and improving patient outcomes (Alhur, 2024; Bhagat, 2024; Shi et al., 2021; Zeb, 2024).

In transportation, AI has been instrumental in advancing autonomous vehicle technology and intelligent traffic management systems. These AI-driven innovations leverage real-time data to optimize routes, reduce congestion, and improve public safety, thereby contributing to sustainability through lower emissions (Kumar et al., 2022; Palaniappan, 2024). In addition, AI-powered navigation systems have significantly improved user experience by providing accurate and real-time traffic updates and route recommendations (Kumar et al., 2022; Palaniappan, 2024).

The communication sector has also undergone substantial transformation through AI advancements. Natural Language Processing (NLP) applications, including chatbots and virtual assistants, have revolutionized customer service by providing instant and contextually appropriate responses, thus facilitating seamless interactions between businesses and consumers (Alhur, 2024). These innovations improve operational efficiency while increasing user satisfaction through personalized engagement (Alhur, 2024; Bhagat, 2024).

#### *The Role of AI in Digital Economy Development*

AI is a fundamental driver of the digital economy, enabling businesses to utilize data for strategic decision-making and operational improvements. The convergence of AI and blockchain technology, for example, has increased transparency and security in financial transactions, fostering greater trust in digital platforms (Kumar et al., 2022; Palaniappan, 2024). This integration facilitates more efficient auditing and compliance processes, which are critical to maintaining the integrity of the financial system (Kumar et al., 2022; Palaniappan, 2024).

In addition, AI-based analytics empower businesses to gain deeper insights into consumer behavior, thus enabling more targeted marketing strategies and better product development. By analyzing customer data, companies can identify market trends and preferences, thereby improving competitiveness and driving innovation (Apell & Eriksson, 2021; Kumar et al., 2022). This data-centric approach ensures that businesses remain agile and responsive to evolving market demands (Apell & Eriksson, 2021; Kumar et al., 2022).

In the healthcare sector, AI's contribution to the digital economy is particularly evident in telemedicine and remote patient monitoring. These AI-enhanced technologies facilitate medical consultations and continuous health monitoring for patients in remote or underserved areas, thereby improving healthcare accessibility and reducing disparities (Palaniappan, 2024; Thu, 2023). The development of AI-powered digital health platforms has transformed how healthcare is delivered, making it more efficient, personalized, and accessible (Palaniappan, 2024; Thu, 2023).

#### **The Transformative Role and Potential Danger of Artificial Intelligence**

The rapid advancement of Artificial Intelligence (AI) has driven major changes in various sectors. However, alongside its benefits, AI also brings significant risks that require close academic scrutiny. Among these concerns is the proliferation of misinformation and manipulation, primarily through deepfake technology, which threatens democratic processes and public trust. In addition, AI applications in national security, particularly in cyberwarfare and political propaganda, present substantial challenges to information integrity and national stability. This analysis critically examines these risks, supported by relevant scientific references.

### *Deepfakes and the Spread of Misinformation*

One of the most pressing concerns associated with AI is the rise of deepfakes- highly realistic digital fabrications that can manipulate audio and visual content. This technology can potentially mislead audiences by spreading false information under the guise of credibility, thus eroding trust in media institutions. Deepfakes have been used to create misleading news reports, distort public opinion, and influence electoral processes, posing a direct threat to democratic governance (Arda, 2024; Mahony, 2024). The relative ease of creation and dissemination of deepfake content amplifies the challenge of distinguishing authentic information from manipulated media, underscoring the importance of media literacy and critical digital engagement (Pillai & Metri, 2022).

Beyond its role in misinformation, deepfake technology contributes to broader epistemic uncertainty, where public skepticism towards legitimate media sources increases. As awareness of digital manipulation increases, the public may begin to doubt verifiable information, leading to widespread distrust of journalism and government institutions (Arda, 2024; Mahony, 2024). This erosion of trust can exacerbate societal polarization, inhibit constructive discourse, and undermine democratic decision-making (Arda, 2024).

Moreover, AI-driven misinformation is not just limited to deepfakes. AI-powered algorithms are increasingly being used to amplify false narratives across social media platforms, reaching large audiences at an unprecedented speed. AI-generated bots and recommendation systems create digital echo chambers that amplify misinformation, complicating efforts to foster informed public discourse (Blauth et al., 2022). The use of AI in orchestrating disinformation campaigns during political events is particularly worrisome, as it can manipulate voter perceptions and alter election outcomes (Arda, 2024).

### *AI as an Instrument of Manipulation and Threat to Democratic Stability*

The application of AI in the media is not only limited to deepfake technology but also includes broader strategies to shape public perception. AI systems are capable of analyzing massive data sets to exploit cognitive biases and influence decision-making through highly personalized messages (Faraoni, 2023). This form of digital persuasion, commonly referred to as “hyper nudging,” involves subtly steering individuals toward certain beliefs or behaviors without their explicit awareness, raising deep ethical questions regarding personal autonomy and consent (Faraoni, 2023). AI's potential to manipulate emotions and public opinion on a large scale is a direct challenge to the democratic process, as it jeopardizes citizens' ability to engage with factual and unbiased information.

Compounding this concern is the difficulty of regulating AI-driven misinformation. The rapid evolution of AI technology outpaces existing legal frameworks, creating a regulatory vacuum that bad actors can exploit (Arda, 2024). The challenge of holding individuals and organizations accountable for AI-generated content highlights the need for comprehensive policies that address the ethical and legal ramifications of AI in the media (Arda, 2024). Without strong oversight, AI-driven disinformation campaigns may continue to destabilize democratic institutions and distort public discourse.

### *National Security Threats Posed by AI*

In addition to the risks AI poses to the integrity of democracy, its implications for national security are equally important. The increasing sophistication of AI-driven cyberwarfare tactics has raised concerns regarding its use in malicious activities, including cyberattacks against critical infrastructure. AI-enhanced hacking techniques can identify and exploit system vulnerabilities on an unprecedented scale, resulting in disruptions to critical services and increasing threats to public safety (Blauth et al., 2022). AI's ability to conduct large-scale cyber operations poses a significant risk to national security, as hostile entities can utilize this capability to destabilize governments and manipulate geopolitical dynamics.

In addition, AI's role in political propaganda expands the reach and effectiveness of disinformation campaigns. Both state and non-state actors can leverage AI to create persuasive narratives tailored to specific demographics, further exacerbating ideological divisions within society (Blauth et al., 2022). AI's capacity to spread propaganda at scale threatens social cohesion, as it encourages misinformation-driven discord that can be exploited to undermine political stability (Blauth et al., 2022).

The intersection of AI and cybersecurity raises ethical concerns regarding developing and deploying autonomous military technologies. AI-driven weapon systems and autonomous drones pose complex dilemmas regarding accountability and decision-making in combat scenarios (Blauth et al., 2022) The delegation of life-and-death decisions to AI-driven systems challenges traditional moral and legal frameworks governing warfare, raising fundamental questions about the ethics of machine-operated combat (Blauth et al., 2022).

### **Transformative Potential and Ethical Imperatives of Artificial Intelligence**

Artificial Intelligence (AI) has become integral to various sectors, fundamentally transforming industries such as healthcare, finance, law enforcement, and social media. While AI offers excellent benefits, its unregulated application poses significant risks, including privacy violations, systemic discrimination, dissemination of misinformation, and potential human rights violations. Without proper regulatory oversight, AI can be exploited in ways that undermine social values and individual freedoms. Therefore, government intervention is essential to ensure the ethical application of AI, protect individual privacy, and uphold fundamental human rights while encouraging responsible technological innovation.

#### *Reducing AI Risks in Various Sectors*

One of the main concerns surrounding AI is its potential misuse in various industries. In law enforcement and surveillance, AI-powered facial recognition has been widely adopted, yet it often exhibits inaccuracies, especially among marginalized communities, leading to wrongful arrests and biased policing practices. In authoritarian regimes, AI-based surveillance mechanisms have been used to suppress dissent and unlawfully monitor citizens, raising profound ethical and legal concerns. In addition, AI is increasingly being integrated into hiring processes, where unchecked algorithms have been found to amplify bias, thus discriminating against certain demographic groups and limiting equal employment opportunities.

The military sector is another area of significant concern, as AI-driven autonomous weaponry is capable of making life-or-death decisions without human intervention, increasing the potential for unethical warfare. In addition, the rise of deepfake technology and AI-generated misinformation exacerbates challenges related to information integrity, as such tools can manipulate public opinion and threaten democratic institutions. Without comprehensive government oversight, AI risks being used as a weapon in ways that jeopardize justice, honesty, and national security.

#### *Protecting Human Rights and Individual Privacy*

Beyond its misuse in specific sectors, AI poses substantial human rights and privacy challenges. AI algorithms can process vast amounts of personal data, often without the user's consent. Governments and companies increasingly use AI to track online behavior, analyze personal data, and create detailed user profiles, leading to widespread privacy violations. AI-powered mass surveillance has contributed to a growing sense of digital oppression, where individuals feel constantly watched in the workplace, public spaces, and online platforms.

Furthermore, AI-driven decision-making systems, especially those used in financial services, healthcare, and criminal justice, can perpetuate systemic bias, disproportionately affecting historically marginalized communities. Without strict legal protections, AI risks exacerbating existing inequalities rather than correcting them, eroding public trust in institutions and technological progress.

### **The Importance of Government Regulation: Achieving a Balance Between Innovation and Responsibility**

While some critics argue that over-regulation can stifle AI-driven innovation, a well-calibrated regulatory framework can ensure that technological advancements are aligned with ethical and societal values. Government policies should establish clear accountability measures for AI developers and companies, mandating transparency in AI decision-making processes. The principle of explainable AI should be enforced, ensuring organizations can provide justifiable explanations for AI-generated decisions.

In addition, AI ethical standards should be mandated to reduce discrimination and bias, while international collaboration should be encouraged to build a globally unified AI governance structure.

AI should not replace human judgment in critical criminal justice, medicine, and finance domains. Governments should mandate human oversight in high-risk AI applications and invest in workforce retraining programs to mitigate the economic impact of AI-driven automation. Investments in retraining and upskilling initiatives are essential to facilitate workforce adaptation in an AI-driven economy.

#### *Preventing Corporate AI Monopolies*

In addition to labor issues, unregulated AI development risks consolidating power in a few dominant companies. Large technology companies have disproportionate access to data, computing resources, and financial capital, giving them a competitive advantage over smaller companies and startups. Without regulatory intervention, these companies can utilize AI to entrench their market dominance further, stifle competition, and block innovation. AI monopolies can result in a scenario where a few entities control critical digital infrastructure, dictate market trends, and limit consumer choice.

To prevent such monopolies, governments should create regulatory frameworks that promote fair competition in AI development. Policies should prohibit anti-competitive practices such as data hoarding, algorithmic bias, and exclusive AI access. Open-source AI initiatives and data-sharing policies can democratize access to AI research and development, allowing small companies and academic institutions to contribute meaningfully to technological advancement. In addition, the government should implement tax incentives to encourage companies to invest in AI-assisted job creation instead of mass layoffs.

#### *Ensuring Financial Market Stability*

The increasing reliance on AI in the financial system poses additional regulatory challenges. AI algorithms are widely used in stock trading, risk assessment, and financial decision-making, but their complexity and opaqueness make them difficult to regulate. Uncontrolled AI in financial markets can lead to economic instability, as evidenced by previous examples of AI-driven market crashes. Algorithmic trading, in particular, can cause rapid fluctuations in stock prices, creating systemic risks for investors and the economy at large. Governments should implement strict regulations to ensure transparency in AI-driven financial markets, reducing the potential for manipulative trading practices and economic destabilization.

#### **The Challenge of Rapid Technological Advancement**

One of the main challenges in AI regulation is the difficulty in keeping up with rapid technological advancements. AI evolves much faster than the legislative process, making it difficult for policymakers to create and implement regulatory frameworks that remain relevant over time. Traditional legal frameworks are often designed for static industries, whereas AI systems constantly evolve through machine learning, neural network updates, and algorithm refinements. When a regulatory policy is enacted, the technology may have outgrown its scope, rendering it obsolete or inadequate. This regulatory lag creates loopholes that can be exploited, leading to significant ethical issues such as biased AI decision-making, data privacy violations, and the development of autonomous weapons.

To address these issues, governments should explore adaptive and flexible regulatory mechanisms that evolve with AI advancements. One possible approach is the establishment of a regulatory sandbox, where AI developers and policymakers collaborate in a controlled environment to test, refine, and iteratively improve AI policies in real-time. Such a strategy would allow regulators to develop a deeper understanding of AI technologies while ensuring that regulations remain adaptable to technological advancements. In addition, adopting a dynamic AI governance model—where legal frameworks are updated continuously in response to new developments—can help mitigate the risks associated with outdated laws.

#### *Regulatory Gap Between Developed and Developing Countries*

The second major challenge in AI regulation is the significant difference between developed and developing countries in establishing comprehensive AI governance. Richer countries, equipped with advanced research institutions, financial resources, and strong regulatory bodies, are better positioned to formulate and enforce AI laws. In contrast, many developing countries lack the necessary infrastructure, expertise, and economic capacity to regulate AI effectively. This imbalance results in an

uneven global regulatory landscape, where AI policies are strictly enforced in some regions while weak or nonexistent in others.

Multinational technology companies often take advantage of this regulatory inconsistency by operating in jurisdictions with minimal AI oversight, allowing them to develop and deploy AI systems without regard to ethical and legal standards. This regulatory gap also leads to economic dependency, where developing countries become dependent on AI technologies produced by a few dominant countries, limiting their influence on AI governance and reducing technological sovereignty.

To address this regulatory gap, international cooperation is required. Global organizations such as the UN, G20, and other transnational regulatory bodies can play a central role in setting minimum AI governance standards that all countries can adopt. The international community can ensure a more equitable distribution of regulatory power by developing an AI ethics framework and encouraging capacity-building initiatives for AI governance in developing countries. In addition, cross-border collaboration in AI policy development can enable knowledge sharing and create mechanisms to mitigate the risks associated with the spread of unregulated AI in economically vulnerable regions.

#### *The Tension Between Innovation and Oversight*

The third significant challenge in AI regulation is the inherent tension between encouraging innovation and ensuring ethical and legal oversight. AI developers and technology companies advocate for minimal regulation to encourage innovation, attract investment, and maintain global competitiveness. They argue that excessive government intervention can stifle AI research, slow economic growth, and hinder the widespread adoption of beneficial AI applications. In contrast, policymakers, ethicists, and human rights advocates emphasize the need for strict AI regulations to mitigate risks, enforce privacy standards, and prevent harmful social impacts.

The dichotomy between technological advancement and regulatory oversight presents a complex policy dilemma. If regulations are too lax, AI systems may be used irresponsibly, resulting in biased decision-making, exacerbated economic disparities, and security vulnerabilities. Conversely, overly rigid regulations can stifle AI development, limiting potential breakthroughs in health, environmental sustainability, and other critical domains.

To reconcile this conflict, governments should adopt a risk-based regulatory approach, where high-risk AI applications (such as predictive policing, facial recognition for law enforcement, and autonomous military systems) are subject to strict oversight. In contrast, lower-risk applications (such as AI-driven customer service solutions) face fewer regulatory barriers. Establishing sector-specific regulatory frameworks can ensure that AI policies are proportionate to the risks associated with different applications.

In addition, AI governance should involve multi-stakeholder collaboration, bringing together governments, businesses, academic institutions, and civil society organizations to create comprehensive policies that balance innovation and accountability. Policymakers should prioritize transparency, requiring AI developers to disclose decision-making processes and ensuring algorithmic fairness through rigorous testing and independent audits. In addition, AI ethical guidelines should be enforced through regulatory bodies that monitor AI deployment and assess compliance with human rights and justice standards.

### **Recommendations for AI Regulation: A Framework for Ethical and Sustainable Governance**

Artificial Intelligence (AI) is profoundly reshaping industries and the fabric of society, offering significant advances while presenting complex ethical and regulatory challenges. As AI technologies evolve, policymakers must create a comprehensive regulatory framework that ensures responsible development and application. Effective AI regulation must balance encouraging innovation and addressing ethical, social, and economic concerns. To achieve this balance, an ideal AI regulatory framework should emphasize risk-based policy development, establish a national AI regulatory authority, increase transparency in AI development, and promote digital literacy throughout society.

#### *Risk-based Policy Development*

The basic principle of effective AI regulation is risk-based policy development, where AI applications are regulated according to their potential social impacts. Not all AI systems pose the same risks, and a uniform regulatory approach may stifle innovation and fail to address the challenges posed

by high-risk applications. Instead, AI technologies should be classified into risk categories for targeted and proportionate oversight.

For example, low-risk AI applications, such as recommendation algorithms for entertainment platforms, may require minimal regulatory intervention. Medium-risk AI, including AI-powered financial advisory services, should be subject to transparency and accountability requirements. High-risk AI, such as autonomous weapon systems, medical diagnostic tools, and AI-driven law enforcement applications, should be governed by strict ethical guidelines, human oversight, and rigorous compliance measures. A risk-based approach enables regulatory adaptation, ensuring that AI policies remain relevant and responsive to ongoing technological advancements.

#### *Establishment of a National AI Regulatory Authority*

The government should establish a dedicated national AI regulatory authority to facilitate effective governance and enforcement of AI regulations. This body should consist of experts in AI, ethics, law, economics, and industry stakeholders, encouraging a comprehensive and interdisciplinary approach to AI oversight.

The national AI regulatory authority will perform various functions, including setting ethical guidelines, monitoring AI-related risks, and ensuring compliance with legal frameworks. In addition, it should also oversee AI audit mechanisms, ensuring that AI applications are free from bias, uphold privacy standards, and do not perpetuate discriminatory practices. The regulatory authority should also collaborate with international AI governance organizations to harmonize policies across jurisdictions, prevent regulatory arbitrage, and ensure global consistency in AI governance. Centralizing AI oversight under a dedicated authority will provide clear and consistent guidelines for businesses, researchers, and developers, promoting ethical AI innovation while protecting the public interest.

#### *Increasing Transparency in AI Development*

Transparency is a cornerstone of ethical AI implementation. Many AI systems function as “black boxes”, where their decision-making processes remain opaque and complex to scrutinize. This lack of transparency raises significant concerns regarding bias, accountability, and fairness, especially in high-stakes criminal justice, recruitment, and healthcare.

To address these challenges, AI regulations should mandate requirements for explanation and auditability. AI developers should be required to disclose key aspects of their models, including data sources used for training, algorithmic decision-making processes, and results from bias and fairness testing. In addition, organizations should be encouraged to adopt open-source AI initiatives and undergo independent third-party audits to verify compliance with ethical AI standards. By encouraging transparency, regulators can increase trust, ensure accountability, and align AI applications with societal values.

#### *Promoting Digital Education and AI Literacy*

An important yet often overlooked component of AI regulation is the promotion of digital education and AI literacy. As AI continues to shape everyday life, citizens must be equipped with the knowledge to critically engage with AI technologies, understand their implications, and advocate for responsible AI governance.

Governments should invest in comprehensive education initiatives incorporating AI ethics, data privacy, and digital rights into school curricula. Universities should integrate AI literacy into multidisciplinary courses to ensure that future professionals understand AI's technical and ethical dimensions. In addition, public awareness campaigns should inform the public about how AI affects decision-making, including personalized advertising, algorithmic hiring bias, and the risk of misinformation caused by AI. Empowering individuals with AI literacy will enable them to make informed decisions, demand accountability from AI developers, and actively participate in shaping AI governance policies.

#### **Lessons for Indonesia from the EU, US, and China**

Indonesia can learn several important lessons from the experiences of these three global powers in regulating AI. From the European Union, Indonesia can emphasize a risk-based approach that focuses on the protection of human rights, transparency, and accountability. This model teaches the importance of clear regulations, although they must be balanced so as not to burden innovation for startups and

SMEs. From the United States, Indonesia can learn about regulatory flexibility through a market-driven approach and multi-level involvement (federal, state, and industry). This approach is relevant for encouraging private sector participation, but the potential for policy fragmentation must be watched carefully. From China, Indonesia can emphasize the need for strong coordination between state institutions in regulating AI, ensuring that innovation is in line with the national agenda, while also paying attention to the risks of overly centralistic control.

### Toward an Indonesian AI Governance Model

The most suitable model for Indonesia is an adaptive hybrid that combines the best elements of all three approaches. First, Indonesia needs to adopt EU-style risk-based regulation, placing human rights protection, transparency, and fairness as key principles. Second, the flexibility of US regulations can be adapted to encourage the involvement of industry, startups, and the research community, thereby maintaining innovation. Third, institutional coordination, such as in China, needs to be organized, for example through the establishment of a cross-sector National AI Authority, while still ensuring public accountability.

For Indonesia, this model will be effective if accompanied by: (i) The development of comprehensive risk-based AI regulations; (ii) Strengthening the capacity of legal institutions and regulators with the support of technology experts; (iii) Active involvement of multiple stakeholders (government, industry, academia, civil society); and (iv) Integration with the national development agenda, including the SDGs and the Indonesia Emas 2045 vision. With this adaptive hybrid model, Indonesia can balance the need for economic innovation with the protection of ethics and community rights, while strengthening its position on the global stage.

### CONCLUSION

The rapid development of artificial intelligence (AI) has brought significant benefits in various sectors, including healthcare, education, finance, and government. However, the poorly regulated application of AI also poses ethical, legal, and social challenges, such as algorithmic bias, privacy violations, and threats to democracy and social stability. Therefore, proper AI regulation is urgently needed to ensure these technologies are developed and applied responsibly.

The results of this study show that AI regulation approaches differ across countries, with the European Union applying a human rights-based model, the United States favoring market-based regulation, and China adopting a strict state surveillance approach. Each approach has advantages and disadvantages, underscoring the need for a balanced regulatory approach between innovation and public protection.

To address the challenges posed by AI, effective policies should include the principles of transparency, accountability, fairness, and protection of human rights. Governments in various countries need to develop adaptive, risk-based policies and encourage cross-sector collaboration to build inclusive and sustainable AI regulations. In addition, public involvement in AI decision-making processes is crucial to ensure that policies reflect the interests and needs of the wider community.

In conclusion, AI regulations should be designed to optimize the benefits of this technology while mitigating the risks it may pose. With a holistic and evidence-based approach, AI can be developed to accelerate social and economic progress without compromising fundamental values such as fairness, transparency, and human rights. This study is expected to contribute to academic and policy discussions related to AI and serve as a basis for developing more comprehensive regulations in the future.

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