

Regulating Artificial Intelligence in Developing and Centralized Legal Systems: A Comparative Study of Indonesia and China

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Keywords:

Artificial Intelligence
Regulation; Comparative Law;
AI Governance; Indonesia;
China.

ABSTRACT

Artificial intelligence (AI) has developed rapidly and is increasingly integrated into various sectors, including public administration, finance, and digital platforms. However, the expansion of AI technologies also presents significant legal and regulatory challenges, particularly in developing legal systems where regulatory frameworks remain limited. This study examined AI regulation in Indonesia and China through a comparative legal analysis using a normative legal research method that analyzed legislation, policy documents, and academic literature related to AI governance. The findings indicated that Indonesia currently adopts a fragmented and policy-based regulatory approach, whereas China has established a more comprehensive and enforceable regulatory framework governing algorithmic systems and emerging AI technologies. The study also identified several regulatory gaps in Indonesia, including the absence of specific AI legislation, limited institutional coordination, and inadequate mechanisms for algorithmic accountability. Therefore, this research argues that Indonesia needs to develop a comprehensive and enforceable AI regulatory framework that integrates legal certainty, risk-based governance, and institutional coordination by drawing lessons from China's regulatory experience while considering Indonesia's legal and institutional context.

INTRODUCTION

Artificial intelligence (AI) comprises computational systems capable of learning from data, performing reasoning, and executing tasks traditionally associated with human intelligence, including decision-making, pattern recognition, and content generation. The widespread deployment of AI across public administration, finance, and digital platforms has accelerated economic activities; however, its rapid integration continues to outpace existing regulatory safeguards as governments and private sectors worldwide increasingly adopt AI as a central component of digital transformation strategies.

Unlike traditional technologies, AI systems possess adaptive and autonomous characteristics that enable them to evolve through large-scale data inputs and algorithmic learning processes. This dynamic nature introduces complex regulatory challenges, particularly in determining accountability, transparency, and liability when AI systems generate decisions that significantly affect individuals and society. Furthermore, AI technologies frequently operate across national borders through digital infrastructures and global technology companies, thereby complicating the jurisdictional scope of national regulatory frameworks.

However, the increasing reliance on AI systems has intensified legal and ethical concerns related to accountability, data protection, algorithmic bias, and potential violations of fundamental rights. Automated decision-making systems may generate outcomes that are difficult to explain and may affect individuals' access to financial services, employment opportunities, or public services. Moreover, the use of large-scale datasets in AI training raises concerns regarding privacy protection and the lawful processing of personal data. These developments highlight the need for effective regulatory mechanisms capable of ensuring that AI development and deployment remain aligned with the principles of transparency, accountability, and protection of public interests.

Although these challenges are global in nature, they are particularly significant in countries undergoing rapid digital transformation, such as Indonesia, where AI adoption has expanded substantially across financial technology, e-commerce, and digital governance sectors. AI is increasingly utilized in financial technology services and e-commerce platforms through recommendation algorithms to improve service delivery and user experiences. Additionally, national policy initiatives such as Indonesia's National Artificial Intelligence Strategy (Strategi Nasional Kecerdasan Artifisial / Stranas KA) demonstrate governmental recognition of AI as a strategic technology for long-term economic development.

Artificial intelligence also raises fundamental questions regarding legal accountability and liability when automated systems produce harmful or erroneous outcomes. Existing legal frameworks are often not designed to address situations in which decision-making processes are delegated to complex algorithmic systems whose operations may not be fully transparent to regulators or affected individuals. This issue is particularly significant in jurisdictions where AI governance remains primarily policy-based rather than legally binding, as the absence of enforceable regulations may limit effective oversight and accountability. In Indonesia, the lack of a dedicated legal framework for AI may create uncertainty regarding responsibility for algorithmic decisions and the protection of individuals affected by such systems.

Beyond regulatory uncertainty, the deployment of AI technologies also raises important constitutional and human rights considerations. The application of algorithmic decision-making in areas such as public services, law enforcement, and digital platforms may affect fundamental rights, including privacy, equality before the law, and due process. Research has shown that algorithmic systems may reproduce or reinforce existing social biases, resulting in discriminatory outcomes when adequate safeguards are absent. In democratic legal systems, ensuring that technological innovation remains consistent with constitutional principles and the rule of law is therefore an essential component of AI governance. Consequently, the absence of comprehensive AI regulation may pose risks not only to legal certainty but also to the protection of fundamental rights within Indonesia's legal system.

Despite the increasing adoption of AI, Indonesia currently does not have a comprehensive and dedicated regulatory framework specifically governing AI technologies. Instead, the existing regulatory approach remains fragmented across sectoral regulations, policy initiatives, and strategic guidelines related to digital governance and data protection. Although these regulatory instruments provide foundational principles relevant to AI governance, they do not fully address the unique characteristics of AI, particularly issues concerning algorithmic transparency, accountability for automated decision-making, and oversight of generative AI systems. Consequently, the absence of a unified AI regulatory framework may create legal uncertainty and governance gaps as AI technologies continue to develop.

The urgency of establishing AI regulation in Indonesia is reinforced by the rapid expansion of digital technologies across economic and governance structures. Indonesia has

emerged as one of Southeast Asia's largest digital economies, with increasing AI adoption in sectors such as financial technology, e-commerce, and public administration. However, accelerated AI integration has not yet been accompanied by the development of a comprehensive legal framework governing its use. Without clear regulatory standards, rapid technological adoption may generate governance challenges related to data governance, consumer protection, and algorithmic accountability. Therefore, developing a structured AI regulatory framework has become increasingly important to ensure that technological innovation progresses consistently with legal safeguards and public interests.

The need for a comprehensive AI regulatory framework in Indonesia is further strengthened by global developments in AI governance. Several jurisdictions have introduced structured regulatory approaches aimed at ensuring that AI technologies are developed and deployed responsibly. For example, the European Union has adopted a risk-based regulatory framework for AI, while other jurisdictions have introduced national AI governance policies emphasizing accountability and safety. These regulatory initiatives reflect growing international recognition that AI requires specific legal instruments capable of addressing its distinctive characteristics and societal impacts.

Indonesia currently relies on a fragmented and principle-based approach embedded within sectoral regulations and policy instruments. In contrast, China has developed a centralized and binding regulatory framework for governing algorithmic systems and generative AI technologies. Through regulations concerning algorithmic recommendation services, deep synthesis technologies, and generative AI, the Chinese government has established enforceable obligations for technology providers and digital platforms. Scholars have noted that China's regulatory strategy reflects a governance model characterized by strong state coordination and centralized oversight of digital technologies.

Moreover, the increasing use of AI in governmental functions reinforces the need for regulatory reform. Technologies such as automated decision-making, digital identity verification, and predictive governance raise legal concerns regarding transparency, procedural fairness, and administrative law principles. Indonesia requires a dedicated AI regulatory framework to provide legal certainty, establish accountability mechanisms, and align its governance approach with evolving international standards while considering domestic legal and socioeconomic conditions.

Against this background, comparing Indonesia and China provides a valuable perspective for understanding how different legal systems respond to AI-related challenges. This study examined both regulatory frameworks to identify relevant practices for Indonesia's legal development while contributing to broader discussions on emerging technology governance across different institutional contexts.

The novelty of this study lies in its comparative legal analysis of AI governance between a developing legal system (Indonesia) and a centralized regulatory model (China). By examining how each country's legal structure, institutional capacity, and regulatory design shape national approaches to AI governance, this research provides insights into how emerging technologies can be effectively regulated while ensuring legal certainty, accountability, and alignment with broader public interests.

This article contributes to existing literature by providing a comparative legal analysis of AI regulation in Indonesia and China, with particular attention to how differences in legal structure, institutional capacity, and regulatory design influence national approaches to AI governance. By examining Indonesia's emerging policy-based framework alongside China's binding regulatory regime, this study identifies key regulatory principles and institutional mechanisms that may inform the future development of AI regulation in Indonesia. The remainder of this article is structured as follows. The next section examines the theoretical and conceptual foundations of AI governance and regulatory approaches adopted in different

jurisdictions. The subsequent section analyzes the current legal and policy framework governing AI in Indonesia, highlighting its institutional characteristics and regulatory limitations, followed by an examination of China's centralized AI regulatory framework, including recent regulations governing algorithms and generative AI. The final section provides a comparative analysis of the two regulatory models and proposes recommendations for the future development of AI regulation in Indonesia.

METHOD

This study employed a doctrinal legal research method combined with a comparative legal approach to examine the regulation of artificial intelligence (AI) in Indonesia and China. The doctrinal approach analyzed legal norms, statutory frameworks, regulatory instruments, and legal principles governing AI regulation in both jurisdictions. Through this approach, the study examined legal provisions, policy documents, and institutional arrangements that shaped AI governance. The analysis aimed to assess the adequacy of existing regulatory frameworks in addressing legal, ethical, and institutional challenges arising from the development and deployment of AI technologies.

In addition to doctrinal analysis, this study applied a comparative legal approach to examine how different legal systems responded to similar technological developments. This approach enabled the identification of similarities, differences, and underlying legal principles across jurisdictions. Indonesia and China represented two distinct regulatory models: Indonesia reflected a developing legal system characterized by sectoral regulation and policy-based governance, whereas China demonstrated a centralized regulatory framework with binding rules governing algorithmic systems and generative AI technologies. By comparing these approaches, this study evaluated the strengths and limitations of each regulatory model and identified regulatory strategies that could inform the future development of AI governance in Indonesia.

This research also employed a statutory approach to analyze relevant legislation, regulatory policies, and official government documents governing AI in both countries. The analysis covered national strategies, regulatory guidelines, and legal instruments addressing algorithmic governance, data protection, digital platforms, and emerging AI technologies. Particular attention was given to Indonesia's policy-based AI governance framework and China's regulatory measures concerning algorithmic recommendation services, deep synthesis technologies, and generative AI. This analysis enabled the assessment of the legal scope, institutional mechanisms, and regulatory objectives embedded within the existing frameworks.

Furthermore, this study utilized a conceptual approach to examine legal doctrines and theoretical perspectives relevant to AI regulation, including algorithmic accountability, transparency, regulatory oversight, and responsible innovation. The conceptual analysis positioned regulatory developments in Indonesia and China within broader academic discussions on technology governance and digital regulation. By integrating doctrinal, comparative, statutory, and conceptual approaches, this research provided a comprehensive understanding of the legal challenges associated with AI governance.

The sources used in this research consist of primary and secondary legal materials. Primary materials include legislation, regulatory instruments, government policies, and official regulatory guidelines related to artificial intelligence governance. Secondary materials include academic literature, journal articles, books, and international policy reports discussing artificial intelligence regulation and comparative legal approaches. These materials are analyzed qualitatively in order to identify regulatory trends, institutional characteristics, and legal gaps within the existing governance frameworks.

Through this methodological framework, the study aims to contribute to comparative legal scholarship on artificial intelligence regulation, particularly in the context of developing legal systems and centralized governance models. By examining the regulatory experiences of Indonesia and China, the research seeks to provide insights into how emerging technologies can be effectively governed while ensuring legal certainty, accountability, and alignment with broader public interests.

RESULTS AND DISCUSSION

Current Legal Frameworks Governing Artificial Intelligence in Indonesia and China

1. Artificial Intelligence Regulation in Indonesia

The regulation of artificial intelligence in Indonesia currently operates within a fragmented and sectoral legal framework, rather than through a comprehensive and dedicated AI law. Existing regulations that indirectly govern artificial intelligence are primarily found in laws relating to electronic information, data protection, digital platforms, and national technology policy (OECD, 2019). As a result, AI governance in Indonesia largely relies on general digital regulations that were not specifically designed to address the unique risks associated with artificial intelligence technologies.

One of the principal legal instruments relevant to AI governance in Indonesia is namely Law Number 1 of 2024 concerning the Second Amendment to Law Number 11 of 2008 on Electronic Information and Transactions (UU ITE No. 1/2024) concerning the Implementation of Electronic Systems and Transactions, which governs electronic systems, digital transactions, and online platforms (Undang-Undang Republik Indonesia Nomor 11 Tahun 2008, sebagaimana diubah dengan Undang-Undang Nomor 1 Tahun 2024, arts. 21–22). Under Article 3(1), Electronic System Operators are required to ensure that electronic systems are operated in a reliable, secure, and accountable manner. Furthermore, Article 4(d) and (e) require electronic systems to provide procedures and information that are understandable to users and to maintain clear accountability mechanisms regarding the operation of such systems (Undang-Undang Nomor 27 Tahun 2022, art. 5). These provisions reflect regulatory principles commonly associated with artificial intelligence governance, including transparency, accountability, and system reliability. However, UU ITE provides only a general regulatory framework for electronic systems and does not specifically address issues unique to artificial intelligence, including algorithmic transparency, automated decision-making, and accountability for AI-generated outcomes.

Another important regulatory development is the enactment of the Personal Data Protection Law, Law Number 27 of 2022, which introduces legal safeguards concerning the processing and protection of personal data in Indonesia by what is stated on Article 5 of the Law that grants data subject the right to obtain information regarding the processing of their personal data, including the purpose of processing and the accountability of data controllers. The opaque nature of AI systems may hinder data controllers from effectively overseeing how personal data are processed and utilized, raising concerns regarding privacy protection, regulatory compliance, and accountability for AI-generated outcomes (Hähnel & Müller, 2025). While the law establishes principles such as consent, data security, and accountability, it does not provide detailed provisions specifically addressing automated decision-making or algorithmic accountability (Mittelstadt et al., 2016).

In addition to legislative frameworks, Indonesia has also adopted a policy-based approach to artificial intelligence governance through the National Strategy for Artificial Intelligence 2020–2045 (NESCAP, 2021). This strategy outlines the government's long-term vision for AI development across sectors such as health, education, public services, and smart cities.

However, the strategy functions primarily as a policy guideline rather than a binding regulatory framework. As a result, it lacks enforceable legal provisions governing the deployment, oversight, and accountability of artificial intelligence systems.

The findings of this research therefore indicate that Indonesia's current approach to AI regulation can be characterized as policy-oriented and sectoral, with governance mechanisms dispersed across various regulatory domains. While these instruments provide an initial foundation for AI governance, they remain insufficient to address the broader legal implications of artificial intelligence, particularly regarding accountability, risk management, and regulatory oversight (Cyberspace Administration of China, 2022a, 2023a, 2023b). This regulatory fragmentation highlights the need for a more integrated and comprehensive legal framework to govern artificial intelligence in Indonesia.

2. Artificial Intelligence Regulation in China

In contrast to Indonesia's fragmented approach, China has developed a centralized and proactive regulatory framework for artificial intelligence governance. Over the past few years, the Chinese government has introduced a series of binding regulations specifically designed to govern algorithmic systems, deep synthesis technologies, and generative artificial intelligence services. These regulations reflect China's broader strategy of combining technological innovation with strong regulatory oversight.

One of the most significant regulatory instruments is the Provisions on the Administration of Algorithmic Recommendation Services, which regulates algorithmic systems used by online platforms (Cyberspace Administration of China, 2022a). The regulation imposes obligations on platform operators to ensure transparency, fairness, and accountability in algorithmic recommendations, particularly in relation to content distribution and user profiling (Creemers & Webster, 2022). Furthermore, the regulation requires companies to conduct algorithmic assessments and register certain algorithms with regulatory authorities, thereby strengthening government oversight of AI technologies.

China has also introduced the Administrative Provisions on Deep Synthesis of Internet Information Services, which address emerging technologies such as deepfakes and AI-generated content (Cyberspace Administration of China, 2023a). These provisions establish regulatory requirements concerning content authenticity, labeling of AI-generated media, and prevention of misinformation (Cyberspace Administration of China, 2023a, arts. 9, 12–13). The regulation reflects growing concerns regarding the societal risks posed by synthetic media and automated content generation.

More recently, China adopted the Interim Measures for the Management of Generative Artificial Intelligence Services, which specifically regulate generative AI systems (Cyberspace Administration of China, 2023b). This regulatory framework establishes requirements related to security assessments, data governance, and compliance obligations for providers of generative AI services. It also emphasizes the need for AI systems to adhere to social, ethical, and legal standards established by the state (Shi et al., 2023).

The results of this study indicate that China's AI governance model is characterized by centralized regulation, proactive policy intervention, and strong state oversight. Unlike Indonesia, where AI regulation is largely embedded within broader digital governance frameworks, China has adopted a more targeted regulatory strategy that directly addresses specific AI technologies and associated risks (Zhang, 2024). This approach enables the Chinese government to respond rapidly to emerging technological developments while maintaining regulatory control over digital platforms and algorithmic systems.

3. Comparative Analysis of AI Regulation in Indonesia and China

The comparison between Indonesia and China reveals significant differences in their respective approaches to artificial intelligence governance. Indonesia's regulatory framework

remains policy-based and decentralized, with AI-related issues addressed indirectly through general digital regulations and national strategies. In contrast, China has implemented a comprehensive and centralized regulatory model, characterized by binding regulations that directly govern specific AI technologies and platforms.

These differences reflect broader variations in institutional structures, regulatory capacity, and governance traditions between the two countries. China's centralized political and legal system allows for rapid regulatory responses to technological developments, whereas Indonesia's legal system operates through a more gradual and sectoral legislative process (OECD, 2019; Zhang, 2024). While Indonesia's approach provides flexibility for innovation, it may also create regulatory gaps that could hinder effective oversight of artificial intelligence technologies.

Overall, the findings demonstrate that Indonesia's current AI governance framework remains in an early stage of regulatory development, whereas China has moved toward a more structured and enforceable regulatory regime (OECD, 2023a). This disparity underscores the importance of strengthening Indonesia's legal framework for artificial intelligence in order to ensure accountability, legal certainty, and effective governance in the digital era.

Legal and Institutional Gaps in Indonesia's Artificial Intelligence Governance Framework

The analysis of Indonesia's current regulatory landscape reveals several significant legal and institutional gaps in the governance of artificial intelligence. While the country has demonstrated growing interest in developing digital governance policies, the absence of a comprehensive regulatory framework creates challenges in addressing the legal, ethical, and administrative implications of AI deployment.

One of the most prominent gaps in Indonesia's AI governance framework is the fragmentation of regulatory instruments. Currently, AI-related governance is dispersed across multiple legal frameworks, including digital governance laws, data protection regulations, and national strategic policies. However, these instruments do not specifically address artificial intelligence as a distinct regulatory subject. As a result, Indonesia's approach to AI governance remains largely policy-driven rather than legally binding (OECD, 2023a).

While such approaches provide flexibility in adapting to technological change, they often lack enforceability and clear compliance mechanisms. Scholars have noted that effective AI governance typically requires a combination of policy guidance and binding regulatory frameworks to ensure accountability and oversight (Abbott & Snidal, 2000). Moreover, fragmented regulation may lead to inconsistent standards across sectors. Different government agencies responsible for telecommunications, digital platforms, and data governance may adopt varying regulatory approaches, creating uncertainty for businesses and technology developers. This regulatory inconsistency can hinder the development of a stable innovation ecosystem within the digital economy (OECD, 2022a).

Another significant gap lies in the absence of dedicated legislation specifically addressing artificial intelligence. Unlike several jurisdictions that have begun adopting AI-specific regulatory frameworks, Indonesia currently regulates AI indirectly through broader digital governance laws. Although existing regulations such as the Personal Data Protection Law provide certain safeguards relevant to AI systems, they do not comprehensively address issues such as automated decision-making, algorithmic transparency, or AI liability (Ministry of Communication and Information Technology of the Republic of Indonesia, 2020; Undang-Undang Nomor 27 Tahun 2022, arts. 20–24).

This legal gap is particularly relevant in contexts where AI systems influence decision-making processes that may affect individuals' rights. For example, automated systems used in financial services, recruitment, or public administration may generate outcomes that raise

questions regarding fairness, accountability, and due process (Cyberspace Administration of China, 2023b, art. 4; Undang-Undang Nomor 27 Tahun 2022, arts. 20–24). Without explicit legal provisions governing these systems, regulatory authorities may face difficulties in ensuring adequate oversight.

Furthermore, the absence of AI-specific legislation may also affect Indonesia's ability to respond to emerging technological developments such as generative artificial intelligence and autonomous decision-making systems. These technologies introduce new legal challenges that traditional digital regulations may not sufficiently address. As a result, legal scholars have emphasized the importance of developing regulatory frameworks specifically designed to address the unique characteristics of artificial intelligence (Floridi et al., 2018).

In addition to legal gaps, institutional challenges also play a significant role in shaping Indonesia's AI governance landscape. The governance of digital technologies in Indonesia involves multiple institutions, including ministries responsible for communication, technology, innovation, and administrative reform (Ministry of National Development Planning/Bappenas, 2020a). While this multi-agency structure allows for diverse expertise, it may also create coordination challenges in the development and enforcement of AI regulations.

Institutional fragmentation can lead to overlapping mandates and regulatory uncertainty. For instance, different government bodies may issue policy recommendations or guidelines related to AI without a unified national regulatory authority overseeing implementation (Floridi et al., 2018). Moreover, the absence of a dedicated regulatory body responsible for AI governance may limit the government's ability to monitor technological developments and enforce compliance effectively.

Another critical gap in Indonesia's AI governance framework relates to the lack of clear mechanisms ensuring algorithmic accountability and transparency. Artificial intelligence systems, particularly those based on machine learning, often operate through complex computational processes that may be difficult for regulators and users to understand. Without appropriate regulatory safeguards, such systems may generate risks related to bias, discrimination, or opaque decision-making (Pasquale, 2015; OECD, 2019).

In the absence of such mechanisms, stakeholders affected by automated decision-making may have limited avenues to challenge or review algorithmic outcomes. This issue is particularly relevant in sectors where AI systems directly influence public services or economic opportunities. Additionally, transparency requirements are essential for building public trust in AI technologies. Studies have shown that citizens are more likely to accept the deployment of artificial intelligence in governance when regulatory frameworks ensure accountability and ethical standards. Therefore, strengthening regulatory mechanisms related to transparency and algorithmic oversight remains a crucial priority for Indonesia's future AI governance reforms.

The identified legal and institutional gaps indicate that Indonesia is currently at an early stage in the development of AI governance frameworks. While existing digital regulations provide a foundational basis for technology governance, they are not yet sufficient to address the complex legal challenges posed by artificial intelligence (OECD, 2022b).

Ultimately, strengthening Indonesia's AI governance framework will be essential not only for managing technological risks but also for enhancing the country's position in the global digital economy. As artificial intelligence continues to transform various sectors, establishing robust regulatory structures will play a critical role in ensuring sustainable and responsible technological development.

Regulatory Lessons from China's Artificial Intelligence Governance Model for Indonesia

The comparative analysis conducted in this study indicates that China's artificial intelligence governance framework provides several important regulatory insights for Indonesia. While Indonesia currently adopts a fragmented and policy-oriented approach to AI governance, China has developed a structured regulatory regime that integrates legal enforcement, technological oversight, and national innovation policy. This divergence reflects broader differences between decentralized and centralized regulatory systems in addressing emerging technologies. However, despite these structural differences, China's regulatory experience offers valuable lessons for Indonesia in designing a comprehensive and enforceable artificial intelligence governance framework.

1. From Soft Governance to Binding Regulatory Frameworks

One of the most significant differences between Indonesia and China lies in the legal status of their AI governance instruments. Indonesia's current framework is primarily based on policy documents, national strategies, and sectoral regulations that indirectly address artificial intelligence. In contrast, China has adopted binding regulatory instruments specifically designed to govern algorithmic systems and AI technologies (Cyberspace Administration of China, 2022a, art. 1, ch. II).

The *Provisions on Algorithmic Recommendation of Internet Information Services* introduce enforceable obligations for digital platforms, including requirements related to algorithm registration, transparency, and content governance (Cyberspace Administration of China, 2022a, ch. II, arts. 7–15, art. 24). One of the clearest examples of China's transition from soft governance to binding AI regulation can be found in Article 2 of the Interim Measures for the Management of Generative Artificial Intelligence Services (GenAI Measures), which provides:

“第二条：在中华人民共和国境内提供生成式人工智能服务（包括通过提供可编程接口等方式支持他人自行生成文本、图片、音频、视频等），适用本办法”

“These Measures apply to the provision of generative artificial intelligence services within the territory of the People's Republic of China, including supporting others in generating text, images, audio, video, and other content through programmable interfaces.” (Cyberspace Administration of China, 2023b, art. 2).

Rather than limiting its application to specific AI products, it covers a wide range of generative AI services, including those provided through application programming interfaces (APIs). By comparison, Indonesia does not yet recognize a distinct legal category for AI service providers. The closest equivalent is the concept of a *Penyelenggara Sistem Elektronik* (PSE) under Article 21 and 22 of the Electronic Information and Transactions Law and Government Regulation No. which provides:

"Penyelenggara Sistem Elektronik adalah setiap orang, penyelenggara negara, Badan Usaha, dan masyarakat yang menyediakan, mengelola, dan/atau mengoperasikan Sistem Elektronik secara sendiri-sendiri maupun bersama-sama kepada Pengguna Sistem Elektronik untuk keperluan dirinya dan/atau keperluan pihak lain."

"An Electronic System Operator is every person, state administrator, business entity, and community member that provides, manages, and/or operates an Electronic System individually or collectively for their own purposes and/or for the purposes of other parties."

However, PSE registration applies only to operators as entities and does not create separate obligations for specific AI systems or services. Although there is Circular Letter No. 9 of 2023 on Artificial Intelligence Ethics which identifies business actors and electronic system operators involved in AI activities as relevant stakeholders, the instrument functions primarily as guidance and does not impose legally enforceable obligations (Kementerian Komunikasi dan Informatika Republik Indonesia, 2023). To address the gap, Article 1(6) could be amended to include a phrase such as: *"including electronic systems utilizing artificial intelligence technologies to generate content, process information, provide recommendations,*

or make automated decisions for users or third parties." Such wording would preserve the existing structure of the PSE framework while expressly bringing AI-based services within the scope of Indonesian electronic system regulation.

Drawing from China's approach, Indonesia could strengthen its AI governance framework through the forthcoming Presidential Regulation on AI Governance by introducing a distinct category of *Penyelenggara Layanan Kecerdasan Artifisial* (Artificial Intelligence Service Operators). Similar to Article 2 of the GenAI Measures, this category could encompass entities providing generative AI services through either consumer-facing applications or programmable interfaces accessible to users in Indonesia, regardless of where the provider is incorporated (Library of Congress, 2023). Such an approach would provide greater legal certainty regarding the scope of AI regulation while enabling Indonesia to move beyond a purely policy-based framework toward a more coherent and enforceable system of AI governance.

2. Institutional Design and Centralized Regulatory Coordination

Another key distinction between the two countries concerns the institutional architecture of AI governance. China's regulatory framework is characterized by a relatively centralized structure in which government authorities coordinate the development and enforcement of digital regulations. The Cyberspace Administration of China plays a central role in supervising algorithmic governance, enabling consistent implementation of regulatory policies across the digital ecosystem (Cyberspace Administration of China, 2022a, art. 3).

Indonesia, by contrast, operates within a more decentralized administrative structure involving multiple ministries and regulatory bodies responsible for digital governance. While this institutional diversity reflects Indonesia's democratic governance model, it may also create coordination challenges in developing coherent AI regulation. Fragmented institutional authority can slow regulatory responses to technological change and create uncertainty for stakeholders operating in the digital economy (Murray, 2019).

From a comparative perspective, China's experience highlights the importance of institutional coordination mechanisms in AI governance. Rather than replicating China's centralized system, Indonesia could develop a coordinated regulatory framework through inter-agency cooperation or the establishment of a national AI regulatory body responsible for policy integration and regulatory oversight. Such an approach would enable Indonesia to maintain institutional pluralism while ensuring regulatory coherence in governing artificial intelligence technologies (OECD, 2022a).

3. Algorithmic Transparency, Accountability, and Regulatory Oversight

Another critical lesson from China's AI governance model concerns the regulation of algorithmic transparency and accountability. China's regulations require digital platforms to ensure that algorithmic systems operate in a manner consistent with public interests and regulatory objectives which include obligations related to algorithm disclosure, user protection, and the prevention of harmful algorithmic outcomes (Cyberspace Administration of China, 2022a, arts. 9, 10, 12, 17).

Article 24 of the Algorithm Recommendation Provisions provides:

第二十四条：具有舆论属性或者社会动员能力的算法推荐服务提供者，应当在提供服务之日起十个工作日内通过互联网信息服务算法备案系统填报服务提供者的名称、服务形式、应用领域、算法类型、算法自评估报告、拟公示内容等信息，履行备案手续。

"Providers of algorithm recommendation services with public opinion attributes or social mobilisation capabilities shall, within ten working days of commencing service provision, submit to the Internet Information Service Algorithm Registration System

information including the provider's name, service form, application domain, algorithm type, self-assessment report, and content proposed for public disclosure, and shall complete the registration procedure." Article 17 of the GenAI Measures extends this filing obligation specifically to generative AI : *"Those providing generative AI services with public opinion attributes or social mobilisation capabilities shall conduct security assessments in accordance with relevant State regulations, and shall complete algorithm registration and procedures for modification or deregistration."* This provisions of China AI Regulation require.

China's framework operates through a two-tier system. The first tier requires registration and disclosure of an algorithm's design, purpose, and data sources, while the second imposes additional security assessments on services with significant public influence before public deployment. The effectiveness of this approach is reflected in its rapid implementation, with eleven companies approved within a month of the Measures taking effect and 748 registered services by the end of 2025 (Cyberspace Administration of China, 2022a, art. 24). Article 17 of the GenAI Measures extends this filing obligation specifically to generative AI (Sun & Zeng, 2024; China Briefing, 2023).

For Indonesia, potential regulatory measures may include algorithmic impact assessments, transparency obligations for AI developers, and independent auditing mechanisms for high-risk AI systems (Future of Privacy Forum, 2023). Although PP No. 71/2019 requires Electronic System Operators (PSEs) to register with Komdigi, the obligation applies only to operators as entities rather than to the specific AI systems they deploy, leaving no mechanism for AI-specific registration, self-assessment, or regulatory oversight (AI Now Institute, 2018). To address this gap, Indonesia could amend PP No. 71/2019 to require PSEs operating generative AI or algorithmic recommendation systems to register basic information regarding system design, intended use, and training data sources, while imposing additional security assessment requirements on high-risk systems operating at scale or in sensitive sectors such as finance, healthcare, and public administration.

4. Integrating AI Regulation with National Innovation Strategies

China's approach to AI governance also demonstrates how regulatory frameworks can be integrated within broader national strategies for technological development. The country's AI regulatory measures are closely aligned with national policies promoting digital innovation, industrial transformation, and technological competitiveness (Cyberspace Administration of China, 2023b, art. 1). China's *Interim Measures for the Administration of Generative Artificial Intelligence Services* (生成式人工智能服务管理暂行办法, GenAI Measures), jointly issued by the Cyberspace Administration of China and six co-regulators on 10 July 2023. Article 1 of the Measures states:

“第一条：为了促进生成式人工智能健康发展和规范应用，维护国家安全和社
会公共利益，保护公民、法人和其他组织的合法权益，根据《中华人民共和国网络安全
法》等法律、行政法规，制定本办法。”

"These Measures are formulated to promote the healthy development and regulated application of generative artificial intelligence, safeguard national security and social public interests, and protect the lawful rights and interests of citizens, legal persons, and other organisations, in accordance with the Cybersecurity Law of the People's Republic of China and other laws and administrative regulations."

The simultaneous use of the terms "促进" (*cùjìn*, to promote) and "规范" (*guīfàn*, to regulate) reflects China's intention to pursue innovation and regulation concurrently. The GenAI Measures are designed to facilitate their continued development within a regulated legal framework (Sun & Zeng, 2024). China's regulatory approach is closely linked to its broader innovation strategy. As noted by the Future of Privacy Forum, several requirements

contained in the April 2023 draft of the GenAI Measures were moderated in the final version, reflecting an effort to balance regulatory oversight with continued commercial AI development (Sun & Zeng, 2024). This approach is consistent with China's *New Generation Artificial Intelligence Development Plan* (新一代人工智能发展规划, NGAIDP), which aims to make China the world's leading AI innovation centre by 2030 while simultaneously developing an AI governance system (治理体系) capable of evolving alongside technological advancement (State Council of the People's Republic of China, 2017).

Building upon the regulatory lessons derived from China's AI governance framework, Indonesia may strengthen its existing legal architecture through targeted regulatory reforms rather than immediately adopting a standalone AI statute. Given that Government Regulation No. 71 of 2019 already serves as the principal framework governing electronic systems and digital platforms, it provides a practical foundation for integrating AI-specific obligations into Indonesia's regulatory regime. The Regulation's conception of an electronic system is, in short, too static to accommodate AI without amendment (Dhiratara, 2024).

In particular, three amendments to GR 71/2019 may be considered. First, Article 1 could be revised to introduce a legal definition of artificial intelligence systems as a distinct category of electronic systems, thereby providing greater legal certainty regarding the scope of AI regulation. Second, Article 3 could be supplemented with provisions requiring algorithmic transparency measures, including disclosure of AI-generated content or decisions, internal documentation requirements, and periodic assessments of system performance and compliance. Third, Article 4 could establish accountability mechanisms for automated decision-making by requiring human review and explanatory procedures for AI-generated decisions that significantly affect individuals' rights or interests. Collectively, these reforms would strengthen transparency, accountability, and regulatory oversight while utilizing Indonesia's existing electronic systems governance framework.

Indonesia faces the challenge of simultaneously promoting digital transformation and addressing regulatory gaps in emerging technologies. Without a comprehensive regulatory framework, rapid technological development may outpace existing legal structures, potentially creating risks for consumers, businesses, and public institutions. Establishing clear regulatory standards could therefore enhance investor confidence and support sustainable technological development within Indonesia's digital economy (World Bank, 2021).

From a comparative perspective, China's experience demonstrates that proactive regulation can contribute to long-term technological governance. Rather than responding to technological risks only after they emerge, governments can anticipate regulatory challenges and design frameworks capable of managing innovation responsibly.

5. Implications for the Future Development of AI Regulation in Indonesia

The findings of this comparative analysis indicate that Indonesia can draw several important lessons from China's experience in regulating artificial intelligence. While Indonesia's democratic governance system differs significantly from China's centralized model, certain regulatory principles remain adaptable to Indonesia's legal and institutional context.

Ultimately, the comparison between Indonesia and China underscores the importance of regulatory preparedness in the governance of artificial intelligence. As AI technologies continue to transform economic and social structures, countries that establish clear and effective regulatory frameworks will be better positioned to manage technological risks while fostering innovation.

For Indonesia, the development of a dedicated AI regulatory framework represents not only a legal necessity but also a strategic opportunity to strengthen its position within the global digital economy and ensure that technological progress aligns with democratic governance principles and the rule of law

CONCLUSION

This study examined the regulation of artificial intelligence (AI) within the legal frameworks of Indonesia and China through a comparative legal analysis. In response to the first research question, the findings demonstrated that both countries recognized the strategic importance of AI for economic development and public governance; however, they adopted significantly different regulatory approaches. Indonesia currently regulates AI through a fragmented framework consisting of general digital governance laws, sectoral regulations, and nonbinding policy instruments. In contrast, China has developed a centralized and enforceable regulatory regime through specific AI-related regulations that directly govern algorithmic systems, generative AI services, and data governance. This study identified several legal and institutional gaps within Indonesia's current AI governance framework, including the absence of comprehensive AI-specific legislation, limited institutional coordination among relevant regulatory authorities, and the lack of legally binding requirements concerning algorithmic transparency, accountability, and risk management. As AI technologies become increasingly integrated into public administration and private-sector decision-making, these limitations may generate regulatory uncertainty and increase risks related to data protection, discrimination, and legal responsibility (2). Consequently, developing a more structured regulatory framework is necessary to ensure that AI deployment remains consistent with the principles of legality, accountability, and public interest.

The comparative analysis highlighted several regulatory lessons that Indonesia may draw from China's AI governance model. China's regulatory approach demonstrates how binding regulations, risk-based governance mechanisms, and coordinated institutional oversight can contribute to effective governance of emerging technologies. Although Indonesia operates within a democratic legal system that differs substantially from China's centralized governance structure, several regulatory principles remain adaptable. These include establishing dedicated AI legislation, strengthening institutional oversight and interagency coordination, and implementing transparency and accountability obligations for AI developers and deployers. Such measures may contribute to creating a more coherent and effective AI governance framework while maintaining legal certainty and public trust. Ultimately, this study concluded that Indonesia is at a critical stage in developing its AI governance framework. The rapid expansion of AI technologies across economic sectors and public institutions requires a comprehensive, adaptive, and enforceable regulatory regime. China's proactive regulatory model demonstrates that mitigating technological risks does not necessarily hinder innovation. By selectively adapting relevant regulatory principles to its constitutional and institutional context, Indonesia can move beyond fragmented policies and develop a resilient digital governance structure that ensures AI development remains aligned with legality, accountability, and public interest principles.

Based on the comparative analysis conducted in this study, several policy recommendations are proposed to support the development of a comprehensive AI regulatory framework in Indonesia. First, Indonesia should consider establishing a dedicated legal framework for AI governance through a Government Regulation (Peraturan Pemerintah). This recommendation is based on the technical and operational characteristics of AI governance issues, including AI risk classification, algorithmic transparency, accountability mechanisms, auditing requirements, and regulatory oversight. A Government Regulation would provide a flexible instrument capable of adapting to rapid technological developments while remaining consistent with existing legal frameworks governing electronic systems, data protection, and digital governance. Currently, AI governance remains embedded within broader digital and data protection regulations that do not fully address the complexities of algorithmic decision-making, generative AI, and autonomous systems.

Second, Indonesia should adopt a risk-based regulatory approach to govern AI systems. Not all AI applications present the same level of societal risk; therefore, regulatory obligations should be proportional to the potential impact of each technology. A formal risk classification framework is required to ensure consistent regulatory implementation across sectors, particularly in relation to vulnerable groups and high-impact AI applications. Third, strengthening institutional coordination and regulatory capacity is essential for effective AI governance. Indonesia's current multiagency governance structure may create fragmented responsibilities and overlapping mandates in regulating emerging technologies. Therefore, Indonesia should establish a national coordination mechanism or specialized regulatory authority responsible for AI governance to ensure consistent policy implementation and enforcement.

Fourth, Indonesia should incorporate stronger algorithmic transparency and accountability mechanisms into its regulatory framework. As AI systems increasingly influence decision-making processes affecting individuals and society, it is essential to ensure that these systems operate transparently and responsibly. Regulatory standards should include mechanisms such as algorithmic impact assessments, explainability requirements, and independent auditing procedures to strengthen accountability. Fifth, AI regulation should be aligned with Indonesia's broader national digital transformation strategy. A comprehensive approach is required to ensure that regulatory frameworks not only mitigate risks but also support innovation, economic growth, and technological development in a coordinated manner.

Finally, Indonesia should actively participate in international cooperation on AI governance. Since AI technologies operate across borders and influence global digital ecosystems, collaboration with international organizations and regulatory partners is essential to strengthen regulatory capacity and align domestic governance with international standards. In conclusion, integrating policy direction with binding legal frameworks, institutional coordination, and risk-based governance mechanisms is essential for developing a robust AI regulatory regime in Indonesia. Effective AI governance depends not only on policy objectives but also on translating these objectives into enforceable legal structures.

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