

Generative Artificial Intelligence and National Sovereignty: Indonesia's Position in a Fragmented Digital Economy

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ABSTRACT

This research addresses a critical gap in understanding how developing nations navigate digital sovereignty amid global technological fragmentation. Generative artificial intelligence (Generative AI) represents one of the most disruptive technologies in the global digital economy, bringing both innovation opportunities and geopolitical challenges, particularly within the context of the splinternet phenomenon. Indonesia, possessing Southeast Asia's largest digital economy potential, faces the risk of becoming a passive technology consumer, potentially weakening national sovereignty. This study analyzes the implications of global digital economy fragmentation on Indonesia's national sovereignty, evaluates generative AI's role in either supporting or undermining this sovereignty, and formulates strategic policies to strengthen Indonesia's position in international digital economy governance. Employing a descriptive qualitative approach with normative-empirical analysis, data was gathered through literature reviews, policy document analysis, and in-depth interviews with 18 key informants comprising regulators, industry players, and academics. Thematic and content analysis techniques were applied to international documents and national AI regulations. Findings reveal that global digital fragmentation positions Indonesia vulnerably as a technology adopter, risking dependence on foreign platforms. This dependence impacts data sovereignty, regulatory independence, and national security. However, opportunities exist through three strategic pathways: strengthening national regulations, developing Indonesian data-driven local innovations, and engaging in digital diplomacy within international forums. This research uniquely contributes by providing an integrated geopolitical-economic-technological analysis specific to Indonesia's position, offering actionable policy recommendations for maintaining digital sovereignty in an increasingly fragmented global landscape.

Keywords: Generative AI; National Sovereignty; Digital Economy; Digital Fragmentation; AI Regulation

INTRODUCTION

The rapid development of artificial intelligence (AI), particularly generative artificial intelligence (Generative AI), has emerged as one of the most disruptive phenomena in the global digital economy. This technology autonomously generates text, images, and code, reshaping business models, labor market dynamics, and state–society interactions (Dwivedi et al., 2023; Zhang et al., 2024; Ng et al., 2025). Beyond its technological dimension, generative AI increasingly functions as a geopolitical instrument influencing national sovereignty. Indonesia, as Southeast Asia's largest digital economy, faces strategic challenges in navigating an increasingly fragmented digital ecosystem (Kshetri, 2021; UNCTAD, 2022; Nugroho & Sari, 2023).

This fragmentation is manifested in the rise of the “splinternet,” where global digital infrastructures and regulations diverge along geopolitical lines (Chander & Sun, 2021; Ferreira & Suzor, 2022; Jia & Winseck, 2023). The United States, China, and the European Union have each developed distinct regulatory ecosystems and generative AI platforms, placing developing nations such as Indonesia in a vulnerable position due to dependency on foreign technologies that may undermine digital sovereignty (Gao, 2021; Floridi, 2022; OECD, 2023).

The urgency of examining this issue is reinforced by Indonesia's projected digital economy growth, expected to reach US\$130 billion by 2025 (Google, Temasek & Bain, 2022; Bappenas, 2023; World Bank, 2024). However, this economic potential risks being overshadowed by widening inequality, weakened data sovereignty, and increased vulnerability to global platform dominance if generative AI adoption proceeds without a coherent national strategy (Fukuyama, 2021; Nugroho et al., 2023; Azhari, 2024). Indonesia's position must therefore be analyzed not only from the perspective of technological adoption but also from sovereignty, governance, and economic resilience.

Table 1. Indonesia's Digital Economy Growth Projections (2020–2025)

Year	Value of the Digital Economy (US\$ Billion)	Growth (%)
2020	44	11
2021	70	16
2022	92	18
2023	110	20
2025*	130 (projection)	22

Source: Google, Temasek & Bain (2022); Bappenas (2023); World Bank (2024).

Previous studies have explored AI, digital economy, and sovereignty linkages. Kshetri (2021) warns of developing nations' tendency to become passive consumers in global AI ecosystems. Floridi (2022) highlights the unequal ethical and regulatory landscape between developed and developing states, while Dwivedi et al. (2023) demonstrate how generative AI shifts economic power toward algorithmic decision-making. Nonetheless, empirical research focusing specifically on Indonesia's position within the fragmented global digital economy remains scarce.

The research gap lies in the absence of integrated studies that link generative AI adoption with Indonesia's national sovereignty in the era of global digital fragmentation. Existing works emphasize technical aspects, sectoral adoption, or broad regulatory challenges, but few examine the multidimensional implications—technological, political, economic, and legal—faced by Indonesia (Ferreira & Suzor, 2022; Jia & Winseck, 2023; OECD, 2023).

The urgency of this research stems from Indonesia's accelerating digital transformation within a volatile global environment. Without timely academic and policy insights, Indonesia risks losing strategic autonomy and entrenching dependency on foreign platforms. If neglected, these vulnerabilities may escalate by 2030, when AI-driven governance and digital trade dominate global value chains.

The novelty of this study lies in its comprehensive analysis of Indonesia's position within the fragmented generative AI ecosystem, with explicit emphasis on sovereignty. Unlike prior studies that isolate technical or regulatory issues, this research bridges geopolitical, economic, and digital governance perspectives to formulate context-specific strategies (Ng et al., 2025; Nugroho & Sari, 2023; UNCTAD, 2022).

Objectives, Benefits, and Implications (Paragraphs 9–11) This study aims to: (1) analyze the implications of global digital economy fragmentation on Indonesia's sovereignty; (2) evaluate the role of generative AI in either reinforcing or undermining sovereignty; and (3) propose evidence-based strategies for Indonesia's active participation in international digital governance.

The expected benefits are threefold. Theoretically, the study contributes to sovereignty and AI governance literature by providing a developing-country perspective. Practically, it offers guidance for policymakers and industry stakeholders to mitigate risks of dependency and inequality. From a policy standpoint, it supports Indonesia's digital sovereignty agenda by proposing strategic pathways to balance innovation and regulation.

The implications extend to both scientific advancement and policy development. For academia, the study enriches debates on digital sovereignty and AI governance in the Global South. For policymakers, it provides a framework for designing regulations that protect national interests while ensuring inclusive digital growth.

METHOD

Research Design

This study employs a descriptive qualitative design combined with normative–empirical analysis. A descriptive qualitative design was chosen because it allows for a deep exploration of complex social, political, and legal phenomena surrounding the linkage between generative artificial intelligence and Indonesia's national sovereignty in the context of global digital economy fragmentation (Creswell & Poth, 2018). The normative analysis focuses on regulations, policies, and legal frameworks, while the empirical analysis involves case studies and in-depth interviews with experts to validate the contextual realities.

Research Location

The research was conducted in three main urban centers Jakarta, Bandung, and Surabaya which represent key nodes of Indonesia's AI ecosystem and digital economy. These cities were selected because they host regulatory bodies, major technology companies, and research institutions actively engaged in AI development and policy-making.

Population and Sampling

The population of this study includes stakeholders in Indonesia's AI ecosystem:

1. Regulators – Ministry of Communication and Informatics, Bappenas, and the State Cyber and Cryptography Agency (BSSN).
2. Industry Players – Local and multinational technology companies adopting generative AI.
3. Academics and Researchers – Lecturers, digital law experts, and public policy researchers.

The sampling technique used was purposive sampling, selecting informants who were directly involved and competent in the research topic. The inclusion criteria were: (a) minimum of 3 years of involvement in AI-related regulation, policy, or industry practice, and (b) institutional affiliation with relevant organizations. The exclusion criteria were: (a) informants without direct engagement in AI adoption or policy, and (b) incomplete participation in interviews. A total of 15–20 key informants were targeted, consisting of representatives from government, industry, and academia to ensure diversity and richness of data.

Research Instruments

The primary instrument was a semi-structured interview guideline, developed based on research indicators:

Adoption levels of generative AI in the public and private sectors.

Risk perceptions regarding data and digital sovereignty.

The impact of digital economy fragmentation on national strategy. Additionally, document observation sheets were used to analyze regulations, national policies, and international reports related to AI and the digital economy.

Data Collection Techniques

1. Literature Study – Reviewing academic works, policy documents, and reports from OECD, UNCTAD, and the World Bank.
2. In-depth Interviews – Conducted face-to-face or online using semi-structured guidelines.
3. Documentation – Collecting secondary data such as regulations, national AI strategies, institutional reports, and relevant media publications.

Research Procedure

1. The research procedure followed these stages:
2. Preparation: Development of theoretical frameworks and identification of key informants.
3. Data Collection: Literature study, interviews, and documentation.
4. Data Reduction: Filtering relevant data aligned with the research objectives.
5. Data Presentation: Organizing findings into narratives, tables, and diagrams.
6. Conclusion Drawing: Interpreting results to answer the research questions.

Data Analysis Technique

The data analysis applied thematic analysis to identify key themes such as “generative AI adoption,” “digital fragmentation,” and “national sovereignty.” The process involved:

1. Coding – Identifying recurring keywords and concepts.
2. Categorization – Grouping codes into technological, economic, political, and legal dimensions.
3. Interpretation – Synthesizing meanings across categories to construct Indonesia's position in the global digital economy.

In parallel, content analysis was used for secondary data (policy documents, international reports) to assess regulatory frameworks, gaps, and alignment with global standards.

Research Ethics

Ethical considerations were maintained through informed consent, ensuring participants were briefed about the study's purpose, confidentiality, and voluntary participation. Anonymity was guaranteed by coding participants' identities, and all data were stored securely for research purposes only. The study adhered to research ethics standards guided by the Indonesian Ministry of Research and Higher Education's ethical protocol for social sciences research.

RESULTS AND DISCUSSION

Global Digital Economy Fragmentation and Implications for Indonesia

The fragmentation of the global digital economy is becoming more pronounced with the formation of three main blocs: the United States, China, and the European Union, each of which applies different regulatory standards, data architectures, and digital platforms (Chander & Sun, 2021; Ferreira & Suzor, 2022; Jia & Winseck, 2023). This condition creates a "splinternet" that has direct implications for the digital sovereignty of developing countries, including Indonesia, which does not yet have a technology ecosystem as strong as developed countries.

Indonesia faces a dilemma between following Western standards that emphasize personal data protection, or following an Asian ecosystem that emphasizes more on the efficiency and dominance of platform technology (Floridi, 2022; Gao, 2021; OECD, 2023). This fragmentation puts Indonesia at risk of losing control of strategic data that can affect national security as well as its long-term dependence on foreign infrastructure.

In the economic context, fragmentation also causes differences in market access for national industry players. Local companies have to adapt to cross-jurisdictional regulations, which often hinder competitiveness (UNCTAD, 2022; Nugroho & Sari, 2023; World Bank, 2024). Therefore, this study finds that digital fragmentation is not only a technological phenomenon, but also a geopolitical strategy that puts Indonesia in a vulnerable position.

Table 2. Global Digital Economy Fragmentation Map

Region/Country	Key Characteristics of Digital Ecosystems	Examples of Key Actors/Regulations
United States	Big Tech ecosystem, dominance of generative AI innovation and global platforms	OpenAI, Google, Microsoft
China	Closed Platform Ecosystem, based on state control and industry integration	Baidu, Tencent, Alibaba
European Union	Regulatory Ecosystem, emphasizing ethics, privacy, and data governance	AI Act, GDPR
Indonesia	Position as a Consumer & Technology Adopter, dependence on global platforms	Adoption of foreign technology, regulations are still developing

Adoption of Generative Artificial Intelligence in Indonesia

The adoption of generative AI in Indonesia has been concentrated in the financial, education, and public sectors. According to one informant from a leading fintech company in Jakarta, "We rely heavily on OpenAI and Microsoft platforms for risk analysis and chatbot services, but the challenge is that all critical data is processed abroad" (Interview, 2025). This statement highlights the structural dependence of local industry players on global platforms.

In the education sector, adaptive learning and e-learning systems supported by generative AI are growing, particularly in urban areas. However, an academic informant from Bandung stated, "Licensing costs are a huge barrier. Many universities want to integrate AI tools, but the budget does not match the needs" (Interview, 2025). These findings illustrate how adoption is progressing unevenly, with limited inclusivity.

Public services have also begun experimenting with AI-powered chatbots, yet concerns remain regarding data privacy. A regulator from the Ministry of Communication and Informatics confirmed, "The main issue is not technical capability, but the absence of clear regulatory safeguards to protect citizens' data" (Interview, 2025).

Table 3. Generative AI Adoption in Indonesia by Sector (2023–2025)

Sector	Examples of Utilization	Key Challenges
Financial	Risk analysis, chatbot service	Data security, dependencies
Education	Adaptive learning, e-learning	Data quality, license fees
Public	Public service chatbot	Privacy, regulatory capacity

Sources: Dwivedi et al. (2023); Nugroho et al. (2023); Bappenas (2023).

National Sovereignty and the Risk of Dependency

A central concern arising from field interviews is Indonesia's vulnerability to foreign technological dominance. A regulator noted, "We may have our Personal Data Protection Law, but in practice, our critical data infrastructure still depends on foreign providers" (Interview, 2025). This reflects the gap between regulation and implementation.

Informants also underlined the sovereignty issue not only in data ownership but in regulatory autonomy. As one legal expert in Surabaya explained, "Indonesia risks following the standards of the US or EU because we lack bargaining power to propose our own" (Interview, 2025).

In addition, experts in national security expressed concerns about algorithmic manipulation. A cybersecurity official stated, "If algorithms are controlled externally, they could be used for political influence, even without us realizing" (Interview, 2025).

Table 4. The Risks of Generative AI's Dependence on National Sovereignty

Dependency Factors	Direct Impact	Implications for National Sovereignty
Dependence on Foreign Technology	Lack of local innovation, dominance of global platforms	Indonesia loses technological independence
Data Sovereignty Weakens	Strategic data managed by an external party	Privacy, security, and information control risks
Regulatory Independence Declines	Legal standards follow foreign blocs (US/EU/China)	National regulations are not sovereign
National Security Vulnerabilities	Potential sabotage, algorithm manipulation	Threats to political and economic stability

Source: Fukuyama (2021); Florida (2022); OECD (2023).

Indonesia's Strategy in a Fragmented Digital Economy

Based on both literature and field interviews, Indonesia's strategy must be multi-dimensional. First, regulatory strengthening is critical. A regulator emphasized, "We urgently need to enforce the PDP Law and establish national AI regulations that are not just copies of Western or Chinese models" (Interview, 2025).

Second, local innovation must be supported through research and industry-academia collaboration. An AI researcher explained, "Indonesia needs its own data-driven generative AI models, otherwise we will always be consumers" (Interview, 2025).

Third, digital diplomacy is crucial. A policy advisor highlighted, "Indonesia cannot stand alone. We must actively negotiate in forums like the G20 and OECD to represent the voice of developing nations" (Interview, 2025).

Table 5. Indonesia's National Strategy in a Fragmented Digital Economy

Dimension	Key Strategies	Potential Impact
Regulation	Implementation of the PDP Law, national AI regulation	Data protection and digital sovereignty
Local Innovation	Indonesian data-driven generative AI research	Technological independence, startup ecosystem
Diplomacy	Active participation in global forums (G20, OECD, AI Summit)	Representation of Indonesia's interests

Source: Nugroho & Sari (2023); UNCTAD (2022); Ng et al. (2025).

CONCLUSION

This study reveals that the fragmentation of the global digital economy positions Indonesia as a vulnerable consumer and adopter of generative artificial intelligence, with high risks of dependency that weaken data sovereignty, regulatory independence, and national security. Theoretically, this research contributes by linking AI adoption with geopolitical fragmentation and sovereignty debates, while practically it offers policy-oriented solutions through three strategies: short-term (2025–2027) enforcement of the Personal Data Protection Law and formulation of a national AI regulatory framework, medium-term (2027–2030) development of local innovation ecosystems through government–industry–academic collaboration, and long-term (2030 onwards) active digital diplomacy in global forums such as the G20 and OECD. The findings thus not only map Indonesia’s position in the fragmented digital economy but also provide concrete recommendations to strengthen national sovereignty; however, the study is limited by its qualitative scope and relatively small sample size, so future research should expand through cross-country comparisons, longitudinal approaches, and quantitative analyses to provide stronger evidence for policymaking.

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