DATA GOVERNANCE FOR ARTIFICIAL INTELLIGENCE IMPLEMENTATION IN THE FINANCIAL SECTOR: AN INDONESIAN PERSPECTIVE

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Abstract

The fast-evolving landscape of Artificial Intelligence (AI) is transforming industries worldwide, including Indonesia's financial sector. While AI presents immense opportunities for innovation and efficiency, it also poses complex challenges in data governance. This paper explores the need for Indonesia to establish a comprehensive and forward-thinking data governance framework tailored to AI implementation in the financial sector. Using a literature review method and drawing on global and local regulatory developments, the paper outlines key principles for AI-related data governance, including transparency, accountability, specificity, enforceability, and adaptability. By reimagining its approach to data governance, Indonesia can mitigate the risks of data misuse, enhance personal data protection, and foster an environment conducive to responsible AI innovation. The research addresses the foregoing issues by offering a conceptual foundation for policymakers, regulators, and financial institutions in Indonesia to develop better rules and practices for managing AI-related data to strengthen Indonesia's technological sovereignty, particularly in the financial sector. The study finds that Indonesia's current data governance framework in the financial sector is not yet optimal for supporting AI implementation. Indonesia's data governance framework requires adjustments in key areas, namely specificity, enforceability, and adaptability, while also promoting stronger cooperation among stakeholders.

Keywords: *artificial intelligence, data governance, AI governance, financial sector, technology regulation*

I. INTRODUCTION

Artificial Intelligence (AI) has undoubtedly become a topic of intense discussion and interest across the globe. Many speculate that it could be the catalyst for a 4th Industrial Revolution. Much like past technological advancements, those nations with the ability to leverage AI effectively may

gain a strategic advantage, including economic supremacy.[1] The rapid adoption of AI is expected to reshape industries and business models in unprecedented ways, making it a pivotal force for shaping the future of the global economy. Naturally, every country and market player is racing toward implementing it to the best of their abilities, and Indonesia is no exception. Studies indicate that AI could add approximately USD 366 billion to Indonesia's gross domestic product over the next decade.[2]

According to Magnuson, "writing about AI requires a certain dose of imagination".[3] As the world grapples with characterising this technology, there have been attempts to define AI and analogise it to other existing technologies. What remains undeniable is that AI is shaping up to be something humanity has never encountered before. However, development and implementation pose critical risks if they go unregulated.

As AI heavily relies on data, issues such as data misuse, privacy breaches, and algorithmic bias are particularly concerning. Without a well-defined set of data governance principles and rules, the development of AI could exacerbate existing inequalities, erode public trust, and lead to unintended societal harms. Beyond addressing technical and ethical concerns of AI, these principles must also serve as the basis for regulatory frameworks that promote the secure and trustworthy deployment of AI implementation. First, we need to define AI. The pioneering legal framework on AI, the EU Artificial Intelligence Act (EU AI Act), narrowly defines an "AI system" as "a machine-based system that is designed to operate with varying levels of autonomy and that may exhibit adaptiveness after deployment, and that, for explicit or implicit objectives, infers, from the input it receives, how to generate outputs such as predictions, content, recommendations, or decisions that can influence physical or virtual environments".[4]

A broader definition of AI encompasses any technology that exhibits adaptive and predictive capabilities in problem-solving contexts.[5] This differentiates AI from past versions of predictive technologies, such as those relying on mathematical probability models to forecast what will occur in the

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[1] Benjamin Fricke, *Artificial Intelligence, 5G and the Future Balance of Power* (Konrad Adenauer Stiftung, 2020), 1, https://www.jstor.org/stable/resrep25281.

[2] Eisya A. Eloksari, "AI to Bring in $366b to Indonesia's GDP by 2030 - Business," The Jakarta Post, October 9, 2020, https://www.thejakartapost.com/news/2020/10/09/ai-to-bring-in-366b-to-indonesias-gdp-by-2030.html.

[3] William J. Magnuson, "Artificial Financial Intelligence," *Harvard Business Law Review* 10, no. 2 (2020): 2.

[4] *Regulation of the European Parliament and of the Council Laying Down Harmonised Rules on Artificial Intelligence (Artificial Intelligence Act)*, art. 3, accessed January 25, 2025, https://artificialintelligenceact.eu/article/3/.

[5] Robin Feldman and Kara Stein, "AI Governance in the Financial Industry," *Stanford Journal of Law, Business, and Finance* 27, no. 1 (2022): 96.

future. For example, technologies used to predict consumer behaviour are already commonly used. AI involves a higher form of those mathematical models, which are commonly referred to as "machine learning" or, to use a more recent and accurate term, "deep learning". The algorithms in machine learning are developed to recognise patterns in data and generate predictions or decisions without the need for explicit programming. It is generally categorised as supervised learning, unsupervised learning, and reinforcement learning.

Supervised learning relies on labelled data to predict an output variable based on given input variables. Supervised learning is commonly applied in areas such as financial forecasting, portfolio management, credit assessment, and fraud detection. In contrast, unsupervised learning aims to train machines to recognise meaningful patterns or relationships within input data. It is utilised in applications such as fraud detection, customer segmentation, portfolio optimisation, credit risk analysis, and market analysis. Reinforcement learning, a more recent concept than supervised and unsupervised learning, involves an agent interacting with an environment to learn how to optimise a reward signal. The agent develops a policy that associates states with actions and uses this policy to determine the appropriate action in each state.[6]

Although AI in finance is still in its infancy,[7] its immense potential has sparked great interest. As earlier technologies have reshaped traditional finance business areas (such as banking and insurance) into a system where everything is implanted with technology (financial technology, or "fintech"), AI implementation now promises a whole new era.[8]

As institutions (including businesses in the financial sector) adopt AI to optimise their operations, improve decision-making, and provide personalised services, the industry stands at the threshold of a revolutionary shift. Moving at a rapid pace, there are calls from industry players for a regulatory anchor.[9] By and large, countries' leaders have publicly stated their official stance on AI development, which is a jurisdiction's regulatory approach to governing this new technology.

A survey conducted by the IDC Asia-Pacific Enterprise Cognitive/AI in 2018 revealed that Indonesia had the highest adoption rate in the region, with 24.6% of organisations implementing AI, followed by Thailand at 17.1%,

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[6] Carsten Maple et al., *The AI Revolution: Opportunities and Challenges for the Finance Sector*, n.d., 11, https://www.turing.ac.uk/news/publications/ai-revolution-opportunities-and-challenges-finance-sector.

[7] Feldman and Stein, "AI Governance in the Financial Industry," 96.

[8] Longbing Cao, "AI in Finance: Challenges, Techniques, and Opportunities," *ACM Computing Surveys* 55, no. 3 (2022): 1, https://doi.org/10.1145/3502289.

[9] *"The EU's AI Act, Explained | WSJ Tech News Briefing."* Posted October 27, 2023, by Wall Street Journal, YouTube video, 7 min., 35 sec. https://www.youtube.com/watch?v=i5iZNH2lC.

Singapore at 9.9%, and lastly Malaysia at 8.1%.[10] This encouraging number comes from the Indonesian government's openness toward AI. This attitude is illustrated by statements from the government on several occasions, including by Indonesia's former President, Joko Widodo, who said that "whoever controls AI would rule the world".[11] Following that statement, Indonesia has made some ambitious moves to get on top of the AI game, including its National Strategy for AI 2020 – 2045,[12] a collaborative effort among multiple government agencies, academicians, communities, and industry players. Additionally, the National Research and Innovation Agency (*Badan Riset dan Inovasi Nasional* or BRIN), a government agency at the forefront of AI development in Indonesia, has founded the Research Organisation for the Assessment and Application of Technology (OR PPT) to showcase Indonesia's AI developments. There is also collaboration with the Artificial Intelligence Research and Innovation (KORIKA), an association that promotes AI innovation.[13]

In addition to the efforts stated above, several Indonesian authorities, such as the Ministry of Communication and Digital Affairs (*Kementerian Komunikasi dan Digital*) and Financial Services Authority (*Otoritas Jasa Keuangan or OJK*), have added to the effort by releasing their ethical guidelines on the utilisation of AI. Indonesia can encourage a collaborative and constructive approach by implementing effective policy incentives that support the responsible use of AI, driving a significant digital transformation across Southeast Asia and beyond.[14]

This paper builds on a growing body of literature that addresses the governance challenges of AI, both domestically and globally, particularly in data processing and protection. Using a literature review method, this paper adapts these global insights to Indonesia's specific regulatory and institutional landscape.

In Indonesia, a robust set of data (especially personal data) from a massive population is being processed in the middle of a rapid digital transformation.

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[10] Ai Lei Tao, "Indonesia Leads ASEAN Region in AI Adoption | Computer Weekly," ComputerWeekly. com, July 12, 2018, https://www.computerweekly.com/news/252444634/Indonesia-leads-ASEAN-region-in-AI-adoption.

[11] OpenGov Asia, "Indonesia Deploys Artificial Intelligence to Accelerate Economy and Digital Transformation," November 9, 2021, https://opengovasia.com/2021/11/09/indonesia-deploys-artificial-intelligence-to-accelerate-economy-and-digital-transformation/.

[12] Badan Pengkajian dan Penerapan Teknologi (BPPT), *Strategi Nasional Kecerdasan Artifisial Indonesia 2020-2045* (July 2020), https://ai-innovation.id/images/gallery/ebook/stranas-ka.pdf.

[13] OpenGov Asia, "Indonesia Deploys Artificial Intelligence to Accelerate Economy and Digital Transformation."

[14] Elina Noor and Mark Bryan Manantan, "Artificial Intelligence," in *Raising Standards: Data and Artificial Intelligence in Southeast Asia* (Asia Society, 2022), 95, JSTOR, http://www.jstor.org/stable/resrep48536.10.

In order to protect Indonesians' privacy, build trust in the burgeoning digital economy, and enable responsible AI deployment, data governance has never been more urgent. However, Indonesia is still grappling with challenges such as a fragmented regulatory landscape and evolving enforcement capacities. The central question guiding this study is: how should Indonesia rethink its data governance approach to responsibly support AI implementation in its financial sector?

The study finds that Indonesia's existing data governance framework is insufficient to support the unique demands of AI implementation in the financial sector, particularly in two critical areas, data availability and personal data protection compliance. Drawing from comparative regulatory models and sectoral best practices, this paper argues for the establishment of a dedicated legislative framework that addresses these issues through more specific, enforceable, and adaptable governance mechanisms. Such a framework would not only enable responsible AI innovation but also help preserve Indonesia's digital sovereignty and strengthen the resilience of its financial sector in a rapidly evolving technological landscape.

The paper proceeds as follows. Section II outlines the foundational principles of AI ethics and data governance. Section III assesses the strengths and weaknesses of Indonesia's current regulatory framework, with an emphasis on data availability and personal data protection issues. Section IV presents a legislative proposal for a more adaptive and specific data governance framework designed to support AI implementation in the financial sector. The paper concludes by reflecting on the broader implications of this framework for Indonesia's digital economy and financial resilience.

II. AI AND DATA GOVERNANCE PRINCIPLES

AI integration into the financial sector can enhance efficiency, innovation, and customer experience. However, these opportunities come with challenges, particularly in regulating them. There has been an active debate on whether we should even consider governing AI. This question, while tough to answer, is followed by another question: *how* should we govern it?

Before we discuss this matter further, it is essential to first establish what we mean by the term "governance". For this article, we are going to lay the foundation by referencing Fukuyama's definition of governance, which is "a government's ability to make and enforce rules, and to deliver services, regardless of whether that government is democratic or not".[15] We are aware

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[15] Francis Fukuyama, *What Is Governance?* (SSRN Electronic Journal, 2013), 3, https://doi.org/10.2139/ssrn.2226592.

that the word "governance" can be defined in many ways, and a broader sense than merely a government's exercise of its authority. However, we believe that, particularly with the governance of AI, it is more urgent to discuss this matter first in a specified space of a government's authority or "public governance".

We recognise that public governance is made up of a collective effort from individuals, communities, organisations, and systems from the public, private, and nonprofit sectors.[16] In this regard, we approach our analysis with that exact collaborative spirit in mind, as we note how AI technology is largely controlled and owned by big technology corporations, which makes these private organisations' authority an impossible element to dismiss.

There are multiple aspects pertinent to AI governance. Given AI's inherent reliance on a large amount of training data, we view data governance as a particularly important subject of AI governance. By governing how data is utilised, we are significantly influencing how AI can be developed and implemented.

This concern is also shared by private banks in Indonesia. For example, Bank Central Asia (BCA) has reportedly adopted a data governance framework to support its AI systems.[17] While details are limited, this shows a growing alignment between private initiatives and broader data governance goals.

This section establishes key principles relevant to governing data activities in the context of AI. In setting out the relevant principles, a tailored approach to a regulatory framework for Indonesia's financial sector is proposed. First, it outlines foundational AI principles, such as accountability, transparency, and fairness, which are critical for building trust in AI systems. Second, it identifies core data governance principles relevant to these AI principles. Finally, it connects these principles with the financial sector, highlighting their relevance to Indonesia's regulatory environment, providing actionable information for Indonesian policymakers. By grounding these principles in Indonesia's unique financial and legislative environment, we are laying the groundwork for AI governance as well as figuring out how it should be positioned within Indonesia's current regulatory framework.

II.A. Foundational Principles of AI Governance

Ethical considerations serve as the foundation for any conversation around AI governance. The study of ethics examines the notions of good and evil

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[16] Pranita Srivastav, "Artificial Intelligence and Public Governance," *Supremo Amicus* 33 (2023): 1.

[17] PT Bank Central Asia Tbk, "Berhasil Perani Perkembangan Digitalisasi, BCA Raih Penghargaan di Ajang DataGovAI 2018," October 17, 2018, https://www.bca.co.id/id/tentang-bca/media-riset/pressroom/siaran-pers/2021/12/07/03/52/berhasil-perani-perkembangan-digitalisasi-bca-raih-penghargaan-di-ajang-datagovai-2018.

and their connection to morality and human behaviour. From historical, geographical, and material perspectives, the existence of a single, uniform, or universal ethical code cannot be justified, although some common principles may be shared.[18]

In approaching AI, ethics become particularly essential in the absence of regulation; however, it is not enough.[19] Boddington highlights that when technology evolves rapidly, the law may struggle to keep pace. In such cases, professional bodies and other stakeholders addressing ethical concerns should advocate for legal changes. Additionally, ethical codes established by professional organisations can often be adjusted more quickly and flexibly than national or international laws.[20]

For AI, these ethical guidelines materialised as principles. There are many versions of these principles as developed by various parties, and effective AI governance requires adherence to a set of foundational principles to ensure that these systems operate ethically, transparently, and responsibly. These principles are critical to building trust in AI, particularly in the financial sector, where decisions driven by AI can have significant economic and social implications.

A 2019 study on global AI ethics identified 84 instruments that set out principles or guidelines for AI ethics. The study found a global consensus around five key principle-based approaches: (i) transparency, (ii) justice and fairness, (iii) non-harmful use, (iv) responsibility, and (v) integrity/data protection.[21] One of the most widely cited sets of these principles was formulated by the Organisation for Economic Co-Operation and Development (OECD), consisting of: 1) principles to assist governments in formulating AI strategies and policies to ensure trustworthy AI; and 2) recommendations for national policies aimed at fostering AI ecosystems that benefit society.[22] These two categories of principles are laid out in the table below:

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[18] Margarita Robles Carrillo, "Artificial Intelligence: From Ethics to Law," *Telecommunications Policy* 44, no. 6 (July 2020): 3, https://doi.org/10.1016/j.telpol.2020.101937.

[19] *Ibid.*, 14.

[20] Paula Boddington, *Towards a Code of Ethics for Artificial Intelligence*, Artificial Intelligence: Foundations, Theory, and Algorithms (Cham: Springer International Publishing, 2017), 25, https://doi.org/10.1007/978-3-319-60648-4.

[21] Stefan Larsson, "On the Governance of Artificial Intelligence through Ethics Guidelines," *Asian Journal of Law and Society* 7, no. 3 (October 2020): 437–51, https://doi.org/10.1017/als.2020.19.

[22] Organisation for Economic Co-operation and Development (OECD), *Recommendation of the Council on Artificial Intelligence* (OECD/LEGAL/0449, 2025).

Table 1.
The 2019 OECD AI Principles, updated by the OECD Ministerial Council in 2024[23]

5 Value-based Principles for Trustworthy, Human-centric AI	5 Recommendations to Governments for AI ecosystems to Benefit Societies
1.1 Inclusive growt, sustainable development and well-being	2.1 Investing in AI research and development
1.2 Respect for the rule of law, human right and democratic values, including fairness and privacy	2.2 Fostering and inclusive AI-enabling ecosystem (data, compute, technologies)
1.3 Transparency and explainability	2.3 Shaping an enabling interoperable governance and policy environment for AI
1.4 Robustness, security and safety	2.4 Building human capacity and preparing for labour market transformation
1.5 Accountability	2.5 International co-operation and measurement on trustworthy AI

For this section, we focus more on the five value-based principles that ensure trustworthy and human-centric AI, which are more relevant to the discussion of data governance, as these principles are broader and can guide stakeholders, including policymakers. These principles form the basis of many jurisdictions' initial efforts to govern AI. Aside from the government or the public sector, the private sector, including big technology companies, and non-governmental organisations (NGOs), such as the Alan Turing Institute, have contributed to the formulation of these principles and the guidelines, frameworks, and policy strategies derived from therefrom. There are multiple incentives for these institutions, from a competitive advantage to signalling social responsibility.[24]

The recent trend in the market has taken these AI ethics and principles and developed guidelines. The Ethics Guidelines for Trustworthy Artificial Intelligence[25] are one manifestation. Although it explicitly excludes legal issues, these guidelines were developed focusing on responsibility, transparency, and data protection as fundamental elements in fostering trustworthy AI development.[26]

Following these AI ethics and principles is referred to as a "self-regulation" phenomenon, which is often a pretext for avoiding formal legislative

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[23] *Ibid.*

[24] Daniel Schiff et al., "What's Next for AI Ethics, Policy, and Governance? A Global Overview," in *Proceedings of the AAAI/ACM Conference on AI, Ethics, and Society* (AIES '20), New York, NY: Association for Computing Machinery, 2020, 153–58, https://doi.org/10.1145/3375627.3375804.

[25] High-Level Expert Group on Artificial Intelligence (AI HLEG), *Ethics Guidelines for Trustworthy AI* (European Commission, April 8, 2019), https://digital-strategy.ec.europa.eu/en/library/ethics-guidelines-trustworthy-ai.

[26] Larsson, "On the Governance of Artificial Intelligence through Ethics Guidelines," 438.

intervention. Several experts are of the opinion that this phenomenon occurs inevitably due to the accelerated development in the AI domain, as it is the catalyst for a more flexible regulatory approach. This approach may be seen as necessary while awaiting pivotal studies to advance and provide a strong framework for robust regulation.

Despite the many ongoing debates on AI governance, there are aspects of AI implementation that, in most jurisdictions, have been robustly regulated. One such aspect is data processing or utilisation. As AI heavily relies on data processing, this article argues that data governance is one of the most urgent matters for the government to focus on. Without immediate concern for how these data governance frameworks fit into the AI implementation, there are risks of data misuse, which, due to the nature of AI, could have irreversible impacts.

II.B. Key Pillars of Data Governance for AI

The rise of AI has fundamentally reshaped the potential of data processing, including how data is managed and utilised. Consequently, it creates both opportunities and challenges for regulators and industry players. Nowhere is this more evident than in the financial sector, where AI-driven insights are beaming with transformational potential but also introduce complex risks. Establishing effective data governance has become imperative to balance innovation with accountability, privacy, and systemic stability.

AI involves processing large volumes of data using iterative algorithms to identify relationships between inputs and outputs, which enables it to recognise patterns, learn from them, and make predictions.[27] The massive volume of data processed has raised multiple threats, for example, violation of personal data protection rules, surveillance, and algorithmic discrimination, sometimes referred to as "algorithmic injustice".

These data-related concerns fall under the scope of the AI principles laid out in the subsequent section. For example, the threat of algorithmic injustice implicates the principle of "explainability", as it relates to how parties using AI technology are unable to "explain" their algorithmic decision-making.[28] According to Cathy O'Neil, "algorithms are opinions embedded in code".[29]

The data used in the development of AI heavily affects the manifestation of these threats. Dan McQuillan suggests that while AI invites comparisons

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[27] Irene Pietropaoli, "Artificial Intelligence and Data Governance," *Singapore Academy of Law Journal* 34, Special Issue (2022): 795-833, https://journalsonline.academypublishing.org.sg/Journals/Singapore-Academy-of-Law-Journal-Special-Issue/Current-Issue/ctl/eFirstSALPDFJournalView/mid/503/ArticleId/1806/Citation/JournalsOnlinePDF.

[28] *Ibid.*

[29] Rikke Frank Jørgensen, eds., *Human Rights in the Age of Platforms* (The MIT Press, 2019).

with science, it is neither universal nor objective. Instead, the knowledge it generates is inherently tied to specific computational processes and training data that shape it.[30]

In the adoption of AI by financial institutions, the data involved is more complex than that of other sectors, which consequently creates more complex data-related challenges. While there are many safeguards regulating model risk, consumer protection (including personal data protection), and information security, financial authorities may need to evaluate whether existing regulations are sufficient, require reinforcement, or warrant the issuance of new guidelines specifically targeting AI-related data governance and management issues.[31]

Drawing a line from the general AI principles laid out above in Section II.A, we will discuss how these principles relate to data, and how it may inform the ideal data governance framework to cultivate compliant AI adoption practices:[32]

1. Inclusive Growth, Sustainable Development, and Well-Being. AI development can have several environmental impacts. For example, heavy data processing activities require massive amounts of energy. This is where an ideal data governance framework could be disproportional (e.g., by requiring or standardising a data minimisation practice).

2. Respect for the Rule of Law, Human Rights, and Democratic Values. Under this principle, one relevant category is "privacy and data governance". Research conducted by the OECD suggests that AI systems have the potential to generate or amplify disparities in access to information and power, influencing dynamics between businesses and consumers, employers and employees, as well as governments and citizens. The foregoing may have a greater impact on the degree of privacy protection. Aligning AI governance with privacy regulations can provide clearer guidance on the role of privacy and data protection laws in AI implementation.

3. Transparency and Explainability. Proprietary elements of explainability and interpretability are not covered by data protection laws to allow model designers to enhance model performance. However, data protection law and AI policy converge to enable individuals impacted by AI systems to comprehend and challenge processes or outcomes or help users identify algorithmic discrimination. Transparency involves addressing how to communicate information about complex systems in a way that is accessible,

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[30] Dan McQuillan, "People's Councils for Ethical Machine Learning," *Social Media + Society* 4, no. 2 (2018): 1-10, https://doi.org/10.1177/2056305118768303.

[31] Juan Carlos Crisanto et al., *Regulating AI in the Financial Sector: Recent Developments and Main Challenges*, FSI Insights No. 63 (Bank of International Settlements, December 12, 2024), 29, accessed January 20, 2025, https://www.bis.org/fsi/publ/insights63.htm.

[32] OECD, *AI, Data Governance, and Privacy: Synergies and Areas of International Co-Operation* (June 20, 2024).

understandable, and comprehensive—an issue that privacy authorities have long grappled with. Traceability also remains a shared concern in both privacy policy and AI communities, where greater collaboration is essential.

4. Robustness, Security, and Safety. AI and privacy policy share several alignments and synergies, particularly in addressing risks such as data leakage through generative AI models. This matter must be addressed in data protection and AI governance, particularly to align the understanding between the two disciplines, among other concerns, to establish a deeper appreciation of the impact of long-standing privacy standards and rules in this field.

5. Accountability. This principle may be manifested by integrating privacy management programs within AI systems to promote consistency in methodological approaches.

As these principles are identified, we move forward by examining how the existing data governance framework operates within the financial sector of Indonesia. This analysis delves into the regulatory landscape and emerging challenges facing the data governance framework within the financial sector. The subsequent section sets out a detailed discussion of these aspects, highlighting both the current framework and the areas for improvement.

II.C. Current Data Governance Framework in Indonesia's Financial Sector

Indonesia's financial legal framework has undergone significant transformations since the banking law of 1992. This evolution has also seen a gradual, yet crucial, shift in the understanding and regulation of data, moving from basic confidentiality principles to a more comprehensive data governance framework.

Law No. 7 of 1992 on Banking laid the foundation for data handling in the financial sector. While not explicitly addressing "data governance" as a distinct concept, the law introduced essential principles of information confidentiality and customer privacy. These principles were embedded within the broader framework of banking secrecy and fiduciary duties, imposing obligations on financial institutions to protect customer information. This implicit protection, however, was primarily focused on preventing unauthorised disclosure of financial information rather than addressing the broader spectrum of data lifecycle management. The absence of explicit data governance provisions reflects the limited role of digital technologies in financial services at the time. Data was primarily physical, and the risks associated with large-scale digital data processing were not yet prominent.

The enactment of IT governance regulations by the OJK, although not specifically focused on data governance, addressed critical elements intrinsically linked to it, such as cybersecurity, data security, and business continuity planning.

OJK regulations began to mandate specific security measures, data backup and recovery procedures, and incident response protocols. This regulatory focus on IT infrastructure and security paved the way for more explicit data governance frameworks.

Law No. 4 of 2023 on the Development and Strengthening of the Financial Sector (UU P2SK) marks a significant advancement in data governance within the financial sector. This legislation acknowledges the role of financial technology and digital finance, providing a legal framework for comprehensive data governance. It highlights the need to treat data as a key asset driving innovation and competition, while ensuring responsible use of data and consumer protection. However, it does not explicitly address data governance in the AI context, an issue explored further in the following sections

Indonesia's financial sector data governance framework has been shaped by a combination of general data protection laws and sector-specific regulations. Navigating this framework requires examining a wide range of regulatory instruments across different legal hierarchy levels, from overarching laws to regulations issued by sectoral authorities.

Under UU P2SK, which serves as the foundation for more detailed and operational regulations, sectoral regulators such as Indonesia's central bank (Bank Indonesia or BI) and OJK are empowered to issue regulations addressing specific aspects of data governance. While some existing regulations predate UU P2SK, the law has driven the need for updates. Although not all regulations have been fully aligned with UU P2SK, Table 2 outlines the prevailing regulations.

Table 2.
Data Governance-Related Regulations for the Financial Sector

Regulation	Key Data Governance Provisions
UU P2SK	• Ensures confidentiality of consumers' personal data[33] • Restricts data sharing with third parties[34] • Regulates cross-border data transfers[35] • Strengthen cybersecurity and system resilience[36]

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[33] Indonesia, L*aw No. 4 of 2023 on the Development and Strengthening of the Financial Sector* (UU P2SK), Art. 236(3) (Indonesia).

[34] UU P2SK, Art. 240.

[35] UU P2SK, Art. 241.

[36] UU P2SK, Art. 242.

Table 2.
Data Governance-Related Regulations for the Financial Sector (Continued)

Regulation	Key Data Governance Provisions
Law on Banking (Law No. 7 of 1992, as amended)	• OJK manages a centralised financial sector information system[37] • Establishes the principle of bank confidentiality (*Rahasya bank*)[38]
BI Regulation on Bank Indonesia Consumer Protection (BI Regulation No. 3 of 2023)	• Ensures data confidentiality and security, including third-party compliance • Requires accuracy and integrity of consumer data • Limits data transfers to third parties[39]
BI Regulation on the Information System Security and Cyber Resilience for Payment System Providers, Money Market, and Foreign Exchange Market Participants, and Other Entities Regulated and Supervised by Bank Indonesia (BI Regulation No. 2 of 2024)	Strengthens information security and cyber resilience through internal policies and reporting mechanisms
BI Regulation on Payment System (BI Regulation No. 22/23/PBI/2020 of 2020)	Regulates data governance for payment service providers, including transparency, data transfer restrictions, and data protection principles
Regulation of the Members of the Board of Governors on the Procedures for the Implementation of Bank Indonesia Consumer Protection (Regulation of the Members of the Board of Governors No. 20 of 2023)	• Restricts third-party data transfers • Requires certain mechanisms for consumer data use[40]
OJK Regulation on the Consumer and Public Protection in the Financial Services Sector (OJK Regulation No. 22 of 2023)	• Ensures data confidentiality and security[41] • Restricts data sharing and usage in specific cases[42] • Strengthens cybersecurity measure[43]
OJK Regulation on the Implementation of Anti-Money Laundering and Counter-Terrorism Financing Programs, including the Prevention of Weapons of Mass Destruction Proliferation Funding, in the Financial Services Sector (OJK Regulation No. 8 of 2023)	Requires data governance measures, including ensuring data accuracy, validity, access control, and confidentiality

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[37] Indonesia, *Law No. 7 of 1992 on Banking* (Law on Banking), Art. 37C (Indonesia).

[38] Law on Banking, Art. 40.

[39] *Bank Indonesia Regulation No. 3 of 2023 on Bank Indonesia Consumer Protection*, Art 33. (Indonesia)

[40] Regulation of the Members of the Board of Governors of Bank Indonesia No. 20 of 2023, art. 19 (Indonesia).

[41] *OJK Regulation No. 22 of 2023 on Consumer and Public Protection in the Financial Services Sector*, art. 19 (Indonesia).

[42] *OJK Regulation No. 22 of 2023,* Arts. 20-23.

[43] *OJK Regulation No. 22 of 2023*, Art. 24.

Table 2.
Data Governance-Related Regulations for the Financial Sector (Continued)

Regulation	Key Data Governance Provisions
OJK Regulation on the Information Technology Management in Commercial Banks (OJK Regulation No. 11/POJK.03/2022 of 2022)	• Requires localisation of electronic systems in domestic data centres and disaster recovery centres[44] • Implements personal data protection measures[45]
OJK Regulation on the Implementation of Risk Management in the Use of Information Technology by Non-Bank Financial Service Institutions (OJK Regulation No. 4/POJK.05/2021 of 2021, as amended)	Mandates the localisation of electronic systems in domestic data centres and disaster recovery centres [46]
OJK Circular on the Evaluation of the Digital Maturity Level of Commercial Banks (OJK Circular No. 24/SEOJK.03/2023 of 2023)	Introduces a self-assessment framework for IT governance, data governance, and personal data protection compliance
OJK Circular on Cybersecurity and Resilience for Commercial Banks (OJK Circular No. 29/SEOJK.03/2022 of 2022)	Provides guidelines for risk management and IT governance, in line with OJK Regulation 11/POJK.03/2022
OJK Circular on the Implementation of Risk Management in the Use of Information Technology by Non-Bank Financial Services Institutions (OJK Circular No. 22/SEOJK.05/2021 of 2021)	Provides guidelines for non-bank financial institutions on risk management and IT governance, aligned with OJK Regulation 4/POJK.05/2021

When compared with the data governance aspects of AI principles discussed in Section II.B, the current regulatory framework in the financial sector emphasises the robustness, security, and safety of data use. While transparency in data processing is also addressed to some extent, a key feature of these provisions is the focus on accountability.

As financial institutions manage large volumes of sensitive personal data, a particularly significant aspect of data governance in the financial sector is personal data protection. For AI governance, this matter is even more crucial.

Indonesia has a comprehensive and overarching law on personal data protection, which was enacted in October 2022. [47] UU PDP fully took effect in October 2024 and introduced several key regulatory compliance requirements, many of which directly impact AI development in the financial sector. Among the most critical issues addressed by UU PDP are consent, data subjects' rights and their fulfilment, cross-border personal data transfer, and data protection impact assessment. The specific provisions are set forth below in Table 3.

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[44] *OJK Regulation No. 11/POJK.03/2022 on the Organization of Information Technology by Commercial Banks*, art. 35 (Indonesia).

[45] *OJK Regulation No. 11/POJK.03/2022,* Arts. 44 and 45.

[46] Indonesia, *OJK Regulation No. 4/POJK.05/2021 on Application on Risk Management during the Use of Information Technology by Non-Bank Financial Service Institutions (as amended)*, art. 23.

[47] Indonesia, *Law No. 27 of 2022 on Personal Data Protection* (hereinafter UU PDP), Art. 22 (Indonesia)

Table 3.
Selected Key UU PDP Regulatory Compliance

Subject Matter	Description
Consent	Consent is among the six lawful bases for personal data processing under the PDP Law. To be valid, consent must be: • Explicit and express (in writing or recorded, including electronic or non-electronic means, e.g., a positive opt-in); • Separate from other terms and conditions; • Easily understood and accessible; • Clear and use plain language, including in Indonesian; • Preceded by a privacy notice outlining the lawful basis, purposes, types of data processed, retention period, and data subject rights; and • Documented as evidenced by the data controller.
Data subject rights	UU PDP provides data subjects the following rights:[48] • Right to be informed. Obtain details about the controller's identity, lawful basis, processing purposes, and accountability. • Right to rectification. Request corrections or updates to personal data. • Right of access. Access personal data held by the controller. • Right to deletion/termination of processing. Request deletion or cessation of processing. • Right to withdraw consent. Revoke consent to processing of personal data. • Right to object to automated decision-making. Challenge automated processing (including profiling) if it significantly impacts the data subject. • Right to restrict processing. Limit or suppress further data use. • Right to data portability. Obtain personal data in a standard, commonly used, machine-readable format and request secure transfer to another controller.
Data protection impact assessment (DPIA)	Controllers must conduct a DPIA when processing presents a high risk to the rights or interests of data subjects. High-risk scenarios include large-scale data processing and the use of new technologies for data processing.[49]
Cross-border data transfer	Personal data transfers to controllers or processors outside Indonesia must comply with UU PDP. Cross-border transfers are permitted if:[50] The recipient jurisdiction has an equivalent or higher data protection standard (official guidance on this standard is pending); The data exporter implements appropriate and binding contractual safeguards, such as data transfer agreements; and In the absence of the above, the transfer is based on the data subject's explicit consent.

Until a more specific regulation is enacted, the above provisions, both the general regulatory framework in the financial sector and the specific protections for personal data, can be applied to the implementation of AI in Indonesia. In reference to the EU Ethics Guidelines for Trustworthy AI,[51] it is important to recognise that there is no legal void, as existing regulations apply to AI. Therefore, AI is not unregulated.

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[48] UU PDP, Arts. 5-13.
[49] UU PDP, Art. 34.
[50] UU PDP, Art. 57.
[51] AI HLEG, *Ethics Guidelines for Trustworthy AI*.

As posited by Carrillo,[52] there are three aspects of the above application. First, legal rules and mandatory principles extend across all aspects of human and social activities, including the development of AI. Second, principles and binding rules can be extended to AI by analogy. Third, certain rules and principles may require revision to accommodate AI's unique characteristics. Existing data governance regulations, particularly those related to data protection, should be reviewed to ensure their continued effectiveness in addressing various scenarios arising from AI's extensive data usage.[53]

Although we have established that Indonesia has regulations that could apply to AI, including on data governance, the question remains whether they are sufficient. We can assess their sufficiency by discussing the application of these laws in the section below.

III. POTENTIAL CHALLENGES IN INDONESIA'S CURRENT DATA GOVERNANCE FRAMEWORK

Data is the fundamental driver of AI, serving as the essential input that enables AI systems to learn, recognise patterns, and make informed decisions. To implement AI initiatives and for them to live up to their potential, it is necessary to acquire the required base data, the mechanism to dynamically modify the data, as well as the security to guarantee its confidentiality and safety.[54]

Many issues exist in the AI sphere. We have highlighted some of the most significant ones for this article.

III.A. Data Availability

AI models require extensive datasets for effective training. As a dataset becomes larger and more diverse, the corresponding model's predictions and decisions become more accurate and reliable. Acquiring high-quality and extensive data sets is essential for enhancing AI model accuracy and adaptability across various applications.[55]

However, obtaining large-scale datasets presents significant challenges, particularly in Indonesia. Many jurisdictions have implemented regulatory frameworks to govern public data, ensuring accessibility, security, and compliance with data protection laws. For instance, the European Union's

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[52] Carrillo, "Artificial Intelligence: From Ethics to Law," 14.

[53] Sandra Wachter and Brent Mittelstadt, "A Right to Reasonable Inferences: Re-Thinking Data Protection Law in the Age of Big Data and AI," *Columbia Business Law Review* 2019, no. 2 (2019): 494-620, https://doi.org/10.7916/cblr.v2019i2.3424.

[54] Srivastav, "Artificial Intelligence and Public Governance," 5.

[55] Maple et al., "The AI Revolution," 15-16.

Open Data Directive (EU 2019/1024) promotes the reuse of public sector information while maintaining privacy safeguards under the European Union General Data Protection Regulation (GDPR). The United States' Open Government Data Act (2019) mandates federal agencies to make public data available in machine-readable formats, fostering transparency and innovation. Similarly, Australia's Data Availability and Transparency Act of 2022 provides a structured approach to secure government data sharing, while South Korea's Act on Promotion of the Provision and Use of Public Data of 2013 ensures public data accessibility for research and technological advancements.

Public data governance in Indonesia is primarily regulated through Law No. 14 of 2008 on Public Information Disclosure (UU KIP), which promotes transparency and ensures public access to government-held information.[56] Many public institutions lack the necessary resources for effective information management, leading to inconsistent implementation of the law.[57] Additionally, public institutions often fail to proactively disclose information, further limiting access to valuable datasets.[58] Importantly, UU KIP does not address data standardisation or interoperability, both of which are essential for AI models to effectively process and analyse large-scale datasets. The absence of these provisions results in fragmented and incomplete datasets, ultimately hindering AI-driven innovation and limiting evidence-based policymaking.

Another initiative in this matter is Satu Data Indonesia (SDI) introduced under Presidential Regulation No. 39 of 2019, which seeks to standardise, integrate, and enhance data interoperability across government agencies by implementing the data-once-only principle, ensuring that national and local agencies synchronise their data systems so citizens, businesses, and institutions only have to submit information one time.[59] Despite its potential, SDI has yet to achieve full operational effectiveness, due to challenges such as weak collaboration between central and regional authorities, inadequate infrastructure, limited data utilisation in policymaking, and insufficient engagement from key government agencies, specifically the Ministry of Home

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[56] Indonesia, *Law No. 14 of 2008 on Public Information Disclosure.*

[57] Wahyu Sudoyo, "Implementasi UU KIP Masih Alami Berbagai Kendala," *Info Publik*, October 30, 2023, https://infopublik.id/kategori/nasional-sosial-budaya/792109/implementasi-uu-kip-masih-alami-berbagai-kendala?utm.

[58] Muharman Lubis, Tien Fabrianti Kusumasari, and Lukmanul Hakim, "The Indonesia Public Information Disclosure Act (UU-KIP): Its Challenges and Responses," *International Journal of Electrical and Computer Engineering (IJECE)* 8, no. 1 (2018): 94, https://doi.org/10.11591/ijece.v8i1.pp94-103.

[59] Rendy Pahrun Wadipalapa et al., "An Ambitious Artificial Intelligence Policy in a Decentralised Governance System: Evidence from Indonesia," *Journal of Current Southeast Asian Affairs* 43, no. 1 (2024): 65–93, https://doi.org/10.1177/18681034231226393.

Affairs (*Kementerian Dalam Negeri*), in promoting regional adoption.[60] As a result, SDI remains underdeveloped and is insufficient to support AI-driven applications effectively.

In the financial sector, data availability is further constrained by regulatory restrictions. The OJK maintains a centralised information database called SLIK (*Sistem Layanan Informasi Keuangan*). While SLIK contains a wealth of financial data, its use is strictly regulated. Data access is limited to specific purposes, such as service provision, legal compliance, and other uses explicitly permitted by law, which do not include AI development that utilises financial data.

Additionally, the OJK imposes restrictions on the use of foreign infrastructure for processing consumer data, which is sometimes seen as a data localisation requirement.[61] This limitation constrains domestic businesses' access to and use of foreign AI solutions. In practical terms, this restriction may affect the capability of AI solutions to generate outputs that align with the specific conditions in Indonesia.

The lack of large, high-quality, and well-integrated datasets in Indonesia presents a major challenge for AI development. Without a structured framework that facilitates public data access for AI research, similar to those in the EU, US, Australia, South Korea, and other leading jurisdictions, AI applications in Indonesia may struggle with accuracy, scalability, and real-world applicability. Addressing these data challenges is essential to fostering a more AI-ready environment and unlocking the full potential of AI-driven innovations in Indonesia.

III.B. Personal Data Protection Issues

It is hard to exclude personal data from training models in AI development and the improvement of these models' decision-making processes. In that regard, UU PDP imposes new regulatory compliance requirements on businesses as personal data controllers.

1. *Challenges in obtaining valid consent*
   Under UU PDP, every personal data processing activity must have a valid lawful basis, such as contractual obligation, legal compliance, legitimate

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[60] "Rapat Dewan Pengarah SDI Tajamkan Strategi dan Program Prioritas," press release, *Kementerian Perencanaan Pembangunan Nasional/Badan Perencanaan Pembangunan Nasional*, July 8, 2022, accessed January 20, 2025, https://www.bappenas.go.id/id/berita/rapat-dewan-pengarah-sdi-tajamkan-strategi-dan-program-prioritas-yeLGG.

[61] Indonesia, *OJK Regulation No. 11/POJK.03/2022 on the Organization of Information Technology by Commercial Banks*, Art. 35 and *OJK Regulation No. 4/POJK.05/2021 on Application on Risk Management during the Use of Information Technology by Non-Bank Financial Service Institutions (as amended)*, art. 23.

interest, or consent.[62] In the financial sector, where customer data is processed to facilitate service delivery, contractual obligations generally serve as the default lawful basis.

Determining an AI system's role in any given financial service product is key in identifying the appropriate lawful basis. If AI is essential (e.g., credit scoring or fraud detection), a contractual obligation may apply. However, if AI is used for general improvements, such as refining algorithms for future use, contractual obligations may no longer be applicable.

One potential alternative is legitimate interest, where data controllers must assess the necessity of data processing and balance it against individuals' rights and freedoms.[63] Given that AI systems function similarly to previous data-driven technologies that require continuous updates, legitimate interest could be a logical legal basis. However, UU PDP lacks clear guidance on conducting legitimate interest assessments. Due to this uncertainty, consent remains the safest basis for AI development for now.

However, obtaining consent at the scale of AI systems is highly challenging. Beyond the scale of the data processing, the involvement of third-party AI developers adds complexity. If these developers utilise data to train their models for multiple purposes, they must obtain consent directly from data subjects for each purpose.

Therefore, despite consent being the soundest legal basis for AI-driven data processing under UU PDP, its implementation presents significant operational hurdles.

2. *Challenges in fulfilling data subject rights*

Even when consent is obtained, businesses must still comply with data subjects' rights under UU PDP, including access, correction, deletion, and portability.[64] AI processing creates new challenges in fulfilling these obligations, particularly due to how AI models aggregate and transform personal data.[65]

Data traceability is a major concern. Unlike structured databases, where data can be retrieved or modified, AI models store data as mathematical

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[62] UU PDP, art. 20.

[63] "Legitimate Interest Assessment (LIA)," Information Commissioner's Office, accessed January 20, 2025, https://ico.org.uk/for-organisations/uk-gdpr-guidance-and-resources/accountability-and-governance/accountability-framework/records-of-processing-and-lawful-basis/legitimate-interest-assessment-lia/.

[64] UU PDP, art 16 (2)C.

[65] European Parliament, Directorate General for Parliamentary Research Services, *The Impact of the General Data Protection Regulation on Artificial Intelligence* (Luxembourg: Publications Office of the European Union, 2020), https://data.europa.eu/doi/10.2861/293.

representations, making it difficult, if not impossible, to extract specific individual data. This complicates access and correction requests, as businesses may lack visibility into how individual data influences AI decisions.

Data portability presents another challenge. While financial providers can provide raw data, AI-generated outputs, such as risk scores or behavioural predictions, are often derived from patterns derived from multiple individuals. UU PDP does not clarify whether such AI-generated insights must be shared.

Additionally, the scale and frequency of data subject requests create an operational burden. AI-driven financial services process millions of customer records. If large numbers of individuals submit simultaneous data subject requests, compliance could be logistically impossible.

For outsourced AI development, responsibility for data subject request fulfilment is unclear. If a financial provider is the data controller, it must ensure an AI developer facilitates compliance. However, if an AI developer processes data for multiple clients, it may become a separate controller, raising questions about who is ultimately responsible for UU PDP compliance.

Given the paucity of UU PDP's AI-related guidance, businesses must interpret compliance obligations case by case or based on each issue, increasing the risk of inconsistent implementation as well as legal exposure.

3. *Challenges in implementing DPIA*
    Under UU PDP, data controllers must conduct a DPIA for high-risk personal data processing, including large-scale AI processing.[66] However, implementing DPIAs in AI development is highly impractical, particularly due to the scale and complexity of data involved.

    A key challenge is that AI models continuously evolve, meaning static risk assessments quickly become outdated. UU PDP does not specify how often DPIAs must be updated for AI models that learn and change over time. If DPIAs are treated as one-time assessments, they would miss emerging risks as AI systems process new data. On the other hand, if DPIAs must be updated frequently, the compliance burden would be unsustainable. Unlike traditional data projects, AI systems are too dynamic to fit within existing DPIA frameworks.

    Data traceability also complicates DPIAs. AI models aggregate and anonymise large datasets, making it difficult to assess risks on an individual

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[66] UU PDP, Art. 34.

level. DPIAs require identifying potential harms to specific data subjects, but when AI systems process millions of data points collectively, this becomes impractical.

In light of the discussion in Section III, Indonesia's regulatory framework poses two key challenges for AI development: limited data availability and the impracticality of new legal obligations under UU PDP. First, existing regulations fail to ensure the availability and access to high-quality, standardised public data, which is essential for AI-driven innovation. Second, UU PDP imposes significant constraints on AI development. Lawful processing requirements, particularly consent, are ill-suited for large-scale AI applications, where direct interaction between data subjects and AI developers is often absent. These regulatory constraints not only complicate compliance but also limit the scalability and effectiveness of AI systems in Indonesia.

IV. PROPOSALS FOR A MORE EFFECTIVE DATA GOVERNANCE FRAMEWORK

AI is a complex technology that, in certain aspects, aims to replicate and even surpass human intelligence.[67] This has become a difficult area to govern, amplified by the notion that AI is legally analogous to humans, which has been the centre of the laws created. Chesterman asserts that the rule of law embodies anthropocentrism, with humans acting as both the central subjects and enforcers of norms that they establish, interpret, and implement within society.[68]

There are many opinions around how AI should be regulated. Some argue that international regulation is inevitable and that the optimal AI governance model would be a universal international organisation founded on an international treaty, defining rights, obligations, and clear commitments regarding its use and development.[69] The foregoing could be conducted by an organisation comprising government entities, big technology companies, and other relevant parties, such as NGOs.

Specifically in Indonesia, based on our analysis in the previous sections, the existing data governance framework is insufficient to address the necessary data activities as well as the risks in the AI development and implementation context. For the financial sector, the existing regulatory walls on data utilisation,

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[67] Carrillo, "Artificial Intelligence: From Ethics to Law," 10.
[68] Simon Chesterman, "Artificial Intelligence and the Problem of Autonomy," *Notre Dame Journal on Emerging Technologies* 1, no. 2 (2020): 210–50, https://doi.org/10.2139/ssrn.3450540.
[69] Carrillo, "Artificial Intelligence: From Ethics to Law," 13.

as explained in the subsequent section, lead to hindrances to AI development at best, and gaps that allow data misuse in AI implementation at worst.

To address this issue, instead of revamping the current data governance framework, we believe that it is worth considering the possibility of creating new legislation instead. Taking inspiration from other jurisdictions with specific legislation governing "special data use", we believe that the same approach can be taken to regulate AI implementation in Indonesia's financial sector.

This legislation, setting aside Indonesia's regulatory hierarchy, should address both data availability and personal data protection. Depending on how the substance of the legislation turns out, beyond data issues, more AI risks can also be addressed.

We identified several approaches of this fictional legislation: (i) one that governs AI development and implementation; (ii) one that governs public data, i.e., bulk data that may be used by certain parties; or (iii) one that is a merger of the previous two approaches. Considering the myriad issues to be addressed, the last approach is what we believe to be the best one, at least for the foreseeable future.

The ideal legislation would govern both the data aspects of the AI development and implementation, as well as the design and use of AI (relevant to data, which remains the primary topic of this legislation). To realise the foregoing objectives, the legislation may tailored to govern: "the use of data (including personal data) in the case of new technology development and implementation".

In the same sense as Indonesia's current SDI regulation governing public data, this proposed legislation would act as a basis for the use of a bulk amount of available as well as future data for new technology development. The reason why we do not recommend limiting its scope to "AI development" is discussed later in this section.

Firstly, it is important to discuss why the data processing oversight is important. Because AI use is inevitable, hindering the use of data could increase reliance on foreign technology solutions. Reliance on foreign data processing risks "data colonialism", where, in the long run, foreign AI providers control data processing and extract economic value without fostering local innovation.[70] From a data sovereignty perspective, Indonesia's dependence on external AI infrastructure weakens its ability to govern its own financial data while subjecting businesses to foreign regulatory and ethical frameworks as they inevitably adopt AI solutions to align with market development. Without proactive reforms to make available the data needed for AI development in

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[70] Pietropaoli, "Artificial Intelligence and Data Governance," 805-806.

Indonesia, we risk becoming either a data-exporting nation—supplying raw data to global AI models without the ability to build and own our AI solutions, or a nation that falls behind due to regulations that restrict AI adoption.

Another major challenge is personal data protection regulation, because the current framework cannot accommodate data processing for AI, which involves a large amount of training data containing personal data from individuals. The ideal training data would not contain personal data altogether; however, this is simply impossible given the current state of this technology. Instead of outright exclusion, a more pragmatic approach would be to provide a "special" basis for compliance on personal data protection in AI applications (one that supersedes the provisions under the UU PDP). These provisions could require anonymisation and pseudonymisation to remove direct identifiers, differential privacy techniques to introduce statistical noise while preserving data utility, data minimisation, and purpose limitation to ensure only essential data is processed. The balance between regulatory compliance and AI development is the ultimate goal.

Secondly, as discussed earlier, we seek to avoid restricting proposed legislation to "AI development". This approach aligns with the "technology neutrality" principle,[71] which advocates that regulations should neither mandate nor favour specific technologies. Instead, regulations should focus on controlling behaviour or mandating outcomes in a way that remains consistent regardless of the technological means employed by the regulated entity. This ensures flexibility and adaptability as technology evolves.

In conclusion, the rapid evolution of AI demands a forward-thinking legislative framework that addresses AI's data-related challenges without stifling innovation. To maintain competitiveness and achieve technological sovereignty, Indonesia needs to reassess its framework of data governance with a holistic understanding of the extensive data processing activities required for AI implementation. Legislation should incorporate key elements such as specificity, enforceability, and adaptability while fostering cooperation among stakeholders. This ensures a regulatory framework that offers legal certainty through clear provisions (specificity), is capable of practical implementation and oversight (enforceability), and remains responsive to technological advances (adaptability). Concurrently, fostering cooperation among stakeholders promotes inclusive, accountable governance essential for sustainable and innovation-friendly AI development.

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[71] Chris Reed, "Taking Sides on Technology Neutrality," *SCRIPT-Ed* 4, no. 3 (2007): 263–84, https://doi.org/10.2966/scrip.040307.263.

V. CONCLUDING REMARKS

The transformative potential of AI in Indonesia's financial sector demands an urgent and well-structured governance response. While AI adoption is still in its infancy, the accelerating pace of technological advancements worldwide leaves no room for complacency. However, these benefits cannot be fully realised without first addressing the structural gaps in Indonesia's existing data governance framework.

As this paper has argued, data governance is not merely an ancillary component of AI implementation; it is the foundation upon which responsible and sustainable AI deployment must be built. The core pillars of data governance—data quality, privacy, ethical use, transparency, accountability, and interoperability—are essential safeguards to ensure that AI systems serve public and institutional interests without exacerbating systemic risks or social inequities. Without these safeguards, AI implementation may entrench biases, compromise consumer protection, or create new forms of digital asymmetry in the financial sector.

As discussed above, the key issues identified include challenges in accessing high-quality and readily available data, as well as concerns surrounding personal data protection. A central obstacle to addressing these challenges is the presence of regulatory barriers that hinder the optimal deployment and operation of AI systems.

Indonesia must urgently untangle existing regulatory knots and establish a forward-looking data governance framework to foster responsible AI adoption. While collaboration among policymakers, financial institutions, technology developers, and other stakeholders is essential to ensure that governance mechanisms are inclusive and practically implementable, such efforts alone are insufficient to address the scale and complexity of AI-related risks. Ultimately, it is robust, adaptive, and enforceable legislation that would serve as the true driving force in establishing regulatory certainty, safeguarding fundamental rights, and mitigating systemic risks. A strong legal foundation is not merely a complement to multi-stakeholder collaboration; it is the structural backbone necessary to ensure that AI implementation in the financial sector is both transformative and responsible.

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