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TRANSPARENCY AND DISCLOSURE IN THE IMPLEMENTATION OF FINTECH AND AI BY FINANCIAL SERVICE INSTITUTIONS IN SUSTAINABILITY REPORTS

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Abstract

This study evaluates the application of financial technology (FinTech) and artificial intelligence (AI), as well as the transparency of their disclosure in Sustainability Reports across four types of financial service institutions (FSIs) in Indonesia: banks, insurance companies, finance companies, and securities firms. By analysing the content of 20 Sustainability Reports, this study finds that banks have the highest level of technology implementation and disclosure, followed by finance, insurance, and securities firms. Although FinTech and AI contribute to operational efficiency, service innovation, and the expansion of financial access, disclosures related to these technologies are still limited in Sustainability Reports, often using terms like "digitalisation" without explicit explanation. These findings underscore the importance of enhanced transparency in technology disclosure to foster public trust and accountability, as well as to ensure compliance with regulations such as the OJK Regulation on Sustainable Finance. This study recommends strengthening reporting standards and regulatory guidelines to improve technology disclosures in the financial sector, thus enabling a sustainable and inclusive digital financial ecosystem.

Keywords: *FinTech, artificial intelligence/AI, financial service institution, general data protection regulation (GDPR), sustainability report.*

I. INTRODUCTION

In today's digital era, the use of financial technology (FinTech) and artificial intelligence (AI) has radically transformed the global financial services sector. FinTech and AI have revolutionised not only how financial institutions operate and interact with customers, but also how they manage the vast data generated by transactions and customer interactions. The use of these technologies aims not only to enhance operational efficiency but also to create innovative products and services, more responsive to the dynamic and diverse market needs.

In addition to providing convenience and efficiency, FinTech and AI have opened up financial services to segments of society previously unreachable by the traditional banking system. These innovations have optimised service personalisation, enhanced transaction security, and enabled more accurate and faster data analysis, helping financial institutions make more precise credit and investment decisions. However, behind these benefits are significant challenges, including data privacy issues, ethical regulations governing AI use, and increasing cybersecurity risks. Therefore, clarity and transparency regarding the use of these technologies by financial service institutions are critically important, especially in efforts to enhance public trust.

In the financial industry, trust is a highly valued asset. By providing transparency on how technologies like FinTech and AI are used, companies can build and maintain customer trust. This helps customers understand how their data is used and how technology affects the services they receive.[1]

In Indonesia, regulations such as the Financial Services Authority Regulation (POJK) No. 51/POJK.03/2017 on the Implementation of Sustainable Finance for Financial Service Institutions, Issuers, and Public Companies have established standards for financial institutions to follow in reporting their sustainability practices. The Sustainability Report is a document issued by companies to inform stakeholders about the economic, environmental, and social impacts of their operational activities.

In addition to the aforementioned regulation, Circular Letter No. 16/SEOJK.04/2021 concerning annual reports of issuer company groups and public companies was also issued. In Part III, number 2, section h, regulating the contents of annual reports, it sets forth the social and environmental responsibilities of public companies. It is stated that the information disclosed in the social and environmental responsibility sections of annual reports constitutes the Sustainability Report as stipulated in POJK 51 of 2017. According to this circular, for public companies, the Sustainability Report is an inseparable part of an annual report, although it may be presented separately.

The Sustainability Report also must disclose matters about the company that are deemed essential to investors, regulators, and the public at large. Based on a sample taken from four financial service institutions, for instance, the matters considered important may include issues relating to transparency and disclosure of the implementation of FinTech and AI, which are becoming increasingly important and relevant due to their significant roles and impacts on stakeholders.

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[1] Enrique Bonsón, and Michaela Bednárová, "Artificial Intelligence Disclosures in Sustainability Reports: Towards an Artificial Intelligence Reporting Framework" in *Digital Transformation in Industry*, ed. Vikas Kumar et al. (Springer, 2022), 393-394, https://doi.org/10.1007/978-3-030-94617-3..

According to Kaplan and Haenlein,[2] transparency in the use of AI demonstrates that institutions are striving to fulfil their social responsibilities by avoiding unethical or discriminatory uses of technology. Accenture[3] adds that through transparency, financial institutions can more effectively engage stakeholders, including customers and investors, who may have concerns about how their data is used and how AI-based decisions affect the services they receive.

As noted by the OECD[4], transparency and explainability are foundational requirements for trustworthy AI, particularly in high-impact sectors such as finance, as they allow for better understanding of algorithmic decisions and facilitate accountability measures.

There has been limited research on the disclosure of FinTech and AI implementation and its impact on corporate stakeholders. Shiyyab[5] and his colleagues investigated the extent to which banks in Jordan adopt AI technology and how disclosing this AI affects their financial performance, specifically their efficiency, profitability, and operational cost reduction. This study found that AI disclosure has a positive impact on banks' financial performance, particularly by enhancing profitability and reducing operational costs. Nevertheless, there is significant variation in AI disclosure among Jordanian banks, indicating that AI reporting standards are still in the early stages of development.

This research builds on the limited existing studies to address several research questions: How financial service institutions in Indonesia implement FinTech technology in their operations; How the use of AI in financial services affects the operational efficiency and security of financial service institutions; and the transparency of financial service institutions in disclosing the use and impact of FinTech and AI technologies in their Sustainability Reports.

The study answers these research questions using content analysis techniques on the Sustainability Reports of financial service institutions. The results of this study provide an overview of the extent to which financial service institutions in Indonesia are cognizant of the importance of transparency to their stakeholders. For central bank and financial services regulators, information on the disclosure of FinTech and AI use can clarify whether

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[2] Andreas Kaplan, and Michael Haenlein, "Siri, Siri, in My Hand: Who's the Fairest in the Land? On the Interpretations, Illustrations, and Implications of Artificial Intelligence," *Business Horizons* 63, no. 1 (1999): 22-23, https://doi.org/10.1016/j.bushor.2018.08.004.

[3] Accenture, *Building trust into conversational AI solutions*, (Accenture, 2022), 15-19. https://www.accenture.com/content/dam/accenture/final/a-com-migration/manual/r3/pdf/pdf-181/Accenture-POV-Ethics-Final.pdf

[4] OECD. *Generative Artificial Intelligence in Finance.* (OECD Publishing, 2023), 33.

[5] Fadi S. Shiyyab et al., "The Impact of Artificial Intelligence Disclosure on Financial Performance," *International Journal of Financial Studies* 11, 115 (2023): 115, https://doi.org/10.3390/ijfs11030115

companies have the proper controls and procedures to manage related risks, such as cybersecurity and data privacy. This is extremely important given the potential risks that can arise from implementing new technologies.

Based on the study's findings, this article also encourages the development of more structured ethical guidelines and governance for the implementation of FinTech and AI in Indonesia's financial services sector. These guidelines are expected to help financial service institutions manage the risks associated with advanced technologies, including data privacy, cybersecurity, and potential biases in decision-making. Additionally, these guidelines can ensure that technological innovations are implemented responsibly and in accordance with sustainability principles, including transparency, accountability, and consumer protection. With strong regulation and governance, Indonesia's financial sector can fully leverage the potential of FinTech and AI to enhance financial inclusion, operational efficiency, and stakeholder trust in an increasingly digitally integrated financial ecosystem.

II. LITERATURE REVIEW

In this literature review section, several concepts related either directly or indirectly to the transparency and disclosure of FinTech and AI applications in financial institutions are discussed. The review covers the implementation of both in Financial Institutions, AI governance, legal and ethical frameworks regarding AI, the benefits and drawbacks of implementing AI, and the importance of transparency in AI applications. Due to its more complex nature, AI is discussed more extensively than FinTech.

II.A. FinTech and Artificial Intelligence in Financial Service Institutions

FinTech has transformed the financial industry by integrating advanced technology to facilitate and enhance financial services. FinTech, which includes applications such as digital payments, peer-to-peer lending, online investing, and blockchain technology, provides consumers and businesses with faster, easier, and more affordable access to financial services. This innovation is crucial in regions previously underserved by traditional banks, where technologies such as blockchain have already simplified transactions and enhanced security.[6]

On the other hand, AI has revolutionised the analytical and operational capabilities of financial institutions. With advances in machine learning and natural language processing, AI has enabled extensive automation of tasks such as credit

[6] Namita Rajput et al., "Global Adoption of Fintech," in *Revolutionary Challenges and Opportunities of Fintech*, ed. Sweta Anand et al., (Apple Academic Press, Inc., 2024), 15-16; OECD. *Generative Artificial Intelligence in Finance.* (OECD Publishing, 2023), 7

risk analysis, fraud detection, and customer service personalisation. AI offers advantages by processing large volumes of data in real time, allowing financial institutions to make more accurate and responsive decisions to customer needs.[7]

The integration of AI and FinTech creates opportunities for further innovation in providing more inclusive financial services. For example, with AI, financial institutions can identify and reach populations underserved due to traditional data limitations. Additionally, AI can enhance operational efficiency by automating routine tasks, thereby reducing costs and allowing financial institutions to focus on more complex strategy development.[8]

However, the use of this advanced technology is not without challenges. Data privacy and security issues are significant concerns, primarily as financial institutions collect and process greater volumes of sensitive personal information. These challenges require strict data governance and adaptable regulations to protect consumers. For instance, the General Data Protection Regulation (EU GDPR) in the European Union has set rigorous standards for data protection and privacy that financial institutions operating or serving consumers within the EU must follow.[9]

The regulatory sandbox approach, as adopted by Singapore and Indonesia, allows FinTech startups to test new products and services in a controlled environment without significant risks to the broader financial system. This approach supports innovation while ensuring potential hazards are identified and managed before products are introduced to a wider market.[10]

Next, the expansion of digital technology in financial services also creates a need for enhanced digital skills in the workforce. Skill enhancement and retraining are crucial to financial institutions' strategies for adapting to technological changes. These training initiatives involve not only introducing new technologies but also developing a deep understanding of the ethical and social implications of AI implementation.[11]

In this context, effective and ethical governance of AI is crucial. Attention to AI is so high because, unlike FinTech, it is unique in the complexity of its high-level decision-making. AI works autonomously and can make its own decisions based on complex algorithms and the data it collects. This raises ethical

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[7] George Luger, *Artificial Intelligence: Principles and Practice* (Springer, 2025), 56-58; Nurhadhinah Nadiah Ridzuan et al., "AI in the Financial Sector: The Line between Innovation, Regulation and Ethical Responsibility," *Information* 15, no. 432 (2024): 5, https://doi.org/10.3390/info15080432.

[8] Luger, *Artificial Intelligence*, 14-16.

[9] Sweta Anand et al., eds., *Revolutionary Challenges and Opportunities of Fintech*, (Apple Academic Press, 2024), 211-212.

[10] Felix I. Lessambo, *Fintech Regulation and Supervision Challenges within the Banking Industry, A Comparative Study within the G-20* (Springer, 2023), 167, 297, https://doi.org/10.1007/978-3-031-25428-4.

[11] Luger, *Artificial Intelligence*, 576.

concerns because decisions made by AI can significantly affect human lives, for example, in credit scoring, insurance determinations, labour recruitment, or even in the judicial system. FinTech, on the other hand, functions more as a tool or platform that connects users with digital financial services. FinTech does not make decisions independently like AI, so the issues surrounding its use are more focused on the security, reliability, and transparency of services, rather than on how decisions are made.[12]

Accordingly, there is a greater risk of bias and discrimination in AI than in FinTech. Decisions made by AI are often difficult to understand or explain transparently to customers because they use complex machine learning models.

II.B. AI Governance

AI governance refers to the systems, rules, policies, and frameworks designed to ensure that the development, deployment, and use of AI are conducted responsibly, safely, fairly, ethically, and in the best interest of the public. As noted by Floridi[13] and Wiesmüller,[14]adherence to values such as fairness, privacy, accountability, and transparency is essential in minimising the risks and maximising the benefits of AI for society, the economy, and the environment.

Ethical principles, as applied in various initiatives including the Asilomar principles and ethical frameworks established by the OECD and the European Union, require AI to be designed to prevent misuse and algorithmic bias, while supporting accountability and preventing the development of autonomous weapons.[15] Zwitter and Gstrein[16] emphasise the importance of transparency and accountability, where AI users and developers must understand how the system works and mechanisms ensure that parties responsible for negative impacts arising from AI can be identified and regulated.

The importance of multi-stakeholder involvement in AI governance cannot be overlooked. Gao[17] reveals that collaboration among governments, the private sector, civil society, and academia creates an inclusive and comprehensive framework. Given the global nature of AI, Zekos[18] argues that

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[12] Shiyyab, "The Impact of Artificial Intelligence Disclosure," 4.

[13] Luciano Floridi, ed., *Ethics, Governance, and Policies in Artificial Intelligence* (Springer, 2021), 44, https://doi.org/10.1007/978-3-030-81907-1.

[14] Sabine Wiesmüller. *The Relational Governance of Artificial Intelligence: Forms and Interactions.* (Cham: Springer, 2023), 9-11, 17-18. https://doi.org/10.1007/978-3-031-25023-1.

[15] Qiqi Gao and Jiteng Zhang, *Artificial Intelligence Governance and the Blockchain Revolution* (Springer, 2024), 26-27, https://doi.org/10.1007/978-981-99-9211-9

[16] Andrej Zwitter and Oskar J. Gstrein, *Handbook on the Politics and Governance of Big Data and Artificial Intelligence*, (Edward Elgar Publishing, 2023), 5-6, 10-11, http://dx.doi.org/10.4337/9781800887374.

[17] Gao, *Artificial Intelligence Governance*, 132-134.

[18] Giorgios I. Zekos, *Political, Economic and Legal Effects of Artificial Intelligence: Governance, Digital Economy and Society* (Springer, 2022), 44-45. https://doi.org/10.1007/978-3-030-94736-1.

governance should also include a cross-border approach, while still considering local contexts in its implementation.

As technological innovation accelerates and awareness of its impact on society grows, AI governance requires an adaptive and human-centered approach to address emerging challenges in the AI era. Multi-stakeholder engagement is essential for building public trust in AI applications. Dialogue among governments, industry players, and civil society is crucial for addressing potential resistance and strengthening the acceptance of this technology.[19]

Another concern in AI governance is sustainability. For example, Floridi[20] points out that AI technology can help financial institutions achieve ESG targets by improving efficiency in risk evaluation and resource allocation. AI can be used to analyse the environmental impact of investments, thereby supporting responsible decision-making.

Facing these challenges, financial institutions must develop transparent and accountable governance for data management systems, highlighting the importance of blockchain to enhance data transparency and security, and reduce the risk of information manipulation.[21] By adopting explainable AI models, humans can understand the logic behind algorithmic decision-making, supporting the principle of transparency emphasised by Wiesmüller.[22]

II.C. Ethical, Legal, and Regulatory Framework for AI

The presence of AI in the financial sector has facilitated more efficient and innovative operations, allowing complex data analysis in seconds that previously could take days.[23] However, this sophistication also raises critical questions about ethics, law, and regulation, particularly in the context of algorithmic transparency, data privacy, and potential biases in decision-making.[24]

Regulators must formulate rules that support innovation while ensuring that all financial transactions fall within ethical and fair boundaries, which is important to maintain public trust and financial system stability.[25] Uncontrolled AI integration could cause significant economic and systemic harm, necessitating preventive actions and an adequate regulatory framework.[26]

According to OECD research, AI can increase market volatility through simultaneous large-scale sales or purchases, exposing new vulnerabilities.[27]

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[19] Zwitter and Gstrein, *Handbook on the Politics,* 10-12.

[20] Floridi, *Ethics, Governance, and Policies*, 213.

[21] Gao, *Artificial Intelligence Governance*, 160.

[22] Wiesmüller, *The Relational Governance,* 137-139.

[23] Alison Lui and Nicholas Ryder, *Fintech, Artificial Intelligence and the Law* (Routledge, 2021), 190.

[24] Floridi, *Ethics, Governance, and Policies in Artificial Intelligence*, 91-92, 140.

[25] Lui, *Fintech, Artificial Intelligence,* 51-52, 203.

[26] Ekaterina Svetlova, "AI Ethics and Systemic Risks in Finance," *AI and Ethics* 2 (2020): 1-2, 4.

[27] OECD, *Generative Artificial Intelligence in Finance,* 30.

Dependence on third-party service providers and the use of uniform AI models can also lead to increased market correlations and volatility. One of the biggest challenges is ensuring that AI acts without prejudice, given that algorithms can reinforce existing stereotypes or produce biased decisions if the data used contains biases.[28]

It is essential to develop AI that is not only intelligent but also fair, requiring transparency from financial services companies in their AI methodologies.[29] The European Commission suggests using representative datasets and processes in a way that prevents gender, racial, or economic biases, supporting principles reinforced by research from Barocas and Selbst.[30]

Transparency is also vital for building and maintaining user trust. It is essential to allow users to understand how decisions are made by AI, especially when those decisions have significant impacts on their finances.[31] FSB also emphasises the importance of developing a framework that allows clear explanations of the algorithms used.[32]

Additionally, data security and privacy issues are paramount, as AI manages large amounts of financial data and must incorporate strong protections to prevent data breaches that could cause financial loss or reputational damage.[33] Regulations like the EU GDPR[34] set strict standards for data protection in AI applications, requiring organisations to implement strong security measures.

Effective regulation should include clear guidelines on the use and limitations of AI, as well as mechanisms for ongoing monitoring and evaluation, supporting research by Ross P. Buckley[35] that emphasises the importance of adaptable regulation that can evolve with fintech developments.

The Ethical Code Guidelines issued by the Indonesian Financial Services Authority (OJK)[36] in 2023 play a vital role in providing a framework to ensure that the implementation of AI in the financial services industry is conducted responsibly and reliably. These guidelines are specifically designed to help stakeholders navigate the unique challenges arising from the use of this advanced technology, including unencountered risks.

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[28] Financial Stability Report. *The Financial Stability Implications of Artificial Intelligence.* (FSB, 2024), 20.

[29] Floridi, *Ethics, Governance, and Policies*, 365.

[30] Solon Barocas and Andrew D. Selbst, "Big Data's Disparate Impact," *California Law Review* 104, no. 3 (2016): 688-689. http://dx.doi.org/10.15779/Z38BG31.

[31] OECD, *Generative Artificial Intelligence in Finance*, 22.

[32] Financial Stability Board. *The Financial Stability Implications of Artificial Intelligence.* (FSB, 2024), 21.

[33] Svetlova, "AI ethics," 9.

[34] Barocas, "Big Data's Disparate Impact."

[35] Ross P. Buckley et al., *FinTech - Finance, Technology and Regulation* (Cambridge University Press, 2024), 298-299, 305. DOI: 10.1017/9781009086943.

[36] Otoritas Jasa Keuangan. *Panduan Kode Etik Kecerdasan Buatan (Artificial Intelligent) yang Bertanggungjawab dan Terpercaya di Industri Teknologi Finansial.* (OJK, 2023), 2-3.

In any ethical, legal, and regulatory framework, these guidelines serve as a tool to ensure that all AI-based applications developed and used by financial services companies in Indonesia meet high ethical and compliance standards, ensuring that finance and technology can develop in tandem with a fair and transparent society.

II.D. Benefits and Risks of AI Implementation in the Financial Sector

AI has brought about a major transformation in the financial sector, leveraging its capability to enhance the efficiency, security, and accessibility of financial services. The use of AI has been proven to increase the speed and accuracy of banking operations, provide in-depth analysis of market trends, and enable better personalisation of customer services.[37]

However, AI also presents significant challenges, especially related to security and data protection. According to Zaralli, financial institutions must manage and protect data on a large scale, which, if not properly handled, can increase the risk of data breaches.[38] This requires a robust security infrastructure and strict privacy policies to protect sensitive customer information.

From a regulatory perspective, the adjustment of policies and frameworks becomes crucial to ensure that AI implementation in the financial sector does not violate existing laws and remains fair to all users. Regulators around the world have struggled to keep pace with this rapidly evolving technology, often creating legal uncertainties for financial institutions wishing to implement new AI solutions, a situation clarified by Dalton.[39]

The opportunity to use AI in risk management has also become an important topic. AI can help financial institutions identify and respond to financial risks faster than traditional methods. This technology enables real-time analysis of extensive market data, providing financial institutions with tools to make more accurate decisions in managing investment portfolios and credit, as shown by Visvizi and Bodziany.[40]

However, there is a risk from over-reliance on this technology. AI algorithms can develop undetected biases that could exacerbate disparities in accessibility to financial services and result in unfair decision-making, as described by Corazza.[41] For example, systems trained on biased historical data can reinforce stereotypes and cause disproportionate credit denials for certain groups.

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[37] Tuomo Sipola et al., eds., *Artificial Intelligence and Cybersecurity: Theory and Applications* (Springer, 2023), 145-147. https://doi.org/10.1007/978-3-031-15030-2.

[38] Mateo Zaralli, *Virtual Reality and Artificial Intelligence: Risks and Opportunities for Your Business* (Routledge, 2024), 112-116.

[39] Gary Dalton, *Artificial Intelligence: Background, Risks and Policies* (Nova Science Publishers, 2024), 64.

[40] Anna Visvizi, and Marek Bodziany, eds., *Artificial Intelligence and Its Contexts: Security, Business and Governance* (Springer, 2021), 115. https://doi.org/10.1007/978-3-030-88972-2.

[41] Marco Corazza et al., eds, *Artificial Intelligence and Beyond for Finance* (World Scientific, 2024), 12, 83.

Financial inclusion presents one of the greatest benefits of AI in the financial sector. With the ability to process financial information from various sources, AI helps financial institutions offer more appropriate and affordable products to previously underserved population segments. This opens the door for more people to access important financial services, such as credit and insurance, a point emphasised by Corazza.[42]

However, the use of AI for purposes such as credit decision-making also raises concerns about transparency. Decisions made by complex algorithms are often difficult for humans to interpret, which can make it difficult for consumers to understand how decisions about them are made, an issue discussed by Crisanto.[43]

Furthermore, AI has the potential to change the role and structure of the workforce in the financial sector. Automation by AI of traditional human roles could reduce the need for labour in conducting routine tasks, which raises questions about the future of work in this sector, as indicated by Aldasaro.[44]

While AI offers many opportunities in the financial sector, it is also important to approach its implementation wisely. Effective regulation, strong ethical guidelines, and a commitment to financial inclusion must be at the core of the financial sector's strategy to leverage this technology, a view shared by Aldasaro.[45]

II.E. Transparency of AI Implementation in Financial Service Institutions

With the rapid development of AI in the financial services sector, transparency in its use becomes increasingly crucial. Banks and financial institutions utilise AI for various functions, from credit risk analysis and fraud detection to customer service automation. However, as revealed by Floridi, behind these benefits, ethical and regulatory challenges arise that require serious attention, particularly in terms of transparency and accountability.[46]

Openness in the use of AI is not just a strategic step for creating public trust but also a corporate responsibility. Non-transparent AI can trigger the public's concerns related to algorithmic bias and personal data protection. Therefore, financial institutions need to communicate how AI is used, including how they manage bias risks and protect customer rights.

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[42] Corazza, *Artificial Intelligence and Beyond for Finance,* 231-233.

[43] Juan C. Crisanto et al., *Regulating AI in the Financial Sector: Recent Developments and Main Challenges*. (FSI and BIS, 2024), 18-19.

[44] Iñaki Aldasoro et al., *Intelligent Financial System: How AI is Transforming Finance* (BIS, 2024), 21-22.

[45] Aldasoro et al., *Intelligent financial system,* 30-31.

[46] Floridi, *Ethics, Governance, and Policies,* 83, 85, 162.

Besides building trust, transparency in AI use is also part of compliance with increasingly strict regulations. The EU GDPR requires companies using AI in decision-making to provide clear explanations of how their systems work, a process also monitored in Indonesia, as shown in the Indonesian Payment System Blueprint 2030 published by Bank Indonesia.[47]

Furthermore, this openness has implications for the sustainability of the financial system. Zwitter[48] states that AI can be an effective tool for enhancing financial inclusion, but without adequate oversight, AI can also create disparities in access to the economic system. Therefore, including information on AI use in Sustainability Reports is essential to ensuring the technology is used fairly, ethically, and responsibly.

Bonsón and Bednárová[49] have discussed the importance of disclosing AI use in company Sustainability Reports. With the increasing use of AI across various industries, including in the context of digital transformation, studies have aimed to develop a framework for companies to disclose AI-related information in their Sustainability Reports. The main goal of this framework is to enhance transparency, accountability, and stakeholders' understanding of how AI is used in company operations and its impact on ESG.

Meanwhile, the OECD and the European Union have developed frameworks for AI governance that emphasise transparency, fairness, and accountability.[50] By adopting these principles, financial institutions can ensure that AI is used not only to enhance business efficiency but also to remain oriented towards social interests and sustainability. This transparency can also help shape better industry standards, as companies that are more open about their AI use tend to gain greater trust from customers and regulators.[51]

According to the Global Reporting Initiative (GRI),[52] financial institutions must disclose their policies and practices for data management, including measures to protect customer privacy and personal data. Institutions also need to disclose data security incidents and their impacts, along with the steps taken to address them. The use of AI in banking, such as in credit risk modelling or customer service automation, requires transparency regarding the algorithms used and how they operate. The GRI emphasises the importance of disclosing how institutions use AI and ensuring that its use is ethical, unbiased, and does not harm any party. Furthermore, financial institutions need to explain how they address the ethical risks associated with AI.

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47 Bank Indonesia *Blueprint Sistem Pembayaran Indonesia 2030* (Bank Indonesia, 2024), 48-50.

48 Zwitter, *Handbook on the Politics,* 138-139.

49 Bonsón, and Bednárová, "Artificial Intelligence Disclosures," 392.

50 Gao, *Artificial Intelligence Governance*, 39-40.

51 Zekos, *Political, Economic and Legal Effects,* 279-280.

52 Global Reporting Initiative. *GRI 2: General Disclosures 2021*. (GRI, 2025), 23, 26, 32.

This openness is not only about revealing that companies use AI but also about explaining how AI is integrated into business operations, how data is used, and the mechanisms implemented to manage its negative impacts. Sustainability Reports can serve as a medium to outline how AI is used to support sustainability, enhance community access to financial services, and ensure that the technology does not create or perpetuate disparities or discrimination.

Conveying information about the use of AI in financial services institutions' Sustainability Reports is not just a trend; it is a critical strategic step. It helps build public trust, ensures regulatory compliance, and encourages more responsible innovation. Thus, companies can demonstrate their commitment to good AI governance, ultimately contributing to a more inclusive and sustainable financial ecosystem.

The literature in this area explores several interconnected concepts regarding the transparency and disclosure of FinTech and AI applications within financial institutions. It discusses the implementation of these technologies, the governance of AI, the legal and ethical frameworks surrounding AI, the advantages and disadvantages of implementing AI, and the critical importance of transparency in its application. The section emphasises AI's greater complexity compared to FinTech, highlighting its broader implications and the need for careful management and disclosure in financial settings. This analysis provides a thorough understanding of how FinTech and AI are reshaping financial services, the potential risks associated with their adoption, and the regulatory measures required to mitigate these risks while maximising their benefits.

II.F. Financial Services Authority (OJK) Regulations Related to Sustainability Reports

Three regulations issued by the Financial Services Authority (OJK), namely POJK No. 51/POJK.03/2017, POJK 37/POJK.03/2019, and SEOJK No. 16/SEOJK.04/2021, each play a highly significant role within the context of this study. Although POJK 37/2019 specifically regulates banks, these regulations, collectively, form a legal framework and technical guidance that not only mandate Sustainability Reporting but also determine the extent to which financial service institutions should disclose the use of technology within the sustainability framework.

POJK No. 51/2017 serves as the principal regulation that obliges all financial services institutions, including issuers and public companies, to adopt sustainable financial principles and report them systematically through a Sustainability Report. While this regulation does not explicitly mention

FinTech or AI, it requires every financial entity to report its efforts to develop financial products and services that support sustainability. In this context, the implementation of digital technologies such as FinTech and AI falls under innovations that can improve operational efficiency, expand financial inclusion, and/or mitigate social and environmental harms. Thus, this regulation codifies that the disclosure of FinTech and AI is not merely a voluntary initiative, but an integral part of corporate responsibility in realising sustainable finance.

POJK 37/POJK.03/2019 focuses on transparency and the publication of bank reports. This regulation requires banks to publish reports that contain information on their financial performance, risk exposure, and other material facts relevant to the public and other stakeholders. Suppose a financial services institution utilises FinTech and AI in its internal systems, risk management, customer service, or product development. In that case, such usage has implications for operational risk exposure, strategic risk, and technology governance.

Meanwhile, SE OJK 16/2021 functions as a technical guideline for issuers and public companies in preparing their annual and Sustainability Reports. This circular clarifies the structure of Sustainability Reporting under the principles outlined in POJK 51/2017, yet organises it in a more systematic, detailed, and operational manner. Within this structure, a section labelled F.26 explicitly states that companies must disclose innovations and the development of sustainable financial products and services, including through technology. At this point, SEOJK 16/2021 becomes methodologically relevant to this study. Section F.26 can serve as a primary instrument for the content analysis of Sustainability Reports to identify whether, and to what extent, companies (financial service institutions that are publicly listed) disclose the use of FinTech and AI in their business processes and services.

Accordingly, POJK 51/2017 provides a normative and comprehensive foundation applicable to all financial service institutions, both public and private, while SE OJK 16/2021 offers technical guidance applicable solely to public companies and is particularly rich in content for systematic analytical frameworks. In this study, these two regulations collectively provide the basis for finding that the disclosure of technologies such as FinTech and AI in Sustainability Reports is not only ethically or reputationally expected but also has a strong regulatory foundation. The combination of these regulations also allows researchers to distinguish between what is mandated and what is implemented, and to assess variation in transparency across company types. POJK 37, in particular, provides a normative basis for the disclosure of the use of FinTech and AI as part of significant activities within the risk structure and information systems of financial institutions, and requires such disclosure in

publicly available reports—especially if such technologies impact risk profiles, performance, and/or governance.

In conclusion, Chapter II of this article explores several interrelated concepts concerning the transparency and disclosure of FinTech and AI applications in financial services institutions in Indonesia. This review has discussed the implementation of these technologies, AI governance, legal and ethical frameworks surrounding AI, the advantages and disadvantages of AI adoption, the importance of transparency in its application, and regulations related to Sustainability Reports. This section emphasises the inherently greater complexity of AI compared to FinTech, highlighting its broader implications and the necessity for careful management and disclosure in financial settings. The analysis provides a comprehensive understanding of how FinTech and AI are reshaping financial services, the potential risks associated with their adoption, and the regulatory measures needed to mitigate these risks while maximising their benefits.

III. METHODOLOGY

The methodology in this study was designed to assess the extent to which financial services institutions in Indonesia have implemented and disclosed the use of FinTech and AI technologies in their annual Sustainability Reports. This study employs content analysis techniques to examine and evaluate the contents of Sustainability Reports published by FSIs under OJK regulations. Content analysis was used to identify, code, and synthesise data obtained from these Sustainability Reports.[53] In this study, four types of FSIs were examined: banks, insurance companies, finance companies, and Securities firms. The sample included companies that serve a large share of the population. The sample included the five largest companies from each of the four types of FSI in terms of core capital valuation, as well as the availability of Sustainability Reports in an analyzable format.

The primary instrument used in this study was the "Content Analysis Coding Sheet for Transparency and Disclosure of FinTech and AI in Sustainability Reports", which is simply designed using three categories: 1) Implementation of FinTech in financial services; 2) Implementation of AI in financial services; and 3) Transparency and disclosure of AI in Sustainability Reports. Each category has several indicators that reflect the intended categories. The determination of categories and indicators was based on several references discussed in the "Literature Review" section.

[53] Klaus Krippendorff, *Contents Analysis: An Introduction and Its Methodology* (Sage Publications, 2004), 3, 18, 413-417.

The limited number of categories, only three, allows this research to remain focused on the most significant aspects of FinTech and AI implementation in the financial sector. It also facilitates deeper, more efficient analysis of these aspects without causing unnecessary data overload. A more detailed explanation of the categories and indicators is presented in Table 1. The indicators are compiled from a synthesis of theoretical explanations relevant to FinTech, AI, and digital governance in the financial sector; explanations of the principles of transparency and accountability in corporate reporting; and references to the provisions of OJK regulations applicable to FSIs.

In the coding sheet for each category, a column/description is added regarding the location (page position) in each Sustainability Report, along with direct quotes or short notes from the coder. Each category has several clear indicators, which were assessed on a rating scale of 1–5, where 1 indicates very poor disclosure and 5 indicates excellent disclosure. Each rating scale has specific criteria indicating the level of disclosure and detail on the implementation of FinTech and AI in company operations.

Table 1.
Categories, Descriptions, and Indicators in the Coding Sheet

Category	Description	Indicators
1. FinTech implementation in financial services	Describes the application of FinTech to enhance the efficiency of financial services	- Names of FinTech technologies used (e.g., mobile banking, blockchain, e-wallet, robo-advisors, insurtech) - Outcomes achieved (enhanced financial inclusion, transaction efficiency) - Integration of FinTech with AI (if any).
2. Implementation of AI in financial services	Describes how AI is used to enhance the efficiency, security, and quality of financial services.	- Use of AI in fraud detection, credit decision-making, or insurance underwriting - Application of machine learning in analysing customer data for risk prediction or service personalisation - Use of AI-based chatbots for customer service - Utilisation of AI in investment management or risk management.
3. Transparency and disclosure of AI in Sustainability Reports.	Measures the level of corporate openness in reporting the use of AI.	- Explanation of AI strategies and their impact on sustainability - Disclosure of AI policies related to regulatory compliance, ethics, and data governance - Stakeholder engagement in the development and oversight of AI - Data/metrics on the effectiveness of AI use in financial services.

Source: Processing of literature review.

As an illustration, a rating scale of 1 (Very Poor) has criteria such as no information or only mentioning the term 'FinTech' or 'AI' without detail or context; essentially, no evidence of FinTech or AI implementation found in the report; and no policy or strategy explained. A rating scale of 5 (Excellent) is given when disclosure of technology implementation is very detailed and comprehensive, including metrics and case studies showing the effectiveness of AI/FinTech and explaining long-term strategies related to technology, R&D investment, and development plans. A score of 5 also mentions stakeholder involvement and compliance with AI/FinTech regulations.

Data was collected through publicly available Sustainability Reports from FSIs listed on the Indonesia Stock Exchange and published on their official websites. The collected data was then analysed using the following methods:[54]

- Pre-Coding: Reviewing documents to understand the structure and content related to FinTech and AI. This involved an initial identification of report sections relevant to the research criteria.
- Coding: Applying the Coding Sheet to mark relevant text in the report according to the predetermined categories.
- Assessment: Assigning rating scores to each category based on the indicators set in the Coding Sheet. Rating scales are 1 (Very Poor), 2 (Poor), 3 (Fair), 4 (Good), and 5 (Excellent), according to the level of detail and information transparency.
- Score Aggregation: Calculating the average score from all three categories to provide an overview of the disclosure level in each report.

Since this research was conducted by a single researcher, an intercoder reliability test was not performed. This could present one of the limitations of this research due to potential bias and subjectivity in the coding process. The methodology chosen in this research systematically examines and assesses the transparency of disclosure regarding the use of FinTech and AI technologies by FSIs in Indonesia. By adopting a content analysis approach, this research strives to provide a deep and objective overview of disclosure practices.

IV. RESULTS AND ANALYSIS

There are four groups of FSIs examined: banks, insurance companies, finance companies, and securities firms. For each group, five companies with the most significant core capital, along with available Sustainability Reports for analysis, were selected, resulting in a sample of 20 Sustainability Reports. However, in choosing the five companies, due to the difficulty in obtaining information

[54] Krippendorff, *Contents Analysis,* 126.

on the actual size of core capital, the companies selected for analysis in some groups may not necessarily reflect the order of the most significant actual capital values.

The researcher analysed 20 Sustainability Reports by assigning ratings on a scale of 1 to 5 for the categories of FinTech implementation, AI implementation, and AI transparency and disclosure. This rating scale represents the average score from the indicators in each category. A summary of the analysis results is presented in Table 2, "Rating Scale Results for FinTech and AI Implementation" in the Sustainability Reports of the 4 FSIs.

From Table 2, it is evident that, overall, the banking group has the highest levels of FinTech and AI implementation and AI disclosure transparency, with an average score of 3.31. The second-highest is insurance companies, with an average score of 2.41, followed by finance companies, with an average of 1.30, and securities firms, with an average of 1.23.

Table 2.
Rating Scale Results for FinTech and AI Implementation

No	Financial Service Institution	FinTech Implementation	AI Implementation	Transparency - AI Disclosure	Avg.
1.	Banking	3,12	3,62	3,20	3,31
2.	Insurance	2,46	2,85	1,92	2,41
3.	Finance Companies	1,66	1,24	1,00	1,30
4.	Securities	1,50	1,20	1,00	1,23

Source: Processing from research data.

To present the results of each category more systematically, the following provides a more detailed explanation of each category.

IV.A. FinTech Implementation

The banking sector is the most prepared for FinTech implementation in Indonesia. Major banks are actively developing digital ecosystems based on FinTech to expand financial inclusion, enhance service efficiency, and strengthen their competitive advantages. Bank Mandiri, for example, launched Livin' by Mandiri as a super app for retail banking services, and KOPRA by Mandiri as a wholesale digital platform. Through these two platforms, customers can open accounts, access loan products, make transactions using QRIS, and run API-based services connected to e-commerce and P2P lending platforms. In 2023, Livin' by Mandiri recorded over 37 million downloads and transactions worth IDR 3,271 trillion.

BRI also leads in digital innovation by offering services such as SenyuM Mobile, BRIspot, and BRIAPI, all of which are designed to extend access

to financial services in remote areas, including micro, small, and medium enterprises (SMEs) and individuals previously excluded from the formal financial system. BRI integrates AI technology into its FinTech services, making digitalisation a central pillar of its business strategy. BNI and Bank Permata have developed mobile banking, open APIs, direct debit, digital onboarding, and integration into FinTech ecosystems that feature e-wallets and digital marketplaces. Thus, the banking sector has made FinTech the main driver of business model transformation, resulting in increased financial inclusion, growth in digital transaction volume, and strengthened customer relationships through omnichannel platforms.

The insurance sector demonstrates FinTech implementation that still focuses more on digitising processes and distribution channels than on full integration, as seen in the banking sector. AIA has developed various digital platforms, including TanyaAnya (a chatbot service), iPOS, ePolicy, and iNeeds—all aimed at providing seamless customer experiences. The policy underwriting process has been fully digitised by Straight Through Processing (STP), reducing time, cost, and paper usage. Meanwhile, MSIG Life has developed an application ecosystem that enables facial verification, online consultation, and health services based on personal risk prediction. This technology accelerates policy acquisition. Sequis Financial, BRI Life, and Allianz Life have developed digital distribution channels through bancassurance, e-certificate utilisation, and online claim submission systems. It can be said that insurance companies are moving toward platform-based insurtech models, though they still rely more on administrative digitalisation than on intelligent, data-driven automation.

In finance companies, FinTech adoption includes digitalising service processes, particularly in credit approval, contract monitoring, and instalment payment processing. Companies such as FIFGROUP, WOM Finance, and Mandiri Tunas Finance have launched mobile applications to facilitate customers' access to financial information, making payments, or submitting vehicle insurance claims. WOM Finance, for example, has partnered with various e-wallets and digital marketplaces, such as DANA, GoPay, ShopeePay, and Tokopedia, to offer flexible payment options. Some companies have implemented a Credit Approval Engine, a digital system to expedite verification and loan approval processes. However, their reports do not explain whether the system is AI or machine-learning-based.

Meanwhile, securities companies lag in FinTech implementation compared to other business groups. Only Mirae Asset Sekuritas Indonesia explicitly disclosed the use of AI-based FinTech, namely an automated stock recommendation system, through its NAVI application. This mobile application is designed to recommend investments based on customers' risk profiles and

investment goals, indicating a move toward data-driven personalisation (a key pillar of modern FinTech). Securities companies such as Mandiri Sekuritas, DBS Vickers, Maybank Sekuritas, and Valbury Sekuritas failed to mention FinTech implementation in their Sustainability Reports. Most of their digital services are merely functional (online trading platforms) and not yet based on intelligent technology or connected to broader FinTech ecosystems.

IV.B. AI Implementation

The implementation of AI in Indonesian banking has shown significant progress, especially in large state-owned banks. AI is used not only to improve operational efficiency but also as a strategic tool to expand financial inclusion and ensure transaction security. One of the most prominent examples is the implementation of an AI-based chatbot called SABRINA, which operates 24 hours a day, is directly connected to WhatsApp, and can answer millions of customer inquiries and process requests. BRI has also developed an AI-based e-KYC (know-your-customer) system that can detect potential biometric misuse, such as fake photos or manipulated videos. AI is also being prepared to detect transaction anomalies to prevent money laundering and, in the medium term, will be applied in providing personalised financial recommendations to customers based on their digital behaviours.

Meanwhile, BNI has a virtual assistant that supports text-based services. At the same time, Bank Permata has developed API-based digital features and a digital onboarding platform, though there is no direct mention of AI in its Sustainability Report. In general, the banking sector has begun to view AI not merely as a technical tool but as a critical foundation for building intelligent, adaptive, and customer-focused banks.

The insurance industry, which focuses on health services and life insurance, uses AI to accelerate policy acceptance processes, accurately assess health risks, and improve customer experience through virtual assistants. MSIG Life has developed an AI-based facial recognition system for automated underwriting, enabling prospective policyholders to be insured quickly and securely without face-to-face interaction. In addition, MSIG Life has created AI and machine learning-based predictive health risk models that can evaluate the probability of 13 types of diseases using only questionnaire data. This technology not only accelerates the process but also provides a personalised and educational experience.

AIA Financial insurance also uses AI. One facet of its AI implementation is the TanyaAnya system, an intelligent chatbot that operates via WhatsApp and facilitates various interactions related to insurance policies. AI is also integrated into its STP system, accelerating the adoption of new policies. Meanwhile,

insurance companies such as Sequis and BRI Life have initiated large-scale digitalisation, although they have not explicitly mentioned AI implementation in their Sustainability Reports. Overall, this sector shows that AI, especially implementations focused on service speed, underwriting accuracy, and operational efficiency, is a key innovation in modern insurance services.

In the financial industry, AI implementation is still relatively limited. FIFGROUP for instance, has developed a chatbot named FIONA, although it is not clearly stated whether the technology utilises AI or merely a rules-based system. WOM Finance and Mandiri Tunas Finance use Credit Approval Engine systems, but there is no confirmation as to whether these systems use machine learning to analyse borrower data. Some finance companies have utilised digital technology to accelerate credit approval processes and expand access to previously untapped segments.

Of the five Sustainability Reports from securities companies analysed, only one explicitly disclosed the use of AI: Mirae Asset Sekuritas Indonesia. They utilise AI in a stock recommendation system for retail customers via their NAVI application, which provides investment advice based on data analysis and investor risk profiles.

IV.C. AI Transparency and Disclosure

In terms of transparency and disclosure of AI usage, BRI provides relatively comprehensive disclosure of its strategy, technological risk management, and its impact on sustainability. It has even established a dedicated digital risk division and mentioned stakeholder engagement forums, although AI was not explicitly mentioned in the text. Other major banks, such as Bank Mandiri, BNI, Bank Permata, and BCA, mention digital transformation and application-based services but do not explicitly disclose AI strategies, AI governance policies, or the sustainability impacts of their implementations. Thus, only BRI consistently discloses AI as an essential part of their sustainability infrastructure and digital governance.

Among the group of insurance companies, AIA Financial and MSIG Life have not explicitly disclosed ethical policies, algorithm governance, or stakeholder engagement in the development of their AI systems. They have also not disclosed technical metrics, such as system accuracy or user adoption rates. Within the finance company group, although some have implemented AI for chatbots and approval engines, there is no disclosure in their Sustainability Reports regarding AI strategy, governance policies, or AI performance indicators.

As for AI implementation disclosure in securities companies, only Mirae Asset Sekuritas Indonesia mentioned the use of AI at all. However, Mirae did

not disclose its strategy, governance policies, AI impact evaluation, or success indicators of the technology's usage.

Although the explanation regarding the implementation of the three categories in this study is quite extensive, the use of "FinTech" or "AI" is generally not mentioned explicitly. These terms are often replaced with proprietary terminology. Researchers must closely examine the type of technology they report to ensure it belongs to the FinTech or AI ecosystem. As an example, PT Wahana Ottomitra Multiartha Finance reported that, from an internal systems perspective, it had developed a more sophisticated credit scoring system. Although it was not explicitly stated that the system uses AI, this suggests the use of digital technology to enhance consumer profiling accuracy. Accurate credit scoring systems often involve machine learning algorithms, which are part of AI. However, no explicit disclosure was found that the company had adopted or used artificial intelligence in the form of AI algorithms, predictive automation systems, or similar technologies typically classified as AI.

A general term that frequently appears in Sustainability Reports is "digitalisation," which is an umbrella term for various technological transformations applied to business processes. However, this term is often used in general without specifying which FinTech or AI applications have been implemented. Digitalisation, as described in Sustainability Reports, encompasses innovations that improve operational efficiency, service accessibility, and the customer experience. However, the technical details—such as digital platforms, AI-based automation, or FinTech-based payment systems—are sometimes not explained explicitly.

The use of the term "digitalisation" may also reflect the lack of a unified reporting standard or guidelines that instruct companies to report specifically on FinTech or AI usage. As a result, the terms used in Sustainability Reports vary wildly, depending on each company's level of technological adoption, understanding, and reporting culture. There is a tendency for companies to highlight technological advancements in general terms, without necessarily connecting them to strategic or sustainable objectives, let alone detailing how the technology is applied or its impacts on economic, social, or environmental aspects.

This research found that many FSIs reported digital transformation as part of their support for sustainable development. However, only a few provided detailed information about the technology implemented and how it supported sustainability goals. For example, some banks stated they had implemented digital banking to improve financial inclusion. Yet the reports often stopped at that narrative and failed to elaborate on AI's role in analysing customer behaviour, managing risks, or preventing fraud. Likewise, the use of FinTech

platforms to provide access to credit for underserved groups is rarely linked in the reporting to sustainability pillars such as poverty alleviation, gender equality, or reduced inequality.

V. DISCUSSION

The level of utilisation of FinTech and AI in the four types of FSI is quite varied. This reflects how company managers view the role of FinTech and AI in enhancing company operations and innovating products and customer services in different ways, even though the sample FSIs have adequate financial resources. However, looking at their business models, the four FSI groups vary in operational focus and have somewhat different technology needs.

For example, banks are adopting FinTech aggressively due to the high demand for fast, efficient transactions. In the financial intermediation model, banks act as intermediaries between parties holding excess funds and those needing loans. According to Saunders, Cornett, & Erhemjamts,[55] due to the large volume of transactions and risks in the banking environment, FinTech technologies such as mobile banking and digital payments are crucial. AI is used for fraud detection and credit analysis, which are highly relevant to managing the significant risks banks face.

On the other hand, since insurance companies focus on long-term risk management, their business model is more oriented towards premium collections and claims management. AI is therefore applied to enhance underwriting processes and risk prediction. However, the application of FinTech is more limited because direct customer interactions occur less frequently compared to banking. Technology assists in simplifying the claims process through digital platforms, but has not yet become widespread.[56]

The business model for finance companies focuses on providing asset-based credit facilities. For this, FinTech plays a role in facilitating online credit applications and managing instalment payments, but on a smaller scale than banks. AI is applied to credit risk analysis, speeding up the credit approval and reducing the risk of default. Securities firms, on the other hand, rely on a business model based on capital market intermediation. They facilitate transactions of stocks, bonds, and other financial instruments. These firms use FinTech to build electronic trading platforms that enhance transaction accessibility and efficiency. AI is primarily used in automated trading algorithms to capture opportunities in the capital markets.[57]

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[55] Anthony Saunders et al., *Financial Institutions Management: A Risk Management Approach* (McGraw Hill, 2024), 533.

[56] Saunders et al., *Financial Institutions Management*, 591.

[57] Saunders, *Financial Institutions Management: A Risk Management Approach*, 534-535.

Table 3.
Summary of Business Model Differences

Aspect	Bank	Insurance	Finance	Securities
Main Concepts	Financial intermediation	Risk management	Asset-based finance	Capital market intermediation
Main Product(s)	Loans, deposits, transactions	Insurance policies	Vehicle/property loans	Stocks, bonds, investment management
Revenue Source(s)	Interest, service fees	Premiums, investment returns	Interest	Commissions, transaction fees
Main Risk(s)	Credit risk, liquidity	Claim risk, actuarial risk	Credit risk	Market risk, liquidity

Source: Processed from Saunders et. al

The different concepts, products, revenue sources, and types of risk in the business models of the four studied FSI groups are not necessarily the cause of the various levels of FinTech and AI implementation. As discussed in the Literature Review, integrating AI and FinTech into these business models creates opportunities for further innovation in providing more inclusive financial services. This is suitable not only for banks but also for other FSIs that deal with a significant number of customers. For example, with AI, FSIs can identify and serve population segments previously avoided due to traditional data limitations.

Another possible explanation for why FSIs other than banks seem less enthusiastic about adopting FinTech and AI is the issue of system compatibility. Ranković et al. [58]found that many existing systems in FSIs are outdated and incompatible with modern AI solutions, creating integration issues and potentially greater security risks. Another challenge is the increased volume and complexity of data, which requires an infrastructure capable of managing and protecting this sensitive data from cyberattacks and leaks.

Ranković et al. advocate for developing global standards and policies to regulate the use of AI in the financial sector. He proposes establishing international cooperation among regulators, industry, and civil society groups to reach consensus on norms guiding the ethical and responsible use of AI. This represents a vision for a future where properly regulated AI technology can maximise its potential for the common good without harming individual rights or social stability.

Furthermore, the OJK's regulation on transparency in Sustainability Reports emphasises the disclosure of accurate, complete, and timely information by FSIs. OJK Regulation No. 51/POJK.03/2017 on Sustainable

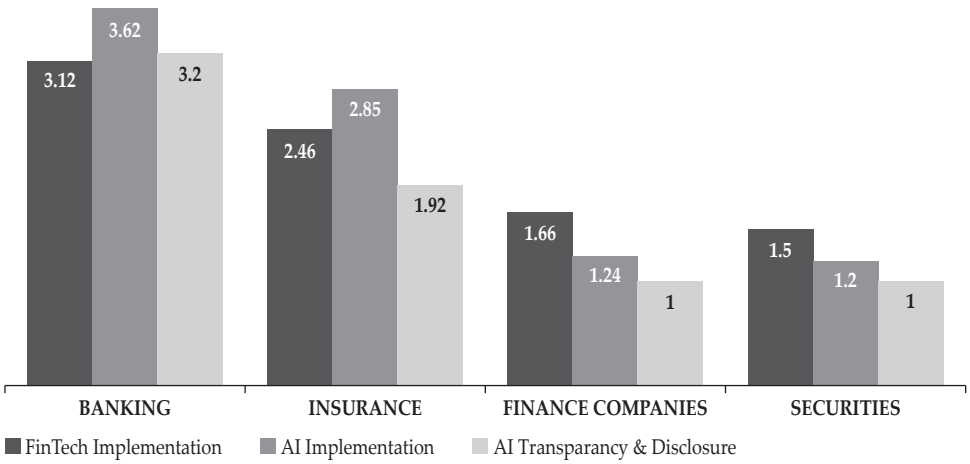
[58] Marko Ranković et al., "Artificial Intelligence and the Evolution of Finance: Opportunities, Challenges, and Ethical Considerations," *EdTech Journal* (2023): 3. https://doi.org/ 10.18485/edtech.2023.3.1.2.

Finance Implementation for Financial Services Institutions, Issuers, and Public Companies requires that FSIs prepare and present Sustainability Reports covering environmental, social, and governance aspects. Additionally, the OJK has issued other regulations supporting transparency, such as OJK Regulation No. 37/POJK.03/2019 on Bank Report Transparency and Publication.

In the context of Sustainability Reports, the principle of transparent corporate governance requires companies to provide material and relevant information to stakeholders, including any technology that could affect business risks and opportunities. FinTech and AI technologies potentially impact company performance, data security, operational efficiency, and service innovation. Both are often used to manage large amounts of customer data, including sensitive personal data. Therefore, companies need to explain how they manage related security risks, privacy, and compliance with data protection regulations.

Another noteworthy point is the existence of SE OJK 16/2021, which obliges publicly traded companies to report their business plans, including the use of FinTech. Of the 20 companies sampled, all banks were publicly traded. In contrast, among insurance and finance companies, only one was listed on the Indonesian stock market, and all securities firms were non-public companies. This disclosure requirement, of course, also encourages companies to publish their FinTech and AI implementations.

Figure 1. Application of FinTech and AI in Four FSI Categories
Rating scale in a range of 1 (very poor) to 5 (very good).



Source: Research data processing.

Thus, although OJK Regulations do not explicitly regulate the disclosure of FinTech and AI use, FSIs that voluntarily disclose such information can enhance transparency, accountability, and trust among investors and other stakeholders. Banks can lead other FSIs in implementing FinTech and AI, and the transparency and disclosure thereof in Sustainability Reports. Following banks' best practices, many other FSIs can adapt and improve their operational services through the implementation of FinTech and AI.

From Figure 1, it is evident that the implementation of FinTech and AI in FSIs is in its early stages. The financial sector, according to Soldatos and Kyriazis,[59] is among the most active in implementing FinTech and AI and thus can serve as a role model for other sectors. As AI penetration is rapid and widespread, there is an urgent need to regulate this technology. AI has changed social, economic, and political paradigms across many areas.

Chesterman[60] identifies various reasons why AI regulation is essential. First, he recognises the risks and uncertainties posed by AI, particularly in terms of privacy, security, and bias. AI technology, which offers efficiency and robust analytical capabilities, also carries the potential for misuse and errors that can impact many people. This includes everything from AI-assisted medical diagnostic errors to the spread of misinformation through biased algorithms.

Additionally, Chesterman[61] discusses when AI regulation should begin. He argues that regulation should be done early. At the same time, norms and standards can still be formed, and before AI becomes too integrated into social infrastructure, it will be too challenging to address. He believes that a proactive approach to regulation would be more effective than a reactive one, which might only be promulgated after damage or misuse has occurred.

In this regard, BI appropriately issued Bank Indonesia Regulation No. 19/12/PBI/2017 on the Operation of Financial Technology, followed by the launch of the Indonesian Payment System Blueprint 2025[62] (updated with BSPI 2025-2030). BI has demonstrated its commitment to accelerating digital transformation in the payments sector, ensuring an efficient, secure, and inclusive payments system, and supporting the growth of Indonesia's digital economy. Further, the OJK has issued OJK Regulation No. 3/POJK.02/2024 on the Operation of Technological Innovation in the Financial Sector, emphasising the importance of applying principles of governance, risk management, information system security, and information system reliability,

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[59] John Soldatos, and Dimosthenis Kyriazis, *Big Data and Artificial Intelligence in Digital Finance – Increasing Personalization and Trust in Digital Finance using Big Data and AI* (Springer, 2022), 11-12. https://doi.org/10.1007/978-3-030-94590-9.

[60] Simon Chesterman, *From Ethics to law: why, when, and how to regulate AI* (NUS Law, 2023), 4-6.

[61] Chesterman, *From Ethics to law,* 6-7.

[62] Bank Indonesia, *Blueprint Sistem Pembayaran Indonesia 2025,* 17, 27.

including cybersecurity resilience, as well as consumer data protection. The combination of steps taken by BI and the OJK shows that the Indonesian financial sector has a positive, transparent, and adaptive approach to global economic dynamics.

This study has several limitations that can serve as notes for future research. First, the companies sampled in this study are financial services institutions, comprising both publicly traded and privately held companies. This necessitates greater transparency obligations for companies. Therefore, when comparing the use of FinTech and AI, as well as the transparency of AI usage disclosure, it must be done with great caution. Ideally, comparisons should be made between the same type of institutions or by developing a more comprehensive disclosure framework. Second, the number of samples used in this study is limited and refers only to a single year. Given these two factors, the findings of this study should not be generalised.

VI. CONCLUDING REMARKS

Based on this study's analysis, banks show a higher level of technology implementation compared to insurance companies, finance companies, and securities firms. Banks have comprehensively integrated FinTech and AI into transaction services, risk analysis, and customer data management. The implementation of these technologies provides advantages in efficiency, security, and service innovation.

The disparity among these categories of FSI manifests in differences in transparency and disclosure of technology use. Although banks are more advanced in communicating the use of FinTech and AI in Sustainability Reports, terms such as "digitalisation" are more frequently used without explicit explanation of the technologies applied. Conversely, other financial institutions, such as insurance and finance companies, less prominently feature this technology in their reporting. This poses challenges in assessing the extent to which FinTech and AI technologies are applied in their business processes.

These findings have important implications for governance and risk management in the financial sector. FinTech and AI technologies can enhance the speed, security, and flexibility of operations, but they also introduce new risks, such as cybersecurity threats and data privacy concerns. Therefore, disclosing information about technologies in Sustainability Reports is crucial for building stakeholder trust and ensuring that financial institutions comply with applicable regulatory standards. Regulations like OJK Regulation No. 51/POJK.03/2017 on sustainable finance provide a relevant framework to ensure that technological innovations are managed responsibly.

Regulations formulated by Bank Indonesia and the OJK, including the Indonesian Payment System Blueprint 2025-2030, provide clear direction for the development of Indonesia's digital financial ecosystem. The blueprint targets strengthening payment system infrastructure, expanding financial inclusion through technology, and improving risk management. This shows that strategic steps to enhance the digital financial sector have been taken, although implementation at the operational level still needs to be advanced.

In conclusion, this study recommends that FSIs increase transparency in disclosing information related to the implementation of FinTech and AI. More specific regulatory guidelines from financial authorities are also needed to assist companies in consistently reporting on the application of these technologies—not only to highlight innovation and efficiency but also to address their potential social and ethical impacts. With such measures, the financial sector is expected to continue developing sustainably and innovatively while maintaining public trust amidst the challenges of the digital era.

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