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Artificial Intelligence in Indonesia's Financial Sector: Regulatory and Islamic Law Perspectives

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Abstract: The Indonesian financial sector still faces fundamental challenges in the form of low investor participation, technological limitations, cyber risks, and regulatory uncertainty that affect banking and Islamic finance. This study positions Artificial Intelligence (AI) as a transformational solution to improve efficiency, mitigate risk, and protect consumers. The method employed is prescriptive legal research on regulations, including the Electronic Information and Transactions Law, the Personal Data Protection Law, and OJK Guidelines, which are analysed within the framework of Islamic law and legal effectiveness theory. The findings indicate that the application of AI has the potential to enhance risk assessment, fraud detection, portfolio optimisation, and market forecasting when supported by a robust legal framework. This study confirms that compliance with *maqāṣid al-shariah*, particularly *ḥifẓ al-māl*, justice, and amanah, will ensure that AI is used ethically to achieve transparency and data protection. Therefore, it is necessary to formulate an AI bill, strengthen the role of the OJK, and prepare a special fatwa from Islamic authorities to ensure the responsible implementation of AI in Indonesia's financial sector.
Keywords*:* financial sector; artificial intelligence; regulation.

Abstrak: Sektor keuangan Indonesia masih menghadapi tantangan mendasar berupa rendahnya partisipasi investor, keterbatasan teknologi, risiko siber, dan ketidakpastian regulasi yang berdampak pada perbankan serta keuangan syariah. Penelitian ini menempatkan Artificial Intelligence (AI) sebagai solusi transformasional untuk meningkatkan efisiensi, mitigasi risiko, dan perlindungan konsumen. Metode yang digunakan adalah penelitian hukum preskriptif terhadap regulasi seperti UU ITE, UU Perlindungan Data Pribadi, dan Pedoman OJK, serta

dianalisis dalam kerangka hukum Islam dan teori efektivitas hukum. Temuan menunjukkan bahwa penerapan AI berpotensi meningkatkan penilaian risiko, deteksi fraud, optimalisasi portofolio, dan peramalan pasar apabila didukung kerangka hukum yang kuat. Penelitian ini menegaskan bahwa kesesuaian dengan *Maqāṣid al-Syariah* terutama *ḥifẓ al-māl*, keadilan, dan amanah akan memastikan bahwa AI digunakan secara etis untuk mewujudkan transparansi dan perlindungan data. Oleh karena itu, diperlukan pembentukan RUU AI, penguatan peran OJK, serta penyusunan fatwa khusus dari otoritas Islam untuk menjamin implementasi AI yang bertanggung jawab dalam sektor keuangan Indonesia.
Kata Kunci: sektor finansial; kecerdasan buatan; peraturan.

Introduction

Indonesia's financial sector faces several significant challenges that require immediate attention. One of the major issues is the low efficiency of the banking market. The Financial Services Authority (*Otoritas Jasa Keuangan*/OJK) has identified that the structure of the national banking market is not yet optimal.[1] This suggests that consolidation and capital strengthening efforts are necessary to enhance efficiency and competitiveness in the face of global economic challenges. Furthermore, there is still much work to be done in Indonesia regarding financial inclusion. Data shows that around 40-60% of Indonesians lack access to official banking services.[2] This condition is exacerbated by low financial literacy and inequality of access to affordable financial services, particularly in rural areas. This results in a significant economic gap, estimated at US$165 billion.[3] This widens the gap between privileged and underprivileged groups in society.

Second, high interest rates are a central issue. According to economist Peter A. Redjalam, high interest rates cause the Indonesian economy to become a "high-cost economy," with domestic credit absorption remaining relatively low in comparison to other ASEAN countries. The data show that Indonesia's domestic credit-to-GDP

[1] Cintika Putri Muafiroh and Taofik Hidajat, "Pengaruh Good Corporate Governance Dan Financial Ratios Terhadap Financial Distress Perusahaan Perbankan," *ECOBISMA (Journal of Economics, Business and Management)* 10, no. 1 (2023): 136–55, https://doi.org/10.36987/ecobi.v10i1.4012.

[2] Dede Aji Mardani, "Peran Perbankan Syariah Dalam Mengimplementasikan Keuangan Inklusif Di Indonesia," *Al-Afkar, Journal For Islamic Studies* 1, no. 1 (2018): 105–20, https://doi.org/10.31943/afkar_journal.V1I1.10.

[3] Gregor Semieniuk et al., "Stranded Fossil-Fuel Assets Translate to Major Losses for Investors in Advanced Economies," *Nature Climate Change 2022 12:6* 12, no. 6 (2022): 532–38, https://doi.org/10.1038/s41558-022-01356-y.

ratio reached only 38.7%, significantly lower than Thailand's 143.7% and Malaysia's 118.7%.[4]

Other challenges include high transaction costs in the financial sector and a limited number of available financial instruments. This condition hinders public participation in financial services. Last but not least, limited financial instruments make people with greater access feel constrained in investing. Low public trust in the financial sector is also a concern, and investor protection needs to be improved to rebuild public trust in the industry.[5] In addition, there is still a need to strengthen the coordination and management of financial system stability to address technological disruption and the increasingly tangible impacts of climate change. To address these challenges, Indonesia's financial industry requires fundamental reform. Steps that can be taken include increasing financial access and literacy, expanding long-term financing sources, and improving efficiency and competitiveness through innovation and the development of new financial instruments. Thus, the Indonesian financial sector can become more inclusive, efficient, and resilient in the face of global economic dynamics. Overall, Indonesia's financial industry faces significant challenges that the government and authorities must address to establish a more inclusive and stable financial system. Thus, based on the various problems in the financial sector, the author attempts to offer a solution by considering the use of Artificial Intelligence in the financial industry, which is supported by regulations and technical guidelines.

This research is something new and has strong novelty because it is based on a research gap with earlier research, including: *First*, in 2024, Nurhadhinah Nadiah Ridzuan, Masairol Masri, Muhammad Anshari, Norma Latif Fitriyani, and Muhammad Syafrudin discovered that Artificial Intelligence applications in banking and finance include fraud detection, credit risk analysis, customer care chatbots, trading algorithms, and forecasting models. The primary advantages include enhanced efficiency and improved risk management, while major obstacles include data quality issues, transparency concerns, talent gaps, and regulatory uncertainties. Although comprehensive cross-industry legislation is still lacking, current AI governance places a strong emphasis on ethical values like accountability and transparency.[6] This article focuses on how the Indonesian government will participate in the financial sector using AI, with regulations in place.

Second, Arfah Habib Saragih, Qaumy Reyhani, Milla Sepliana Setyowati & Adang Hendrawan examined AI applications to assist the Indonesian government

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4 Piter A Redjalam, "Ekonom Sebut Dua Masalah Utama Sektor Keuangan Indonesia," ANTARA News, 2019, https://www.antaranews.com/berita/823144/ekonom-sebut-dua-masalah-utama-sektor-keuangan-indonesia.

5 Fatima Medina Septiyanti et al., *Meneropong Arah Sektor Keuangan* (Jakarta, 2021).

6 Nurhadhinah Nadiah Ridzuan et al., "AI in the Financial Sector: The Line between Innovation, Regulation and Ethical Responsibility," *Information 2024, Vol. 15, Page 432* 15, no. 8 (2024): 432, https://doi.org/10.3390/INFO15080432.

in updating its tax administration system.[7] The findings suggest that AI applications in the tax sector can help tax authorities enforce the law, facilitate taxpayers' compliance with tax obligations, promote justice for all taxpayers, and reduce tax compliance costs. This research, which focuses on the effects of AI on the financial sector from a regulatory perspective, is obviously distinct. It looks at taxes as well as the sector as a whole. *Third*, a paper by Wardah Yuspin, Kelik Wardiono, Arief Budiono, and Said Gulyamov, stated that Artificial Intelligence will have a significant impact in the future on the Islamic Finance industry, but in the Indonesian context, various efforts are still required to reduce the potential risk that eventually has a significant impact on the progress of Islamic banks.[8]

Fourth, the recent paper written by Shabana Kausar, Ali Raza Leghari, and Abdul Salam Soomro, recommended that the use of Artificial Intelligence is allowed only for a reinterpretation of Islamic laws, awareness, and unity on common interest issues, and that Ijtihad can save the integrity and soul of Islamic Law.[9] *Fifth*, Miszairi Sitiris and Saheed Abdullahi Busari stated that artificial intelligence does not possess all the traits necessary to be considered for natural legal capacity. However, AI has the trait of artificial personality that is justified in Islamic jurisprudence.[10]

Sixth, Andistya Pratama, Dwi Ratna Indri Hapsari, and Listiyani Wulandari, found that while Indonesian legislation continues to prioritise consumer protection and operational stability, with a need for a more specialised framework about AI, Singapore has aggressively adopted the concepts of ethics, transparency, and accountability. Indonesia must harmonise its regulations on innovation and consumer protection.[11] *Seventh,* Kurniawan Arif Maspul and Nugrahani Kartika Putri on their paper entitled "Will Big Data and AI Redefine Indonesia's Financial Future?", found that to create an inclusive and resilient financial future, Indonesian government needs to strike a balance between regulatory caution and technology innovation because of big data and AI would redefine financial operations, improve decision-making, and reduce market inefficiencies in the Indonesian banking

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7 Arfah Habib Saragih et al., "The Potential of an Artificial Intelligence (AI) Application for the Tax Administration System's Modernization: The Case of Indonesia," *Artificial Intelligence and Law* 31, no. 3 (2023): 491–514, https://doi.org/10.1007/S10506-022-09321-Y/METRICS.

8 Wardah Yuspin et al., "The Law Alteration on Artificial Intelligence in Reducing Islamic Bank's Profit and Loss Sharing Risk," *Legality : Jurnal Ilmiah Hukum* 30, no. 2 (2022): 267–82, https://doi.org/10.22219/LJIH.V30I2.23051.

9 Shabana Kausar et al., "Analysis of the Islamic Law and Its Compatibility with Artificial Intelligence as a Emerging Challenge of the Modern World," *Annals of Human and Social Sciences* 5, no. 1 (2024): 99–114, https://doi.org/10.35484/AHSS.2024(5-I)10.

10 Miszairi Sitiris and Saheed Abdullahi Busari, "The Legal Capacity (al-Ahliyyah) of Artificial Intelligence from an Islamic Jurisprudential Perspective," *Malaysian Journal of Syariah and Law* 12, no. 1 (2024): 31–42, https://doi.org/10.33102/MJSL.VOL12NO1.453.

11 Andistya Pratama et al., "Bridging Regulation and Reality: Comparative Study of Artificial Intelligence Regulation in the Financial Sectors," *Legality : Jurnal Ilmiah Hukum* 33, no. 2 (2025): 307–33, https://doi.org/10.22219/LJIH.V33I2.38908.

ecosystem.[12] *Eight authors,* including Agustianto Agustianto, Henry Soelistyo Budi, Lu Sudirman, Nurlaily Nurlaily, and Windi Afdal, in their recent article, found that the banking sector in Indonesia might greatly benefit from AI, especially in the area of financial risk assessments. To ensure the moral and responsible application of AI systems, they must be supported by a robust legal framework.[13]

The differences are apparent from the eight papers, the majority of which discuss one aspect of the financial sector, such as tax, Islamic banking, Islamic law, Islamic legal jurisprudence, or the harmonisation of AI with other tools, or macro-level discussions of AI regulations for the financial sector at the ASEAN level. Meanwhile, this article focuses on and discusses the impact of AI in Indonesia from the perspective of existing regulations, with adjustments from an Islamic law perspective. Therefore, this article will discuss two main topics: the problems of the financial sector in Indonesia and the potential use of AI, examining its impact from a regulatory perspective within the internal comparative approach for legal reform.

The Problem of the Financial Sector in Indonesia

Financial sector is a sector consisting of companies that provide financial services to commercial and retail customers, including: 1) Banking – includes central banks, commercial banks, and rural banks that provide savings, credit, and payment services;[14] 2) Capital Markets – where transactions in stocks, bonds, and other financial instruments take place; 3) Non-Bank Financial Institutions (NBFIs) – such as insurance companies, pension funds, and leasing companies; and 4) Fintech (Financial Technology) – includes technology-based financial services, such as digital wallets, online loans, and digital investments. This collection of financial companies and institutions, along with their supporting institutions, is often referred to as the Financial Services Industry (*Industri Jasa Keuangan*/IJK).[15] Their activities are monitored by the Financial Service Authority (*Otoritas Jasa Keuangan*/OJK).[16]

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[12] Kurniawan Arif Maspul and Nugrahani Kartika Putri, "Will Big Data and AI Redefine Indonesia's Financial Future?," *Jurnal Bisnis Dan Komunikasi Digital* 2, no. 2 (2025): 21–21, https://doi.org/10.47134/JBKD.V2I2.3739.

[13] Agustianto Agustianto et al., "Analisis Risiko Finansial Perbankan Melalui Artificial Intelligence (AI): Politik Hukum Dan Potensi Pengembangan Hukum," *Jurnal Magister Hukum Udayana (Udayana Master Law Journal)* 14, no. 1 (2025): 17, https://doi.org/10.24843/JMHU.2025.V14.I01.P02.

[14] Ely Masykuroh et al., "Islamic Corporate Philanthropy in Islamic Banking: Implementation of Zakat Regulation and Sharia Compliance in Indonesia," *Justicia Islamica* 22, no. 1 (2025): 211–46, https://doi.org/10.21154/justicia.v22i1.10397.

[15] Septiyanti et al., *Meneropong Arah Sektor Keuangan*.

[16] Hasan et al., "Reassessing Islamic Banking Supervision in Indonesia: A Contemporary Islamic and Socio-Legal Perspective on OJK's Integrated Model," *MILRev: Metro Islamic Law Review* 4, no. 1 (2025): 619–44, https://doi.org/10.32332/milrev.v4i1.10851.

1. The Problem in the Banking Sector

From early January to August 2023, the OJK identified problems in the financial sector, including 6,693 in the banking sector, 3,475 in financial technology (fintech),[17] 2,793 in peer-to-peer lending, 1,147 in insurance-related issues, and 266 in the capital market sectors and other Non-Bank Financial Institutions (NBFIs).[18] The banking sector in Indonesia is facing several risks, including: a) Credit Risk; b) Market Risk; c) Liquidity Risk; d) Operational Risk; e) Legal Risk; f) Reputation Risk; g) Strategic Risk; and h) Compliance Risk.[19]

Due to the numerous risks and cases in the banking sector, at least 15 banks are expected to have their licenses revoked by the OJK in 2024 due to bankruptcy.[20] All of these banks are types of people's credit banks (*Bank Perkreditan Rakyat*/BPR) that are located in a city or regency and do not have any branches in other towns or regencies. The high risk in the banking sector is not just due to people's lack of financial literacy, but it is also due to the lack of technological transfer. The majority of failed institutions were conventional banks that lacked the sophistication of blockchain or AI.

2. The Problem in the Capital Markets Sector

The Indonesian capital market faces several challenges that impact its efficiency and growth. One of the primary concerns is the low level of financial literacy among the general public. This condition results in a limited number of domestic investors and a high dependence on foreign investors, which can exacerbate market volatility. Aside from that, the diversification of investment products in the Indonesian capital market remains suboptimal. Even if corporate bonds are accessible, investment is concentrated on stocks and government securities (*Surat Berharga Negara*/SBN). Alternative investment instruments, such as derivatives and other innovative products, are still scarce. As of 2024, there will be 462 companies listed on the Indonesia Stock Exchange (Bursa Efek Indonesia/BEI); however, this number does not reflect the variety of investment products offered.[21]

Furthermore, the increased use of digital technologies may lead to significant financial losses and erode investor confidence due to the rising prevalence of

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17 R. Dwi Tjahja K. Wardhono et al., "Legal Reforms in Indonesia's Financial Sector on Institutional Relations between Bank Indonesia and the Government," *Hasanuddin Law Review*, January 20, 2025, 57–81, https://doi.org/10.20956/halrev.v11i1.5438.

18 Friderica Widyasari Dewi, "Masalah Sektor Perbankan Paling Banyak Diadukan Ke OJK," CNN Indonesia, 2023, https://www.cnnindonesia.com/ekonomi/20230905161019-78-995092/masalah-sektor-perbankan-paling-banyak-diadukan-ke-ojk.

19 Agus Humaidi, "Problematika Wewenang Pengawasan Perbankan Dari Bank Indonesia Ke Otoritas Jasa Keuangan," *Jurnal Penelitian Hukum Legalitas* 10, no. Vol 10, No 2 (2016) (2016): 53–66.

20 Romys Binekasri, "15 Bank Bangkrut Di RI Sepanjang 2024, Ini Penyebabnya," CNBC Indonesia, 2024, https://www.cnbcindonesia.com/market/20240918073902-17-572576/15-bank-bangkrut-di-ri-sepanjang-2024-ini-penyebabnya.

21 Rohyati Rohyati et al., "Tantangan Dan Peluang Pasar Modal Indonesia Dalam Meningkatkan Minat Investasi Di Era Digital," *Kompeten: Jurnal Ilmiah Ekonomi Dan Bisnis* 3, no. 1 (2024): 909–18, https://doi.org/10.57141/kompeten.v3i1.133.

cybersecurity threats. Regulations that are less adaptive to technological innovation in the financial sector might hinder the development and adoption of new technology, generating uncertainty for industry players. Furthermore, the capital market also has an impact on the national economy. Naturally, the government and IDX monitor the continuity of capital market investment operations.[22] Increasing financial literacy through widespread education and outreach, diversifying investment products, enforcing stringent laws against manipulative practices, and creating regulations that are flexible enough to accommodate technological innovation—particularly in the area of AI—are all strategic measures to fortify the Indonesian capital market.

3. The Problem in the Non-Bank Financial Institutions Sector

NBFI includes insurance companies, pension funds, and leasing companies. As of September 2024, insurance penetration in Indonesia was recorded at only 2.8%. This figure indicates that most Indonesians lack adequate insurance protection.[23] The fact is most likely similar to the market share, which offers few products for customers. It is considerably different from the current pay-later trend. Although the Non-Performing Financing (NPF) ratio for finance companies is maintained at 2.60%, concerns exist that an increase in financing, such as Buy Now Pay Later (BNPL), which is rising rapidly (103.40% year-over-year), may increase the risk of bad credit in the future.[24]

Moreover, many NBFIs, including finance companies and P2P lending providers, have not met the minimum equity requirements set by the OJK. In September 2024, six finance businesses had not reached the minimum equity obligation of IDR 100 billion, while 14 of the 97 P2P lending providers had also not met the similar requirement of IDR 7.5 billion.[25] The last risk that probably occurred in NBFIs is their slow implementation of sophisticated technology, such as digital platforms and data analytics, which limits their competitiveness and capacity to serve consumers efficiently.

4. The Problem in the Fintech Sector

Bank Indonesia (Indonesia Central Bank) divides five types of fintech, namely: *first* crowdfunding, for example, kitabisa.com. The *second* is peer-to-peer lending, such as Investree. The *third* is a market aggregator, for instance, cekaja.com. The *fourth* is Risk and Investment Management, which includes financial. The *fifth* is mobile

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22 Rohyati et al., "Tantangan Dan Peluang Pasar Modal Indonesia Dalam Meningkatkan Minat Investasi Di Era Digital."

23 Uyu Septiyati Liman, "Memperkuat Industri Keuangan Non-Bank Di Tengah Ketidakpastian Ekonomi," ANTARA News, 2024, https://www.antaranews.com/berita/4551926/memperkuat-industri-keuangan-non-bank-di-tengah-ketidakpastian-ekonomi?page=all&utm_source=chatgpt.com.

24 OJK, "Siaran Pers: Sektor Jasa Keuangan Yang Resilient," OJK, 2024, https://ojk.go.id/id/berita-dan-kegiatan/siaran-pers/Pages/RDKB-November-2024.aspx.

25 OJK, "Stabilitas Sektor Jasa Keuangan Terjaga Di Tengah Meningkatnya Risiko Geopolitik," OJK, 2024, https://ojk.go.id/id/berita-dan-kegiatan/siaran-pers/Pages/Stabilitas-Sektor-Jasa-Keuangan-Terjaga-di-Tengah-Meningkatnya-Risiko-Geopolitik-RDKB-Okt-2024.aspx.

payment/online banking, for example, OVO.[26] Although many fintech companies have entered Indonesia, including those made in Indonesia, the development of the fintech ecosystem remains fluctuating. Several times, the government has taken action against illegal peer-to-peer lending, loan failure, or even closed bankrupt fintechs. Even the most recent, e-Fishery, one of Indonesia's unicorns and a fintech company, was found to have experienced fraud and subsequently retired its CEO.[27] The integration of technologies such as blockchain and artificial intelligence (AI) presents several opportunities for enhancing operational efficiency, improving services, and driving product innovation. However, this presents significant challenges, particularly in terms of adapting to technology, ensuring data security, and enhancing IT infrastructure.[28] As a summary of the problems in the financial sector, the following table highlights the risks and proposed solutions.

Table 1. The Problem in the Financial Sector in Indonesia

No.	Sector	Problem	Solution
1.	Banking	Credit risk, banking literacy, legal risk, and being left behind in technology	1. Increasing financial literacy awareness
2.	Capital Markets	Financial literacy, *sahamgorengan,* share products, technology issue	2. Adopting current relevant technologies, such as AI, blockchain, etc
3.	NBFIs	Insurance and pension fund products, diversity, credit risk, AI issues, and financial literacy	3. Drafting the special Bill for AI and its relation to the financial sector
4.	Fintech	blockchain and AI issues, monitoring by OJK, fintech literacy	4. Strengthening cybersecurity 5. Strengthening the role of OJK

Source: Author(s), 2025

Based on Table 1, it is evident that a comprehensive and long-term approach is necessary to address Indonesia's financial sector challenges. Increasing financial literacy must be prioritised to promote greater financial inclusion, particularly in remote areas. To ensure stability and transparency in the financial sector, the government and the OJK must improve regulations and oversight of both banking

[26] Dina Dwi Setiani et al., "Fintech Syariah : Manfaat Dan Problematika Penerapan Pada UMKM," *Jurnal Masharif Al-Syariah: Jurnal Ekonomi Dan Perbankan Syariah* 5, no. 1 (2020), https://doi.org/10.30651/JMS.V5I1.4718.

[27] Nadya Zahira, "Ini Dampak Negatif Yang Ditimbulkan Imbas Dugaan Fraud eFishery," Kontan, 2025, https://keuangan.kontan.co.id/news/ini-dampak-negatif-yang-ditimbulkan-imbas-dugaan-fraud-efishery.

[28] Aditya Wiguna et al., "problematika dan tantangan dalam sektor perbankan dan keuangan di tahun 2024," *Neraca: Jurnal Ekonomi, Manajemen Dan Akuntansi* 2, no. 6 (2024): 627–32, https://doi.org/10.572349/neraca.V2I6.1868.

and non-banking institutions. Furthermore, financial technology (fintech) innovation must be optimised with adaptive laws to increase access to secure and efficient financial services. To adapt to global economic changes,[29] Institutions must improve their coordination and become more competitive by diversifying their financial products.

Should Artificial Intelligence be Deployed and Enacted in the Financial Sector?

Circular Letter of the Minister of Communication and Information Technology No. 9 of 2023 concerning the Ethics of Artificial Intelligence will serve as a strategic legal basis for the development of AI in Indonesia. As a quick response to the adoption of AI, the government attempted to issue or enable AI guidance for specific sectors, including the financial industry. Since the Industrial Revolution, technology has continually advanced, taking priority in production and driving economic growth. Labour-intensive and manual tasks have been replaced by technological innovations, particularly machines that have significantly contributed to human progress.[30] Beyond assisting with physical labour, artificial intelligence (AI) represents a major technological breakthrough, allowing humans to transition from manual work to higher cognitive functions across various industries. AI is a field of science and technology that enables intelligent systems and programs to accomplish tasks that would typically require human intelligence. One of AI's key advantages is its ability to carry out human-like functions, learn from experience, and adapt to new data and environments. To achieve optimal performance in specific tasks, AI leverages vast information sources, including Big Data.[31] The significant progress in computer storage and computational power has precipitated the integration of diverse methodologies and instruments of artificial intelligence (AI) throughout numerous dimensions of existence.[32]

AI has been utilised to enhance various real-world applications, including online health platforms, banking systems, businesses, and industry, as well as everyday life.[33] Finance is no exception to this trend, with AI technology

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[29] Yanran Hong et al., "Interpreting the Effect of Global Economic Risks on Crude Oil Market: A Supply-Demand Perspective," *International Review of Financial Analysis* 91 (January 2024): 103008, https://doi.org/10.1016/J.IRFA.2023.103008.

[30] Abdul Kadir Jaelani et al., "Artificial Intelligence Policy in Promoting Indonesian Tourism," *Volksgeist: Jurnal Ilmu Hukum Dan Konstitusi* 7, no. 1 (2024): 109–37, https://doi.org/10.24090/VOLKSGEIST.V7I1.10623.

[31] Omar Ali et al., "A Systematic Literature Review of Artificial Intelligence in the Healthcare Sector: Benefits, Challenges, Methodologies, and Functionalities," *Journal of Innovation & Knowledge* 8, no. 1 (2023): 100333, https://doi.org/10.1016/J.JIK.2023.100333.

[32] Satish Chandra and G. Bala Krishna, "Artificial Intelligence in Finance: A Systematic Literature Review," *Lecture Notes in Networks and Systems* 993 LNNS (2024): 277–82, https://doi.org/10.1007/978-981-97-4727-6_28.

[33] Tita Alissa Bach et al., "A Systematic Literature Review of User Trust in AI-Enabled Systems: An HCI Perspective," *International Journal of Human–Computer Interaction* 40, no. 5 (2024): 1251–66, https://doi.org/10.1080/10447318.2022.2138826.

increasingly being integrated.[34] The financial sector has become increasingly interactive with advances in AI over the past few decades. This trend reflects the long-term interdisciplinary synergy between AI, finance, and economics, which will be greatly enhanced by the next generation of AI and its applications. Google search trends for key terms connected to artificial intelligence in finance, such as AI-Finance and AI-Fintech, demonstrate this expanding interest. AI in finance is revolutionising the economic-financial system, making it more intelligent, efficient, personalised, and secure.[35] By changing how data and information are created, analysed, and integrated into decision-making processes,[36] AI has revolutionised the finance sector.[37] The classic research in AI in finance includes various key areas such as mathematical modelling, statistical modelling, quantitative analysis, game theories, theories of complex systems, simulation, and machine learning (ML), among others.[38]

ML enables computers to learn and improve from experience automatically; thus, it is a critical component in AI implementation.[39] ML has emerged as a prominent technology in the banking industry, delivering extraordinary possibilities for the advancement of multiple operations and services. ML algorithms, driven by extensive datasets, empower financial institutions to derive significant insights, automate operational processes, and augment their decision-making capabilities. Nevertheless, ML is widely employed by economic entities to refine a multitude of operations, bolster decision-making processes, and deliver superior customer service. Moreover, ML models have the capacity to accurately forecast credit defaults by analysing historical data related to customer behaviour, transaction patterns, and creditworthiness, as well as evaluating the risks associated with lending to specific individuals or enterprises. This capability enables banks to render more judicious decisions regarding loan approvals and interest rate determinations, ultimately mitigating the risk of defaults and enhancing the overall performance of their portfolios. Furthermore, the domain of fraud detection within the banking industry represents another significant area where ML exerts substantial influence. Nevertheless, ML algorithms are capable of analysing extensive volumes of transactional data in real-time, thereby identifying patterns

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34 Chandra and Krishna, "Artificial Intelligence in Finance: A Systematic Literature Review."

35 Longbing Cao, "AI in Finance: A Review," *SSRN Electronic Journal*, ahead of print, Elsevier BV, July 2020, https://doi.org/10.2139/SSRN.3647625.

36 Fatma M. Talaat et al., "Towards Sustainable Energy Management: Leveraging Explainable Artificial Intelligence for Transparent and Efficient Decision-Making," *Sustainable Energy Technologies and Assessments* 78 (June 2025): 104348, https://doi.org/10.1016/J.SETA.2025.104348.

37 Sean Shun Cao et al., "Applied AI for Finance and Accounting: Alternative Data and Opportunities," *Pacific-Basin Finance Journal* 84 (April 2024): 102307, https://doi.org/10.1016/J.PACFIN.2024.102307.

38 Cao, "AI in Finance: A Review."

39 Keng-Yu Lin and Kuei-Hu Chang, "Artificial Intelligence and Information Processing: A Systematic Literature Review," *Mathematics 2023, Vol. 11, Page 2420* 11, no. 11 (2023): 2420, https://doi.org/10.3390/MATH11112420.

and anomalies that signify potentially fraudulent activities. Continuous learning from newly acquired data enables ML models to adapt to evolving fraud schemes and enhance the effectiveness of fraud prevention strategies.[40] Thus, the essential domains within financial institutions where ML could be effectively deployed are presented in Table 1 below.

Table 2. Key Areas of Financial Institutions[41]

Machine learning	Application
Credit Scoring and Risk Assessment	Automates the loan approval process, reduces biases in credit scoring, and speeds up decision-making.
Anti-Money Laundering (AML) Compliance	Monitors large volumes of transactions, identifies suspicious activities, and reports them to relevant authorities.
Fraud Detection and Prevention	Identifies unusual transactions, prevents unauthorised access, and flags suspicious activities for further investigation.
Market Sentiment Analysis	Helps in understanding market trends and investor sentiment, which in turn influences trading strategies and investment decisions.
Predictive Analytics	Forecasts market movements, customer needs, and financial outcomes to guide strategic planning and decision-making.
Financial Forecasting	Supports investment strategies, budget planning, and risk assessment by providing accurate financial forecasts.
Loan Default Prediction	Helps manage loan portfolios and mitigate risks by identifying borrowers with high-risk profiles.
Regulatory Compliance	Automates reporting, monitors transactions for compliance, and flags potential regulatory breaches.
Document and Data Processing	Speeds up tasks such as KYC processes, loan applications, and compliance checks by digitising and analysing documents for enhanced efficiency.

Source: Author(s), 2025

Moreover, understanding how to use machine-readable data has a significant impact on both financial infrastructures and empirical financial investigations. For example, the financial services sector is progressively reliant on computational methodologies, wherein advanced computational power, supported by cutting-edge hardware and software innovations, enables machines to construct high-dimensional, intricate models that facilitate the comprehensive assessment of novel information. Specifically, the integration of artificial intelligence and machine

[40] Abdullah Eskandarany, "Adoption of Artificial Intelligence and Machine Learning in Banking Systems: A Qualitative Survey of Board of Directors," *Frontiers in Artificial Intelligence* 7 (November 2024): 1440051, https://doi.org/10.3389/FRAI.2024.1440051/BIBTEX.

[41] Eskandarany, "Adoption of Artificial Intelligence and Machine Learning in Banking Systems: A Qualitative Survey of Board of Directors."

learning is fundamentally reshaping trading and investment strategies.[42] Furthermore, one subset of ML that excels at processing and analysing big, complicated datasets is deep learning (DL). Numerous applications of DL have also been identified in the financial industry, offering innovative solutions for a range of problems. As a result, this featured key applications where deep learning has demonstrated notable impacts:

1. Algorithmic Trading: Deep learning algorithms are used to analyse market data and identify trading opportunities in real time. By processing large volumes of data swiftly, deep learning models can make informed decisions on buying or selling assets.
2. Risk Management: Deep learning techniques are employed to assess and mitigate risks in financial portfolios. These models offer advanced risk estimation by analysing complex patterns and correlations in historical data.
3. Credit Scoring: Deep learning models are utilised to assess the creditworthiness of individuals or organisations. By analysing diverse data points, these models deliver more accurate predictions of credit risks.
4. Portfolio Optimisation: Deep learning algorithms aid in optimising investment portfolios to achieve better returns. By considering multiple factors and historical market data, these models can suggest optimal portfolio compositions.
5. Market Forecasting: Deep learning is used for predicting market trends and prices based on historical data patterns. By analysing and learning from vast datasets, these models offer insights into potential market movements.
6. Fraud Detection: Deep learning plays a crucial role in detecting fraudulent activities in financial transactions. It has the potential to significantly enhance fraud detection by leveraging advanced algorithms and real-time data processing. This transformation is driven by the ability of AI to analyse vast datasets, identify anomalies, and adapt to evolving fraud tactics, ultimately improving operational efficiency and security. These models can correctly and quickly detect questionable transactions after learning from previous fraudulent behaviours.

These applications showcase the versatility and effectiveness of deep learning in revolutionising various financial processes, enhancing decision-making, and improving overall efficiency within the finance industry. Therefore, the use of AI in the financial sector presents significant advantages, including enhanced efficiency, improved decision-making, and personalised customer experiences. The process for reaching decisions with integrated AI should provide a balance between managing

[42] John W. Goodell et al., "Artificial Intelligence and Machine Learning in Finance: Identifying Foundations, Themes, and Research Clusters from Bibliometric Analysis," *Journal of Behavioral and Experimental Finance* 32 (December 2021): 100577, https://doi.org/10.1016/J.JBEF.2021.100577.

organisational risk, maximising profits, and increasing financial inclusion.[43] The advent of AI technology in the financial sector has triggered profound transformations across the entire financial industry. Pioneering financial services encompassing intelligent investment advisory, automated credit evaluation and surveillance, predictive risk assessment, and sophisticated customer service functionalities have proliferated.[44] This is consistent with Soerjono Soekanto's theory of legal effectiveness,[45] which holds that when the law is applied correctly and backed by both law enforcement and society's legal culture, it becomes effective.[46]

Thus, AI should be deployed in the financial sector to improve decision-making, automate tasks, improve operational efficiency, and personalise customer interactions. It also optimises fraud detection, credit scoring, and investment strategies to mitigate risks and ensure regulatory compliance. However, the limitations of AI, including ethical issues, the lack of comprehensive cognitive abilities in current algorithms, the high cost of computing power, and challenges with big data, pose significant obstacles to the widespread deployment of AI. Fundamental questions concerning AI's potential to replicate human intelligence, emotional intelligence, and consciousness remain unsolved, as are concerns about technological unemployment and ethics. The impact of AI on the labour market, productivity, and societal structures from an economic perspective remains a subject of intense debate, with proposals for measures such as trade unions and regulation to address distributional outcomes and productivity growth.[47] Then, from a sociological perspective, AI would influence daily activities, from a busy line at customer service to a single click on a gadget (such as a smartphone or tablet). Every single conventional financial activity would be reduced by an app, with user-friendly and easy-to-use apps. Moreover, from a legal perspective, the rapid development of AI in the financial sector presents both opportunities and challenges, as the government's political will to draft a bill related to AI is being questioned.

The deployment and enactment of AI in the financial sector in Indonesia align with the Islamic law theoretical framework. The principles of *maqāṣid al-sharīʿah*, the objectives or higher intents of Islamic law, according to classical scholars such as Al-Ghazali and contemporary ones like Jasser Auda, aim to preserve five essential

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43 Omar H. Fares et al., "Utilization of Artificial Intelligence in the Banking Sector: A Systematic Literature Review," *Journal of Financial Services Marketing* 28, no. 4 (2022): 1, https://doi.org/10.1057/S41264-022-00176-7.

44 Zhihan Lv et al., "Evaluation Standards of Intelligent Technology Based on Financial Alternative Data," *Journal of Innovation & Knowledge* 7, no. 4 (2022): 100229, https://doi.org/10.1016/J.JIK.2022.100229.

45 Soerjono Soekanto, "Ilmu Hukum Dan Politik," *Article* 5, no. 7 (1988): 230–37.

46 Sholahuddin Al-Fatih, "Rekonstruksi Tujuan Welfare State Dan Gejala Privatisasi Di Indonesia," *Jurnal Komunitas Yustisia* 5, no. 1 (2022): 367–81, https://doi.org/10.23887/jatayu.v5i1.46468.

47 Carlo Milana and Arvind Ashta, "Artificial Intelligence Techniques in Finance and Financial Markets: A Survey of the Literature," *Strategic Change* 30, no. 3 (2021): 189–209, https://doi.org/10.1002/JSC.2403.

values: 1. Protection of Faith *(ḥifẓ al-dīn)*; 2. Protection of Life *(ḥifẓ al-nafs)*; 3. Protection of Intellect *(ḥifẓ al-'aql)*; 4. Protection of Wealth *(ḥifẓ al-māl)*; and 5. Protection of Lineage *(ḥifẓ al-nasl)*. These ideas, which are also relevant within Fiqh Muamalah, encompass several key principles, including: 1. *al-'adl* (justice and fairness). Transactions must be equitable and non-exploitative. AI-based financial decisions should avoid bias, discrimination, and the manipulation of market data; 2. Avoidance of *gharar* (uncertainty). Contracts should not involve excessive uncertainty. AI systems must ensure transparency in algorithmic decision-making to prevent hidden risks; 3. Avoidance of *Riba* (prohibition of Interest). Earning money without productive effort is prohibited. AI has a must to support financing models compliant with profit-sharing *(Mudarabah; musharakah)* instead of interest-based lending; and 4. *Amanah* (trustworthiness). Financial data and consumer privacy are a trust (*amanah*). AI systems must uphold data protection and ethical responsibility.

The Key Role of Regulation in Deploying Artificial Intelligence in the Financial Sector

Artificial Intelligence (AI) is revolutionising the financial sector by providing transformative benefits, including enhanced efficiency, improved customer experience, and advanced risk management. However, the rapid adoption of AI also introduces significant risks, including ethical concerns, data privacy issues, and systemic vulnerabilities. Regulation is critical to ensure that AI is deployed responsibly and sustainably in the financial sector. By establishing clear frameworks, regulators can strike a balance between innovation, consumer protection, market stability, and ethical considerations. One of the primary roles of regulation is to address moral and bias-related challenges in AI systems. AI algorithms are only as unbiased as the data on which they are trained, and historical data often reflects existing biases. For instance, biased lending algorithms could disproportionately deny credit to specific demographic groups, perpetuating inequality. Regulatory bodies, including the Financial Conduct Authority (FCA) in the UK and the European Banking Authority (EBA), have emphasised the need for transparency and fairness in AI decision-making processes.[48] Regulations can mandate regular audits of AI systems, requiring financial institutions to demonstrate that their algorithms are free from discriminatory practices.

Another critical area where regulation is essential is data privacy and security. AI systems rely heavily on vast amounts of data, including sensitive customer information. The misuse or mishandling of this data can lead to severe breaches of privacy and trust. Regulations such as the General Data Protection Regulation

[48] Bank of England, "Artificial Intelligence and Machine Learning," Bank of England, 2022, https://www.bankofengland.co.uk/prudential-regulation/publication/2022/october/artificial-intelligence.

(GDPR) in the European Union set stringent standards for data collection, storage, and processing.[49] By enforcing such rules, regulators ensure that financial institutions implement robust cybersecurity measures and obtain explicit consent from customers before using their data. Regulation also addresses the issue of mitigating systemic risk. The increasing reliance on AI in essential financial activities such as trading, credit scoring, and fraud detection increases the risk of systemic breakdowns. For example, a failing AI-driven trading system could cause widespread market disruptions. Regulatory frameworks advocated by the International Monetary Fund (IMF) and the Bank for International Settlements (BIS) emphasise the importance of stress testing and contingency planning to avoid such crises.[50] Authorities can reduce the risk of catastrophic failures by requiring financial institutions to maintain human oversight and control over AI systems. However, human power is necessary because AI could become a threat if left unsupervised.

Moreover, regulation fosters innovation and competition by ensuring a level playing field. Without clear guidelines, smaller financial institutions and fintech companies may struggle to compete with larger players who have more resources to invest in AI. Regulatory sandboxes, such as those implemented by the Monetary Authority of Singapore (MAS) and the FCA, allow startups to test AI-driven solutions in a controlled environment.[51] This encourages innovation while ensuring that new technologies comply with existing laws and standards. Regulation plays a crucial role in building public trust in AI-driven financial services. Many consumers remain sceptical about the use of AI, fearing a lack of transparency and accountability. By mandating explainability and accountability in AI systems, regulators can reassure the public that these technologies are being used responsibly. For instance, the European Union's proposed Artificial Intelligence Act requires high-risk AI systems to provide clear explanations for their decisions, ensuring that users understand how and why specific outcomes are reached.[52]

The last regulation is indispensable in the implementation of AI in the financial sector. It addresses ethical concerns, safeguards data privacy, mitigates systemic risks, promotes innovation, and builds public trust. As AI continues to evolve, regulators must adopt a proactive and adaptive approach, collaborating with industry stakeholders to create frameworks that support sustainable and inclusive growth. By striking the right balance between innovation and oversight, regulation

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[49] Chris Jay Hoofnagle et al., "The European Union General Data Protection Regulation: What It Is and What It Means," *Information and Communications Technology Law* 28, no. 1 (2019): 65–98, https://doi.org/10.1080/13600834.2019.1573501.

[50] Andreas A. Jobst et al., "A Framework for Macroprudential Bank Solvency Stress Testing: Application to S-25 and Other G-20 Country FSAPs," International Monetary Fund, 2013.

[51] Monetary Authority of Singapore, "Overview of Regulatory Sandbox," Monetary Authority of Singapore, accessed January 31, 2025, https://www.mas.gov.sg/development/fintech/regulatory-sandbox.

[52] European Commission, "AI Act," European Union, accessed January 31, 2025, https://digital-strategy.ec.europa.eu/en/policies/regulatory-framework-ai.

can unlock the full potential of AI while safeguarding the integrity of the financial system. This description is based on insights from reputable sources, including the Financial Conduct Authority (FCA), the European Banking Authority (EBA), the International Monetary Fund (IMF), the Bank for International Settlements (BIS), and the Monetary Authority of Singapore (MAS). These organisations have published extensive research and guidelines on the role of regulation in AI adoption within the financial sector. Is it possible to adopt in Indonesia's financial industry? Let's discuss this further in the following paragraph.

The integration of Artificial Intelligence (AI) into the financial sector in Indonesia presents both significant opportunities and challenges. As AI technologies advance, the need for a robust regulatory framework becomes increasingly crucial to ensure the ethical and responsible implementation of these technologies. Regulation is critical to striking a balance between innovation and consumer protection, as well as data privacy and security, within the financial landscape. The lack of comprehensive rules is one of the most significant barriers to AI deployment in Indonesia's financial sector. While the country has established foundational laws, such as the Personal Data Protection Law and guidelines from the Financial Services Authority (OJK), these frameworks are often insufficient to address the rapid advancements in AI technology. The OJK has introduced a Code of Ethics for AI in Fintech, emphasising principles such as fairness, accountability, transparency, and security. However, experts argue that more specific regulations are necessary to tackle unique challenges posed by AI, particularly in sensitive areas such as banking and e-commerce.

Data privacy is another serious issue. The use of AI often involves processing vast amounts of personal data, raising concerns about how this data is collected, stored, and utilised. Without stringent regulations to safeguard consumer information, there is a heightened risk of data breaches and misuse. The OJK's guidelines aim to mitigate these risks by promoting responsible data management practices among fintech companies.[53] Moreover, cybersecurity remains a critical issue as AI systems can be vulnerable to attacks that exploit their algorithms or data inputs. The rapid pace at which technology evolves often outstrips existing legal frameworks, leaving gaps that malicious actors can exploit. Regulatory bodies must prioritise developing cybersecurity standards that specifically address the vulnerabilities associated with AI.[54] The ethical implications of AI deployment in finance also necessitate careful consideration. As algorithms make decisions that can significantly impact consumers—such as credit scoring or loan approvals—there is a need for transparency regarding how these decisions are made. The OJK's

[53] SSEK, "Regulation of Artificial Intelligence in Indonesia," SSEK Law Firm, 2024, https://ssek.com/blog/indonesia-law-update-regulation-of-artificial-intelligence/?lang=id.

[54] OECD, *regulatory approaches to artificial intelligence in finance*, no. 24 (2024).

guidelines stress the importance of clarity in AI operations to foster trust among users.

Furthermore, the Islamic perspective on AI issues. Islamic teachings do not categorically ban AI; instead, they emphasise the ethical application and potential benefits of AI for humanity. Islam embraces technological advancements, including AI, as long as they serve humanity positively.[55] The benefits of AI for human activities include: AI could enhance arbitration, legislation, and judiciary processes, provided it is used appropriately and does not replace human judgment.[56] Then, the development and deployment of AI must adhere to Islamic moral principles to prevent misuse, such as promoting radicalisation or distorting religious values.[57] There are also concerns that AI could be exploited to propagate harmful ideologies or distort religious teachings. Moreover, the creation of human-like images through AI raises theological questions, as it may conflict with Islamic views on idolatry.[58] Thus, while AI is not inherently prohibited in Islam, its ethical application is crucial to align with Islamic values, such as *Maqashid Sharia*, including: protecting faith (*hifzad-din*), protecting soul (*hifz an-nafs*), protecting mind (*hifz al-aql*), protecting descendants (*hifz an-nasl*), and protecting wealth (*hifz al-mal*).[59] Conversely, the rapid advancement of AI poses challenges that require careful consideration to avoid negative implications for religious integrity and societal norms.

Then, how about ijtihad or fatwa related to AI in Indonesia? The discourse surrounding ijtihad and fatwa about artificial intelligence (AI) in Indonesia is evolving, reflecting the need for contemporary Islamic legal frameworks to address modern challenges. The Indonesian Ulema Council (*Majelis Ulama Indonesia*/MUI) plays a pivotal role in this process, employing various ijtihad methods to issue fatwas that address the complexities of AI and its implications for Islamic law. The MUI employs three primary approaches in its ijtihad: *nash qath'i, qawli*, and *manhaji*,

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55 Ana Khoirunisa et al., "Islam in the Midst of AI (Artificial Intelligence) Struggles: Between Opportunities and Threats," *Suhuf* 35, no. 1 (2023): 45–52, https://doi.org/10.23917/SUHUF.V35I1.22365.

56 Mohammad Azam Hussain et al., "The Potential Prospect of Artificial Intelligence (AI) in Arbitration from the International, National and Islamic Perspectives," *Journal of International Studies* 19, no. 1 (2023): 95–122, https://doi.org/10.32890/JIS2023.19.1.4.

57 Faisol Hakim et al., "Artificial Intellegence (AI) Dan Dampaknya Dalam Distorsi Pendidikan Islam," *Urwatul Wutsqo: Jurnal Studi Kependidikan Dan Keislaman* 13, no. 1 (2024): 129–44, https://doi.org/10.54437/urwatulwutsqo.V13I1.1330.

58 Vahram V. Mghdesyan, "Որքանո՞վէընդունելիարհեստականբանականությանմիջոցովստեղծվածնկարըԻսլամիկողմից / How Acceptable Is a Picture Created by Artificial Intelligence by Islam?," *Region i Mir*, no. 2 (February 2024): 74–77, https://doi.org/10.58587/18292437-2024.1-74.

59 Sholahuddin Al-Fatih et al., "academic freedom of expression in indonesia: A Maqashid Sharia Notes," *El-Mashlahah* 13, no. 2 (2023): 203–24, https://doi.org/10.23971/el-mashlahah.v13i2.7573; Fatima Zohra Benali et al., "The Algorithmic Fiqh: Qiyas and the Cryptocurrency Paradigm," *Indonesian Journal of Islamic Law* 8, no. 1 (2025): 1–28, https://doi.org/10.35719/c3g8zb70.

which are contextually relevant to contemporary issues.[60] Fatwas issued by MUI regarding financial technology, which includes AI applications, demonstrate a progressive legal spirit, aligning with the growth of Islamic financial products.[61] The application of ijtihad has been crucial in addressing the ethical and legal implications of AI, particularly in areas such as finance and social practices. However, until this article was published, the MUI had not issued fatwas regarding AI and its specific applications, such as those in the financial sector, regulatory issues, and other related matters. As mentioned by Nahdlatul Ulama, AI can be used, but it would be haram to ask a fatwa from AI.[62]

Therefore, based on the discussion above, it can be confirmed that the application of AI in the financial sector in Indonesia is feasible, in line with the effectiveness law theory by Soerjono Soekanto, provided that adequate regulations, including national regulations and fatwas from Islamic organisations such as MUI, are also in place. Currently, Indonesia has the PDP Law and the OJK Guidelines. The OJK Guidelines, which govern AI in the financial industry, are nearly identical to those in the US, UK, EU, and Singapore. Nevertheless, in Indonesia, human oversight and harmonisation are required, as ethical responsibility and clarity are essential. Thus, if we refer to the absence of existing legal norms from a regulatory perspective, Indonesia needs to strengthen the PDP Law in the form of technical regulations in the form of Ministerial Regulation or Circular Letters (also called as delegated legislation)[63] in the form of Government Regulations or Presidential Regulations, as well as strengthening the institutional role of the OJK. Furthermore, it appears that Indonesia may require an AI Bill in the future, similar to how the AI Act was adopted in the European Union.[64] Because, if we discuss AI in the context of the IET Law, of course, it is very different because philosophically and sociologically, the formation of the IET Law is to accommodate the legal vacuum in online transactions (based on *Naskah Akademik* or Academic Transcript of IET Law), not to accommodate the needs and legal vacuum regarding AI.[65]

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60 Ihwan Agustono, "The Significance of Ijtihad and Fatwa Methods in The Development of Islamic Law in Indonesia," *Taqnin* 6, no. 02 (2024): 120–120, https://doi.org/10.30821/TAQNIN.V6I02.18229.

61 Ibnu Pelu and Ahmad Dakhoir, "The Role of Ijtihad and the Development of Sharia Financial Technology Products in Indonesia," *Proceedings of the 1st Conference on Islamic Finance and Technology, CIFET*, EAI, May 19, 2020, https://doi.org/10.4108/EAI.21-9-2019.2293937.

62 Ratih Rahma Dewi, "Problematika Artificial Intelligence Sebagai Pemberi Fatwa Dalam Perspektif Hukum Islam," *Jurnal Analisis Hukum* 7, no. 2 (2024): 209–23, https://doi.org/10.38043/JAH.V7I2.5137.

63 Sholahuddin Al-Fatih et al., "Rethinking Delegated Legislation in the Indonesian Legal System," *Jurnal Hukum Novelty* 14, no. 2 (2023): 240–51, https://doi.org/10.26555/novelty.v14i2.a27517.

64 Ministry of the State Secretariat of the Republic of Indonesia, "Urgensi Undang-Undang Kecerdasan Buatan (Artificial Intelligence)," Setneg RI, 2024, https://www.setneg.go.id/baca/index/urgensi_undang_undang_kecerdasan_buatan_artificial_intelligence.

65 Zaka Firma Aditya and Sholahuddin Al-Fatih, "Indonesian Constitutional Rights: Expressing and Purposing Opinions on the Internet," *International Journal of Human Rights* 25, no. 9 (2021): 1395–419, https://doi.org/10.1080/13642987.2020.1826450.

Conclusion

This study concludes that the deployment of AI in the Indonesian financial industry is both feasible and strategically beneficial, as long as it is underpinned by a solid legal foundation, including relevant fatwas, the forthcoming AI Bill, strengthened enforcement of the Personal Data Protection Law, and clearer supervisory parameters through the OJK AI Guidelines. These findings align with the theoretical foundations of Islamic Law—particularly *maqashid al-shariah* and *fiqh muamalah*—which emphasise justice, transparency, and the protection of public interest. AI, therefore, has the potential to enhance financial-sector performance through applications such as algorithmic trading, risk management, credit scoring, portfolio optimisation, market prediction, fraud detection, and financial literacy tools. Theoretically, this study contributes to the emerging discourse on "Islamic AI governance" by linking technological innovation with syariah-based legal reasoning. For the financial sector, the implications are substantial: improved operational efficiency, stronger consumer protection, and enhanced regulatory oversight. However, this study is limited by its normative approach and does not empirically test AI systems currently used by Indonesian institutions. Future research should include empirical evaluations of AI risk profiles, comparative studies with other Muslim-majority jurisdictions, and the development of measurable indicators for syariah-compliant AI governance.

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