# Legal Aspects of Digital Transformation

# Islamic Banking: A Study of Compliance with Sharia Principles

**Sutrisno**

Faculty of Law, National Development University "Veteran" East Java

Rungkut Madya Street No. 1 Gunung Anyar, Surabaya, East Java

E-mail: sutrisno.sh@upnjatim.ac.id

## Abstract

This study aims to examine how Islamic banking adheres to Islamic economic principles in the context of the digital revolution in Indonesia. It employs a normative juridical approach, reviewing existing literature, focusing on Law No. 21 of 2008 regarding Islamic Banking, regulations from the Financial Services Authority (OJK), and guidelines from the National Sharia Council of the Indonesian Ulama Council (DSN-MUI), as primary legal references. The findings suggest that digital transformation has improved efficiency and creativity in Islamic financial services. However, it has also introduced normative and technical challenges that may hinder the thorough application of Islamic principles. Law No. 21 of 2008 does not explicitly govern automated digital monitoring systems, and OJK regulations remain generic, without specifying Sharia-compliant norms related to technology. Conversely, DSN-MUI fatwas are predominantly normative-philosophical and lack practical technical instruction. This study also acknowledges the potential for digital Islamic shadow banking activities that operate outside institutional oversight, thereby posing risks to the values of equity, transparency, and consumer protection. Therefore, it is essential to create a synergy among positive law, Sharia fatwas, and advancements in digital technology by formulating technical standards for digital Sharia systems, providing competency training for Sharia experts in financial technology, and updating regulations to align with the evolving dynamics of the financial industry. This research enhances the regulatory framework and Sharia compliance practices within the national digital banking ecosystem.

*Keywords: Islamic banking, digitalization, sharia compliance, Islamic economic law.*

## Introduction

Digital transformation has emerged as a global phenomenon, driving substantial changes across multiple sectors, particularly within the financial services industry. Digitalization enhances efficiency, speed, and convenience in financial services while expanding public access, particularly in rural areas that were previously challenging to reach through conventional financial systems (Asmawi & Rahmawati, 2025). In the banking sector, innovations such as mobile banking, internet banking, artificial intelligence, and blockchain have transformed the interactions and operations between financial institutions and customers. This has established new public expectations for rapid, immediate, and round-the-clock service. Conventional banks have rapidly adopted many technological advances to address these challenges (Aditya & Lestari, 2025).

In light of these changes, Islamic banks must likewise adapt accordingly. Islamic banks, as financial organisations grounded in Islamic principles, encounter a dual challenge. They must adapt to the currents of modernisation and digitalization to maintain relevance and competitiveness both nationally and globally. Conversely, they must guarantee that all digital innovations, products, and services comply with Sharia principles, including the prohibition of riba (interest), gharar (uncertainty), and maysir (speculation), while emphasising the values of justice and public benefit (Rohmah, 2024). Although in practice, the digital change within Islamic banks does not consistently unfold seamlessly. Multiple instances have demonstrated that digital advances have generated new challenges in Sharia compliance. Digital or electronic contracts, without a defined ijab qabul (consent) mechanism or paper paperwork as legal evidence, are frequently utilised. This raises questions regarding the validity of transactions from an Islamic legal perspective. If the contract, an important aspect of a transaction, is not legally executed, the validity of the entire transaction may be challenged (Hassandi & Pangestu, 2025).

One specific subject presently being examined is the rise of numerous digital funding applications purporting to be affiliated with Sharia finance (Qothrunnada et al., 2023). Multiple applications partner with Islamic banks to offer online finance products. Nevertheless, not all business concepts and contracts employed have received sufficient Sharia scrutiny. Certain apps impose late penalties that closely resemble interest or establish fixed profit margins without accounting for the proportional profit-sharing mechanism outlined in the principles of mudharabah and musyarakah (Sakhinah & Citra, 2025).

The interesting growing phenomenon is the disagreement between the policies of financial institutions, such as the Financial Services Authority (OJK), and the fatwas promulgated by the National Sharia Council of the Indonesian Ulama Council (DSN-MUI). The OJK, as a government agency, primarily emphasises cybersecurity, customer data protection, and system efficiency, despite not having released technical guidelines on the application of sharia principles in digital platforms (Zulfikar & Harley, 2024). On the reverse side, the DSN-MUI (Indonesian Council of Ulama) promulgates generic fatwas that inadequately encompass the intricacies of digital technology, including smart contracts, Sharia-compliant peer-to-peer lending systems, and the utilisation of blockchain technology in muamalah contracts. This circumstance engenders a concerning legal void (Abrar & Ihza, 2025). Innovation is advancing swiftly, whereas rules are falling behind, resulting in legal ambiguity for industry participants who are torn between the desire to innovate and the necessity of adhering to Sharia compliance. The lack of compatible and unified regulations has compelled certain Islamic banks to implement compromises that occasionally lead to significant breaches of Sharia precepts (Wijaya et al., 2025).

The digital transformation of Islamic banks encounters obstacles related to human resource capabilities (Aziz, Islami, et al., 2025). Multiple technology professionals lack a comprehensive understanding of Sharia principles, while some experts in Islamic jurisprudence are not well-versed in digital financial technology. This disparity has led to the creation of Sharia-compliant digital products and services that often lack a comprehensive understanding, rendering them susceptible to both procedural and substantive inconsistencies. A crisis of trust has emerged within the Muslim community, which is the primary demographic for Islamic financial services. This community is increasingly scrutinising the compliance of digital services with Sharia norms. The term “Sharia” often carries symbolic significance but lacks clarity regarding contract frameworks, profit margin assessments, and fund disbursement mechanisms (Latisha & Dirkhareshza, 2024). The scarcity of transparency has diminished public understanding and confidence in digital Islamic financial services, perhaps leading to a discrepancy between the “Sharia” designation and real operations (Sudarmanto et al., 2024). The crucial importance of this research is amplified by recent statistics indicating a substantial increase in the use of digital services within the Islamic banking sector following the epidemic. Islamic banks have witnessed a substantial increase in digital transactions, particularly through mobile banking and online financing platforms. Nonetheless, this expansion has not been matched by a sufficient enhancement of the Islamic supervisory framework. The majority of Islamic banks have not created digital Islamic compliance teams that can consistently evaluate digital products and services from an Islamic jurisprudential standpoint. Furthermore, challenges arise regarding the application of blockchain technology and smart contracts in this domain. Despite the potential for enhanced transparency and efficiency, the integration of these technologies within the Islamic legal system is still constrained. Currently, there are no legal regulations that explicitly address the incorporation of smart contracts with Islamic contracts, such as ijarah, murabahah, or salam. In the absence of a revised legal framework and a contextual fiqh approach to modern technologies, Islamic banks may struggle to effectively engage in the digital financial era.

The absence of collaboration among regulators, academia, and industry stakeholders in formulating inclusive Islamic digital governance intensifies these issues. Academic research is frequently underleveraged strategically, whereas industry progresses swiftly without a robust scientific basis. This disparity generates a chasm between commercial requirements and the Sharia legal principles that ought to support digital transformation. Countries like Malaysia and Bahrain have established regulatory frameworks and Sharia compliance norms for digital financial services. Malaysia, via Bank Negara Malaysia, has implemented a Shariah Governance Framework tailored for the digital economy. Conversely, Indonesia, the nation with the largest Muslim population globally, lacks a legal structure that harmonises positive law with Islamic law in this domain. The situation is paradoxical and highlights the necessity for thorough scholarly research (Hanifah et al., 2025).

This urgency aligns with Indonesia’s commitment to establishing a national Sharia economic environment, as outlined in the 2019–2024 Indonesian Sharia Economic Masterplan (MEKSI). The establishment of Sharia financial infrastructure is a fundamental component of this agenda. Nonetheless, its implementation in the sector continues to encounter numerous challenges, including insufficient harmonization between conventional and Sharia standards and the absence of a robust digital Sharia compliance assessment system. As a result, legal studies are important to assess how many Sharia principles are included in digital banking and to determine how to create rules that meet market needs while adhering to Islamic legal standards. This study project aims to deliver both scholarly contributions and substantial practical benefits for regulators and industry stakeholders in formulating equitable, adaptable, and value-oriented policies. This study aims to elucidate the significance of establishing a proactive national digital sharia legal framework, rather than merely reacting to change. This method enables Sharia banks to become pivotal players in digital change, exhibiting both economic superiority and spiritual and ethical resilience in alignment with Islamic principles.Top of Form

## Research methods

This study employs a normative juridical method as the principal framework for examining the norms and principles of Islamic law that regulate digital transformation in Indonesia’s Islamic banking sector. This method was chosen because the study primarily focuses on clearly stated legal rules, such as laws, Sharia fatwas, and legal concepts derived from academic writings. According to a normative legal viewpoint, law is perceived as a collection of norms integrated within the formal legal framework rather than as behaviours comprehended through empirical observation. Therefore, this research focuses not on the social behaviour of digital service consumers but on the degree to which relevant legal standards facilitate innovation while ensuring adherence to Sharia principles in digital banking goods and services.

The principal legal object examined is Law Number 21 of 2008 regarding Sharia Banking, which constitutes the formal legal foundation for the establishment and functioning of Islamic banking institutions in Indonesia. This legislation establishes the normative basis for the prudential concept, Sharia compliance, and the institutional structure of Islamic banks. Within the framework of digital transformation, these laws provide a foundation for assessing the adequacy of existing legislation about advancements in information technology and the digitisation of financial services. Additionally, laws from the Financial Services Authority (OJK) concerning digital banking service systems, technology risk management, and consumer protection are significant subjects for examination. These regulations demonstrate the state’s role as a regulator in advancing digital systems within the financial sector, particularly in promoting security and efficiency principles in Islamic institutions. Fatwas issued by the National Sharia Council of the Indonesian Ulama Council (MUI) are evaluated within the framework of normative Sharia law, which regulates the legitimacy of contracts and transactions in muamalah (religious transactions), encompassing their execution in a digital environment. These fatwas embody Sharia norms and ideas that should underpin the design and implementation of ethical, Sharia-compliant digital financial services in alignment with Islamic jurisprudence.

This study classifies data according to the hierarchy and nature of its sources to develop a comprehensive and structured legal framework. The initial category comprises primary data, including official legal documents such as laws and regulations, OJK decrees, and DSN-MUI fatwas. The primary data demonstrates legal authority and is immediately subject to normative assessment. The second category, secondary data, comprises academic research and scientific literature that provide theoretical and analytical insights into how Islamic economic law has evolved in response to digitalization. Essential resources such as books, journal articles, theses, and dissertations enhance interpretations and allow for the juxtaposition of normative analysis findings with previous research. Finally, tertiary material data is utilised to elucidate a conceptual understanding of the legal terminology and principles found in primary and secondary sources. Legal dictionaries, sharia encyclopaedias, digital financial glossaries, and supplementary papers facilitate precision in terminology.

Data gathering employed a systematic and structured literature review methodology. This method entailed the retrieval and categorisation of legal materials via national legislation databases, the official DSN-MUI fatwa directory, and both national and international academic repositories. The literature analysis examines legal documents, key concepts in Islamic economic law, methods for regulating digital finance, and the advancement of technology-based Sharia governance. This study enhances the normative method by including semi-structured interviews with multiple key informants. The interviews aimed to obtain contextual insights, specifically concerning sharia compliance practices in the digitalization of Islamic banks and the challenges encountered by industry stakeholders, regulators, and fatwa authorities in providing sharia-compliant and technologically competitive products. The participants in this study included individuals working in sharia banking who are involved in digital transformation, members of the National Sharia Council (DSN-MUI) who contributed to the development of digital financial guidelines, scholars and researchers in sharia law, and financial technology experts who understand how to apply sharia principles in digital systems.

All collected data were then analyzed using the qualitative descriptive method, which allowed researchers to describe the content and meaning of legal texts, examine their normative implications, and compare them with digitization practices in the field. The analysis included reviewing legal articles and OJK rules, understanding the reasoning behind DSN-MUI fatwas, and verifying the findings with scientific literature and interviews that offered context and practical insights. This approach was chosen because it allows for exploration of the deeper meaning of legal texts and provides space for a synthesis between written legal norms and the need to adapt to technological innovation. Using this method, researchers can find any missing laws, overlapping rules, or inconsistencies between the national legal system and Sharia principles, which should be reflected in the Sharia digital financial framework.

The qualitative descriptive analysis method enables researchers to clearly explain legal arguments by examining Islamic law, ushul fiqh (Islamic jurisprudence), and the maqasid (Islamic principles) about the goals of financial digitalization. This paper aims to demonstrate how Islamic banks are addressing digital transformation and to propose a more flexible and proactive framework, based on a review of current laws and regulations.

This technique not only presents a static representation of regulations but also develops a constructive narrative that promotes legal reform initiatives in line with advancements in digital technology and accordance with Sharia principles.  This research method prioritises the integration of positive law and Islamic law within the digitalization of Islamic banking, rendering it pertinent for public policy formulation, enhancing Islamic legal literacy, and advancing technology-driven Sharia governance frameworks in the future.

## Research Results and Discussion

The advancement of digital technology has triggered profound transformations across various sectors, including the banking industry. Digital transformation provides convenience, efficiency, and speed in financial services while necessitating extensive modifications to rules and operational frameworks to comply with relevant principles. This difficulty within Islamic banking is becoming increasingly intricate. Islamic banks, as financial institutions adhering to Islamic principles, must be attuned to technological advancements while ensuring that all digital services they create align with Sharia values, including the prohibitions against riba (usury), gharar (uncertainty), and maysir (gambling), as well as the principles of justice and benefit. In the context of the digital era, the legal dimension is crucial as a protective measure and framework to ensure that digital transformation aligns with Sharia principles. To ensure that digital services in Islamic banking are both legally compliant and ethically acceptable, it is crucial to adopt clear laws, a dependable regulatory framework, and relevant fatwas from religious authorities in a synergistic manner. Aligning favorable legislation with Islamic legal concepts is crucial for establishing a sustainable, Sharia-compliant digital financial environment. This paper seeks to thoroughly analyse the legislative frameworks regulating digital transformations in Islamic banks in Indonesia. The study primarily examines adherence to Sharia principles in the development and execution of digital technology, using primary legal sources, including Law No. 21 of 2008 on Islamic banking, regulations from the Financial Services Authority (OJK), and fatwas from the National Sharia Council of the Indonesian Ulama Council (DSN-MUI).  This study employs a legal approach to outline key laws, identify gaps in current regulations, and assess the extent to which Sharia principles are incorporated into the digital services provided by Islamic banks.  This study aims to make a significant contribution to the development of policies, the revision of regulations, and the improvement of Sharia financial practices, enabling them to keep pace with the digital age while adhering to key Islamic principles.

### Analysis of Compliance with Sharia Principles in Law Number 21 of 2008 concerning Sharia Banking

Law No. 21 of 2008 is a significant statute that regulates the establishment and operation of Islamic banking in Indonesia.  This legislation not only creates the legal framework for the establishment of Islamic banks as financial entities but also governs the application of Islamic principles, which serve as the operational foundation that all Islamic banks in Indonesia must follow. In this context, Law No. 21 of 2008 mandates that Islamic banks operate under principles of justice and blessings, explicitly prohibiting riba (interest), gharar (uncertainty), and maysir (gambling), while necessitating the clarity and validity of contracts as essential prerequisites for all financial transactions.

In practice, this regulation serves as the primary framework for the ongoing digital transformation of various Islamic banks in Indonesia. Although the law does not directly regulate digital technology, the Islamic norms and principles it encompasses act as the essential criterion to ensure that all innovations in digital services comply with Islamic law. For instance, in providing digital services such as mobile banking, internet banking, and digital wallets, Islamic banks must ensure that the offered products employ Sharia-compliant contracts, including murabahah (sale and purchase with a specified profit margin), mudharabah (profit sharing), musyarakah (capital partnership), and ijarah (rental), while avoiding any transactions that may incorporate elements of usury or ambiguous contractual terms (Tambunan & Nasution, 2023).

On the other hand, it is quite influential; the swift advancement of technology has presented intricate obstacles to the execution of Law No. 21 of 2008 concerning the digitisation of Islamic banks. One major issue is the absence of an automated Sharia supervisory mechanism incorporated into the banking information system. The Sharia Supervisory Board (DPS), tasked with ensuring Sharia conformity, continues to perform its functions both traditionally and mechanically, utilising document reviews and periodic audits. This supervisory method complicates the early detection of potential Sharia infractions, especially in high-volume and rapid digital transactions.

One additional rising concern is the inadequate technical understanding of certain Sharia specialists regarding digital technology and financial system programming. Despite numerous DPS members possessing proficiency in Islamic jurisprudence (fiqh muamalah) and Islamic economics, many still lack a comprehensive understanding of the functionality of digital systems, including innovative contract mechanisms and the influence of algorithms on profit margins. This constraint leads to a suboptimal validation procedure for digital products, which is primarily conceptual and lacks sufficient technical oversight (Ardianto et al., 2024).

In highlighting transparency and fairness in transactions, Law No. 21 of 2008 mandates the provision of information to customers to ensure openness and fairness in transactions. Digital systems necessitate the creation of applications and platforms that provide extensive and readily accessible information regarding contract structures, customer rights and obligations, and dispute resolution processes in the event of issues. Reconciling the necessity of transparency with a user-friendly interface design and optimal transaction speeds presents challenges. Numerous Islamic banking organisations have failed to deliver optimal digital solutions that simultaneously satisfy legal stipulations and user requirements, potentially casting doubt on the halal validity of their products and services.

The emergence of Islamic digital shadow banking is a significant issue. Numerous digital financial services purporting to adhere to Sharia principles function beyond the jurisdiction of the Sharia Banking Law and the Sharia Supervisory Board (SPS). The absence of rules expressly addressing Sharia fintech practices creates an opportunity for unregulated financial operations, which could damage the reputation of Sharia banking and introduce systemic risk. Regulatory ambiguity affects technical elements, such as contract validation and data security, due to the absence of national norms for Sharia digital system certification or technological assessments. This will increase the likelihood of divergence from Sharia principles, which is growing.

Despite these challenges, Law No. 21 of 2008 remains the primary reference for advancing and regulating digital transformation within the Sharia banking sector. Prominent banks, such as Bank Syariah Indonesia (BSI) and Bank Muamalat, have demonstrated their commitment to incorporating Sharia principles into their digital offerings by engaging the SPS and adhering to rigorous internal standards. Nonetheless, these initiatives are inadequate without enhanced regulatory backing and augmented human resource capability in both technology and Sharia to guarantee successful synergy.

Consequently, reforming the laws is essential to facilitate the establishment of a technology-driven sharia supervisory framework, a certification process for digital systems adhering to sharia principles, and a comprehensive training program for sharia experts in financial technology.  This phase is essential to ensure that the implementation of Law No. 21 of 2008, within the framework of digital transformation, is both operationally efficient and upholds the integrity of Sharia principles in all facets of digital banking services in Indonesia.

### The Role and Implementation of Financial Services Authority (OJK) Regulations in the Digitalization of Islamic Banks

The Financial Services Authority (OJK) serves as the regulatory and supervisory entity for Indonesia’s financial services sector, playing a vital role in monitoring the digitalization of banking, particularly Islamic banking.  In response to the swift advancement of digital transformation, the OJK has promulgated many rules aimed at regulating information technology governance, digital payment services, consumer protection, and cybersecurity risk management.  These regulations aim to establish a secure, dependable, and legally compliant digital banking ecosystem, thereby protecting consumers from various technological abuses, including data theft, electronic fraud, and privacy infringements (Hanifah et al., 2025).

This study suggests that OJK regulations provide comprehensive technical guidelines for managing information systems and electronic transactions. OJK Regulation No. 12/POJK.03/2021 regarding Information Technology Governance for Commercial Banks requires all banks, especially Islamic banks, to implement strong cybersecurity systems, maintain client data confidentiality, and conduct regular technology audits. The Financial Services Authority (OJK) governs reporting protocols for security events and digital operational hazards, facilitating effective oversight and risk mitigation. This protection is essential due to the intricate nature of digital technology, which presents chances for cyberattacks and financial fraud (Aziz, Nurhaliza, et al., 2025).

On the other hand, research in the domain reveals that the execution of OJK laws in Islamic banks continues to encounter numerous substantial challenges. First, numerous regulations established by the OJK remain broadly defined and fail to adequately address the distinctive attributes of Islamic banking. Consequently, Islamic banks frequently need to implement dual governance frameworks: adhering to OJK technical standards, which are predominantly conventional, while also making internal modifications to ensure that digital products and services align with Sharia principles. This circumstance imposes a significantly higher operating and oversight burden compared to traditional banks.

Second, human resource capability and technology support continue to pose substantial challenges, particularly for small and medium-sized Islamic banks. Investing in advanced digital infrastructure necessitates substantial financial resources, while individuals possessing both technological proficiency and knowledge of Sharia law are exceedingly scarce. As a result, the deployment of digital security solutions and adherence to compliance standards have been neither consistent nor optimal. Banks with such constraints are more susceptible to security breaches and procedural inaccuracies that might erode public confidence in digital Islamic banking.

Third, the OJK rules are considered inadequate in their response to the swift evolution of Islamic financial technology. The OJK currently lacks a definitive legal framework for blockchain and smart contract technology, despite their potential to enhance efficiency and transparency. The lack of official regulations regarding these technologies leads to legal ambiguity and increased compliance risks for participants in the Islamic fintech sector. Additionally, industry stakeholders often opt to await the introduction of more flexible and forward-thinking legislative frameworks to avoid hindering the advancement of digital innovation due to possible legal infractions.

The OJK urgently needs to enhance its real-time, technology-driven digital oversight system.  Now, supervisory methods remain predominantly manual and infrequent, which is deemed inadequate for mitigating the compliance and operational risks associated with extensive and swift digital transactions. The development of an automated monitoring system seamlessly connected with the internal systems of Islamic banks will substantially facilitate the sustainable enforcement of Sharia standards and digital security. Several Islamic banks, such as Bank Syariah Indonesia (BSI) and Bank Muamalat, have exhibited a robust dedication to adhering to OJK requirements throughout their digitalization efforts. They establish multi-tiered security frameworks, engage the Sharia Supervisory Board in the design of digital products, and perform stringent internal compliance audits. Achieving this requires the OJK to provide policy assistance that is better aligned with the specific needs of Islamic banking, particularly in enhancing the ability of human resources to bridge the gap between technological proficiency and an understanding of Sharia principles (Zulfikar & Harley, 2024).

Consequently, the Financial Services Authority (OJK) plays a pivotal role in ensuring that the digital transformation of Islamic banking is secure, responsible, and consistent with Islamic principles. Achieving this necessitates close collaboration among regulators, industry stakeholders, and the Sharia Supervisory Board to develop comprehensive and flexible policies. Regulatory updates that keep up with new digital technology, along with investments in improving skills in Sharia law and information technology, are crucial for building a trustworthy, efficient, and valuable digital Islamic banking system in Indonesia.

### Fatwa of the National Sharia Council of the Indonesian Ulama Council (DSN-MUI) as a Pillar of Sharia Compliance in Digitalization

The DSN-MUI fatwas serve as the principal reference for guaranteeing Sharia compliance in all Sharia banking operations, particularly with the digitalization of products and services. The DSN-MUI, as a preeminent body for formulating Islamic law relevant to modern economic practices, has promulgated numerous fatwas that function as obligatory directives for Sharia-compliant financial institutions in the advancement of technology-driven services. These fatwas address several essential elements, including the utilisation of Sharia-compliant electronic currency, the execution of traditional contracts such as murabahah, ijarah, mudharabah, and musyarakah, as well as digital transaction methods that must adhere to Sharia norms.

This analysis shows that the DSN-MUI fatwas strongly emphasise the importance of using legal contracts for all digital Sharia banking products. The fatwa about Sharia-compliant electronic currency stipulates that digital wallets for fund storage must be founded on explicit and transparent contracts, thereby accurately representing the rights and responsibilities of both service providers and customers. Electronic transactions are forbidden to involve components of usury (riba), excessive uncertainty (gharar), or speculation (maysir). This fatwa outlines the processes for storing, managing, and utilizing funds in a digital context to ensure adherence to Islamic norms (Syahrani & Fitri, 2025).

The information indicates that the DSN-MUI fatwas are primarily normative and philosophical, thus lacking detailed technical guidance for the development of complex digital systems. This presents a significant challenge for Islamic banking organisations, particularly in translating the core concepts of fatwas into the language of information technology, which encompasses algorithms, transaction automation systems, and real-time Sharia compliance verification. To ensure that Sharia values are not merely conceptually acknowledged, a strong collaboration between Sharia experts and technology developers is crucial for the effective integration of these principles into digital systems.

The swift progression of digital technology necessitates that the DSN-MUI uphold the pertinence of its fatwas. Blockchain and smart contract technology, prevalent in the financial environment, provide fundamentally distinct transaction models compared to traditional transactions. Similarly, using artificial intelligence (AI) in Sharia-compliant risk management and compliance requires clear, detailed, and adaptable legal guidance. A further problem emerges from intricate cross-border digital transactions, where legal restrictions and Sharia compliance criteria can differ markedly between nations.

This research highlighted the necessity for periodic updates and adjustments to fatwas to guarantee that the DSN-MUI remains attuned to technological advancements. A proactive strategy is crucial for preventing fatwas from becoming static regulations and for transforming them into dynamic and relevant legal instruments. In this manner, Islamic banks can continue to innovate while ensuring that the products and services they provide adhere to the principles of valid Islamic law. DSN-MUI fatwas serve as the principal basis for ensuring the legitimacy and Sharia conformity of Islamic banking digitalization. Addressing the intricate and dynamic difficulties of digitalization necessitates strong collaboration among the Sharia Board, regulators, and industry stakeholders. This teamwork is crucial for refining existing fatwas, establishing technical guidelines for digital Sharia compliance, and developing the skills of individuals who understand how to integrate Sharia principles with technology. This collaboration will ensure sustained digital development in Islamic banking while upholding the fundamental and essential concepts of ethics, security, and fairness, which are integral to the Islamic financial system.

### Synergy and Harmonization between Laws, OJK Regulations, and DSN-MUI Fatwas

The integration and alignment of Law No. 21 of 2008 regarding Islamic Banking, technical regulations from the Financial Services Authority (OJK), and fatwas from the National Sharia Council of the Indonesian Ulama Council (DSN-MUI) constitute the essential foundations for ensuring that the digital transformation of Islamic banking occurs in an orderly and directed manner while adhering to Islamic principles. These three legal instruments ideally complement and strengthen one another, offering a comprehensive legal framework and operational direction for Islamic banks to navigate the intricate and swiftly evolving landscape of digitalization.

Law No. 21 of 2008 constitutes the essential legal framework, affirming the existential legality of Islamic banks and the obligatory Islamic principles that provide guidance. Nonetheless, due to its normative and broad character, the implementation of this law necessitates more specific and applicable technical rules. The OJK’s function is vital, especially in the promulgation of legislation about essential elements such as information technology governance, data security frameworks, electronic transactions, and digital consumer protection. Simultaneously, the DSN-MUI fatwas serve as ethical and legal frameworks for the development of Sharia-compliant Islamic financial products and services, underscoring that each transaction must be free from components of usury (riba), uncertainty (gharar), and gambling (maysir) (Syahrani & Fitri, 2025).

The findings of this research indicate a significant discrepancy in the practical application of these three legal instruments. OJK laws are mainly developed through a technocratic lens, drawing heavily on established practices from the conventional finance sector concerning digitalization. Consequently, the regulatory framework of OJK laws does not adequately correspond to the specific needs and characteristics of Islamic banking operating systems. In contrast, DSN-MUI fatwas are generally more normative, focusing on the principles of muamalah fiqh (Islamic jurisprudence) without thoroughly addressing the technical aspects of digitalization. This situation places Islamic banks in a difficult position, caught between the need to comply with OJK’s regulatory requirements and the necessity of adhering to the Sharia principles laid out by the National Sharia Council (DSN-MUI) in the development of their digital services.

The gap in contrast between legal instruments presents a significant obstacle to expediting the digital revolution of Islamic banking. Regulatory misalignment and insufficient coordination among institutions may result in discrepancies between the digital services or products created by Islamic banks and the relevant Sharia laws. This not only jeopardises regulatory compliance and adherence to principles, but it may also adversely affect public trust and the institution’s reputation. This study highlights the necessity of implementing a sustainable, organised, and formal cross-institutional coordination framework. This method can be advanced by collaboratively coordinating forums, conducting comprehensive technical seminars, or creating interdisciplinary work units specifically assigned to incorporate regulatory elements and fatwas into the digitisation process.

In addition to coordination, there is a need for national technical standards that explicitly incorporate Sharia compliance considerations throughout all phases of the banking digitalization process. These standards should encompass the design of information systems, the rules for creating contracts, data security systems that adhere to Sharia, automated checks for Sharia compliance, and technology audit rules based on Islamic law. Such criteria will provide Sharia banks with a clear and measurable framework for developing digital services that are both efficient and secure while remaining in alignment with Islamic law. This will strengthen internal controls by the Sharia Supervisory Board and enhance external regulatory oversight, making them more effective and sustainable.

### Challenges of Implementing Islamic Bank Digitalization Based on Legal Aspects

The integration of digitization in Islamic banking in Indonesia faces numerous complex challenges, particularly in ensuring compliance with Islamic legal principles and relevant formal regulations. Conversations with professionals and analysts in the Islamic banking sector have highlighted several significant obstacles. One major issue is the low level of digital literacy and understanding of Sharia rules among both clients and staff within Islamic banks. Many clients struggle to differentiate between traditional and Sharia-compliant digital services, which complicates the evaluation of the legitimacy of digital contracts. Additionally, the lack of qualified personnel with a deep understanding of both Sharia and digital technology hinders Islamic banks from developing and offering digital services that fully comply with Sharia principles.

Another issue arises from Sharia oversight and auditing, which predominantly rely on manual or semi-digital techniques. This method is not very effective at recording and confirming the high-volume, high-speed transactions that are common in the digital economy. In the absence of an advanced information technology system connected with a Sharia compliance framework, the Sharia Supervisory Board (SSB) will face challenges in executing thorough and real-time oversight. This situation could lead to violations of Sharia rules, such as hidden elements of usury (riba), unclear contracts (gharar), or the use of transaction systems that do not clearly define the rights and responsibilities of the parties involved (Wijaya et al., 2025).

Another significant issue is the high investment costs associated with the information technology (IT) sector. To establish a secure, reliable, and Sharia-compliant digital service system, Sharia banks need to have advanced digital infrastructure and skilled personnel. However, small and medium-sized Sharia banks often face limited budgets and restricted human resource capabilities, preventing them from keeping pace with the rapid digitalization implemented by larger Sharia banks. This gap ultimately widens the divide between Sharia banking institutions that have adopted integrated digital systems and those that still rely on traditional or semi-digital systems.

### Opportunities and Potential for the Development of Digitalization of Islamic Banking

Despite numerous hurdles, digital transformation in Islamic banking offers strategic potential to substantially enhance growth and broaden the range of Islamic financial services. A significant opportunity exists in digital technology’s ability to access communities that have been historically excluded from the official banking system, particularly in remote regions. Islamic banks can deliver rapid, efficient, and Sharia-compliant financial services through mobile applications, internet-based platforms, and digital agents, thereby eliminating the need for capital-intensive physical infrastructure, such as branch networks.

The digitalization enables Islamic banks to develop more adaptable, customized, and innovative offerings. Technologies such as big data and artificial intelligence (AI) can be leveraged to gain a comprehensive understanding of client needs, enabling the provision of Islamic financial solutions tailored to each individual’s risk level, spending habits, and transaction preferences. Digital systems facilitate the automation of intricate Islamic contracts, real-time transaction verification, and the delivery of transparent information, thereby enhancing public confidence in the integrity of the Islamic banking system.

The digital revolution presents a genuine opportunity to enhance Islamic financial inclusion, which has lagged behind the traditional banking sector. By adopting a more pragmatic and effective digital strategy, Islamic banks can tap into previously neglected segments of society, including the youth and micro, small, and medium-sized enterprises (MSMEs). Consequently, digitalization transcends mere updating of service systems; it serves as a strategy to promote more equitable economic growth grounded in Islamic ideals of justice.

Furthermore, opportunities for collaboration between Islamic banks and Sharia-compliant fintech firms are progressively expanding. This strategic alliance has the potential to establish a more expansive, innovative, and adaptable digital financial ecosystem that meets the growing demands of society. With supportive rules and skilled personnel who understand both technology and Sharia principles, digitalization can play a crucial role in making Islamic banks modern and competitive on a global scale while upholding Islamic values.

## Discussion

The findings of this research indicate that the Fatwas issued by the National Sharia Council of the Indonesian Ulama Council (DSN-MUI) are essential for ensuring compliance with Sharia principles in all Sharia banking operations. This role is increasingly important as Sharia banks navigate rapid and complex digital advancements. Furthermore, DSN-MUI fatwas serve as both normative references and ethical and legal guidelines that Sharia banks must follow when developing technology-driven financial products and services. As a result, these fatwas safeguard the identity, integrity, and authenticity of the sharia banking system, ensuring its continued operation in alignment with sharia principles in the face of disruptive financial technology.

This study shows a conceptual and practical disparity between the normative framework of fatwas and the significantly more technical and detailed requirements of the digital realm. The DSN-MUI fatwas, although fundamentally incorporating Sharia principles, inadequately provide the necessary technical guidance for constructing a digital financial system. Currently, there are no fatwas or guidelines that explain how to design information systems that can automatically verify contracts, identify hidden riba elements, or ensure that transaction system algorithms adhere to the rules against gharar. Furthermore, the lack of technological guidance hinders Islamic banks from converting normative concepts into practical and operational digital frameworks.

The advancing technology—such as blockchain, smart contracts, big data analytics, and artificial intelligence (AI)—intensifies the necessity for fatwa revisions. These technologies provide considerable potential to enhance public trust in transaction transparency and efficiency; nonetheless, they are not explicitly referenced in current fatwas. In the absence of responsive and progressive revisions, the DSN-MUI fatwas may become static and incapable of integrating technology advancements that, if well managed, can uphold Sharia principles. A dynamic, collaborative, and industry-oriented fatwa adaptation system is crucial for maintaining the relevance of Sharia in addressing digital concerns.

Strategies for addressing this difficulty might be examined via the lens of diverse legal philosophies. In the context of legal positivism, generic fatwas that lack technical specificity generate normative ambiguity, which affects their application and results in interpretative gaps in the field. The absence of legal certainty regarding the operational aspects of digital systems can hinder Islamic banks’ ability to effectively and quantitatively meet their compliance obligations. In the realm of Islamic legal theory, fatwas emerge from ijtihad (intellectual effort) by experts, connecting sharia scriptures with modern requirements. Accordingly, the principles of maslahah (benefit), fairness, and permissibility (halal) must be consistently promoted through contemporary ijtihad that addresses technical advancements. Fatwas should go beyond simply determining the legal status of contracts; they need to evolve into a digital framework that ensures the proper implementation of Sharia principles within the modern financial system.

Sociological legal theory states that the effectiveness of law depends on the accuracy of norms and how well society understands, accepts, and enforces them. In this context, fatwas will only be effective if industry participants and the public utilizing Islamic banking services possess a comprehensive comprehension of the fatwa’s content and the means and capabilities to implement it in digital practice. The efficacy of fatwas as a legal instrument in the digital realm is significantly contingent upon socialization, literacy, and the establishment of user-friendly, Sharia-compliant technologies.

Harmonization between the DSN-MUI fatwas, the technical regulations of the Financial Services Authority (OJK), and the formal legal norms established by Law No. 21 of 2008 is crucial. These three legal instruments must be integrated into a cohesive legal framework that addresses the requirements of digitalization while upholding Sharia principles. Such harmonization is essential not only to avoid overlaps or gaps in regulations but also to enhance the legitimacy of the Islamic banking system in an increasingly global digital transformation era.

Furthermore, this study project highlights the need for robust collaboration among Islamic scholars (ulama), technological practitioners, and Islamic banking regulators. This partnership is essential for establishing a resilient and credible digital Islamic ecosystem. Islamic scholars argue that efforts are necessary to transform Islamic values into concepts that can effectively address the challenges presented by modern technology. From a technology perspective, information system engineers need to transform these concepts into technical frameworks that facilitate transaction automation, algorithmic transparency, and digital security. Regulators must ensure that established policies are progressive, inclusive, and supportive of innovation, all while adhering to the Islamic framework.

This research highlights the importance of developing human resource (HR) capacity that can connect the Islamic world with the realm of technology. In Indonesia, there is an urgent demand for human resources with multidisciplinary capabilities in Islamic jurisprudence (fiqh muamalah), banking, and computer systems engineering that remains unfulfilled. The lack of experts who can translate fatwas into technical terms and vice versa makes it very difficult to create a digital Islamic system that truly adheres to fatwas and functions effectively.

The development of higher education curricula in Islamic economics and Islamic information technology should be oriented toward producing graduates who possess a comprehensive understanding of Islamic principles and are proficient in digital technology engineering. This should be a long-term endeavor.  Sharia professional certification bodies and Islamic financial technology associations can also play a strategic role in facilitating cross-disciplinary training that is focused on comprehensively enhancing the quality of digital Islamic compliance.

The fatwas of the National Sharia Council (DSN-MUI) serve as a robust normative framework to ensure that digital innovation in the banking sector aligns with Islamic ideals.  To ensure the continued relevance of fatwas amidst technological disruption, a dynamic renewal process is essential, along with the establishment of fatwas in technical formats and the formation of cross-sector alliances founded on integrative principles.  This cohesive and forward-thinking strategy aims to ensure the successful digitalization of Islamic banking by effectively addressing the increasing demands for both efficiency and accessibility. Simultaneously, it upholds the dignity and trust of the Muslim community, which is a cornerstone of the Islamic financial system, particularly as it navigates the complexities and opportunities of the digital era. By balancing technological innovation with cultural and religious values, this approach aims to create a sustainable and trustworthy digital banking environment that meets contemporary needs without compromising its foundational principles.

## Conclusion

Research on Islamic banking’s adherence to Islamic economic principles amid digital transformation indicates that the digitalization of Islamic banking in Indonesia has made considerable progress. However, various substantial institutional, normative, and technical challenges continue to hinder this advancement. Law Number 21 of 2008 establishes a robust legal framework to ensure that Islamic banking practices adhere to Islamic principles, including the prohibition of usury (riba), uncertainty (gharar), and gambling (maysir). On the other hand, there are substantial voids in its implementation in the digital era, particularly in the absence of automation and continuous Sharia supervisory mechanisms that are integrated with banking technology. The Financial Services Authority (OJK) regulations play a crucial role in establishing a framework for consumer protection, digital security, and information technology governance. Conversely, these regulations continue to be generic and predicated on conventional methodologies, necessitating that Islamic institutions implement further modifications to incorporate Sharia principles into universally designed systems. On the other hand, the fatwas of the National Sharia Council (DSN-MUI) continue to be a significant normative reference for the legality of Sharia-compliant digital products. However, they have not fully accounted for the intricacies of contemporary digital technologies, including blockchain, artificial intelligence, and smart contracts. Therefore, it is essential to create a stronger connection and alignment between the formal legal rules (Law No. 21 of 2008), technical guidelines from the Financial Services Authority (OJK), and the fatwas from DSN-MUI. The primary objective is to establish a legal framework that is operational, adaptable, and integrated to provide comprehensive support for the digital transformation of Sharia banking. Urgent strategic actions include establishing digital technical standards that align with Sharia principles, enhancing the technical skills of Sharia experts and administrators, and updating fatwas to reflect new developments in digital technology. Therefore, the digital transformation of Sharia banking in Indonesia can be optimized, sustainable, and efficient while maintaining the authenticity of Islamic values in serving modern society.

## Recommendation

In an effort to enhance Sharia compliance in the digitalization of Sharia banking services, a variety of strategic structural, normative, and technical measures are required in response to the diverse challenges and findings detailed in this study. These recommendations are directed at critical stakeholders, including regulators (OJK and the government), religious authorities (DSN-MUI), industry actors (Sharia banks and Sharia fintech), and pertinent educational and training institutions.

First, revising and enhancing favorable legal norms is essential to conform to the dynamics of digitalization. Amendments to Law No. 21 of 2008 or the formulation of supplementary implementing laws should be considered to expressly encompass facets of digital transformation, including technology-driven supervisory processes, the safeguarding of Sharia-compliant consumer data, and digital authentication of legal contracts. These regulations must also encompass emerging digital services, such as mobile lending, smart contracts, and Sharia-compliant digital wallets.

Second, the DSN-MUI should periodically construct and update fatwas utilizing a responsive and adaptive technological approach. Fatwas concerning blockchain, artificial intelligence, smart contracts, and Sharia-compliant digital payment systems should be formulated in collaboration with technological experts and industry practitioners to enhance their practical application and implementation. To promote sustainability, the DSN-MUI is advised to form a Digital Fatwa Committee as a think tank focused on Sharia legal innovation within the financial technology sector.

Third, national technical standards must be established for digital Sharia banking systems. These requirements must encompass digital contract frameworks, Sharia compliance algorithms, system audits, and halal certification for digital financial services. These standards enable the Sharia Supervisory Board (DPS) to conduct supervision in a more systematic and technology-driven manner, incorporating monitoring dashboards and real-time data processing.

Fourth, the most important task for transdisciplinary human resource training and development is pressing. Training programs for DPS, technology developers, and Sharia bank staff should focus on understanding the concepts of Islamic jurisprudence (fiqh) in muamalah (religious law) and their application in information systems. Collaboration among financial institutions, colleges, and professional certification organizations can exemplify a model for cohesive human resource development grounded in Sharia technology.

Fifth, the Financial Services Authority (OJK), as a regulator, must establish a digital Sharia sandbox to facilitate structured testing of Sharia banking digital products and to foster interaction among supervisory agencies, the industry, and the National Sharia Council (DSN-MUI). It is essential to address the regulatory disparity concerning the speed of innovation and enhance interagency collaboration, which has been fragmented and compartmentalized.

Sixth, public Sharia digital literacy requires enhancement via public campaigns, social media, and educational initiatives in schools and Islamic boarding institutions. Enhanced literacy will enhance consumer comprehension of digital Sharia contracts, promote the growth of a digital Sharia economy, and strengthen public confidence in national Sharia finance. The success of digital transformation in Sharia banking is intrinsically linked to collaboration among stakeholders, including the government, religious authorities, the industry, and the community. The amalgamation of legal frameworks, contemporary fatwas, technological preparedness, and human competencies constitutes the primary pillars for achieving a robust and sustainable digital Sharia financial ecosystem that adheres to Islamic principles.

## Policy and Practical Implications

This research offers significant strategic implications for policy formation and the advancement of Islamic financial industry practices in the digital age. The research findings suggest the necessity for a more cohesive and flexible legal framework. Law No. 21 of 2008, the foundational legal framework for Islamic banking, requires contextual reinterpretation or enhancement via the implementation of rules tailored to address digital concerns. This enables lawmakers to create new laws that align with Islamic values and the needs of digital systems, including protecting consumers, ensuring contracts are transparent, validating electronic documents, and maintaining cybersecurity in accordance with Islamic principles. The Financial Services Authority (OJK) ’s technical regulations must adopt a more proactive approach and be tailored to the business models and governance structures of digital Islamic banks. Regulations should not simply replicate traditional industry practices, as a fundamental premise of Islamic compliance characterizes Islamic banks. Therefore, the OJK should consider issuing specific regulations for digital Islamic services that explicitly incorporate Islamic principles into the framework of technology governance, consumer protection, and system supervision. The practical implication of this research for the DSN-MUI is the pressing necessity for progressive institutional ijtihad. Fatwas must encompass not only inquiries regarding halal (permissible) and haram (forbidden) but also the technical intricacies involved—such as the structuring of contracts within digital frameworks, the capacity of algorithms to identify sharia violations, and the application of smart contracts and AI by maqasid al-shariah (the principles of sharia). This approach necessitates a redesign of the DSN-MUI’s institutional capability, including the formation of a digital sharia committee and comprehensive training for fatwa compilers in technology.

The other practical implication pertains to the internal governance of Islamic institutions. Institutions need to improve the Sharia Supervisory Board’s (DPS) role so that it acts not just as a rule-setting group but also as an active and skilled monitor of digital systems. The implementation of compliance dashboards, AI-driven Sharia audit technology, and the engagement of the DPS in the digital product design process from inception will enhance system integrity and mitigate the risk of contravening Sharia principles. Additionally, Islamic banks must collaborate closely with technology providers, Islamic fintech groups, and digital halal certification organizations to ensure that all their operations adhere to Islamic law and ethical guidelines. From a public perspective, digital transformation that adheres strictly to Sharia principles can enhance financial inclusion and promote digital literacy in Sharia-compliant practices. The transparency of contracts, the openness of transactions, and the assurance of compliance with Sharia law will foster greater public trust in the digital services offered by Islamic banks. This is particularly important for attracting younger individuals and micro, small, and medium enterprises that have not yet fully engaged with Islamic financial services. As a result, the policy and implementation implications of this research underscore that the digital transformation of Islamic banks must be propelled not solely by the necessity for efficiency and modernization, but also by the ethical and normative obligation to preserve Sharia values in the forthcoming digital financial framework. The integration of progressive regulatory frameworks, relevant fatwas, and Sharia-compliant technical advancements is the essential foundation for equitable, competitive, and sustainable digital Islamic banking.

## Research Limitations

This study provides both theoretical and practical insights into the dynamics of Sharia compliance in the context of the digital transformation of Islamic banking. However, several limitations warrant further examination to establish a foundation for additional research. First, the methodology used is primarily juridical-normative, with a limited number of interviews included. Consequently, it cannot thoroughly investigate how digital technology is utilized across different Islamic banks, especially considering their varying sizes, technological capabilities, and internal regulations.

Second, the analysis primarily focuses on the national legal framework, including Law No. 21 of 2008, OJK regulations, and fatwas issued by the National Sharia Council (DSN-MUI). This research has not performed a comprehensive comparison with international legal frameworks or practices in countries that are more advanced in digital Islamic financial transformation, such as Malaysia, Bahrain, or the United Arab Emirates. Comparative studies have the potential to broaden perspectives and promote cross-jurisdictional learning in the creation of technologically innovative legal frameworks.

Third, technical testing of the digital information systems employed by Islamic institutions is not conducted in this research, and the examination of technological aspects remains conceptual. These limitations result in the absence of an exhaustive mapping of how well existing digital infrastructure automatically and efficiently implements Sharia-compliant principles. Consequently, future research may implement a multidisciplinary approach that includes the development of digital contract algorithm prototypes, Sharia-based information technology investigations, or system evaluation techniques.

Fourth, this study has not primarily focused on the user (customer) perspective of trust, comprehension, and preference for Sharia-compliant digital services. The success of digitization in Sharia banking is contingent not only upon Sharia-compliant legislative and technological frameworks but also on public literacy, engagement, and acceptance of these services. Subsequent studies could employ an empirical, survey-based, or mixed-methods approach to elucidate more extensive social dynamics. Given these limitations, further research is likely to improve the results, broaden the analysis, and strengthen the operational, technological, and social elements necessary to create a comprehensive and enduring digital Sharia-compliant banking system.

## References

Abrar, M., & Ihza, M. H. (2025). Transformasi digital dalam perbankan syariah: Mengadopsi teknologi era masa kini untuk meningkatkan layanan. *Jurnal Keuangan dan Manajemen Terapan*, *6*(1).

Aditya, R., & Lestari, B. C. (2025). Sinergi pengawasan syariah dan tantangan regulasi fintech dalam penguatan tata kelola perbankan syariah di Indonesia. *JIMU: Jurnal Ilmiah Multidisipliner*, *3*(2), 1177–1188.

Ardianto, R., Ramdhani, R. F., Dewi, L. O. A., Prabowo, A., Saputri, Y. W., Lestari, A. S., & Hadi, N. (2024). Transformasi digital dan antisipasi perubahan ekonomi global dalam dunia perbankan. *MARAS: Jurnal Penelitian Multidisiplin*, *2*(1), 80–88.

Asmawi, M., & Rahmawati, N. S. (2025). Inovasi dan tantangan perbankan syariah pada era digital di Indonesia. *El-Arbah: Jurnal Ekonomi, Bisnis dan Perbankan Syariah*, *9*(1), 93–106.

Aziz, A., Islami, N., Al-Habsy, A. R., Khoerunnisa, F., Pamungkas, J. D., Fadilah, M. F., & Suryani, R. (2025). Inovasi produk keuangan syariah dalam perspektif Generasi Z: Studi kasus mahasiswa ekonomi syariah IUQI. *Integrity: Perspective on Social Science Journal*, *2*(1), 1340–1350.

Aziz, A., Nurhaliza, A., Khairunazwa, A., Ningsih, A., Putri, N., & Hafuza, R. A. (2025). Peran digitalisasi dalam meningkatkan efisiensi dan transparansi dalam ekonomi syariah. *Jurnal Inovasi Keuangan dan Manajemen*, *6*(1).

Hanifah, A., Fitri, A. O., & Bahrudin, M. B. (2025). Analisis peran digitalisasi terhadap peningkatan inklusi keuangan syariah di Indonesia. *Inflasi: Jurnal Ekonomi, Manajemen dan Perbankan*, *2*(1), 70–76.

Hassandi, I., & Pangestu, M. G. (2025). Identifikasi risiko dalam era digital: Studi kasus risiko teknologi pada PT Bank Syariah Indonesia. *Jurnal Manajemen Teknologi dan Sistem Informasi*, *5*(1), 996–1004.

Latisha, N., & Dirkhareshza, R. (2024). Optimalisasi regulasi transformasi digital perbankan dengan implementasi berbasis environmental social governance sebagai bentuk transisi menuju green banking. *Jurnal Ilmiah Penegakan Hukum*, *11*(2), 198–215.

Qothrunnada, N. A., Iswanto, J., Hendratri, B. G., & Subekan, S. (2023). Transformasi digital lembaga keuangan syariah: Peluang dan implementasinya di era industri 4.0. *Indonesian Journal of Humanities and Social Sciences*, *4*(3), 741–756.

Rohmah, R. R. (2024). Evolusi hukum perbankan syariah di Indonesia. *Al Midad: Jurnal Ilmu Pendidikan dan Studi Keislaman*, *1*(1), 49–62.

Sakhinah, I. N., & Citra, S. (2025). Analysis of legal protection for bank customers from the perspective of sharia banking law: Analisis perlindungan hukum bagi nasabah bank dalam perspektif hukum perbankan syariah. *Ekonomia: Jurnal Ekonomi, Manajemen dan Bisnis*, *3*(1), 112–121.

Sudarmanto, E., Yuliana, I., Wahyuni, N., Yusuf, S. R., & Zaki, A. (2024). Transformasi digital dalam keuangan Islam: Peluang dan tantangan. *Jurnal Ilmiah Ekonomi Islam*, *10*(1), 645–655.

Syahrani, S., & Fitri, A. O. (2025). Pengaruh transaksi digital terhadap fee based income pada bank umum syariah di Indonesia. *Inflasi: Jurnal Ekonomi, Manajemen dan Perbankan*, *2*(1), 90–96.

Tambunan, R. T., & Nasution, M. I. P. (2023). Tantangan dan strategi perbankan dalam menghadapi perkembangan transformasi digitalisasi di era 4.0. *Sci-Tech Journal*, *2*(2), 148–156.

Wijaya, A., Hartono, C., & Arwanto, B. (2025). Perlindungan hukum nasabah bank digital syariah di Indonesia yang berkepastian hukum. *Jurnal Ilmu Hukum, Humaniora dan Politik*, *5*(3).

Zulfikar, F. R., & Harley, A. B. M. (2024). Analisis hukum dalam kasus serangan siber pada Bank Syariah Indonesia (BSI). *Media Hukum Indonesia*, *2*(4), 501–504.