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THE APPLICATION OF BLOCKCHAIN TECHNOLOGY AND SMART CONTRACTS IN SHARIA FINTECH: OPPORTUNITIES AND CHALLENGES

Imam Mabrur[1], Ahadiah Agustina[2]
[1,2]Universitas Muhammadiyah Mataram, Nusa Tenggara Barat, Indonesia.
Email: imabrur.idn@gmail.com

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Abstract. The rapid growth of financial technology (fintech) has transformed the global economic landscape, including the Islamic finance sector, which seeks to align innovation with Shariah principles. This study aims to analyze the opportunities and challenges of applying blockchain technology and smart contracts in the Islamic fintech ecosystem, with a particular focus on enhancing Islamic financial principles in the digital era. It employs a Systematic Literature Review (SLR) approach combined with qualitative descriptive analysis of fifteen scientific articles indexed in Scopus, ScienceDirect, Garuda, and Sinta, covering the period from 2020 to 2025. The data was analyzed thematically to identify patterns of findings, research gaps, and academic and practical implications. The results indicate that blockchain technology and smart contracts have the potential to enhance transparency, efficiency, and accountability in Islamic financial transactions. Their implementation also opens opportunities for product innovation, such as smart sukuk and Islamic crowdfunding, which foster Shariah-based financial inclusion. However, challenges remain, including unclear Shariah digital regulations, technological complexity, low digital literacy, and ethical and data security issues. The findings underscore the importance of collaboration among regulators, technology experts, and scholars in developing adaptive and Shariah-compliant fintech standards.

Keywords: Blockchain, smart contract, sharia fintech, Islamic finance.

Abstrak. Pertumbuhan pesat teknologi keuangan (fintech) telah mengubah lanskap keuangan global, termasuk sektor keuangan Islam, yang berusaha menyelaraskan inovasi dengan prinsip-prinsip Syariah. Penelitian ini bertujuan untuk menganalisis peluang dan tantangan penerapan teknologi blockchain dan kontrak pintar dalam ekosistem fintech syariah, khususnya dalam konteks penguatan prinsip-prinsip keuangan syariah di era digital. Penelitian ini menggunakan pendekatan Systematic Literature Review (SLR) yang dikombinasikan dengan analisis deskriptif kualitatif terhadap lima belas artikel ilmiah yang terindeks di Scopus, ScienceDirect, Garuda, dan Sinta, mencakup periode dari 2020 hingga 2025. Data dianalisis secara tematis untuk mengidentifikasi pola temuan, celah penelitian, dan implikasi akademis serta praktis. Hasil menunjukkan bahwa teknologi blockchain dan kontrak pintar berpotensi meningkatkan transparansi, efisiensi, dan akuntabilitas dalam transaksi keuangan Islam. Penerapannya juga membuka peluang inovasi produk, seperti sukuk pintar dan crowdfunding Islam, yang mendukung inklusi keuangan berbasis Syariah. Namun, tantangan tetap ada, termasuk regulasi digital Syariah yang belum jelas, kompleksitas teknologi, rendahnya literasi digital, serta masalah etika dan keamanan data. Temuan menyoroti kebutuhan akan kolaborasi antara regulator, ahli teknologi, dan cendekiawan untuk mengembangkan standar fintech yang adaptif dan sesuai Syariah.

Kata Kunci: Blockchain, kontrak pintar, fintech syariah, keuangan Islam.

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INTRODUCTION

Digital transformation has become a global phenomenon, changing almost every aspect of life, including modern financial systems. Advances in information technology, particularly in the last two decades, have driven the emergence of various financial innovations that mark a shift from conventional financial systems to digital-based ecosystems (Rihani et al., 2025). One of the most prominent innovations is blockchain technology, known as a decentralized and transparent data recording system. This technology not only enables transactions to be more efficient and secure but also reduces dependence on third parties as financial intermediaries (Suryawijaya, 2023). Blockchain has become the main foundation for the development of various innovations, including crypto assets, decentralized finance (DeFi), and smart contracts that have the potential to revolutionize traditional transaction systems (Sasvito et al., 2025).

In line with global digital transformation, the financial technology (fintech) sector is experiencing rapid growth in various countries, including Indonesia. The Global Islamic Fintech Report (2023) shows that Indonesia occupies a strategic position as one of the largest sharia fintech markets in the world, with continued growth potential. Sharia fintech, conceptually, is a financial service system based on Islamic principles that uphold the values of justice, openness, and avoidance of usury, gharar, and maysir (Handayani et al., 2024). In its development, the application of blockchain technology and smart contracts offers significant opportunities for this sector to improve efficiency, trust, and Sharia compliance through the digitization of contracts (Gunawan, 2025). As an instrument for automating transactions based on digital codes, smart contracts have great potential to transform traditional contract mechanisms into ones that are more transparent, efficient, and well-documented (Nugroho & Warsono, 2025).

Several previous studies have shown that the integration of blockchain technology and smart contracts has great potential in supporting transparency, efficiency, and Sharia compliance in Islamic financial systems. Matondang et al. (2024) conducted a bibliometric study of international literature and found that the trend of research on blockchain in Islamic finance has continued to increase since 2017. The results of this study confirm that blockchain plays a strategic role in building a financial system that is more open, secure, and in accordance

with the principles of justice. Meanwhile, Desky & Hye (2025) Examined the concept of smart contracts from an Islamic finance perspective and explained that automated digital contracts can be an effective means of realizing Sharia contracts efficiently, as long as the algorithm design is adjusted to the principles of fiqh muamalah. In this context, smart contracts are seen as an important innovation in contract automation that can reduce the potential for violations of Sharia principles due to human error.

Furthermore, Septianda et al. (2022) emphasize that blockchain is highly relevant to the Islamic economy due to its ability to improve the accountability and traceability of transactions, whether in the context of Islamic finance, waqf management, or the halal value chain. On the other hand, Wirayuda et al. (2025) emphasize the security implications of online financial transactions and posit that the implementation of smart contracts can enhance data integrity and thwart transaction manipulation. However, they acknowledge the necessity of strict Sharia policies and audits to ensure the integrity of financial systems. In addition, Gunawan (2025) research examines the implementation of smart contracts in the context of Sharia finance. The study's findings suggest that this technological framework has the potential to automate financing agreements and enhance the transparency of waqf management. However, the study also acknowledges the challenges that remain in the face of regulatory frameworks and the digital infrastructure capacity of Indonesian Sharia financial institutions.

Concurrently, Aini & Juliana (2025) Underscore the potential of blockchain to enhance transparency and accountability in the administration of religious funds, including zakat and waqf. However, they note a persistent necessity to improve technological literacy among Sharia institution managers. Conversely, Sanjaya & Akhyar (2022) Present a blockchain-based Sharia Crowdfunding (SCF) model and smart contracts as innovative solutions to automate the distribution of investment returns and ensure Sharia compliance on digital funding platforms. Furthermore, Fitria & Dian Rahmita Sari (2025) Researched the application of blockchain in improving the transparency of Islamic banking transactions. They emphasized that this technology is capable of strengthening public trust in the Islamic financial system, although aspects of regulation and Islamic legal validation still require in-depth study.

Based on a review of previous studies, it can be identified that although blockchain technology and smart contracts have been widely discussed in the context of Islamic finance and sharia fintech, most studies still focus solely on technical aspects and potential benefits. Studies such as (Desky & Hye, 2025; Matondang et al., 2024; Septianda et al., 2022) Emphasize the efficiency and transparency of digital transactions, without elaborating in depth on how these technological changes affect the structure, mechanism, and validity of contracts

from an Islamic law perspective. Meanwhile, regional studies such as (Aini & Juliana, 2025; Fitria & Dian Rahmita Sari, 2025; Gunawan, 2025; Sanjaya & Akhyar, 2022)There has been an escalating interest in the implementation of blockchain within Indonesia's Islamic finance ecosystem. However, the methodologies employed remain constrained to conceptual descriptions and normative analyses. There is a paucity of studies that comprehensively integrate the dimensions of technology, the principles of maqasid al-shariah, and the dynamics of recontextualizing contracts in the digital era.

This research gap highlights the need for studies that not only explore the potential and challenges of applying blockchain technology and smart contracts in Islamic fintech, but also examine the implications of technological transformation on the principles of contracts and Islamic financial governance. Consequently, this study offers a novel contribution by providing a comprehensive thematic analysis through a literature and secondary data approach to identify the opportunities and challenges of applying blockchain technology and smart contracts in the context of Islamic fintech. The objective of this study is to conduct a comprehensive analysis of the dynamics underlying the implementation of these two technologies within the digital Islamic finance ecosystem. Additionally, the study seeks to evaluate their compatibility with Islamic principles. The findings of this study are expected to make theoretical contributions to the development of a competitive and innovative Islamic finance digital ecosystem, grounded in the principles of justice and compliance with Islamic law.

METHOD

This study employs a systematic literature review (SLR) approach, complemented by qualitative descriptive analysis, to examine the opportunities and challenges associated with the application of blockchain technology and smart contracts within the Islamic fintech ecosystem. The SLR process was executed systematically, progressing through the phases of identification, selection, and synthesis of pertinent literature from credible databases, including Scopus, ScienceDirect, Garuda, and Sinta. The inclusion criteria encompassed articles published between 2020 and 2025, written in English or Indonesian, and explicitly addressing the subjects of Islamic finance, Islamic fintech, blockchain, or smart contracts. The data obtained was then analyzed thematically to identify patterns, trends, and existing research gaps. A qualitative descriptive approach was used to interpret the results of the literature synthesis contextually, taking into account Sharia principles and the dynamics of digital financial technology development. Consequently, this approach facilitated the development of a comprehensive and in-depth conceptual framework for the issues under review.

RESULTS

A literature search was conducted across various publications from 2020 to 2025. From over 100 articles, 15 relevant ones were selected on the use of blockchain in Sharia fintech. Articles were analyzed using specific criteria. A summary of the results is in Table 1.

Table 1. Summary of Literature Review Results

No	Titles	Authors	Methods	Results
1	*Fintech in Islamic finance literature: A review*	(Alshater et al., 2022)	Hybrid bibliometric + content review	Categorizing Islamic FinTech research into several main streams, marking blockchain and compliance as growing fields.
2	*Tokenization of sukuk: Ethereum case study*	(N. Khan et al., 2022)	Case studies and technical analysis	Demonstrating sukuk tokenization via Ethereum can reduce costs and increase transparency, highlighting regulatory and compliance issues.
3	*Exploring the Role of Islamic Fintech in Combating the Aftershocks of COVID-19: The Pen Social Innovation of the Islamic Financial System*	(Rabbani et al., 2021)	Conceptual review	Affirming the role of FinTech (including blockchain) for economic inclusion and recovery, emphasizing the need for a Sharia framework.
4	*Enhancing trust through digital*	(Chong, 2021)	Reflective discussion / conceptual	Blockchain and smart contracts have the

	Islamic finance and blockchain			potential to increase trust and accountability in Shariah products (e.g., smart sukuk).
5	*FinTech, Blockchain and Islamic Finance: An Extensive Review*	(Unal & Aysan, 2022)	Literature review	Grouping literature: digital Islamic banking, blockchain & crypto, non-bank digitalization; recommending research on governance & compliance.
6	*Sharia-compliant Blockchain Technology and Islamic Finance: A Literature Review*	(Huurinainen, 2024)	Literature review	Providing an up-to-date overview of blockchain practices in Islamic finance, including fiqh questions related to crypto and smart contracts.
7	*Ṣukūk on blockchain: A legal, regulatory and Sharī'ah review*	(Kunhibava et al., 2020)	Doctrinal review / qualitative	Examining legal, regulatory, and Shariah issues in the application of blockchain-based sukuk, emphasizing the need for legal guidelines.
8	*Developing a Hybrid Shariah-Compliant Blockchain Model for Islamic Finance*	(Soamole, 2025)	Empirical evidence + simulation / conceptual	Proposing a hybrid model to ensure Sharia compliance and operational efficiency in Sharia blockchain applications.

9	*Integration of Blockchain-Based Smart Contracts as a Solution for Automation and Sharia Compliance in Islamic Banking Products*	(Cahyani & Baidhowi, 2025)	Literature review/descriptive analysis	The identification of smart contracts has the potential to enhance the efficiency and compliance monitoring process; however, implementing this approach requires adapting fiqh to code logic.
10	*Leveraging Blockchain-Based Smart Contract for Shariah Alignment*	(Zulkepli et al., 2023)	Literature review / conceptual content analysis	The primary issue under consideration is the tension between the principles of smart contract immutability and the necessity for contractual flexibility. To address this tension, the following recommendations are made: first, to offer code design solutions that can accommodate changes; and second, to provide a framework for evaluating the efficacy of these solutions.
11	*Smart Participation Contract Matrix for Islamic Banks*	(R. U. Khan & Amin, 2025)	Conceptual/design model	Proposing a smart contract matrix that integrates regulatory nodes and Sharia compliance for Islamic banks.

12	*Blockchain in Islamic Finance: a review using bibliometric*	(Matondang et al., 2024)	Bibliometric review (161 articles)	Mapping research trends from 2017 to 2024, identifying research gaps in digital contracts and Sharia governance.
13	*The Role of Sharia Fintech in Improving Halal Financial Inclusion in MSMEs in Indonesia*	(Dewi & Adinugraha, 2023)	Empirical/descriptive studies	The study shows that Sharia fintech increases access to MSME financing and indicates the potential of blockchain for distribution accountability.
14	*Penerapan Teknologi Blockchain Dalam Industri Keuangan Syariah : Tantangan Dan Peluang Bridging Faith and Innovation: A Systematic Literature Review of Islamic FinTech Adoption Patterns and Regulatory Frameworks (2020-2024)*	(Najibulloh & Rahmalia, 2024)	Literature review	Describing blockchain applications in sharia payment systems, price disclosure, and digital platforms, highlighting infrastructure readiness.
15		(Suswanto et al., 2025)	Literature review	This text synthesizes the adoption, regulation, and challenges of Islamic FinTech, demonstrating the need for integrative research related to blockchain and smart contracts.

Source: Data Processed (2025)

DISCUSSION

Overview of the Development of Sharia Fintech and Blockchain Technology

The rapid development of digital technology in the last two decades has brought significant changes to the global financial system landscape, including in the realm of Islamic finance. The concept of financial technology (fintech), which integrates digital innovation with financial services, has promoted efficiency, affordability, and inclusiveness for the wider community (Feriyanto et al., 2024). In the context of Islamic finance, the emergence of Islamic fintech is a response to the need for a financial system that is not only efficient but also based on Islamic principles that reject the elements of usury, gharar, and maysir (Dewi & Adinugraha, 2023). This phenomenon marks a paradigm shift from conventional financial practices to a digital system oriented towards ethical values and social justice.

Conversely, the advent of blockchain technology has fortified this digital metamorphosis through a distributed, transparent, and tamper-proof transaction recording system. In the Islamic finance ecosystem, blockchain functions not only as a technological infrastructure but also as an instrument that has the potential to strengthen the principles of honesty (shiddiq), trustworthiness, and openness in financial activities (Aini & Juliana, 2025). Smart contract technology, which operates on the blockchain platform, enables the automatic execution of contracts based on programmed agreements, thereby opening up opportunities for the digitization of various Islamic financial instruments such as murabahah, ijarah, and sukuk (Mufidah et al., 2025). Consequently, the synergy between Islamic fintech and blockchain signifies a novel trajectory for the advancement of Islamic finance in the digital era. This integration of technological innovation and Islamic values is poised to yield the creation of an inclusive, transparent, and equitable financial ecosystem.

Opportunities for Blockchain and Smart Contract Implementation in Sharia Fintech

Transparency and Accountability

Blockchain technology possesses two primary characteristics: immutability and decentralization, which make it a promising tool for enhancing transparency and accountability in Islamic financial systems (Seshadrinathan & Chandra, 2025). In this system, every transaction is permanently recorded in a distributed network, thereby reducing the possibility of data manipulation and financial practices that do not align with Islamic principles. The application of blockchain in Islamic financial institutions is believed to strengthen public trust, a major pillar in the implementation of muamalah contracts. Previous studies have demonstrated that blockchain-based digital recording systems can establish information

symmetry between transacting parties, while also enhancing the Shariah audit mechanism (Aini & Juliana, 2025). In this context, increased transparency is a crucial foundation for ensuring that all transactions adhere to the values of honesty (shiddiq) and responsibility (amanah), as emphasized in Islamic economic principles.

Moreover, the transparency engendered by blockchain technology fosters the implementation of accountability in the administration of Islamic public and social finances, including zakat, infaq, and digital waqf (M.Masrukhan, 2024). A multitude of studies have demonstrated the efficacy of blockchain-based systems in mitigating the risk of fund misuse and enhancing public trust in Islamic social fund management institutions (Dewi & Adinugraha, 2023; Rabbani et al., 2021). This finding underscores the relevance of blockchain not only in commercial contexts but also in terms of social value, particularly in enhancing the governance of Islamic financial institutions. Therefore, the implementation of blockchain can be regarded as a tangible manifestation of the Islamic principle of hisbah, which involves establishing a system for the supervision and assurance of economic justice.

Transaction Efficiency and Contract Automation

In addition to enhancing transparency, the implementation of smart contracts in Islamic financial systems holds considerable promise in enhancing transaction efficiency and automating contract execution (Jamal, 2024). Smart contracts are a type of digital code that facilitates the automatic execution of financial agreements, contingent upon the fulfillment of predetermined conditions, thereby eliminating the requirement for third-party intervention. This approach has been shown to reduce operational costs, accelerate transaction completion, and diminish the risk of moral hazard that frequently emerges from reliance on intermediaries (Fitri, 2023). A multitude of studies have demonstrated that this technology can expedite and enhance the execution of contracts, including murabahah, mudharabah, and ijarah, resulting in a more efficient process (R. U. Khan & Amin, 2025; Soamole, 2025; Zulkepli et al., 2023). From the perspective of maqasid al-shariah, this efficiency aligns with the objectives of maslahah and adl, as it has the potential to generate substantial economic benefits for the broader community.

However, this efficiency is not solely technical in nature; it also introduces a transformational dimension to the concept of contracts itself. The digitization of contracts through smart contracts necessitates a reinterpretation of the principles of clarity (gharar) and legal responsibility in the Islamic financial system (Kilawati & Nasrulloh, 2024). A multitude of studies have demonstrated that the implementation of automated transactions, governed by algorithmic codes, has the capacity to diminish the likelihood of human error and to fortify the

legal certainty of contracts (Cahyani & Baidhowi, 2025; R. U. Khan & Amin, 2025). Conversely, the successful implementation of smart contracts in Islamic finance is contingent upon the system's capacity to guarantee that all digital contract logic is in alignment with the principles of fiqh muamalah. Consequently, collaboration between Sharia experts and technology developers is imperative to ensure transaction efficiency remains within the framework of Sharia compliance.

Product Innovation and Sharia Financial Inclusion

The integration of blockchain and smart contracts presents a significant opportunity for the development of more inclusive Islamic financial products. This technology enables Islamic financial institutions to develop innovative instruments, such as smart sukuk, Islamic crowdfunding, and Sharia-compliant peer-to-peer lending, characterized by enhanced transparency and efficiency. These innovations have the potential to broaden public access to halal financial services and to stimulate the growth of the Islamic MSME sector at the national level (Rabbani et al., 2021; Soamole, 2025). In the context of Indonesia, integrating digital technology with Islamic principles has the potential to enhance Islamic financial literacy and support the financial inclusion agenda initiated by the OJK and Bank Indonesia.

Furthermore, blockchain technology has the potential to serve as a mechanism for ensuring Sharia compliance in the domain of digital financial product innovation. By employing a transparent transaction recording system, financial institutions can guarantee that all financing mechanisms are free from usury and excessive speculation. Concurrent studies have demonstrated that the implementation of smart contracts fosters the establishment of a more equitable and efficient community-based microfinance system. This is achieved by automating the verification and distribution of funds in accordance with the principles of Islamic distributive justice (Alshater et al., 2022; Kunhibava et al., 2020; Unal & Aysan, 2022). Consequently, blockchain-based innovations and smart contracts not only enhance the competitiveness of the Islamic fintech industry but also have the potential to make meaningful contributions to inclusive and sustainable Islamic economic development.

Challenges in Implementing Blockchain and Smart Contracts in Sharia Fintech

Regulatory and Sharia Compliance Aspects

A significant challenge in implementing blockchain technology and smart contracts in the Islamic fintech sector is the absence of a clear and comprehensive regulatory framework (Jamal, 2024). Blockchain-based financial systems are predicated on the principle of decentralization, a tenet that often stands in direct opposition to the centralized oversight model applied by national financial authorities. The lack of technical guidelines governing aspects of

smart contracts, the validity of digital signatures, and the legal recognition of electronic contracts results in legal uncertainty during their implementation. Numerous studies have shown that regulatory uncertainty poses a substantial barrier to the adoption of blockchain technology within Islamic financial institutions. This is because it engenders compliance risks and is incompatible with the tenets of fiqh muamalah (Huurinainen, 2024; Matondang et al., 2024; Wirayuda et al., 2025). Furthermore, the lack of universal standards for Shariah compliance in digital contracts has led to divergent interpretations in determining the validity of contracts in fiqh.

In the context of Shariah compliance, an additional challenge emerges concerning the process of validating and supervising contracts executed by automated systems. Contracts in Islamic finance are not merely legal documents; they are also moral and spiritual in nature, requiring conscious intent and agreement between the transacting parties (*taraqī al-'aqd*) (Chairunnisa et al., 2025). The application of automation through smart contracts has the potential to obscure this dimension of agreement, especially in cases where algorithms make decisions without human intervention. A multitude of studies underscore the imperative of the Shariah supervisory board's involvement in the formulation of algorithms and the validation of code during the design process. This involvement is instrumental in ensuring adherence to Islamic legal principles (Kunhibava et al., 2020; Septianda et al., 2022). Consequently, these regulatory and Shariah challenges necessitate multidisciplinary collaboration between regulators, scholars, and technology developers to ensure that digital innovation remains within the established framework of Islamic law and ethics.

Technological Complexity and Infrastructure Readiness

The subsequent challenge pertains to the intricacy of blockchain technology and the preparedness of digital infrastructure in Islamic financial institutions. The implementation of blockchain technology necessitates substantial technological resources, encompassing computing capacity, cybersecurity measures, and system integration with conventional financial platforms. The majority of Islamic financial institutions in developing countries, including Indonesia, continue to face limitations in their operational capacity and technical expertise when implementing distributed ledger technology-based systems (Cahyani & Baidhowi, 2025). This has led to a gradual and exploratory adoption of blockchain technology, which has not yet reached the stage of widespread implementation. Furthermore, the substantial initial investment costs associated with system development and maintenance present a significant challenge for small institutions and Islamic fintech startups with limited capital (Gunawan, 2025).

Technical complexity also includes challenges in integrating smart contracts with existing Islamic financial systems. Islamic financial systems have various contract models with different characteristics, such as murabahah, mudarabah, ijarah, or wakalah, which are not easily converted into digital logic algorithms (Khotijah & Hamida, 2022). Several studies show that the process of translating fiqh contracts into programming language often results in simplifications that can reduce the substantive meaning of the contract (Soamole, 2025). Consequently, developing a Shariah-centric digital contract design model is imperative, requiring the involvement of fiqh experts in the design process. These infrastructure challenges and technological complexities underscore that the adoption of blockchain in Shariah fintech is not only a matter of digital innovation, but also the readiness of the supporting ecosystem as a whole.

Digital Literacy and User Trust

Another critical challenge is the limited public understanding of and confidence in blockchain-based financial systems. The majority of Islamic finance users continue to adhere to conventional transaction models and lack comprehension of the operational mechanisms of decentralized technology (Jannah & Abidin, 2025). The lack of knowledge about cybersecurity, data privacy, and digital verification mechanisms has led to the perception that blockchain systems are high-risk and difficult for financial authorities to monitor (Zulkepli et al., 2023). This issue is further compounded by the limited dissemination of information regarding the benefits and mechanisms of smart contracts from a Sharia perspective, which has resulted in resistance to adoption among conservative Muslims.

Trust among users is a critical component in the development of Sharia fintech. Although blockchain offers a transparent and secure system, the level of public trust is still greatly influenced by the understanding of the Sharia-compliance principles of the technology. Research indicates that public perception of the halal nature of a digital financial product significantly influences its adoption rate (Suswanto et al., 2025). Consequently, efforts to enhance digital literacy must be complemented by comprehensive Sharia education, ensuring that users understand how this technology genuinely reinforces the principles of justice and transparency within the Islamic economic framework. Collaboration among the government, educational institutions, and the Sharia fintech industry is a crucial strategy for fostering a trust ecosystem rooted in Islamic values in the digital era.

Ethical and Data Security Risks

In addition to regulatory and technical factors, ethical and data security aspects pose significant challenges in implementing blockchain and smart contracts. Despite the recognized

security benefits of blockchain systems due to their encrypted nature, concerns regarding privacy violations and data misuse persist, particularly in the context of digital identity management (Jamal, 2024). In Islamic financial systems, the protection of individual rights and transaction confidentiality is part of the principles of amanah and adl, which must be upheld in every form of technological innovation (Pasaribu & Ningtias, 2025). A multitude of studies underscore the notion that threats to cybersecurity and the potential exploitation of personal data can undermine Islamic ethical values in the context of digital finance practices (R. U. Khan & Amin, 2025).

Moreover, the utilization of smart contracts, which are entirely executed by algorithms, has the potential to give rise to ethical dilemmas in the event of system errors or code failures. This is due to the absence of a party that is directly responsible for the legal and social ramifications. From the perspective of fiqh, contractual responsibility is not merely mechanical but also moral. Consequently, it is imperative to devise oversight and accountability mechanisms that can harmonize digital efficiency and Islamic ethical values (Dewi & Adinugraha, 2023). Consequently, the implementation of blockchain technology in the domain of Islamic fintech must prioritize ethical considerations, ensuring that it not only focuses on achieving technical efficiency but also safeguards the fundamental human and spiritual values that underpin Islamic economics.

CONCLUSION

The findings of this study indicate that the implementation of blockchain technology and smart contracts holds considerable strategic potential in fortifying the Islamic fintech ecosystem. This strengthening is evidenced by an enhancement in transparency, efficiency, and accountability of financial transactions, all of which are in accordance with the tenets of shiddiq, amanah, and adl as defined within the Islamic framework. The study's findings demonstrate the potential of this technology to facilitate the development of innovative Islamic financial instruments, including smart sukuk, Islamic crowdfunding, and inclusive and transparent peer-to-peer lending. However, various fundamental challenges still need to be overcome, particularly those related to digital sharia law regulations, technological infrastructure readiness, public digital literacy, and the strengthening of ethics and data security so that its implementation is truly in accordance with maqasid al-shariah.

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