JURNAL ISLAM NUSANTARA

Vol. 10 No. 1, p. 30-44

Algorithmic *Sighat* in Blockchain Ecosystems: Formulating New Validity Standards for Smart Contracts in Contemporary *Fiqh muamalah*

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Received: January 2026; Revised: April 2026; Accepted: May 2026
DOI: http://doi.org/10.33852/jurnalin.v10i1.713

Abstract:

The rapid development of smart contracts within blockchain technology has accelerated; however, their legal status in Islam still requires deeper normative inquiry. Existing literature has largely focused on technical efficiency, thereby leaving a research gap concerning the ontological shift in the structure of *akad* within *fiqh muamalah*. This study analyzes the validity of smart contracts from the perspective of contemporary *fiqh muamalah*. The data sources consist of primary literature on classical juristic principles and the frameworks of decentralized technology. This research employs a qualitative, normative-juridical method and uses content analysis to examine the data. The findings reveal that: (1) Smart contracts transform the traditional concept of *akad* from static documents into self-executing algorithms that accurately fulfill the pillars of *sighat* (ijab–qabul), while simultaneously minimizing the potential for disputes (khushumah). (2) The transparent nature of blockchain inherently reduces elements of *gharar* (uncertainty), aligning with the principle of *hifdz al-mal* (protection of wealth). (3) This study formulates a new standard of validity that bridges classical juristic principles with decentralized systems. This study contributes to the development of a theoretical framework for *Sharia*-compliant digital contracts. It offers a strategic roadmap for regulators to adopt modern technology without compromising the substantive values of Islamic law.

Key Words: *Smart Contract, Blockchain, Fiqh muamalah, Validity of Akad, Digital Economy*

Abstrak:

Perkembangan pesat kontrak pintar dalam teknologi blockchain telah dipercepat; namun, status hukum mereka dalam Islam masih membutuhkan penyelidikan normatif yang lebih dalam. Literatur yang ada sebagian besar berfokus pada efisiensi teknis, sehingga meninggalkan kesenjangan penelitian mengenai pergeseran ontologis dalam struktur *akad* dalam *fiqh muamalah*. Penelitian ini menganalisis validitas kontrak pintar dari perspektif *fiqh muamalah* kontemporer. Sumber data terdiri dari literatur primer tentang prinsip-prinsip hukum klasik dan kerangka kerja teknologi terdesentralisasi. Penelitian ini menggunakan metode kualitatif, normatif-yuridis, menggunakan analisis konten untuk memeriksa data. Temuan ini mengungkapkan bahwa: (1) Kontrak pintar mengubah konsep tradisional *akad* dari dokumen statis menjadi algoritma yang dieksekusi sendiri yang secara akurat memenuhi pilar *sighat*

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(ijab-qabul), sekaligus meminimalkan potensi perselisihan (khushumah). (2) Sifat transparan blockchain secara inheren mengurangi unsur-unsur *gharar* (ketidakpastian), selaras dengan prinsip *hifdz al-mal* (perlindungan kekayaan). (3) Studi ini merumuskan standar validitas baru yang menjembatani prinsip-prinsip hukum klasik dengan sistem terdesentralisasi. Studi ini berkontribusi pada pengembangan kerangka teoritis untuk kontrak digital yang sesuai dengan Syariah. Ini menawarkan peta jalan strategis bagi regulator untuk mengadopsi teknologi modern tanpa mengorbankan nilai-nilai substantif hukum Islam.
Kata Kunci: *Smart Contract, Blockchain, Fiqh muamalah, Keabsahan Akad, Ekonomi Digital*

INTRODUCTION

There are three primary reasons why it is essential to examine the validity of smart contracts from the perspective of contemporary *fiqh muamalah*. First, the transformation of the digital economy through blockchain technology has fundamentally shifted legal interactions from centralized systems to decentralized structures. Research by Centobelli, as well as Yan Teng, suggests that blockchain is not merely a technological innovation but a new trust protocol that ensures transparency in global transactions (Centobelli et al., 2022; Teng, 2023). Second, smart contracts offer automated execution, minimizing the risk of human error. In a similar vein, Halaburda et al. (2024) and Toyi & Hamidun (2025) emphasize that digital code automation can enhance legal certainty and significantly reduce transaction cost. Third, determining the legal validity of this technology within Islamic law constitutes an urgent necessity for the global Islamic financial ecosystem. According to Syahriani et al. (2023), the integration of financial technology (fintech) within a *Sharia* framework requires in-depth normative analysis to ensure compliance with *maqasid al-shari'ah*, particularly in the aspect of wealth protection (*hifdz al-mal*).

Numerous studies have examined the application of blockchain technology and smart contracts within Islamic financial systems or analyzed the strategic challenges of their implementation. First, research by Maspul & Mubarak (2025) Mohaiyadin et al. (2022) Nazeri et al. (2026) explores the potential integration of decentralized technologies to enhance efficiency and accountability across various *Sharia* instruments, such as *zakat*, *waqf*, and *sukuk*. Second, Rafaheh (2024) argues that the automation of smart contracts can strengthen transactional justice in digital environments, provided that the conditions of *akad* remain free from elements of *gharar* and *riba*. This body of scholarship generally highlights how decentralization and immutability can support *muamalah* principles. However, it continues to face challenges posed by immature regulatory frameworks and low levels of public technological literacy.

Third, studies conducted by Mayangsari and Rokhim move toward legal reconstruction by analyzing shifts in *sighat* communication patterns and the classification of digital *akad*. Mayangsari examines the transformation of *ijab-qabul* into automated programmed communication (Mayangsari et al., 2025). At the same time, Rokhim identifies smart contracts as a modern form of *al-'aqd al-*

mu'aṭṭar or *al-'aqd al-ittifaqi* within contemporary *fiqh muamalah* (Rokhim, 2026). Fourth, research by Nursobah proposes a more fundamental methodological framework by formulating a digital-*maqasidi ijtihad* model that integrates the epistemology of usul *fiqh* with blockchain architecture (Nursobah, 2025). This approach aims to embed *Sharia* values intrinsically into system design, thereby guiding regulators and *fatwa* institutions to respond proactively to digital economic disruption.

However, there remains a lack of studies that specifically examine the transformation of *sighat* into an algorithmic form as an ontological shift in determining the validity of *akad* within *fiqh muamalah*. Previous studies tend to position smart contracts merely as technical instruments or tools of efficiency rather than as new expressions of legal intent that directly reshape the structure of *akad*. Therefore, this article seeks to fill this gap. Specifically, this study aims to: (1) formulate the concept of algorithmic *sighat* as a new framework for understanding the expression of *akad* in Islamic law; (2) analyze the relationship between blockchain characteristics such as transparency, immutability, and automated execution with issues of uncertainty in transactions; and (3) develop a formulation of *akad* validity standards that integrate classical *fiqh* principles with decentralized digital contract systems. This research is based on two assumptions: (1) the transformation of *akad* expression from linguistic to computational forms necessitates a reconstruction of the ontology of *akad* within *fiqh muamalah*; and (2) smart contracts possess a normative dimension that is relevant to be examined within the framework of *maqasid al-shari'ah*, particularly in the aspect of wealth protection (*hifdz al-mal*) within the digital economic ecosystem.

RESEARCH METHOD

This study adopts a qualitative normative-juridical approach, selected to examine the legal validity of smart contracts from the perspective of *fiqh muamalah* (Amrullah, 2026; Fatimah, 2025). This design enables an in-depth analysis of classical Islamic legal principles while evaluating their application within decentralized blockchain technology. By employing this approach, the study captures the ontological transformation of traditional contracts (*akad*) into self-executing algorithmic forms, allowing an assessment of whether these digital instruments align with *Sharia*-compliant standards (Gulyamov, 2024; Nursobah, 2025).

Data were collected through comprehensive literature review and document analysis. Primary data included technical frameworks of smart contracts, such as Ethereum standards and Solidity programming language, and classical *fiqh muamalah* principles regarding contractual obligations. Supporting data encompassed contemporary *fatwa*s and *Sharia* standards issued as international journal articles and contemporary *muamalah* literature relevant to the integration of digital technology in Islamic economic transactions. This method

ensured a holistic perspective encompassing both jurisprudential and technological dimensions.

The collected data were analyzed using content analysis, linking algorithmic code to the execution of *akad* pillars and conditions in accordance with *fiqh muamalah* (Huda et al., 2025; Mansur et al., 2025). The study employed an interpretative-analytical method to compare smart contracts with traditional contract theories and to evaluate the logical implications of automated contract execution for the protection of rights (*hifdz al-mal*). This analytical framework emphasizes that the validity of contracts is determined not only by textual formalities but also by the system's capacity to enforce agreements in a *Sharia*-compliant and equitable manner.

To ensure data validity, the study conducted cross-checking between technical blockchain data and *fiqh* principles, mitigating potential misinterpretations in contextualizing digital contracts within Islamic law. This verification process confirmed that algorithmic execution aligns with the legal and ethical requirements of *akad* and ensures that the study's conclusions regarding the normative status of smart contracts are robust and reliable (Wandira & Masuwd, 2025; Yetti et al., 2025).

RESULTS AND DISCUSSION

Smart contracts enact a radical transformation of the ontological nature of *Sharia*-based *akad*.

The emergence of smart contracts has triggered an ontological revolution that eliminates reliance on physical documentation, a factor that has long hindered the acceleration of the Islamic economy. Hasanah & Widuri (2025) and Rahman & Zen (2025) argues that the primary pillar of *akad* lies in the clarity of the parties' intent to be legally bound in a definitive agreement. A deeper evaluation demonstrates that digital algorithms provide a level of intentional certainty far more precise than verbal rhetoric, which is often entangled in interpretive ambiguity. This technological shift marks the end of the era of static contracts and the beginning of dynamic *akad* aligned with the demands of an instant, digitally driven civilization.

The constraints of space and time in the *ijab–qabul* process have now been fundamentally dissolved through the integration of permanent, decentralized networks. While classical *fuqaha* emphasized the unity of the contracting session (*majlis*) as a physical presence, the blockchain era introduces the concept of a virtual *majlis* that ensures real-time data synchronization. DSN-MUI has legitimized that electronic data transmission has the same legal status as verbal expression in fulfilling the pillar of *sighat* (Evans & Price, 2020; Permana et al., 2025). This study considers such transformation a major evolution distinguishing

slow, traditional economic systems from future-oriented systems that prioritize efficiency without neglecting *Sharia* compliance.

Computer algorithms have effectively assumed the role of traditional witnesses, with a level of mathematical integrity virtually immune to human manipulation. Al-Kasani explains that clarity in *sighat* is the primary safeguard against legal disputes or *khushumah* that may harm one of the contracting parties (Al-Kasani, 1910; O'g'li, 2023). Smart contracts function as impartial executors, faithfully implementing coded instructions in accordance with the initial agreement without the possibility of breach. The analysis confirms that this technology's accuracy significantly surpasses that of manual contracts, which often contain legal loopholes that irresponsible actors can exploit.

Human sovereignty as a legal subject remains the principal navigator within autonomous contractual mechanisms operating on blockchain systems. Although execution occurs without intervention, moral and legal control continues to rest upon the initial design formulated by humans in accordance with permissible principles in *muamalah*. Al-'Izz ibn 'Abd al-Salam emphasizes that every legal instrument must ultimately serve the welfare (*maslahah*) of individuals in economic transactions (Wahid, 2023). This analysis concludes that smart contracts do not pose a threat to humanity; rather, they serve as digital agents that ensure the values of Islamic justice are executed with precision in every line of code.

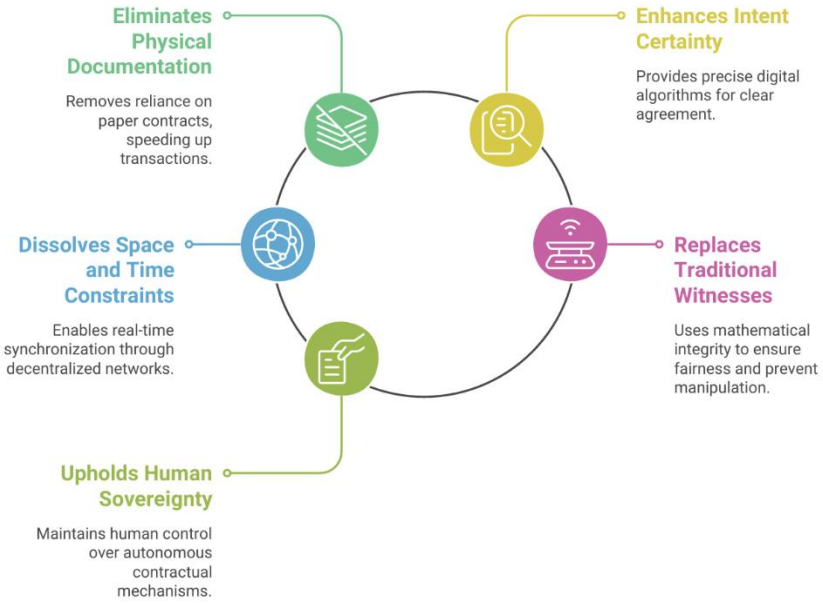


Figure 1. Ontological Transformation of *Sharia Akad*

The diagram conveys not just a list of features, but a conceptual framework showing how smart contracts fundamentally reconfigure the nature

of contractual engagement in digital environments. It suggests that by embedding contractual terms into code and executing them on a decentralized ledger, smart contracts move beyond the limitations of traditional legal instruments: they remove physical documentation, which accelerates transaction flows and reduces frictions associated with manual processing; they break down spatial and temporal barriers, enabling contract execution to be globally synchronized and instantaneous without reliance on centralized intermediaries. At the same time, the graphic emphasizes that automation does not equate to human abdication of responsibility smart contracts can uphold human sovereignty by preserving human decision-making and control over when and how autonomous mechanisms are triggered. On a deeper level, the technology enhances intent certainty by encoding precise algorithms that leave less room for interpretive ambiguity compared to natural language contracts. Finally, by replacing traditional witnesses with cryptographic and mathematical guarantees, smart contracts propose a new form of evidentiary assurance where integrity and fairness are mathematically verifiable rather than socially corroborated. Taken together, these elements portray smart contracts as a paradigm shift that supports faster, more transparent, and more reliable contractual relationships while maintaining core values of control, clarity, and trust.

Blockchain transparency systemically eliminates *gharar*.

Information opacity, which has historically led to economic injustice, is now illuminated by blockchain transparency, leaving no room for manipulation. Al-Qarafi warns that uncertainty or *gharar* in transactions is a destructive element that undermines the validity of *akad muamalah* (Andriani, 2023). In contrast to conventional banking systems, which often obscure transaction details behind bureaucratic barriers, decentralized technology makes all records publicly verifiable. This study finds that such transparency represents the highest manifestation of the religious imperative to uphold honesty in global trade practices.

The immutability of data has established a new standard of trust that surpasses the guarantees offered by any financial institution. AAOIFI emphasizes that documentation accuracy is the cornerstone of maintaining the integrity of the global Islamic financial system against fraud risks (AAOIFI (Accounting and Auditing Organization for Islamic Financial Institutions), 2017). An evaluation of blockchain immutability reveals that this technology provides a far more stable guarantee of asset security than centralized data storage

systems, which are vulnerable to breaches. This reality signifies a paradigm shift from institution-based trust to technology-based trust that is more democratic and transparent for all market participants.

The implementation of smart contract functions serves as a robust digital shield for achieving the objective of asset protection (*hifdz al-mal*) in the cyber era. Al-Shatibi asserts that protecting wealth is one of the primary necessities of human life, which must be preserved through a strong, preventive legal framework (Jahangir, 2025; Parid, 2025). Through automated execution, risks such as fraud or *tadlis* can be mitigated at the outset before transactions enter the permanent network. This study finds that the superiority of this system lies in its ability to detect non-compliance instantly, representing a significant advancement over conventional legal systems that tend to react only after violations occur.

The efficiency in cost and speed resulting from automated risk mitigation embodies substantive economic justice for the community. The validity of an *akad* is no longer measured solely by the legality of written documents but also by its contribution to eliminating systemic harm in digital markets (Amrullah, 2026; Ghazilan & Mallow, 2024). This study emphasizes that reducing costly intermediaries through smart contracts is a strategic step in strengthening the global competitiveness of the Islamic economy. The success of this technology in reducing transaction costs demonstrates that decentralized innovation closely aligns with the Islamic vision of equitable and efficient prosperity.

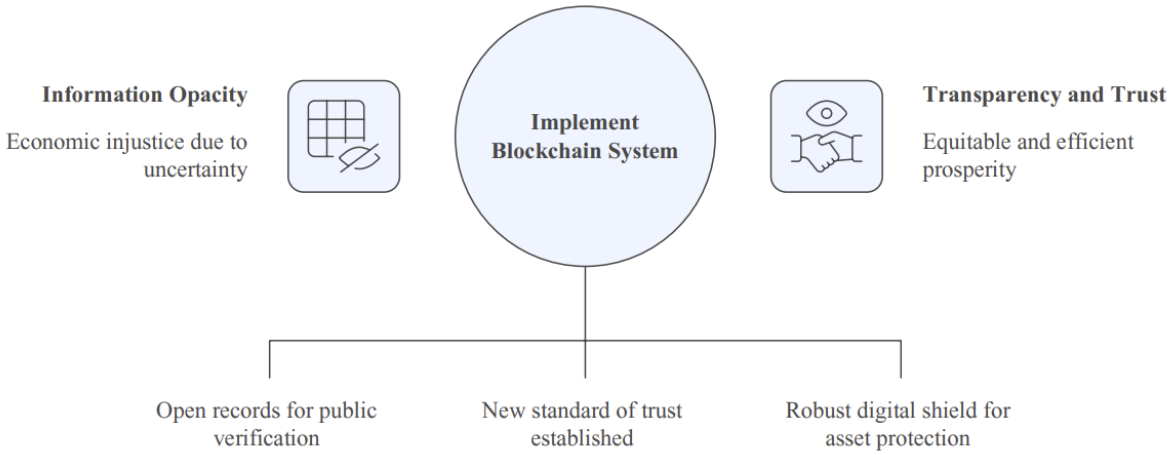


Figure 2. Systematic Elimination of *Gharar*

The harmonization of *fiqh* and decentralization establishes a new standard of validity.

The integration of classical *fiqh* principles with decentralized systems has

produced a new standard for the validity of *akad* that transcends the rigidity of traditional positive law. Ibn Nujaym asserts the principle that the intent and objectives of a contract take precedence over mere formal wording (Wright, 2022). A critical analysis reveals that this harmonization demonstrates Islamic law's flexibility in adopting advanced technologies without losing its moral identity. This transformation is crucial as it shifts the focus of validity from administrative formalities to the substantive fulfillment of rights and obligations executed automatically and fairly.

The integrity of external data sources has become a crucial factor, equivalent to the concept of trustworthy transmission in knowledge traditions. The validity of digital *akad* depends heavily on the accuracy and honesty of input data transmitted from the real world into blockchain systems (Ghazali et al., 2022; Hemairy et al., 2024). This study emphasizes that without proper verification of digital data sources, automated contracts may produce unintended injustices. Therefore, strict criteria for data integrity are essential to ensure that all automated processes remain within the bounds of truthfulness, a fundamental requirement for the validity of Islamic *muamalah* in the digital ecosystem.

State authority must transform into an intelligent regulatory body that legitimizes the use of decentralized technology to safeguard broader public welfare. Al-Mawardi explains that the authority of leadership functions as an instrument to maintain both religious and worldly affairs, ensuring social stability and justice (Jalili, 2024; Kustiawan et al., 2025; Syafi'i, 2024). Empirical observations indicate that collaboration between state regulation and the rigidity of digital code can create a dual layer of protection for participants in the digital economy. This perspective rejects the assumption that decentralization implies the absence of law; rather, it represents a new form of legal enforcement that is resistant to corrupt intervention.

The future of Islamic economic civilization stands at a peak of opportunity through the adoption of blockchain technology grounded in the principle of social *tawhid*. This study provides empirical evidence that Islamic law possesses sufficient intellectual capacity to guide a more transparent and ethical global economic order. The standardization of smart contract validity will serve as a critical foundation for the Islamic finance industry to achieve global competitiveness through technological excellence and strong ethical values. With a progressive spirit of *ijtihad*, *fiqh muamalah* will continue to serve as a moral compass guiding the advancement of an increasingly dynamic, digitally complex world.

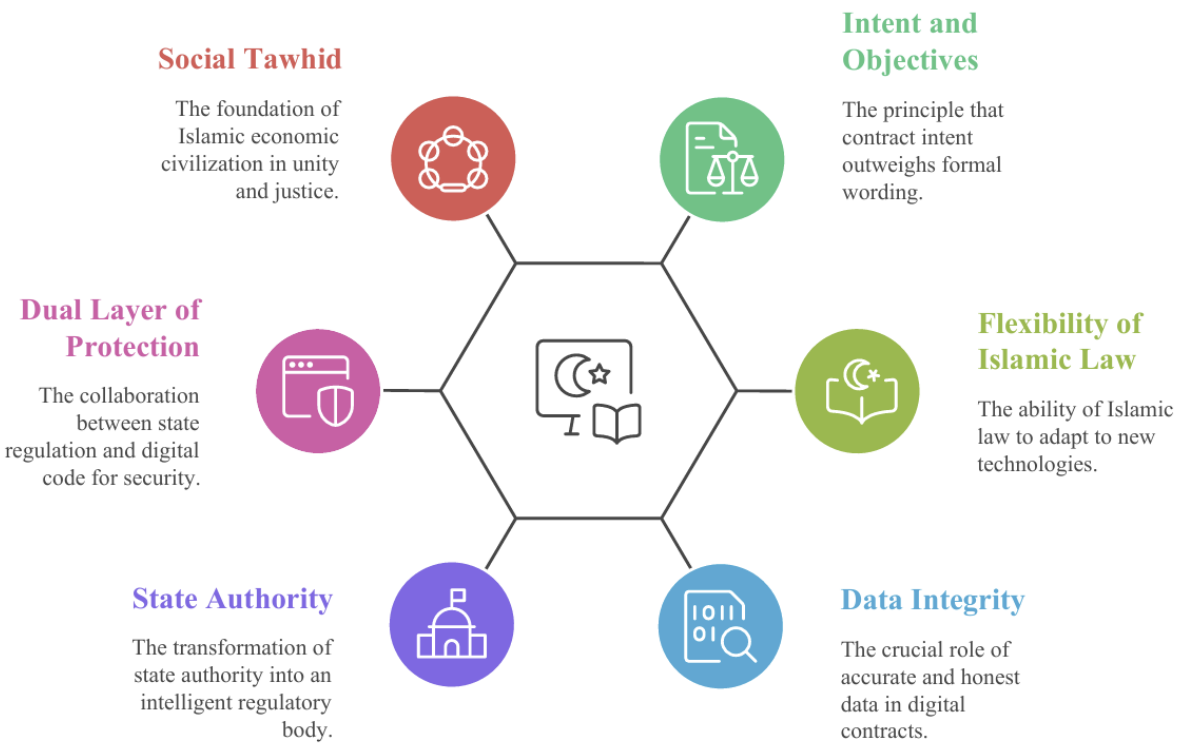


Figure 3. Harmonization of *Sharia* Validity

The transformation of *akad* into digital code represents an epistemological leap that dismantles the conventional boundaries of contract law, which have long been overly focused on physical symbolism. This phenomenon aligns with the "Code is Law" theory proposed by Henningsson & Eaton, in which digital architecture serves as a regulator of behavior far more effective than written legal rules (Henningsson & Eaton, 2023). However, from the perspective of *muamalah*, algorithmic code does not stand autonomously; rather, it must be anchored in transcendental values to avoid falling into morally empty legal positivism. This analysis demonstrates that the transition is driven by the need for legal certainty, which can no longer be provided by manual contracts vulnerable to post-agreement manipulation. This shift marks the emergence of an era in which validity is no longer sought in paper-based documents but in the integrity of transparent digital execution.

The logical consequence of adopting autonomous algorithms is the deconstruction of the role of traditional mediators within the structure of Islamic economic law. While classical social contract theory emphasizes the necessity of third parties as guarantors of trust, smart contracts introduce cryptography-based trust that operates autonomously. Ibn Qayyim al-Jawziyya emphasized that Islamic law must revolve around the axis of *maslahah* and justice without being confined to mere formal labels (Tohari et al., 2022). This evolution demonstrates that automation does not eliminate the human element; rather, it purifies human intention from ambiguities that often arise in verbal interactions. Consequently, human sovereignty in contracting is strengthened through

technological precision that ensures every agreement is executed without injustice toward any party.

The presence of absolute transparency within decentralized networks effectively neutralizes the theory of information asymmetry, which has long been the root of economic fraud. One party's lack of knowledge about the quality of a transaction object can undermine the entire market (Boukhatmi & Van Opstal, 2026; Feuß et al., 2022). Blockchain emerges as a radical solution by providing equal access to information for all market participants, thereby minimizing the potential for fraud to near zero. This study argues that acceptance of this technology is rooted in the failure of centralized financial systems to provide transparent, honest data. As a result, the Islamic moral principle of honesty in trade is now supported by a robust technical infrastructure that is resistant to unilateral manipulation.

The long-term impact of eliminating informational opacity is the emergence of a new standard of business ethics based on collective digital verification of facts. Consequently, trust is no longer a scarce commodity monopolized by major financial institutions but becomes a public right secured within distributed ledgers. This aligns with Ali Murtadho et al view, who emphasizes that Islamic economics must distance itself from unproductive and harmful speculation (Murtadho et al., 2025). Through immutable data transparency, every economic actor is compelled to act honestly, as their digital footprint cannot be erased or manipulated. This embodies the essence of a barakah-oriented economy, where profit is derived not from exploiting informational asymmetries but from genuine, transparent value creation.

The harmonization of *fiqh* principles with decentralized technology establishes a new standard of validity, positioning Islam as a leader in legal innovation in the digital economy. This approach resonates with (Almajri et al. (2025) and Thalgi (2024) thought on *maqasid al-shari'ah*, which emphasizes that the objective of Islamic law is to establish social order and facilitate human well-being. Unlike approaches in some jurisdictions that rely on restrictive measures, this new standard opens the door to adopting decentralized technology as an instrument for strengthening national economies. This analysis suggests that global demands for financial ecosystems resilient to systemic crises drive the emergence of this standard. Accordingly, this harmonization demonstrates the intellectual resilience of Islamic law in guiding technological advancement toward global welfare.

The logical consequence of establishing this new validity standard is the necessity for comprehensive reform in higher education curricula in Islamic law worldwide. The background of this need lies in the growing competency gap, where legal scholars often lack technological literacy, while technologists lack understanding of *Sharia* principles. Monzer Kahf asserts that the revival of Islamic economics depends on the ability of its intellectuals to integrate revelation with modern knowledge in a practical manner (Widyanto et al., 2026).

Ultimately, this transformation will give rise to a new generation of legal practitioners capable of drafting *akad* in the form of programming code that is both religiously valid and internationally recognized. This synergy will serve as a foundational step for Islamic economic civilization, not merely to observe but to become a principal architect of a more just and dignified global digital economy.

This study contributes to both theoretical and practical domains by establishing a new framework for validating digital contracts in accordance with classical *fiqh* principles. The novelty lies in conceptualizing algorithmic *sighat* as an ontological transformation of traditional *akad*, where contract execution is encoded and enforced automatically while adhering to *Sharia* objectives. Unlike prior research that emphasizes technical efficiency, this study integrates normative analysis with technical evaluation, providing a comprehensive method to assess the legitimacy and ethical compliance of smart contracts. The impact of this contribution is multifaceted: academically, it offers a foundation for future scholarship in Islamic contract law, blockchain, and digital finance. Practically, it provides regulators, financial institutions, and technologists with concrete guidance for implementing *Sharia*-compliant smart contracts. By bridging jurisprudential standards with decentralized execution, this research promotes transparency, reduces the potential for disputes, and enhances trust within digital financial ecosystems. It also positions Islamic legal thought at the forefront of global financial innovation, demonstrating its capacity to guide ethical and resilient technological adoption.

CONCLUSION

The most significant findings of this study highlight the transformative impact of smart contracts on Islamic contractual law. The research demonstrates that smart contracts trigger an ontological revolution by converting traditional *akad* into decentralized, self-executing algorithms, thereby enhancing the precision and reliability of contractual obligations while minimizing human error and potential disputes (*khushumah*). The integration of blockchain technology ensures transparency and automatic reduction of *gharar*, establishing a new validity standard in which the legitimacy of contracts is evaluated not only by textual documentation but also by the system's capacity to safeguard rights (*hifdz al-mal*) across all parties. These findings provide the key lesson that the digital economy can uphold both operational efficiency and *Sharia* compliance simultaneously, offering a paradigm in which technological execution serves as a guarantor of justice and ethical adherence in Islamic finance. Additionally, the study underscores the importance of data sovereignty and the integrity of external data sources (oracles) as essential pillars for ensuring the functional validity of automated digital contracts.

The study's strengths lie in its theoretical and practical contributions to Islamic finance and legal scholarship. It develops a new framework for the

ontological repositioning of digital *akad*, offering a reference point for international Islamic contract law and enhancing understanding of how smart contracts can automatically mitigate *gharar* and enforce Sharia principles. Strategically, it provides policymakers and regulators with a roadmap for adopting decentralized technologies without compromising substantive Sharia values, while also advocating reforms in Islamic legal education to integrate technological literacy with normative knowledge. Nonetheless, the study is limited by its reliance on normative analysis and secondary sources, and future research could empirically test the implementation of smart contracts in real-world Islamic financial institutions to evaluate their effectiveness and practical compliance with *Sharia* objectives.

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