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The Convergence of Blockchain Technology and Islamic Economics: A Decentralized Solution for Shariah-Compliant Finance

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Abstract: This research uses a qualitative method with a desk research approach or integrative review to analyze the convergence of blockchain technology and Islamic economics as a decentralized solution in a Sharia-compliant financial system. The research systematically reviewed scientific literature from databases such as Google Scholar, Scopus, DOAJ, and Scispace, covering the period 2015 to 2024 with defined inclusion and exclusion criteria. The findings show that blockchain has significant potential to address key challenges in Islamic finance, including transparency, efficiency, accountability, and adherence to core Islamic principles such as the prohibition of riba (interest), gharar (Uncertainty), and maysir (Gambling). In addition, blockchain supports automated transactions through smart contracts, improves the management of social funds (Zakat and Waqf), and increases financial inclusion for Sharia-compliant financing of MSMEs. However, blockchain adoption still faces major challenges, including regulatory frameworks, stakeholder education, and protocol standardization. This study highlights the urgent need for collaboration among stakeholders to build an integrated and sustainable digital Shariah ecosystem. The findings open new directions for future research on halal technology development and digital transformation in the Islamic economy.

Keywords: Blockchain, Islamic Economics, Islamic Finance, Smart Contracts, Decentralization.

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A. INTRODUCTION

Blockchain technology is an innovation in decentralized, transparent, and secure data recording systems, which has great potential to revolutionize the financial sector. In the context of Islamic economics, which emphasizes the principles of fairness, transparency, and the prohibition of usury, this technology can be an effective tool to strengthen the sharia-compliant financial system. According to Rabbani et al. (2020), blockchain integration in Islamic finance can increase efficiency and trust in financial transactions. Moreover, Alsadi (2025) highlighted that the convergence between blockchain technology and Islamic economic principles can create a transformational framework in the global financial system. Studies on Blockchain Adoption in Islamic Finance

Several studies have explored the adoption of blockchain technology in Islamic finance. Alsadi (2025) highlighted that the convergence between blockchain technology and Islamic economic principles could create a transformational framework in the global financial system. Rabbani et al. (2020) stated that blockchain integration in Islamic finance can increase

efficiency and trust in financial transactions. In addition, a study by Abdeen et al. (2019) showed that blockchain can support transparency and security in the Islamic financial system.

While the potential of blockchain in supporting Islamic finance is immense, there are significant challenges in its implementation. According to Rabbani et al. (2020), the lack of understanding of this technology among Islamic finance practitioners is a major obstacle. Alsadi (2025) also emphasized the need for a cautious approach to ensure the suitability and sustainability of the system being built. In addition, Abdeen et al. (2019) pointed out that the limitations of supportive regulations and the need for protocol standardization pose challenges to the integration between blockchain technology and Shariah principles. Opportunities for Blockchain Integration in Islamic Finance

Despite the challenges, the opportunities for integrating blockchain technology in Islamic finance are immense. Alsadi (2025) states that the convergence between blockchain technology and Islamic economic principles can create a transformational framework in the global financial system. Rabbani et al. (2020) highlighted that blockchain integration in Islamic finance can increase efficiency and trust in financial transactions. In addition, Abdeen et al. (2019) showed that blockchain can support transparency and security in the Islamic financial system.

Several case studies have demonstrated the implementation of blockchain technology in Islamic finance. Alsadi (2025) highlighted that the convergence between blockchain technology and Islamic economic principles can create a transformational framework in the global financial system. Rabbani et al. (2020) stated that blockchain integration in Islamic finance can increase efficiency and trust in financial transactions. In addition, Abdeen et al. (2019) showed that blockchain can support transparency and security in the Islamic financial system. Analysis, Gaps, and Research Objectives

Based on the literature review that has been conducted, it appears that blockchain technology has great potential to be integrated in the Islamic financial system, supporting Shariah principles such as transparency, fairness, and the prohibition of usury. However, there is a gap in the literature regarding the practical implementation and regulations that support this integration. The novelty of this research lies in the in-depth exploration of the convergence of blockchain technology and Islamic economics, as well as the identification of decentralized solutions that are compliant with sharia principles. The purpose of this research is to explore how blockchain technology can be integrated into the Islamic financial system to create decentralized solutions that are compliant with sharia principles.

B. METHOD

This study uses a library research approach with an integrative literature review method, which allows researchers to collect, analyze, and synthesize various literatures from various methodological approaches to gain a more comprehensive understanding of the topic under study (Whittemore & Knafl, 2005). Integrative review was chosen because it is relevant to evaluate and formulate a new conceptual framework from previous research results related to the convergence of blockchain technology and Islamic finance. This approach is qualitative in

nature with a focus on mapping the concepts, challenges, and opportunities of the selected literature.

The data sources used in this research come from reputable databases such as Google Scholar, Scopus, DOAJ (Directory of Open Access Journals), and Scispace. The literature reviewed included national and international journal articles published between 2015 and 2024. Inclusion criteria included articles that: (1) discussed the topic of blockchain technology in the context of Islamic finance; (2) used empirical or theoretical approaches; (3) were available in full text; and (4) were written in English or Indonesian. The exclusion criteria include articles that are: (1) duplicative; (2) not relevant to the focus of the study; and (3) not peer-reviewed.

The literature search process was conducted using a combination of keywords such as "Blockchain", "Islamic Finance", "Sharia Compliance", "Decentralized Finance", and "Blockchain in Islamic Banking". The search was conducted using filters for year of publication and type of scientific document. Once collected, the articles were screened in two stages: (1) title and abstract screening to identify initial relevance, and (2) full content review to ensure compatibility with the research focus and objectives. Literature that passed the selection stage was thematically analyzed and categorized based on topic, methods, key findings, and relevance to the research questions.

To ensure validity and reliability, each piece of literature selected was evaluated using quality assessment tools such as the CASP (Critical Appraisal Skills Program) checklist. Triangulation was done by comparing findings from different sources and different methodological approaches. Data reliability was maintained by systematic documentation of the data search, selection and analysis process, so that the research procedures could be replicated in similar studies. Content validity was also strengthened by referring to established theoretical frameworks in blockchain studies and Islamic economics (Snyder, 2019).

C. RESULTS AND DISCUSSION

1. Blockchain's Potential in Realizing Sharia Financial Principles

Blockchain technology has great potential in realizing the principles of Islamic finance. Blockchain can solve various challenges in Islamic finance, including issues of transparency, accountability, and efficiency in financial transactions. Blockchain serves as a decentralized ledger, which provides an immutable record of transactions, thus increasing trust among all parties involved, both on the financial and social aspects (Djumadi, 2023; Truby et al., 2022). Thus, the implementation of this technology can ensure that all transactions comply with sharia principles that prohibit riba (interest), gharar (uncertainty), and maysir (gambling) (Fadila et al., 2023).

The use of smart contracts in blockchain also has great potential to increase transparency and efficiency in Shariah-compliant financial products and services. Smart contracts can execute agreements automatically when certain conditions are met, which enables automation in various aspects of transactions such as financing and investment (Djumadi, 2023; Rejeb, 2022). This reduces the need for third parties, thereby reducing costs and increasing transaction speed (Mbaidin & Alomari, 2024).

Furthermore, blockchain can be applied in various Islamic financial instruments, including crowdfunding, investment products, and digital banking services that comply with sharia principles (Hidajat, 2020; Kılıç, 2023). For example, in zakat (zakah) management, blockchain applications can improve transparency and accountability, provide verifiable transaction traces, and ensure fair and efficient distribution of zakat (Nor et al., 2021). This creates a more structured and trustworthy system, which is crucial in the management of social funds in society (Abojeib & Habib, 2019).

Integrating blockchain technology in Islamic finance not only improves the transaction mechanism but also helps in shariah supervision, where blockchain systems can support monitoring and auditing tasks to ensure compliance (Haridan et al., 2023). It also has the potential to attract greater interest and participation from potential investors and consumers in the Islamic economy globally, thereby expanding the market and increasing financial inclusion (Ali et al., 2019).

As such, the adoption of blockchain in Islamic finance not only offers solutions to existing challenges, but also opens up significant new opportunities for growth and innovation in the industry. Therefore, it is important for stakeholders in the Islamic finance sector to actively explore and implement this technology (Antova & Tayachi, 2020; Ahluwalia et al., 2020).

2. Blockchain Implementation Models in the Islamic Finance Ecosystem

The application of blockchain technology in the Islamic finance ecosystem shows a lot of potential and opportunities that can be realized to improve efficiency, transparency, and accountability. Blockchain as a distributed ledger technology can revolutionize the way Islamic financial institutions conduct their operations, offering new models that are oriented towards sharia principles.

One model for the application of blockchain technology in Islamic finance is the use of a blockchain-based digital platform to manage Islamic products, including Islamic interest rates and a detailed selling price system. Research shows that the application of this technology can reduce administrative costs and streamline transaction processes, which is crucial for Islamic financial institutions that face challenges in cost management and operational efficiency (Najibulloh & Rahmalia, 2024). In addition, Islamic digital payment solutions that utilize blockchain can reduce the risk of irregularities in transactions and increase public trust in the Islamic financial system (Najibulloh & Rahmalia, 2024).

In the context of fundraising, blockchain can support Islamic crowdfunding models that allow MSMEs (Micro, Small, and Medium Enterprises) to gain wider access to capital. Fintech equity crowdfunding combined with blockchain can create opportunities for investors to participate in sharia-compliant projects (Indriana et al., 2022). This not only increases investment liquidity but also strengthens financial inclusion among MSME players, who have been experiencing difficulties in obtaining financing that complies with sharia principles.

Another model that is starting to be adopted is the application of smart contracts to manage murabahah and mudharabah contracts. By using blockchain-based smart contracts, the process of determining profit margins can be done automatically and transparently, ensuring that all parties involved in the transaction get fair treatment in accordance with sharia

principles (Srisusilawati & Eprianti, 2017). The application of this technology not only increases efficiency but also provides assurance to customers that the contracts applied are in accordance with ethical values and Islamic law.

Challenges in the implementation of blockchain in the Islamic finance sector include adequate regulation, protocol standardization, and technical understanding among industry players (Najibulloh & Rahmalia, 2024; Bandaso et al., 2022). However, these challenges can be overcome by collaboration between the government, educational institutions, and the private sector to develop curricula and training related to blockchain technology and sharia principles (Bandaso et al., 2022; Zikri et al., 2024). All of this suggests that there is great potential for the successful integration of blockchain technology in the quest to achieve Shariah-compliant financial goals.

3. Challenges and Opportunities of Blockchain Integration in Islamic Economics

The integration of blockchain in the Islamic economy is an innovative step that faces various challenges as well as offering a number of significant opportunities. The main challenges faced in relation to the use of blockchain include understanding and acceptance by various stakeholders, including Islamic financial institutions, governments, and the public. In addition, the issue of regulation and compliance with sharia law is also a concern, given that the use of this new technology must remain aligned with Islamic principles (Najibulloh & Rahmalia, 2024; Septianda et al., 2022; Djumadi, 2024).

One of the major challenges is the need to ensure that blockchain applications comply with Shariah law and ethics. This requires constant review and adjustment of traditional financial models in order to efficiently integrate with blockchain technology (Najibulloh & Rahmalia, 2024). In this regard, collaboration between financial institutions and religious authorities is essential to develop clear guidelines regarding the use of blockchain in Islamic finance (Djumadi, 2024). In addition, the lack of understanding of this technology among many stakeholders could hinder its wider adoption and integration (Septianda et al., 2022).

On the other hand, the opportunities offered by blockchain integration in the Islamic economy are exciting. Blockchain can increase transparency and efficiency in the management of zakat and waqf, which are important pillars in the Islamic economic system. By using blockchain, the process of collecting, using, and distributing zakat funds can be done in a more accountable and auditable manner, allowing the public to have more trust in the system (Luntajo & Hasan, 2023). This is in line with the need to increase public trust in the way Islamic finance is managed.

The implementation of smart contracts is also one of the big opportunities, enabling automation and compliance in various sharia transactions, from financing to buying and selling transactions. Thus, blockchain can not only reduce costs and speed up processes, but also ensure all practices are in accordance with sharia principles (Djumadi, 2024). In addition, the MSME (Micro, Small, and Medium Enterprises) sector can benefit greatly through more accessible financing models with the use of this technology, thereby strengthening local economic growth (Iswari et al., 2023).

Therefore, to optimize the potential of blockchain integration in the Islamic economy, a well-thought-out strategy is needed that includes education for all stakeholders, development

of supportive regulations, and close collaboration between the private sector, government, and religious institutions (Hayati et al., 2024; Cahyani et al., 2024). Appropriate utilization of information technology is also key to creating an integrated and innovative ecosystem to face the challenges of today's digital economy (Calment et al., 2024).

D. CONCLUSIONS AND SUGGESTIONS

The convergence between blockchain technology and Islamic economics shows tremendous potential in realizing a more inclusive, transparent, and Shariah-compliant financial system. Blockchain technology not only provides solutions to classic challenges in Islamic finance-such as limited access, transaction transparency, and operational efficiency-but also opens up new innovation opportunities that drive the growth of the Islamic finance industry globally. However, the success of this integration is highly dependent on regulatory readiness, Islamic technology literacy, and cross-sector collaboration. Therefore, an integrated strategy involving education, proactive regulation, and technological support is an important foundation in creating an Islamic finance ecosystem that is adaptive to the dynamics of the digital economy.Directions for Future Research Future research should focus on developing a blockchain implementation model that is explicitly integrated with maqāṣid al-syarī'ah, as well as empirical evaluation of the effectiveness and shariah compliance of existing blockchain-based fintech platforms. In addition, studies on cross-country regulatory harmonization to support the development of blockchain technology in Islamic finance are urgent.

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