

The Potential Application of Blockchain Technology in Zakat Management in Indonesia

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ABSTRACT

This research aims to examine the potential application of Blockchain technology in the management of zakat in Indonesia as a solution to various issues such as lack of transparency, accountability, and efficiency in the distribution of zakat. The method used in this study is literature review by examining literature, scientific articles, and previous research related to zakat and Blockchain. The results indicate that zakat plays an important role in the Islamic financial system and is believed to be able to improve the living standards of society in Indonesia. This research seeks to explore how the utilization of technology, particularly digital platforms and Blockchain technology, can be used to manage zakat more optimally. Meanwhile, Blockchain technology offers advantages in terms of transparency and accountability, as every transaction can be tracked in real-time and is difficult to manipulate. This can certainly prevent the misappropriation of funds. Additionally, The data generated from this digital system can also be used to analyze the needs of beneficiaries, so that the distribution of zakat can be more targeted. If implemented correctly, the integration of technology in the zakat system has great potential to strengthen transparency, improve efficiency, and provide a positive impact on the welfare of society at large.

INTRODUCTION

Indonesia has the largest majority Muslim population in the world (Pew Forum On Religion And Public Life, 2009). This certainly presents significant potential for the collection, management, and distribution of zakat, as zakat is a mandatory act in Islam. Zakat has the potential to alleviate poverty and encourage economic development in Indonesia (Hajar et al., 2023). With about 87% of the Indonesian population effectively having the potential to make a significant impact in addressing social issues and improving the welfare of the less fortunate (Musana, 2023).

The distribution of zakat funds also poses a significant challenge in Indonesia (Ningsih et al., 2024). While zakat is primarily intended to support those belonging to the 8 asnaf, there is a lack of effective mechanisms to ensure that funds reach the intended recipients. Issues such as corruption, misallocation, and inadequate monitoring systems hinder the equitable distribution of zakat, limiting its impact on poverty alleviation and socio-economic development. The management of zakat in Indonesia faces various challenges. Although there are regulations governing zakat management, namely Law No. 23 of 2011, the lack of comprehensive guidelines that regulate and facilitate the practice of collecting and distributing zakat hampers effective decision-making and strategic planning. In addition, the limitations of human resources and technical capacities within zakat institutions hinder the efficient management and monitoring of zakat activities (Luntajo & Hasan, 2023).

The use of blockchain technology is spreading across various sectors, including in the management of zakat. One example of its implementation can be seen in the i-Zakat service developed by Desto FinTech, a company based in the United States. According to (Omar & Khairi, 2021), i-Zakat

presents itself as a global zakat platform that relies on blockchain technology to ensure a more transparent, efficient, and sustainable process. This technology is also capable of preventing abuse, misallocation, loss of funds, and theft, while significantly reducing operational and zakat collection costs, allowing the system to operate in the long term. Meanwhile, in Indonesia, zakat management is carried out by two types of institutions: BAZNAZ and LAZ. BAZNAZ is the official government agency for national zakat regulation, while LAZ is established by the community and is tasked with collecting and distributing zakat. In addition, BAZNAZ also established the Zakat Collection Unit (UPZ) as part of the efforts to expand the reach of zakat collection, as explained by (Hamdi, 2024). However, until now, BAZNAZ has still not implemented a blockchain-based system due to the absence of government regulations specifically governing the use of this technology.

This research addresses the use of blockchain technology for effective zakat management in Indonesia. The framework utilizes blockchain technology to enhance the processes of collection, distribution, and monitoring of zakat. By leveraging technological advancements, the proposed framework aims to tackle challenges related to transparency, accountability, and efficiency in zakat management that can maximize the impact of zakat in poverty alleviation and socio-economic development (Wardani, 2024).

LITERATURE REVIEW

The implementation of blockchain technology in zakat management has emerged as a significant academic discourse in the past decade. Natasya et al. (2023) explored the potential of blockchain in enhancing transparency, accountability, and efficiency in zakat management in Indonesia. They emphasized that traditional zakat distribution faces structural challenges, including corruption, misallocation, and weak monitoring systems. Blockchain, with its decentralized and immutable ledger, offers a promising solution by enabling real-time tracking of zakat funds, thus ensuring they reach the intended beneficiaries. This technology could revolutionize the zakat ecosystem by fostering public trust and optimizing the impact of zakat on poverty alleviation and social welfare.

Similarly, Omar and Khairi (2021) conducted a comprehensive review of the integration of blockchain within zakat systems globally. Their study highlighted that blockchain's application in zakat aligns with the Islamic principles of transparency and justice. They argued that blockchain can address the recurring issues of inefficiency and lack of traceability in zakat disbursement by utilizing smart contracts, which automate and secure transactions according to predefined criteria. This automation ensures that the zakat funds are distributed based on verified data, thereby enhancing operational effectiveness and reducing the risk of human error or manipulation.

Furthermore, Putra (2024) analyzed the utilization of blockchain in Indonesian Islamic financial institutions, particularly in zakat management. His findings reinforced that blockchain could significantly reduce operational costs and increase the speed of zakat distribution. Putra's research emphasized the importance of digital infrastructure readiness and the need for regulatory frameworks that accommodate technological advancements while adhering to Shariah principles. This integration would require collaboration between zakat institutions, technology developers, and regulatory authorities to ensure ethical and legal compliance.

Suganda et al. (2024) also investigated the efficiency gains achieved through blockchain in the management of zakat fitrah and zakat mal. Their study demonstrated that blockchain not only enhances transparency but also supports data integrity and security. They highlighted that the technology could establish a more inclusive zakat system by enabling broader participation from stakeholders, including government bodies, private sectors, and the general public. Such collaboration is crucial in developing a robust ecosystem that can sustain the digital transformation of zakat management.

Lastly, Sulistiyarningsih et al. (2024) explored the prospects of blockchain in achieving Sustainable Development Goals (SDGs) through zakat management. Their research posited that blockchain could facilitate the efficient allocation of zakat resources to sectors critical to SDGs, such as education, health, and poverty reduction. By ensuring precise targeting and accountable fund management, blockchain has the potential to amplify the socio-economic impacts of zakat, contributing not only to national development but also to global sustainability agendas.

Collectively, these studies affirm that blockchain technology represents a transformative tool for modernizing zakat management. While challenges related to digital infrastructure, regulatory acceptance, and Shariah compliance persist, the literature underscores a consensus on blockchain's

capacity to improve transparency, efficiency, and trust in zakat systems. This growing body of research sets the groundwork for further empirical studies and practical implementations tailored to the socio-economic context of Indonesia and other Muslim-majority countries.

RESEARCH METHOD

This research uses a descriptive qualitative approach with a conceptual study method. This method is chosen to deeply examine the potential application of blockchain technology in the management of zakat in Indonesia, by utilizing various sources of scientific literature, policy documents, journal articles, and relevant institutional reports. According to (Sari et al., 2024), data was collected through a systematic literature review of references sourced from indexed journals, scientific proceedings, academic books, and digital publications from zakat institutions and financial authorities. Analysis was conducted using a content analysis approach, which allows researchers to identify key themes, trends in thinking, and implementation gaps of blockchain technology in the zakat system.

In addition, this research also develops an implementation framework based on case studies and best practices from various similar initiatives, such as the i-Zakat platform and smart contract simulations using Ethereum blockchain. With this method, the research is not only exploratory towards the literature but also offers the construction of a framework that is applicable and relevant to the Indonesian context.

RESULTS AND DISCUSSION

Zakat and Its Problematic Issues

Zakat is one of the instruments of Islamic economics that plays a strategic role in realizing social justice and the welfare of the community (Aziz, 2020). As the third pillar of Islam, zakat has a profound spiritual and socio-economic dimension. In the context of Indonesia—a country with the largest Muslim population in the world—the optimization of zakat management has great potential in addressing issues of poverty and social inequality. Nevertheless, the reality on the ground shows that the systems of collection, recording, and distribution of zakat still face various structural and technical problems, ranging from lack of transparency, bureaucratic inefficiencies, to limited integrated digital infrastructure.

The main problem in the conventional zakat management system in Indonesia is the lack of an integrated information system. Zakat Management Institutions (LAZ) and the National Zakat Agency (BAZNAS) currently tend to work separately with internal recording mechanisms that are not interconnected (Jaelani, 2015). This results in data duplication, the inaccuracy of target distribution, as well as difficulties in monitoring and evaluating the impact of zakat distribution. On the other hand, public trust in zakat management institutions remains a significant challenge. When transparency and accountability are low, community participation, especially from potential donors, tends to stagnate (Ma'ruf, 2024).

Implementation of Zakat Management

Blockchain technology presents an innovative solution that has the potential to transform the management system of zakat into a more modern, transparent, and efficient one. Blockchain is a decentralized digital recording system that allows every transaction to be permanently, transparently, and immutably recorded. Each transaction performed will enter a 'block' and will automatically be chronologically connected to previous blocks, forming a 'chain' of data that is accurate and verifiable by all stakeholders (Hidayat et al., 2023).

The implementation of blockchain in the zakat system can create comprehensive transparency from upstream to downstream. Every rupiah of zakat paid by the muzaki can be traced from the moment of payment until it reaches the hands of the mustahik. This process automatically enhances public trust and strengthens the principle of accountability, which is a fundamental basis in the management of public funds based on sharia. Furthermore, blockchain supports the principles of maqasid sharia, particularly in terms of wealth preservation (hifzh al-mal) and upholding justice (al-'adl) in the distribution of resources (Sulistiyaningsih et al., 2024).

In terms of technology, the blockchain system uses cryptography and public key infrastructure to ensure the security and authenticity of transaction data. Every party involved in the zakat ecosystem can participate in data validation, whether it be LAZ, the government, or the community. This opens up

opportunities for the formation of an inclusive and collaborative digital zakat ecosystem. In addition, the development of smart contracts on blockchain platforms can be used to automatically execute the distribution of zakat funds when certain criteria are met—for example, disbursing zakat to mustahik when supporting data has been verified (Baiquni & Dirgahayu, 2023).

The following is the process of practical implementation related to the use of blockchain technology in zakat as proposed by (Baiquni & Dirgahayu, 2023).

The implementation of blockchain technology in zakat management involves several important stages carried out by various actors. The first stage is the collection of zakat, where the muzakki—as the party obliged to pay zakat—makes payments through a web-based application. Zakat funds are paid in the form of Ether (Ethereum), which is previously converted from the Rupiah currency. To ensure security, the muzakki must authenticate through Metamask before the funds are stored in a specially designed smart contract.

The next stage is verification and recording, which involves application systems and zakat institutions, particularly the distribution and finance division. In this stage, the zakat institution prepares a zakat distribution program, and the system automatically verifies the availability of funds in the smart contract. After the supporting documents are uploaded and approved, the fund disbursement is carried out according to standard operating procedures (SOP). This entire process is automatically recorded on the blockchain to ensure transparency and data reliability.

After the funds are verified, the next stage is distribution. The approved funds are channeled to a distribution wallet managed by the distribution department of the charity organization. Next, evidence of program implementation, such as photo documentation, is uploaded to the system. Funds can be converted back from Ether to Rupiah before being distributed to the beneficiaries. The system will automatically update the program status from 'pending' to 'ongoing', and finally 'confirmed' after the distribution process is completed.

The fourth stage is the recording in the blockchain, where all transactions involving collection, disbursement, and reporting are permanently stored within the Ethereum Blockchain network. In a local simulation, this system uses Ganache. The advantage of this system is that it allows the government or regulators to monitor the entire process in real-time, which can ultimately increase public trust in the management of zakat conducted by official institutions such as BAZNAS or LAZ.

The technological components used in this system include the Ethereum Blockchain as the main database, smart contracts built using the Solidity language, and Web3.js for communication between the user interface and the blockchain. User authentication is performed through Metamask, while photo documentation is stored using Firebase. The application interface is built using React and Tailwind CSS to support an optimal user experience.

The Impact of Blockchain Implementation on Increasing Efficiency and Trust

Several previous studies have demonstrated the effectiveness of blockchain in the non-profit sector, including philanthropy and zakat. (Putra, 2024) shows that the use of blockchain in Islamic social finance institutions can minimize operational costs, accelerate distribution, and strengthen transparency. This is also supported by research (Suganda et al., 2024) that asserts that the adoption of blockchain in the zakat system is not only technically feasible but also aligned with Sharia principles.

The adoption of this technology is indeed not without challenges, especially regarding the readiness of digital infrastructure, human resource competence, and regulatory aspects. Therefore, the integration of blockchain in the zakat system requires a strategic partnership between zakat institutions, the government, technology industry players, as well as scholars and academics to ensure that its implementation is not only technically valid but also legally valid according to Sharia.

Thus, blockchain is not just a technology, but a structural reform instrument in the zakat system of Indonesia that has the potential to bring the management system of zakat into a new era that is more modern, transparent, accountable, and has a direct impact on poverty alleviation and the sustainable empowerment of mustahik.

CONCLUSION

The implementation of blockchain technology in the management of zakat in Indonesia offers concrete solutions to various structural problems that have hindered the effectiveness of zakat, such as a lack of transparency, low accountability, bureaucratic inefficiencies, and risks of manipulation and

corruption. With a decentralized, transparent, and immutable recording system, blockchain allows every zakat transaction to be tracked in real-time from collection to distribution to the mustahik.

The implementation process consists of stages of collecting zakat, verification and recording, distribution, and permanent recording on the blockchain. Each process is managed with a smart contract that ensures all procedures follow applicable standards, closes loopholes for fraud, and enhances public trust (muzakki) in zakat institutions.

In addition to increasing the efficiency and security of data, the use of blockchain also supports the principles of maqasid syariah in the management of zakat funds, especially in safeguarding wealth (hifzh al-mal) and upholding justice in distribution (al-'adl). However, the implementation of cryptocurrency as a means of exchange in this application still faces challenges in terms of Islamic law and legal regulations in Indonesia.

Therefore, to optimize the application of blockchain in the zakat system, collaboration is needed between zakat institutions, the government, scholars, financial regulators, and technology industry players to ensure that its implementation aligns with sharia principles, national regulations, and can have a tangible impact on poverty alleviation and economic empowerment of the community.

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