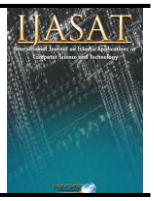

The Future of Zakat in Blockchain Era: Opportunities and Implementation Challenges

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Abstract
The integration of blockchain technology into Zakat management presents an innovative approach to enhancing transparency, efficiency, and accountability within the system [1]. Zakat, a fundamental pillar of Islam, mandates the donation of a portion of wealth to assist the needy; however, traditional collection methods are often marred by inefficiencies and a lack of transparency. This research examines the potential of blockchain to streamline zakat processes through features like decentralization and smart contracts, thereby improving fund allocation, reducing fraud, and lowering operational costs. Despite its promising benefits, the adoption of blockchain in Zakat management faces significant technical, regulatory, and sociocultural challenges. A thorough analysis of these barriers is crucial for developing effective strategies to overcome them and successfully integrate blockchain systems. Ultimately, this study highlights the need for targeted research and collaborative efforts to support more transparent and impactful zakat distribution.
Keywords *- Blockchain Technology, Zakat Management, Smart Contract*

1. INTRODUCTION

In Malaysia, the management of zakat operates in a decentralized framework, with each state maintaining its own Zakat Collection Centre (PPZ), which is overseen by the State Islamic Council. These centers are responsible for the collection, management, and distribution of zakat within their respective jurisdictions. While Malaysian institutions are actively exploring the application of blockchain technology to enhance transparency and efficiency, the comprehensive implementation of such solutions in zakat management remains in its infancy. This slow progress is primarily attributed to the absence of appropriate regulatory frameworks to facilitate digital and cryptocurrency transactions specifically for Zakat purposes.

As one of the Five Pillars of Islam, zakat obligates Muslims to allocate a portion of their wealth to support those in need. Historically, systems for collecting and distributing zakat have encountered challenges such as inefficiency, lack of transparency, and errors, which can erode trust among donors and beneficiaries [20]. These challenges underscore the limitations of traditional systems and highlight the necessity for technological advancements to bolster trust and accountability.

Blockchain technology has emerged as a potentially transformative solution to these issues. Its decentralized and secure architecture enables real-time tracking and transparency in transactions, which could significantly improve zakat management. By utilizing smart contracts, blockchain technology can automate processes, reduce administrative costs, and ensure that funds are directed efficiently and accurately to their intended recipients, thus minimizing delays and the risk of mismanagement.

However, the integration of blockchain into zakat management is not without challenges. These include technical barriers, regulatory and compliance issues, and socio-cultural resistance among stakeholders. Addressing these complexities necessitates a thorough evaluation of both the benefits and obstacles associated with this integration. This research aims to investigate the current state of zakat administration, assess the potential role of blockchain in mitigating inefficiencies, and propose strategies for its integration in Malaysia.

This research aims to explore these dynamics by examining the current state of zakat administration, evaluating the role of blockchain in overcoming existing inefficiencies, and proposing actionable strategies for its integration in Malaysia. By shedding light on these aspects, the paper intends to contribute to the ongoing dialogue about digital transformation in Islamic financial practices, enhancing the overall impact of zakat in the global community.

2. LITERATURE REVIEW

a. Challenges in Zakat Administration

Zakat institutions faced several challenges that impeded their effectiveness, which included structural inefficiencies such as collection and distribution processes, lack of transparency and issues related to trust among stakeholders.

The main reason for the efficiency is the decentralized collection system. The process involves regulatory bodies and a variety of practices across different regions. With this being said, the fragmentation leads to inconsistencies in zakat collection and distribution processes. For instance, in Malaysia, different states have a variety of regulations, thus the issue arises as it creates an imbalance in efficiency of zakat management. The complication in standardizing practices and modernizing collections systems [19]. Similarly, Indonesia has a lack of coordination among zakat institutions which results in operational inefficiencies that undermine effective fund distribution [23]. Especially with the current manual standard operating procedures (SOPs) can result in delays and mismanagement of funds, which ultimately affects the beneficiaries who rely on timely assistance.

b. Lack of Transparency

Transparency is important in fostering trust between zakat institutions and donors. However, many existing systems lack mechanisms especially for real-time tracking of funds. This may lead to the donors being skeptical on how donations are utilized. Zakat via fintech platforms must ensure that users' personal and financial data are well protected. Consequently, this may cause users to hesitate to use zakat applications due to fears of cybersecurity risks [1]. The lack of transparency not only diminishes public confidence but also discourages individuals from contributing through the

official channels. Without transparency, it decreases donor confidence and engagement, therefore zakat administration is crucial to generate engagement and trust [29].

Moreover, inadequate reporting and auditing processes further exacerbate transparency issues [29]. Many Zakat institutions do not publish comprehensive annual reports or even conduct regular financial audits. This leads to perception of mismanagement or corruption within these companies as the accountability measures are robust and public trust in Zakat institutions remains fragile.

c. Trust Issues

Trust is the fundamental component in zakat transactions; however, many donors are still harbouring doubts on the integrity and efficiency of zakat institutions. A study highlights that public skepticism regarding transparency and efficiency of zakat institutions impacts significantly on compliance rates [13]. This increases the concerns about potential misuse of funds or fraudulent activities and can deter individuals from fulfilling their zakat obligations through formal channels.

Since Malaysia is known for multiple races and cultures, it also plays an important role on perception in shaping the public's perspective on zakat institutions. In many regions, there is a lack of general awareness of zakat obligations and the importance of institutionalized giving. Educational campaigns are often aimed at increasing public awareness towards zakat, but are often insufficient as the compliance rates are lower and contributions are decreasing [2]. In the research paper, it indicates that many potential zakat payers are unaware of the benefits that contribute through established institutions. This is because they prefer informal channels where they feel more control over the distributions of their funds.

In this section, we will explore the challenges related to the implementation of blockchain technology in Zakat management, alongside the opportunities it offers. Furthermore, we will review and analyze a case study on the application of blockchain technology in Zakat management in Indonesia, with the aim of extracting insights that can facilitate successful implementation in Malaysia.

2.1. Challenges of Implementing Blockchain Technology - Technical and Organizational Challenges

Blockchain technology has drawn highlights for its potential to transform a number of industries, including charity and banking. This increases the efficiency, transparency, reliability, and/or speed of many tasks that were previously carried out by humans [33]. The utilization of digital platforms, such as zakat calculators, mobile applications, blockchain-based systems, and crowdfunding efforts, has significantly transformed the effectiveness and influence of zakat practices [5]. But even with these benefits, there are still major obstacles to its uptake. The adoption of blockchain technology in Zakat management presents several technical and organizational challenges that need to be addressed to ensure successful integration. Existing literature highlights key areas of concern, including technical limitations, organizational readiness, and the need for comprehensive training.

a. Technical Challenges

Blockchain technology, while offering significant transparency and security, is not without technical constraints. The security of the user should be one of the main concerns. These days,

criminals who commit different types of cybercrimes view cryptocurrencies as both a tool and a target. Numerous cyberattacks have been carried out against people or exchanges since the inception of cryptocurrencies [16]. Another concern is the limitation in transaction speed and volume, depending on the blockchain platform used. This limitation could impact the efficiency of processing numerous zakat transactions [34]. Furthermore, issues related to the scalability of blockchain networks are critical, as large-scale adoption by multiple zakat organizations could strain existing infrastructures.

The regulatory environment surrounding cryptocurrencies is changing, and authorities tasked with establishing a strong legal framework for Zakat collection via blockchain face a major obstacle in the form of unclear instructions. Finding a balance between operational effectiveness and adherence to Shariah standards in the collecting and distribution of zakat is a challenge encountered by zakat through fintech institutions. Fintech companies that offer zakat must make sure that these procedures adhere to Shariah values including compassion, justice, and trust [1]. The regulatory environment is made even more complex by Malaysia's lack of defined legal procedures for enforcing Zakat on Bitcoin [16].

b. Organizational Challenges

From an organizational perspective, the integration of blockchain technology requires a paradigm shift in traditional record-keeping and transaction processes. The need for significant training of both staff and stakeholders to ensure effective use of blockchain systems is very crucial [21]. This involves not only technical training but also a change in mindset to foster trust and understanding of blockchain’s benefits.

Additionally, potential users may harbor misunderstandings or mistrust of blockchain technology, as it fundamentally alters conventional financial operations [34]. This public perception challenge can hinder adoption and requires strategic efforts to educate and communicate the benefits transparently.

c. Structural & IT Readiness

Implementing blockchain within Zakat institutions necessitates substantial upgrades in IT infrastructure. Organizations must assess their current systems' readiness to integrate with blockchain platforms. This includes securing interoperable systems that can work seamlessly with blockchain to automate processes and ensure continual data flow without interruptions [35].

Insufficient availability of resources may be challenging for many people to access and use digital zakat applications because they lack the fundamental knowledge of digital technology. This is also driven by a lack of technological knowledge, complex systems, concerns about risks, distrust of digital technology, unclear benefits of zakat via fintech, legal issues, and the use of confusing language [1].

In summary, while blockchain holds promise for transforming zakat management, addressing these technical and organizational challenges is crucial for its effective implementation. Future research should focus on developing targeted solutions to overcome these barriers, facilitating the smooth transition of Zakat institutions into the digital era.

2.2. Opportunities Enhancing Zakat administration

The integration of blockchain technology into Zakat administration offers substantial opportunities to improve efficiency, transparency, and accountability while navigating legal and regulatory frameworks. This literature review explores these opportunities in detail, focusing on three key areas.

a. Efficiency Improvements

Blockchain technology can significantly streamline Zakat administration by automating processes through smart contracts, which ensure that funds are distributed automatically under predetermined conditions. This automation reduces the need for manual intervention, thereby minimizing errors and potential fraud [3]. Furthermore, blockchain's ability to record every transaction in real-time substantially reduces administrative overhead, such as paperwork and auditing [10], and allows for more funds to be directed towards beneficiaries [35].

b. Transparency and Accountability

Enhancing transparency and accountability is one of blockchain’s most compelling benefits for zakat management. Blockchain provides tamper-proof transaction records, facilitating real-time tracking of how and where zakat contributions are utilized [32]. This level of visibility can boost donor trust, as donors are assured of the accurate allocation of their contributions. Additionally, transparency in fund allocation processes can improve donor engagement and encourage higher contributions [24].

c. Legal and Regulatory Challenges in Blockchain for Zakat Management.

Malaysia has been a pioneer in using blockchain for zakat management. Indonesia and Saudi Arabia are among the other countries studying or using blockchain in this industry. Indonesia, for example, has created platforms that include blockchain for transparency in zakat and waqf management. These platforms aim to track contributions, promote accountability, and increase donor trust.

Saudi Arabia has been proactive in implementing blockchain technology as part of its Vision 2030 strategy, with regulatory oversight from the Saudi Central Bank (SAMA) and the Capital Market Authority (CMA). The 2021 open banking framework, which is supported by the 2023 Implementing Regulations for Payment Services, allows for the secure, consent-based sharing of client financial data with authorized third parties in order to promote innovation. This ecosystem relies heavily on blockchain to ensure data integrity, secure transactions, and interoperability. The Personal Data Protection Law (PDPL) requires blockchain platforms to establish clear data-use rules and methods for user rights such as data access, correction, and deletion [11].

Indonesia is gradually adopting blockchain technology, with a strong emphasis on financial inclusion and sustainability. The country's Financial Services Authority (OJK) has created a strategy for 2024-2028 that emphasizes blockchain's involvement in transparent carbon credit trading, with the goal of increasing the traceability and reliability of environmental offsets. Furthermore, the government is looking at blockchain's potential to boost the digital economy, particularly through Bank Indonesia's development of a Central Bank Digital Currency (CBDC), which intends to improve digital payment systems and financial transaction efficiency. Despite these promising projects, Indonesia confronts a number of regulatory challenges, particularly

regarding cross-border blockchain applications and environmental, social, and governance (ESG) compliance. Regulatory clarification is required to match blockchain innovation with national and international standards [11]. While blockchain offers robust solutions for zakat administration, aligning these innovations with legal and regulatory requirements is crucial. The necessity for updated regulations and clear legal definitions that address the unique aspects of blockchain technology [27]. Regulatory compliance in Malaysia, particularly with laws like the Personal Data Protection Act (PDPA) 2010, is essential to safeguard sensitive information involved in zakat transactions [11]. Moreover, ensuring that blockchain implementations adhere to Shariah principles is critical for acceptance within Islamic frameworks.

In conclusion, although blockchain presents numerous opportunities to enhance zakat administration, careful attention to efficiency, transparency, and regulatory conditions is necessary for its successful application. Further research and policy development are needed to fully realize these benefits while addressing potential challenges.

3.0 Opportunities for Enhancing Zakat Administration

The administration of zakat is one of the important components of Islamic philanthropy, and has traditionally faced several challenges including efficiencies, lack of transparency and accountability issues [12]. However, the emergence of the Fourth Industrial Revolution presents significant opportunities to transform zakat management. With technology playing a central role in our lives, we now have unprecedented access to computing power and data, largely driven by advancements on the internet and digital technologies. This interconnectedness enhances our ability to improve the Zakat process, making it more efficient and transparent.

For instance, the use of digital platforms can streamline the collection and distribution of zakat funds, reducing delays and minimizing errors. Moreover, real-time tracking and reporting capabilities can foster greater transparency, allowing stakeholders to monitor fund allocation and usage more effectively. As a result, these technological advancements can significantly enhance accountability within Zakat organizations, ultimately improving public trust and engagement in charitable activities [7].

a. Efficiency Improvements

One of the most promising aspects of blockchains is the use of smart contracts. It can automate and execute agreements when predefined conditions are met. Smart contracts are self-executing agreements with the terms directly written into code. This allows for automation when predefined conditions are met. The automations can significantly streamline fund distribution processes by reducing the time required for manual processing. For instance, the donor that contributes to a zakat fund, then the smart contracts will automatically allocate funds to eligible beneficiaries based on a certain criterion. This is to ensure that the aid reaches those in need without the unnecessary delay of transaction [30].

The implementation of smart contracts not only accelerates the distribution process but also minimizes the potential for human error, in which it is a common issue on those traditional zakat management systems. Human error can lead to misallocation funds or delays in assistance, leading to affecting those who rely on timely support. By automating these processes through blockchain technology, Zakat institutions can enhance operational efficiency significantly.

Moreover, smart contracts can be programmed with specific conditions that must be met before funds are released. For instance, funds that are allocated based on verified needs assessments or any specific project milestone being achieved. This level of automation ensures the resources are used efficiently and only disbursed when they meet a predefined criterion.

b. Cost Reduction

By minimizing administrative overheads that are associated with manual processes, blockchain can increase the substantial cost savings for zakat institutions. Traditional zakat management often involves numerous intermediaries that add more complex processes, thus increasing the cost fund to distribution. The savings realized from this reduction can be redirected towards enhancing service delivery and outreach efforts.

When using blockchain, the savings will be redirected towards delivery. For instance, enhancing the cost of delivery service towards places that are outreached [4]. With lower operation costs due to streamline processes and reduced need for intermediaries. The reduction in operational costs may allow more resources to be allocated directly to beneficiaries, thereby increasing the overall impact of zakat.

To support this, as noted by [28] study, by integrating blockchain technology, it will eliminate intermediaries and automate processing through smart contracts. Thus, this approach reduces transaction costs significantly while benefiting donors and recipients alike. The reduction in costs allows Zakat institutions to expand their reach and improve their services without compromising on quality and efficiency.

c. Transparency and Accountability

Block chains with real-time tracking enable them to track the funds from collection and distribution. The capability enhances visibility into how donations are utilized, thereby increasing the donor's engagement and confidence [26]. With transparency, it allows the stakeholders to verify transactions easily, promoting trust in the institution's operations. Research suggests that when donors can track their contribution in real time, they are more likely to contribute again in the future, hence this will create a cycle of trust and engagement within Zakat.

Furthermore, real-time tracking allows Zakat institutions to provide regular updates to donors about how their contribution is being utilized. For example, donors could receive notifications about specific projects that are funded by their contributions or updates on the impact achieved through donations. This level of engagement not only fosters trust but also encourages ongoing support from donors who feel connected to their outcomes of contributions.

Next, block chain also improves reporting and auditing processes. The immutable nature of blockchain records facilitates improvement on reporting and auditing practices with zakat institutions. Each transaction is permanently recorded on a public ledger that can be accessed based on verification purposes. The transparency allows for all funds to be accounted for and utilized appropriately, by aligning with Islamic principles regarding financial integrity [25].
According to past research papers [18], blockchain enhances the reporting mechanism that leads to the improvement of accountability among zakat institutions, as stakeholders can easily access information about fund allocation and usage. Enhanced reporting capabilities enable institutions

to produce detailed financial reports that reflect not only how much was collected but also how it was spent and the impact as well.

d. Case Studies and Practical Implications

Several studies have explored the practical implications of implementing blockchain technology in zakat administration.

Malaysia's zakat management system could benefit greatly by integrating blockchain into existing zakat management framework and significantly improves operational efficiency and governance [20]. The proposed blockchain architecture allows for real-time monitoring and verification of fund utilization, promoting solid governance within Zakat institutions. The study also highlighted the integration of blockchain leading to more effective management practices. This is by providing transparency in the framework in tracking contributions and distribution. Furthermore, the integration aligns with Malaysia's goals in improving financial inclusion and ensuring fundamental management practices that are ethical.

Next, a past research paper that focuses on Indonesia's zakat ecosystem, highlights the potential of blockchain technology to improve the credibility of zakat collection systems with transparency [28]. With the adoption solutions, Indonesia zakat institutions could address the challenges related to low collection rates despite the high potential. The research suggests that by utilizing blockchain, it can enhance stakeholder's trust by providing higher levels of disclosure on reporting within the Zakat system. The increased transparency is important where public confidence in formal zakat channels has been historically low.

In conclusion, the integration of blockchain technology into zakat administration has both challenges and opportunities. While issues related to inefficiency, lack of transparency and trust persist within the traditional system, blockchain offers innovative solutions that enhance the operational effectiveness. By leveraging smart contracts for automation and creating transparent tracking systems, Zakat institutions can significantly improve their delivery service.

Future research should focus on developing a more comprehensive framework for implementing blockchain technology in various contexts while addressing regulatory challenges associated with its adoption. As more Zakat institutions explore these opportunities, they will be better positioned to fulfill their mission in supporting those in need within communities worldwide.

3. DISCUSSION

To deepen the focus and improve the quality of our research, we conducted a comprehensive analysis using the SWOT Analysis technique. This approach allows us to systematically evaluate the potential strengths, weaknesses, opportunities, and threats associated with integrating blockchain technology into zakat management.

The results of this SWOT analysis led us to formulate the following hypothesis for our research paper "Integrating blockchain technology into zakat management will enhance traceability, efficiency, and security. However, it will encounter challenges such as user knowledge gaps, scalability issues, cybersecurity threats, and public perception concerns."

This hypothesis aims to guide our exploration of the transformative potential of blockchain technology while highlighting the critical areas that require strategic attention and development

a. STRENGTH

The integration of blockchain technology into Zakat management is poised to bring several significant advantages. Primarily, blockchain enhances transparency by providing real-time tracking and tamper-proof transaction records. This heightened level of visibility fosters trust among donors and recipients by ensuring that zakat funds are used appropriately and efficiently [22]. Additionally, automation through smart contracts drastically improves efficiency; it reduces manual errors and administrative tasks, enabling accurate and swift delivery of funds to designated recipients. Blockchain also promises improved accountability, as detailed and immutable records facilitate regular audits and promote responsible fund management, thereby boosting donor confidence.

b. WEAKNESS

Despite promising benefits, the implementation of blockchain in zakat management presents notable weaknesses. Technical limitations, such as scalability issues and inadequate transaction speeds, may hinder its widespread adoption [27]. Furthermore, the integration costs associated with upgrading IT infrastructure can be prohibitive for many zakat institutions, requiring significant financial and logistical resources. Another challenge is the upskilling of personnel; introducing this advanced technology necessitates extensive training and cultural shifts within organizations, a process that can be both resource-intensive and time-consuming [26].

c. OPPORTUNITIES

The implementation of blockchain technology offers substantial opportunities for zakat institutions. It can enable global reach and expansion, allowing for efficient cross-border fund management without the constraints of traditional banking systems [26]. Additionally, enhanced transparency and accountability can lead to improved donor trust, thereby increasing engagement and contributions [7]. Embracing such technological innovations can position zakat institutions as pioneering leaders within the realm of digital transformation in Islamic finance, offering a competitive advantage [23].

d. TREATS

Several external threats could adversely impact the adoption of blockchain in zakat management. Regulatory challenges remain a significant concern, as current laws may not fully accommodate blockchain technology, demanding updates and alignment with Shariah principles [27]. Privacy concerns also pose a threat; balancing blockchain's inherent transparency with the need to protect personal data presents complex challenges, especially in relation to data protection regulations like the PDPA 2010 [7]. Moreover, public perception and resistance to new technology may impede its adoption, necessitating extensive educational initiatives to overcome mistrust and enhance awareness among stakeholders [9].

4. RESULTS

The goal of implementing blockchain technology in Zakat management is to improve the management of Zakat money's efficiency, transparency, and confidence. The main objective is to

establish an auditable and unchangeable system that guarantees responsibility in the distribution and collecting of zakat.

The framework also aims to guarantee adherence to Malaysian legal frameworks and Islamic standards, expedite administrative procedures, and cut overhead expenses. By utilising blockchain technology, Malaysia can increase donor trust and guarantee that money reaches qualified recipients (Asnaf) in a timely and correct manner.

Based on the literature review, there are three main components that need to be focused on to implement Blockchain in Zakat management in Malaysia. The key components are the stakeholders, technology infrastructure and data management.

a. Empowering Stakeholders

The responsibilities of running the blockchain platform, supervising money collecting, and allocating aid, Zakat institutions will be vital. More transparency about the use of donations will be advantageous to both private and corporate donors. Asnaf, the beneficiaries, will have access to a more equitable and open aid distribution mechanism. Government agencies like BNM and Zakat Authority, including regulators and religious leaders, will make sure the blockchain system complies with Malaysian legal requirements and Shariah norms (Jalal & Che Abdullah, 2024).

b. Enhancing Technology Infrastructure

Smart Contract can be introduced in the implementation of Blockchain to the Zakat management. By guaranteeing that contractual requirements are confirmed and carried out only when circumstances are satisfied, smart contracts can aid in lowering uncertainty (Gharar) [27]. By using secure, unchangeable verification, they automate the entire process and reduce counterparty and operational risks [9]. Additionally, because smart contracts streamline procedures and get rid of redundancy, Gharar brought on by administrative and legal complications is lessened. By employing self-executing technologies, smart contracts significantly reduce legal and administrative expenses, which are frequently mentioned as challenges in implementing Blockchain in Zakat administration. Additionally, because they are decentralised, they may execute tasks more quickly and at lower costs while preserving traceable and irreversible transactions, which removes the possibility of moral hazard for participants.

c. Optimizing Data Management

Lack of transparency and trust issues are the main challenges that are faced in Zakat management. Secure and unchangeable data management will be made easier by blockchain technology. Strict privacy protocols will be used to preserve donor records, protecting their names and guaranteeing donation traceability. Based on recognised Asnaf categories, such as the impoverished, needy, and indebted, beneficiary profiles will be prepared to confirm their eligibility. Every transaction from the payment of Zakat to its distribution will be documented on the blockchain, offering an auditable trail for internal and external parties.

5. CONCLUSION

This research paper explored the potential of integrating blockchain technology into zakat management, focusing on improving transparency, efficiency, and accountability in the distribution of zakat funds. Throughout our analysis, we identified key opportunities, such as

enhanced traceability and automated processes, which blockchain can provide. These benefits promise to boost donor confidence, reduce operational costs, and ensure accurate fund allocation.

However, our study also highlighted significant challenges that must be addressed for successful implementation. Technical issues like scalability and integration costs present considerable hurdles, as do the cybersecurity threats and compliance with both Shariah principles and data protection regulations. Moreover, the necessity of upskilling organizational personnel and overcoming sociocultural resistance and public perception issues cannot be overlooked.

The SWOT analysis conducted revealed a pressing need for targeted research and collaborative efforts to address these barriers. By focusing on resolving technical limitations, developing regulatory frameworks, and promoting awareness and education about blockchain's benefits, Zakat institutions can effectively leverage this technology.

In conclusion, while blockchain technology holds substantial promises for transforming zakat management, its successful adoption will require not only innovative technical solutions but also strategic organizational and regulatory adaptations. Future research should aim to bridge these gaps, facilitating a more transparent and impactful distribution of zakat that adheres to Islamic financial principles.

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