



The Sustainability of Cash Waqf Using Blockchain Technology: a Conceptual Study

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ABSTRACT

This paper explores the potential of integrating blockchain technology to enhance the sustainability of cash waqf, a significant Islamic endowment supporting charitable causes. Traditional cash waqf systems are facing challenges such as opacity, accountability gaps and inefficiency. The study provides a comprehensive overview of cash waqf and blockchain technology, exploring their synergies and potential in managing cash waqf initiatives. Through a detailed examination of challenges and opportunities, the paper establishes a robust research framework incorporating experience, knowledge, and blockchain to influence cash waqf sustainability. The proposed integration includes designing a blockchain architecture, implementing a blockchain-based cash waqf system and conducting security and privacy assessments for long-term viability. Research findings show blockchain's transformative impact, demonstrating its potential to enhance transparency, reduce fraud, increase accountability, and improve overall efficiency in managing and distributing cash waqf funds. For future work, continued exploration is needed to implement and assess the proposed blockchain integration in real-world cash waqf scenarios. The effectiveness of the system should be evaluated over an extended period, considering diverse community needs and regulatory contexts. In conclusion, conceptual research lays a foundation for a more sustainable future for cash waqf in redefining the landscape of charitable activities.

1. INTRODUCTION

Cash waqf is a charitable endowment in Islamic finance that promotes social welfare and sustainable development (Sarker, 2019). It involves individuals or organizations donating funds to support specific charitable causes in perpetuity.

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This endowment supports various social and humanitarian initiatives, including education, healthcare, poverty alleviation, and community development. Their sustainability ensures cash waqf funds' long-term viability and effectiveness. Various factors contribute to the durability of cash waqf funds, including proper management, effective investment strategies, and continuous community support. Implementing sustainable cash waqf management strategies ensures that the funds generated through cash waqf are utilized effectively and efficiently (Cahyono & Hidayat, 2022).

Blockchain technology has been transforming several industries, such as finance, logistics, and supply chain management, with new use cases emerging daily (Jabbar et al., 2020). However, the widespread adoption of this technology still faces challenges in terms of scalability, interoperability, regulatory concerns, and standardization (Duy et al., 2018). It is vital to emphasize the importance of accurate and reliable information storage and processing (Polyviou et al., 2019). Blockchain technology's unique properties of decentralization, security, transparency, and anti-tampering can revolutionize various industries, including the financial industry (Duy et al., 2018). For instance, blockchain technology could revolutionize transaction processes in the financial sector, demonstrating its potential to transform transactions (Polyviou et al., 2019).

Cash waqf knowledge and experience are essential for understanding and successfully implementing cash waqf initiatives. To ensure their sustainability, knowing cash waqf and Islamic finance is crucial. Islamic scholars and financial experts bring expertise in aligning these initiatives with Islamic principles, ensuring transparency, accountability, and adherence to ethical standards. Ongoing research in the field enhances the understanding of the evolving landscape of Islamic finance, allowing for the adaptation of cash waqf models to contemporary challenges (Nadwi & Kroessin, 2013; Alshater et al., 2020; Ismail et al., 2023). Cash waqf initiatives depend significantly on experience, which provides valuable knowledge on interacting with donors, managing funds and distributing them (Ismail et al., 2023). Islamic philanthropic organizations and financial institutions have significant expertise in managing cash waqf, emphasizing the importance of trust, transparency, appropriate allocation of funds and efficient governance mechanisms. This information can help create effective governance frameworks and strategies, enabling future efforts to overcome obstacles and achieve lasting results (Laallam et al., 2020).

Cash waqf can drive sustainable development in Malaysia but needs effective fund management, public awareness and regulatory support (Ismail & Rasool, 2021). Collaborative initiatives among various entities such as organizations, institutions, and governments can enhance its sustainability. Leveraging technological advancements and online entrepreneurship can enhance the process of fund collection and administration (Ismail & Rasool, 2021). Additionally, addressing the challenges faced by waqf institutions and providing resources, support, and training is crucial (Khamis & Salleh, 2018). Using digital platforms and blockchain technology can facilitate the process and broaden the target audience (Jalil et al., 2019; Ismail, 2020).

This paper explores the intersection of cash waqf and blockchain technology to understand how they can work together to promote sustainability and social impact. Through this exploration, we hope to uncover the opportunities and challenges of using blockchain to support cash waqf and increase its positive effects on communities.

2. LITERATURE REVIEW

Cash Waqf

Prophet Muhammad (pbuh) created the waqf foundation, which was thereafter continued by his close companions (Khamis & Salleh, 2018). According to the Islamic language, waqf refers to the dedication of a property provided for charity to preserve its benefits for humans. In the English language, waqf is likely defined as an 'endowment' or means 'detain' in Arabic language and was recognized as one of the voluntary charitable acts in Islamic law (Pitchay et al., 2014). From the perspective of Islamic law, waqf may be defined

as holding a *maal* (an asset) and preventing its consumption to repeatedly extract its right to use to represent the goal of justice or philanthropy (Kahf, 1998). In a simple way, waqf means diverting *ayn* or property from private ownership and using its use rights for charitable purposes (Mohsin, 2013; Abulatifa, 2023). Waqf is a voluntary act and the endowed asset is restricted from any other deals, such as *wassiyah*, *hibah*, inheritance, or sale. In the era of prophethood, the waqf demonstrated its ability to assist the government in providing infrastructure and social services to local communities, such as education, healthcare, social work, and public utilities (Saleh, Muayyad, & Fahd, 2023). Historical evidence indicated that under the magnificent time of the Ottoman Caliphate, the waqf system was employed for governance activities to handle the welfare of the Muslim community and raise their living quality to have a more congenial life (Anwar, 2023).

Cash waqf is defined as the money contributed by the founder (person, firm, institution, private or public organisation) in exchange for a commitment to use the social welfare service indefinitely (Mohsin 2013). According to Lahsasna, cash waqf sources are based on the continuous collection of funds from donors and their investment in productive assets, providing access or income for future consumption of individuals or groups while taking into account donor contributions, policies and guidelines (Lahsasna 2010). Cash waqf donations must be deposited in the cash waqf fund to ensure liquidity for future investment and profit sharing. Donors can give as much as they can afford where it could be as little as ten cents from their bank account. It is the donation of money from one's property for social welfare or any other reason (Khademolhoseini, 2008; Mohsin, 2013). Similarly, it is the capital invested in productive economic sectors at a specific percentage for societal benefit (Hilmi, 2012b). In other words, cash waqf refers to funds awarded to the authorised waqf trustee, with the principal retained for the benefit of the beneficiaries (JAWHAR, 2009), or one of the financial techniques devised by Muslim jurists for the development of waqf holdings around the world (Iman & Mohammed, 2017).

Although in practice, waqf typically involves the transfer of permanent assets such as buildings or land; however, many donors are unable to implement waqf practices that involve permanent assets, so the concept of cash waqf was born, to create liquidity to invest in assets that will benefit and then distributing profits at the next level (Saleh, Muayyad, & Fahd, 2023). The concept of cash waqf initially originated during the Ottoman Turkish era in the 15th century AD and it supplanted real estate waqf as the primary method in 1560 (Cizacka, 2000; Ibrahim & Rahman, 2021; Mandaville, 1979). Although Turkish intellectuals such as Civizade and Birgevi Efendi, disagreed at first about the need for financial waqf, Sheikh al-Islam's fatwa approved it, and it became law during Ottoman Turkey's early modernization (Anwar, 2023). The Ottoman Turkish government firmly supported Sheikh al-Islam, the Ottoman Turkish government's official mufti, in his view of monetary waqf as a paradigm change (Mandaville, 1979), and the majority of Islamic jurists accepted the concept. Syara defines cash waqf as a technique of raising finances to create waqf property for charitable purposes, either through general or specific financing (Ibrahim & Rahman, 2021). The formation of a cash waqf as transportable property stimulates participation in waqf endowment while also having the potential to be a strong institution in garnering funds for social benefit. However, there is a misperception concerning waqf in which many assume that it only exists in the form of physical property such as land and buildings, which accounts for low involvement in cash waqf.

With the recent rise of cash waqf development in Muslim society, many wealthy Muslims have begun donating money to Islamic religious and community organizations in specific institutions (Kachkar, 2017). Cash waqf resources have been used to improve socioeconomic development and alleviate poverty in a variety of ways, including small and medium-sized businesses, education, microfinance, economic development, financial institutions, non-profit financial intermediaries, poverty alleviation, microenterprises, and health care services (Çizakça, 1998; Ahmed, 2007; Haneef et al., 2015; Duasa & Thaker, 2016; Siswantoro, Rosdiana & Fathurahman 2018; Mohsin, 2013). Cash waqf is seen as a pooled waqf asset and must be carefully managed until it increases and creates income for social welfare (Saad & Anuar, 2010; Tohirin & Hudayati, 2011; Saifuddin et al., 2014; Khamis & Salleh, 2018). The correct cash waqf management consists of three primary phases: Waqf

fund collection, Waqf fund investment, and Waqf fund (profit) disbursement. However, waqf organizations in Malaysia encounter various barriers that make cash waqf management ineffective. It is mostly due to internal constraints such as a lack of qualified human resources, transparent reporting and systematic documentation (Ibrahim, Amir, & Masron, 2013; Manat, 2007; Masruki & Shafii, 2013; Yaacob et al., 2012).

However, due to the inefficiency of cash waqf as reported above, the recent revolution on cash waqf products which is associated with blockchain development has created. Cash waqf needs proper management to ensure its effectiveness and efficiency. Blockchain is a pure electronic peer-to-peer version that allows online payments to be sent directly from one party to another without going through financial institutions (Vidiati et al., 2021). A blockchain is a machine for creating trust (Berkeley, 2015). Overall, these technological advances will be closer to the blockchain mainstream and decentralized web, also known as Web 3.0.5. This means that blockchain is expected to revolutionize computing in several areas, especially where centralization is unnatural and privacy is important (Davidson, De Filippi & Potts, 2018). Where the internet is the second communication revolution, a form of democratization of electronic communication, and has invited more people into the knowledge process (Bagchi, 2005). Blockchain is a kind of distributed ledger maintained by network nodes, which records transactions executed between nodes (i.e., messages sent from one node to another). Information entered into the blockchain is public and cannot be modified or deleted (Swan, 2015).

Knowledge and Sustainability

The notion of cash waqf endowment has garnered considerable interest in recent years owing to its capacity to contribute to sustainable development and alleviate poverty. Cash waqf is a promising instrument for achieving sustainable development in the context of Islamic finance. It occupies a distinct place in the field of sustainable development by integrating the principles of charity, finance, and social entrepreneurship. To fully comprehend the various aspects of cash waqf, a thorough examination is necessary to explore how this type of endowment strengthens communities and promotes long-lasting socio-economic development. Furthermore, it is essential to examine the approaches by which cash waqf contributes to sustainable development, poverty reduction, and social welfare to comprehend its wider ramifications. An in-depth examination of the function and impact of technology, specifically blockchain, in promoting knowledge sharing and involvement in cash waqf programs can lead to a more comprehensive comprehension of their ability to tackle current socio-economic difficulties.

However, the long-term sustainability and effectiveness of cash waqf programs depend on various aspects, with one of the most critical elements being the awareness and comprehension of these projects among potential donors and stakeholders. The relationship between knowledge and sustainability in the context of the cash waqf endowment would enhance the understanding of its capacity to tackle current difficulties and foster enduring socio-economic progress. Additionally, it emphasizes the significance of including the spread of knowledge and education into cash waqf efforts to empower communities, promote sustainable socio-economic development, enhance the well-being of communities, and encourage lifelong learning regarding the Islamic financial tool (Khamis & Che Mohd Salleh, 2018; Zeb et al., 2022). Recognizing the role of cash waqf in promoting educational infrastructure and facilitating access to knowledge resources is crucial for utilizing its potential to achieve sustainable socio-economic development and alleviate poverty (Zeb et al., 2022; Owais & Ali, 2023). The study by Julendra et al., (2021) in Indonesia has found, that knowledge of waqf especially cash waqf is crucial in realizing sustainable development goals.

Several researchers have identified the beneficial influence of knowledge in discerning the components that contribute to the waqf institution (Amirul Faiz Osman et al., 2016; Johari et al., 2015; Shukor et al., 2015). More than mere knowledge is needed to generate awareness. Effective information-dissemination channels can support the growth of knowledge that results in ethical behavior and knowledgeable societies that engage in cash waqf (Zulkiflee et al., 2015). However, the lack of knowledge among individuals and within the

Islamic community has led to numerous difficulties, including mismanagement and corruption in various waqf institutions (Anwar et al., 2019; Ibrahim et al., 2013).

By exploring the relationship between knowledge and sustainability in cash waqf, this study will contribute valuable insights to enhancing the effectiveness and longevity of these initiatives. Moreover, developing blockchain technology to raise knowledge dissemination for effective governance, can ultimately contribute to fostering a more sustainable and impactful development model within the Islamic finance landscape.

Experience and Sustainability

Experience is essential in decision-making, particularly in matters concerning institutional governance. Nevertheless, decision research has predominantly concentrated on novel decisions for an extended period, disregarding the significance of prior experience (Tilman Betsch, 2014). Experience has been observed to exert a substantial impact on the desire to re-donate in the context of donations (Aly et al., 2017). The experience of waqf in Islamic countries demonstrates that waqf can effectively fulfill the objectives of the development of social roles.

Gaining a comprehensive understanding of how experience and sustainability intersect within the framework of cash waqf is crucial for guaranteeing the efficient administration and enduring influence of waqf endowments. An analysis of previous waqf initiatives can provide significant insight regarding successful approaches, encountered challenges and acquired knowledge. Hence, guiding the creation of sustainable plans for future cash waqf initiatives. Prior research on cash waqf experience has indicated that the organizational capacity is contingent upon the experience of waqf institutions, the contributions of waqifs and the skill of personnel in achieving their sustainability goals, which could have a notable impact on the waqf (Anwar et al., 2019; Fauzi et al., 2019).

However, inexperience in waqf and cash waqf management should be tackled strategically. The competence of Mutawallis in efficiently administering cash waqf to ensure a consistent flow of funds for its long-term sustainability is doubtful due to its lack of administrative and organizational experience. A study conducted by Saiti et al. (2019) and Qurrata et al. (2021) has found that the management of cash waqf in Malaysia encounters difficulties stemming from insufficient expertise, supervision, shariah compliance and advisory board involvement. These challenges adversely affect the decision-making process, resulting in time-consuming, ineffective and inconsistent practices that do not align with Malaysia's Vision 2020. Introducing technologies like blockchain can likely alleviate the stress surrounding this issue. By leveraging past experiences, stakeholders and waqifs, for instance, can better navigate the complexities of cash waqf administration, ultimately contributing to the sustainability and lasting impact of endowment initiatives.

Furthermore, analyzing the long-term sustainability of cash waqf initiatives is vital. This involves assessing the continuity and impact of past waqf as well as developing frameworks for ensuring that cash waqf contributions endure and continue to support socio-economic development in the long run. For example, the Majlis Ulama Islam Singapura (MUIS) has achieved success by establishing a subsidiary company called Wakaf Real Estate of Singapore (WAREES Investment Pte. Ltd). This company has effectively enhanced the value of waqf properties, resulting in a tenfold rise and generating higher revenue for the waqf fund (Qurrata et al., 2021). This implies that by incorporating experiences and taking sustainability into account, it is possible to maximize the long-lasting impact of cash waqf endowments in the future.

Sustainability

In Malaysia, the concept of cash waqf has evolved over the years to adapt to the modern financial system while maintaining its religious and charitable essence. The legal framework surrounding cash waqf in Malaysia involves a combination of Islamic law principles and regulatory requirements set forth by the country's authorities. These regulations aim to ensure the proper functioning and sustainability of cash waqf initiatives within the Malaysian financial ecosystem (Hasan et al., 2019). Several organizations and institutions in Malaysia

have been actively involved in promoting and implementing cash waqf sustainability measures. These initiatives encompass a wide range of sectors, including education, healthcare and social welfare, to maximize the impact of cash waqf contributions in addressing societal needs (Pitchay et al., 2018).

While cash waqf has the potential to drive sustainable development in Malaysia, some challenges need to be addressed. Raising public awareness, overcoming regulatory obstacles and guaranteeing efficient management of waqf money are all examples of such issues (Ismail & Rasool, 2021). Despite these challenges, the opportunities for expanding and enhancing cash waqf sustainability in Malaysia are significant, especially in the context of how committed the country is to social duty and Islamic finance. Looking ahead, the prospects for cash waqf sustainability in Malaysia appear promising. With the growing momentum in the Islamic finance sector and increasing awareness of social responsibility, there is a favorable environment for further development and innovation in the cash waqf landscape (Jelili et al., 2016). Collaboration between governmental bodies, financial institutions, and charitable organizations can play a pivotal role in advancing the sustainability and impact of cash waqf initiatives.

In addition, developments in technology and the rise of online entrepreneurship present new opportunities for cash waqf sustainability. For example, the use of digital platforms and crowdfunding instruments can facilitate the collection and administration of cash waqf funds, making it more accessible and efficient for individuals to contribute and for organizations to manage these funds (Ismail & Rasool, 2021). Overall, the revitalization of cash waqf in Malaysia holds great potential for driving sustainable development, promoting social welfare and empowering Muslim communities. In order to ensure the sustainability of cash waqf initiatives in Malaysia, it is crucial to address the challenges faced by waqf institutions and provide them with obligatory support, resources and training (Khamis & Salleh, 2018).

Incorporating advanced financial tools and technology can also enhance the efficiency and transparency of cash waqf management. Digital platforms and blockchain technology can streamline the process of collecting and disbursing waqf contributions, enabling greater accessibility and accountability for donors and beneficiaries (Jalil et al., 2019). Moreover, leveraging e-commerce platforms can widen the reach of cash waqf campaigns and attract more participation from the Muslim community. By leveraging the widespread use of social media and online platforms, cash waqf initiatives can effectively reach and engage a larger audience, enabling them to contribute to the development of cash waqf sustainability in Malaysia easily and conveniently (Ismail, 2020). Active engagement and participation from various stakeholders, including, religious scholars, community leaders and the public, are essential for the long-term sustainability of cash waqf in Malaysia (Haron et al., 2021). Building knowledge, gaining experience and fostering collaboration can foster a supportive ecosystem for cash waqf, encouraging more individuals and organizations to contribute to impactful initiatives.

Blockchain

The emergence of blockchain technology has revolutionized the way transactions are conducted, creating a secure and transparent decentralized platform for data transfer (Ali, Mohd Yusof, & Mokhtar, 2018). Blockchain is a digital ledger that records all transactions securely and transparently, without the need for intermediaries (Rahayu et al., 2021). It utilizes distributed consensus protocols to validate transactions and maintain a tamper-proof ledger.

Initially introduced as the underlying technology behind cryptocurrencies such as Bitcoin and Ethereum, blockchain has rapidly expanded its reach, transforming industries such as finance, healthcare, and logistics. Its distributed and transparent nature makes it an attractive alternative to traditional centralized systems that often have issues with fraud, errors, and inefficiency (Venkatesan & Rahayu, 2024).

Blockchain technology offers several features that can enhance the sustainability of cash waqf. Management of funds can be improved using blockchain core features such as transparency and immutability, ensuring trust and accountability. Another important feature is smart contracts. By automating transactions and enforcing predefined criteria, smart contracts

may cut down on administrative expenses and deal with middlemen. Furthermore, blockchain allows for decentralized governance, enabling greater participation from stakeholders and reducing the risk of corruption.

Its ability to enable secure and transparent transactions between parties has led to increased interest in exploring its potential for social impact, particularly in the context of Islamic philanthropy such as cash waqf (Ahmed et al., 2019; Suleiman & Haron, 2020). By leveraging blockchain technology, the cash waqf system can overcome the limitations of the current system, promoting transparency, accountability and efficiency in the allocation and management of funds towards charitable causes.

Overall, blockchain technology has shown significant potential in positively transforming various industries. Its ability to create secure and transparent transactions without intermediaries makes it an appealing technology for those seeking to increase efficiency and transparency. In the context of cash waqf, the adoption of blockchain technology could address the existing challenges of accountability and transparency which contribute towards the sustainability of the Islamic endowment system.

Proposed Conceptual Framework

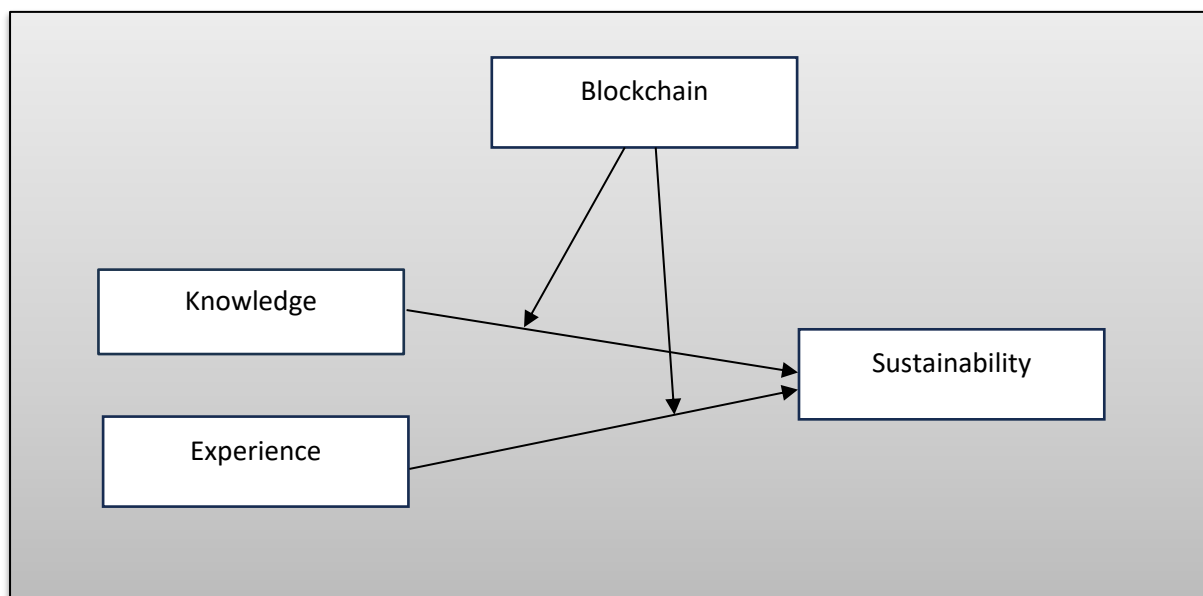


Figure 1: Suggested Framework of Study

The relationships between the variables in this framework involve experience, knowledge and blockchain which are expected to influence the sustainability of cash waqf initiatives. This framework consists of: (i). Knowledge: This can be measured by the level of education and training in Islamic finance and waqf management, knowledge of specific investment mechanisms and impact measurement tools and awareness of best practices in cash waqf governance. (ii). Experience: This can be measured in years of experience working in the cash waqf sector, specific expertise in areas like finance, investment or social development and a track record of successful cash waqf initiatives. (iii). Blockchain: This can be seen as a technological moderator that can influence the relationship between experience, knowledge, and sustainability. Blockchain can enhance transparency, accountability, and traceability in cash waqf operations, potentially leading to greater trust and confidence among stakeholders. It can also facilitate secure and efficient financial transactions, potentially improving the financial sustainability of cash waqf initiatives. (iv). Sustainability: This is the dependent variable which can be measured using a variety of indicators, such as financial sustainability (e.g., return on investment, debt-to-equity ratio), social sustainability

(e.g., impact on poverty reduction, education, or healthcare), and environmental sustainability (e.g., compliance with environmental regulations, investment in renewable energy).

3. METHODOLOGY

For cash waqf, an Islamic endowment, to have a lasting effect on charitable initiatives, it must be sustainable. The shortcomings of traditional cash waqf systems include inefficiency, accountability issues, and a lack of transparency. The new blockchain technology presents a possible way to deal with these problems. The approach for guaranteeing cash waqf's sustainability by incorporating blockchain technology is suggested in this section. The proposed methodology for this study (Figure 2) is as follows:

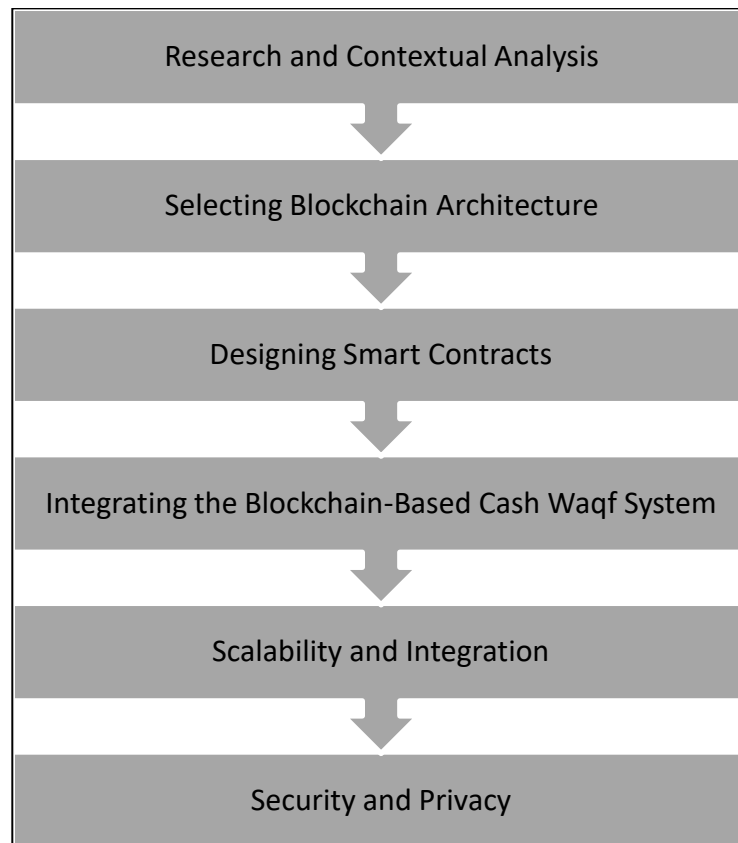


Figure 1.2: Proposed Methodology Stages

During the research and contextual analysis phase, the comprehensive review of existing literature on blockchain technology in the context of cash waqf reveals a growing body of research highlighting its potential benefits and challenges. Best practices often emphasize the transparent and decentralized nature of blockchain, fostering trust and reducing the risk of fraud in financial transactions.

However, challenges such as scalability, regulatory uncertainties, and technical complexities persist. In analyzing the specific requirements and challenges of the current cash waqf system, key issues emerge in terms of transparency, accountability, efficiency and sustainability. Blockchain technology presents an opportunity to address these concerns by providing an immutable and transparent ledger, enhancing accountability and reducing administrative overhead. Nevertheless, a degree of understanding of the cash waqf landscape is crucial to effectively integrating blockchain solutions and navigating potential challenges for a sustainable and efficient system.

The second phase is selecting the most suitable blockchain architecture for cash waqf, careful consideration of various factors is essential. The choice should focus on scalability, speed, decentralization, consensus mechanisms and customization options. Bitcoin,

Ethereum, and Hyperledger Fabric represent prominent blockchain architectures with distinct features. For cash waqf, it is imperative to weigh the specific requirements such as the number of participants, transaction volume, scalability needs, and regulatory compliance. For instance, Ethereum, with its smart contract capabilities, may offer flexibility for customization, while Hyperledger Fabric's permission structure may align well with regulatory considerations. The ultimate decision must align with the unique characteristics and goals of the cash waqf system to ensure an effective and tailored blockchain solution.

The third phase is focusing on designing smart contracts. In the design of smart contracts for the cash waqf system, a comprehensive set of protocols needs to be developed to oversee critical processes such as donation collection, project selection, fund distribution and auditing. The smart contracts should be cautiously crafted to ensure transparency, accountability and adherence to Islamic principles and regulatory requirements governing cash waqf. This entails incorporating features that align with the ethical and *Sharia-compliant* aspects of Islamic finance, guaranteeing that the smart contracts operate within the boundaries of Islamic law. Additionally, measures should be taken to address regulatory requirements specific to the jurisdiction in which the cash waqf operates. Striking a balance between technological innovation and adherence to religious and legal principles is paramount in the design phase to ensure the effectiveness and acceptance of smart contracts within the cash waqf ecosystem.

In the integration phase of the blockchain-based cash waqf system, the first step involves developing a robust platform that seamlessly integrates the chosen blockchain architecture and the designed smart contracts. This integration is pivotal to ensure the efficient execution of processes related to donation collection, project selection, fund distribution and auditing. The platform should be designed with a user-friendly interface, catering to the diverse needs of stakeholders such as donors, administrators, beneficiaries, and auditors. This interface should facilitate easy interaction with the system, providing stakeholders with transparent and accessible information. Ensuring a user-friendly experience is essential to encourage widespread adoption and active participation in the cash waqf system, fostering trust and engagement among all involved parties. The successful implementation of the blockchain-based cash waqf system relies on both the technical robustness of the platform and its accessibility to diverse user groups.

The subsequent phase addresses scalability challenges in the blockchain-based cash waqf system, it is crucial to implement mechanisms that can accommodate a growing number of transactions and participants. This involves incorporating solutions like sharding and layer-two protocols to enhance the platform's scalability without compromising efficiency. Simultaneously, efforts should be directed toward ensuring compatibility and seamless integration with existing financial and regulatory systems. Interoperability is vital, allowing the cash waqf system to interface with external networks, financial institutions and regulatory bodies. The integration process should be conducted with meticulous attention to compliance with relevant laws and regulations governing cash waqf, ensuring that the blockchain-based system aligns with established standards and legal frameworks. By addressing scalability concerns and promoting integration, the cash waqf system can achieve a balance between technological innovation and adherence to regulatory and financial norms, fostering a sustainable and inclusive financial ecosystem.

In the last phase, security and privacy, robust security measures, including encryption, access control, and digital signatures, must be implemented to safeguard the integrity and privacy of transactions and sensitive data. Encryption ensures that data is transmitted securely, access control mechanisms restrict unauthorized access and digital signatures authenticate the validity of transactions. Additionally, to proactively address potential vulnerabilities, regular security audits and vulnerability assessments should be conducted. These assessments help identify and mitigate risks, ensuring that the cash waqf system remains resilient to evolving cybersecurity threats. By prioritizing security and privacy measures, the blockchain-based cash waqf system can instill confidence among stakeholders, fostering trust in the integrity and confidentiality of financial transactions within the platform.

While the potential benefits of blockchain in cash waqf are promising, there are still challenges to be addressed. These include regulatory concerns, scalability issues, adoption barriers, and the integration of blockchain with existing cash waqf frameworks (Ahmed et al., 2019; Islam & Islam, 2019). Future research should focus on finding solutions to these challenges and developing practical implementation guidelines for cash waqf organizations.

As a conclusion, the proposed methodology aims to ensure the sustainability of cash waqf by leveraging the potential of blockchain technology. By thoroughly studying the specific requirements and challenges of the cash waqf system, selecting an appropriate blockchain architecture, designing smart contracts, and implementing a secure and scalable blockchain-based solution, the methodology seeks to enhance transparency, accountability, and efficiency, ultimately contributing to the long-term success of cash waqf initiatives.

4. CONCLUSION

Drawing insights from global best practices in waqf management and sustainability can further enrich the approaches adopted in Malaysia. Analyzing successful models from other countries and adapting them to the local context can provide valuable lessons and strategies for enhancing the effectiveness of cash waqf initiatives in Malaysia (Firdaus & Rizal, 2021). By implementing these strategies, Malaysia has the potential to establish cash waqf as a sustainable and impactful financing instrument. Overall, by harnessing innovation and technology, engaging stakeholders, and learning from global best practices, Malaysia can ensure the long-term sustainability and effectiveness of cash waqf initiatives, thereby contributing to the economic empowerment and development of the Muslim community and society as a whole (Mohsin, 2013).

In conclusion, the landscape of cash waqf sustainability in Malaysia is characterized by a blend of historical tradition, legal frameworks, current initiatives, and challenges. Nonetheless, the potential for future growth and impact is considerable, and concerted efforts in innovation, stakeholder engagement, and learning from global best practices can pave the way for a sustainable and thriving cash waqf ecosystem in Malaysia.

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