

Application of Blockchain Technology in the Management of Waqf Institutions: Concepts, Challenges and Recommendations

Norsaremah Salleh

*Kulliyah of ICT
IIUM Gombak*

Kuala Lumpur, Malaysia
norsaremah@iium.edu.my

Salina Kassim

*Institute of Islamic Banking and Finance
IIUM Gombak*

Kuala Lumpur, Malaysia
ksalina@iium.edu.my

Niaz Makhdam Muhammad

*Institute of Islamic Banking and Finance
IIUM Gombak*

Kuala Lumpur, Malaysia
niaz.m@live.iium.edu.my

Syarah Syahira Mohd Yusoff

*Institute of Islamic Banking and Finance Institute of Islamic Banking and Finance Institute of Islamic Banking and Finance
IIUM Gombak*

Kuala Lumpur, Malaysia
syarahyusoff@iium.edu.my

Nur Farhah Mahadi

*Institute of Islamic Banking and Finance Institute of Islamic Banking and Finance Institute of Islamic Banking and Finance
IIUM Gombak*

Kuala Lumpur, Malaysia
farhahmahadi@iium.edu.my

Kartina Md Ariffin

*Institute of Islamic Banking and Finance
IIUM Gombak*

Kuala Lumpur, Malaysia
kmdariff76@gmail.com

Abstract—Existing studies on performance aspects of waqf institutions have mainly focused on quantitative aspects, including financial ratios, with no inclusion of other alternative analysis tools such as qualitative measurement. To the best of our knowledge, research effort in this area has been lacking. Moreover, there is a literature gap in the adoption of modern technology such as blockchain technology in the management of the waqf entities. This is undoubtedly the missing impetus to the growth and efficiency of waqf sector, realising the high degree of accuracy, accountability and reliability it demands. This study aims to explore into the feasibility of incorporating the blockchain technology to be applied in the performance measurement system that is credible and reliable for waqf institutions in Malaysia. Three experts working in Malaysian Fintech companies were interviewed, and thematic analysis approach was used for interpreting the data. This study delves into the understanding of how the blockchain technology leads to a performance measurement system that is credible and reliable for waqf institutions in Malaysia. As found in this study, there is a necessity for using effective blockchain-based performance measurement systems for Waqf institutions once the knowledge and maturity are acquired, which will contribute towards developing a more comprehensive waqf sector. It is expected that the outcomes of this study will contribute towards enriching the literature on measuring waqf organization performance.

Index Terms—Waqf, blockchain technology, efficiency, performance measurement

I. INTRODUCTION

Islamic endowment, or usually known as Waqf is a multidimensional phenomenal that aims to address challenges in globalization such as unequal distribution of wealth, financialization of economy, reconfiguration of social policies and also viability of a welfare state [1]. Since Waqf is considered as a significant source particularly for Muslim community development today, the Waqf institutions therefore must ensure their effectiveness in managing Waqf funds and assets, so

to improve public trust and to establish an Islamic social economy that is more progressive and inclusive [2]. Based on the existing research, there are many studies conducted to measure the performance of various organizations mainly in the public, private and the third sector [3]. Nonetheless, studies related to performance measurement of Waqf institutions are still lacking. Most of the performance measurement of Waqf institutions discussed in prior studies merely revolves around quantitative approach such as accounting standards and financial ratios with no inclusion of other alternatives analysis tools such as qualitative measurement.

With the advancement of technology such as blockchain, there are several potential benefits that can be achieved with regard to the management of Waqf funds, assets and endowment documents. The blockchain technology is designed to ensure trust, security, transparency, and the traceability of data shared across a network via shared and immutable ledger that can only be accessed by verified members [8]. Hence, the blockchain technology is undoubtedly the missing impetus to the growth and efficiency of waqf sector realising the high degree of accuracy, accountability and reliability it demands.

Considering the importance of implementing blockchain technology, this study aims to explore the application of blockchain technology in managing the waqf institutions, to discuss potential challenges and possible recommendations for implementation. Understanding how blockchain technology can be implemented is important to achieve the promising benefits of the technology such as its credibility, openness, accuracy, speed of deployment, and cost savings. This paper is organized as follows: Section 2 describes the related work available in management of Waqf institutions. Section 3 describes the blockchain technology use cases. Section 4 reports the research methodology whereas Section 5 presented the

results and discussion on the challenges and recommendations of implementing the blockchain technology in managing waqf institution. Finally, Section 6 concludes this study.

II. RELATED WORK

This section describes the existing research works related to the waqf institutions management and the use of blockchain technology on waqf system. Some of the previous researchers discussed the concepts of using the blockchain technology for managing waqf institutions. For instance, in 2018, researchers in [4] conducted a review study on the applicability of blockchain as a tool to ease provision of perpetual funds for better waqf management. They have also proposed a conceptual framework of waqf management using blockchain technology focusing on movable and immovable assets. Their findings indicated that blockchain provides solutions to many current problems in waqf management in which it allows transactions to be easily auditable and reduce the cost of verification.

Previous researchers also performed a review on the effectiveness of waqf institutions management in Malaysia [2]. Their findings showed that there is no available measures or a set of core competencies that can be used to determine waqf management effectiveness. They highlighted that it is important to identify competencies such as leadership communication styles and roles that would lead to establishment of a productive organizational environment. Based on the review, many of the existing studies focused on the accountability, transparency, and financial aspects when studying the effectiveness of waqf institutions in Malaysia.

Researchers in [5] discussed the possible use of blockchain to contribute to waqf instruments. Based on their SWOT analysis, the strength of using blockchain in managing waqf is that it provides faster access, in which it eliminates intermediaries, no transfer fees, and no commission fees in the transaction process. In terms of drawback, the most relevant weaknesses relate to the scalability, energy consumption and performance aspects. Despite the drawback, waqf blockchain provides opportunity in terms of potential to collaborate with sharia fintech ecosystem, and the availability of large amount of heterogeneous data driven by the blockchain.

Another study [6] explored the potential suitability and the extent of blockchain and smart contract technology in improving and enhancing waqf institutions. The common problems faced by the waqf institutions include asset administration, transparency, accountability and governance. Their findings indicated that the implementation of the blockchain technology is still very limited to the usage of cryptocurrency such as bitcoins. Although the existence of blockchain technology will decentralize the governance on most of the things via the use of public ledger, there are several challenges that would hinder effective implementation of the blockchain technology in waqf institutions. Some of the challenges include the human resources ability to adapt with the new technology, and the concept of decentralized governance, different dimension of ownership, and borderless transparency may displease relevant

authorities, particularly the government, as they may not be able to exercise sufficient control of whatever existed under their jurisdiction.

In terms of adoption of financial technology (fintech) among waqf institutions, another group of researchers studied the perception of institutions managers involved in waqf institutions in Malaysia [7]. Using the Diffusion Innovation Theory (DOI) and analysis based on the Structural Equation Modeling (SEM), they analyzed the relationship between awareness, knowledge, relative advantage, social norms, perceived trust and fintech adoption in waqf institutions in Malaysia. Their findings indicated that perceived trust and social norms significantly influence the adoption of fintech by Malaysian waqf. However, other factors such awareness, relative advantage, and knowledge do not appear to significantly influence the adoption of fintech amongst Malaysian waqf institutions.

With regard to measuring the performance and accountability of waqf institutions in Malaysia, Arshad and Zain [3] discussed the conceptualization of waqf institutions performance based on the financial and non-financial aspects of measurement. In terms of financial measurement, the financial ratios were used as the performance measurement, whereas for non-financial measurement, the input and the outcome generated from the activities of the organization were the important measures.

III. BLOCKCHAIN TECHNOLOGY

Blockchain is defined as a “shared, immutable ledger that facilitates the process of recording transactions and tracking assets in a business network” [8]. An asset can be any tangible or intangible property (e.g., cash, patents, copyright) in which the value can be virtually tracked and traded. In blockchain, each transaction is recorded by a “block” of data, in which it can be time-stamped and the records cannot be easily altered. Fig. 1 illustrates how the blockchain technology works. Each block of transaction has a unique hash value that serves as a fingerprint.

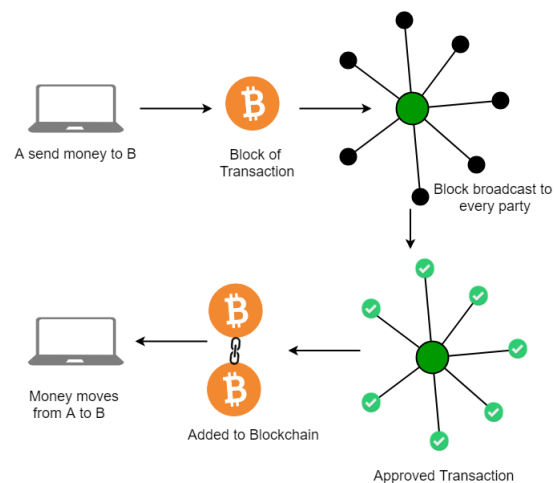


Fig. 1. Blockchain Technology (Source: [9])

According to a systematic review of blockchain [10], there are five popular research theme related to blockchain: “economic benefit”, “blockchain technology”, “initial coin offerings”, “fintech revolution”, and “sharing economy”. These themes were identified based on 119 articles retrieved from the Web of Science Core Collection focusing on Business and Economics subject area. They have suggested a few important areas for further research, which include: privacy protection and security issue, ways to manage digital currencies and how to regulate the cryptocurrency market.

In terms of adoption of blockchain technology, Iftikhar et al. (2021) [11] have proposed a theoretical framework for blockchain technology adoption in the Malaysian higher education sector. Their findings showed that perceived usefulness, competitive pressure, and top management support have a significant and positive influence on Malaysian higher education institutes’ intention to adopt blockchain technology.

IV. RESEARCH METHODOLOGY

This paper focuses on developing a blockchain-based comprehensive performance measurement framework (PMS) for efficient and sustainable waqf institutions in Malaysia. Data collection was held using a semi-structured online interview. Given the nature of the study, we aimed to conduct three (3) to five (5) interviews. The research assistant contacted experts from the industry and local government officers to invite them to participate in the study.

Due to the time and scheduling limitation of some potential participants, the interview was conducted online using Zoom, an online platform. Information about the research and consent forms were sent by email to each participant. An invitation to the interview together with the scheduled Zoom meeting was also sent by email.

Eventually, we were able to collect data from three participants (n=3) for this study due to scope and time constraints. All of them represented experts from the Fintech companies in Malaysia. Each recorded session of the semi-structured interview lasted approximately one hour and 30 minutes. The results from the analysis of data are presented in the following subsections.

Semi-structured interviews using interview guide were designed to elicit the participants’ perspective on the implementation of PMS for waqf institutions in terms of their challenges and proposed recommendations. More specifically, we would like to acquire their recommendations and to know how PMS could promote good governance in order to ensure efficient operation and sustainability of waqf institutions. Following each interview, the data gathered were manually transcribed into a Word document. Thematic analysis was employed to identify, analyse, and report themes within the data. Atlas.ti was used as a software tool to analyze the data.

V. RESULTS AND DISCUSSION

Overall remark given by the first participant (interviewee) is that there is a very important need for a framework to measure the performance of Waqf institutions in Malaysia.

However, there are several challenges that should be acknowledged and addressed, as opined by the participants of this study. Accordingly, a few recommendations have been proposed as a way forward to bring in the agenda of implementing PMS based on the blockchain technology.

A. Challenges in Implementing a blockchain-based performance measurement system in Waqf institutions

According to first participant (P1), at present there is no available complete or wholesome solution for measuring performance of waqf institutions in Malaysia. The only available systems or digitalization efforts so far include the financial or accounting system, HR system, project management system and a website. As mentioned by the P1, “I have been involved in the blockchain and the crypto world since 2016 quite deeply. I come from a technology background, so I understand it and I am involved not only in programming but developing. I have worked in many different industries on the blockchain. Now, unfortunately in Malaysia, the adoption other than that is a speculative adoption, using it as a cryptocurrency or multilevel marketing, all those kinds of things. The enterprise utilisation of blockchain is extremely poor in Malaysia. Whether it is from the financial sector or any other sector, blockchain does not exist as compared to India, Singapore, UAE, Saudi Arabia; where there are private and public use cases in the use of blockchain. In India, there is even a national digital currency that is backed by the Indian Group - Central Bank Digital Currency, being piloted in India. In Malaysia, there is no such pilot.”

Highlighted challenges include the following:

Lack of promotion. The mindset of waqf institutions is more towards management and administration, and not so much on creating awareness. It is important to “creating bigger waqf or bringing other people to contribute” as mentioned by P1. The reason for lack of promotion might be due to the fact that “Institutions are run by not IT savvy individuals” hence they are “reluctant to accept and adopt”.

Waqf institutions are not geared up for cash management. There is a need for cash waqf in future due to the difficulty in obtaining a land property. However, according to the first participant, the main issue is the mindset and the knowledge required to be able to manage cash are still not adequate.

No available entity to govern the implementation of PMS. According to the first participant, there is a need to identify the agency or entity that will be championing the effective implementation of the performance measurement framework. When there is centralized governance, setting the benchmark to compare performance of institutions can be materialized.

Decentralized Waqf management. Currently, Waqf institutions is “on the state-to-state level because the rules of each state are different”. Hence, applying a performance measurement framework is a real challenge. There should be a central body that can manage and control the pool of Waqf. Otherwise, the autonomy remains at the state level and they

have their own state rulers and state religious councils to make decisions. The third participant (P3) reiterates the point that “waqf institution today is not properly institutionalised”, hence there is a lack of standardisation.

Lack of big use case in blockchain. The first participant highlighted that the use of accepting or adopting and paying for new technology is due to specific pain point. Otherwise, there is no reason to spend extra money and blockchain became a technology that is “nice to have”. P1 mentioned “The enterprise utilisation of blockchain is extremely poor in Malaysia”. The lack of government initiatives and budgets to drive blockchain adoption contributes to the lack of big use case of blockchain in the country.

Lack of maturity to manage a blockchain system. P1 is in view that the application of blockchain in Waqf institution is not mandatory. He further mentioned that “It is something nice to have, it has its benefits, but it does not mean that Waqf cannot survive without blockchain”. It is more important to build up the knowledge and to acquire certain level of maturity before pushing for the blockchain agenda. The maturity of the process needs to be established first, at least similar to the financial banking industry.

Change management and knowledge to adopt. It requires knowledge to adopt a new technology and change management must happen in order to promote blockchain solution. The main concern is “Do they have the people that know how to use and operate it because if they are not going to use or operate it well, the ROI efficiency is not there” [P1].

Technology blueprint. Any organization has their technology blueprint, i.e., the kind of methods, servers, security, and databases they are using. All these existing setup needs to match with the new blockchain technology so to maintain the existing ecosystem. Hence, the main challenge is how to ensure the security and efficiency will not be comprised due to the introduction due to the introduction of such new technology.

B. Recommendations

Some recommendations for implementing a blockchain-based PMS have been suggested by the study participants. The recommendations include the following:

The need to define objectives. Waqf institutions need to define objectives in order to “grow the industry, to bring vision, and to create some change[s] or revolution in that industry” (P1). Traditionally, waqf institutions are purely administrative body to administer waqf assets. When waqf is managed by a professional body to administer, objectives can be defined clearly and the needs for waqf institution can be built accordingly.

Establish a proper Process and Procedure (P&P). There is a need to ensure that waqf institution operated systematically by following the standard guidelines or process and procedures. For example, there must be a process to register and monitor the performance of waqf assets, a process to register the waqf contributors, and to monitor the waqf beneficiaries.

Learn on how to manage cash waqf. P1 highlighted that cash waqf is “the future of Waqf” because it is becoming expensive to own a property or a land. Nonetheless, there is a need to shift the mindset and the learning required to be able to manage cash waqf.

Getting buy-ins. Waqf management in Malaysia is decentralized at a state level. The rules set by the states can be different because they are autonomous. Therefore, it is important to get the necessary buy-ins from the state religious councils and state ruler councils (Majlis Raja-Raja) in order to create proper and centralized governance to manage waqf in the country. This perhaps can be obtained by JAUHAR (Department of Awqaf, Zakat and Hajj). Efforts toward digitalization or automation of the process should be developed so that once the industry is matured; it would be easy to bring in technology such as blockchain.

Develop trust. Improving and gaining trust is a journey. Important actions suggested by the study participants include: take initiatives to share information because availability and visibility of information is crucial to let people (especially the public) to know what is going on or what is happening to the donation that people made for waqf institution. Secondly, there must be a disclosure of information, and thirdly the visibility of activities organized by the waqf institution. In this period of social media, information can be spread easily through various online platforms. As opined by P3, “I believe that whatever system is in place, trust should be the main thing. Elements of trust should also be applied in systems such as blockchain, accounting management, data management, etc. We no longer use conventional methods that used papers and books to store information. If there is a project, the information should be recorded immediately using whatever system in place.”

Showcase a project. Another effort that can be taken is to showcase a case study or a project and for this one, it is recommended to conduct a small project as a use case to show the viability or efficiency of implementing a blockchain-based PMS.

Establish a proper IT system. Prior to establishing an IT system to automate the processes involved in managing waqf institution, it is crucial to have a framework and a proper legislation to mandate the corporate governance. As commented by P1, “Blockchain is purely a registry of your transactions from the normal system onto a blockchain and it creates pages like traceability, transparency, etc.” P1 also stated, “A system needs to be in place, so that all data can be properly audited and be easily reported”. Overall there is a need for a PMS for waqf but it does not necessarily need to rely on blockchain technology. P1 highlighted that what is needed basically is a proper monitoring system to monitor the performance of beneficiaries and a management system that can record the waqf assets.

C. Discussion

Waqf is a crucial part of Islamic social finance since it aids Muslim communities in promoting charitable giving and social welfare. The Waqf asset’s income is used to support a

number of causes, such as those that promote social welfare, education, and religion. One of Waqf's key benefits is that it provides an ongoing and limitless stream of funding for charitable endeavours. Because waqf assets cannot be sold, the capital is maintained indefinitely and the income generated can always be used to fund charitable projects. This makes waqf a tempting option since it enables the creation of a long-term and sustainable source of funding for charitable causes. Waqf also plays a critical role in assisting Muslim communities in addressing social issues and advancing social welfare. Waqf funds have formerly been used to support a range of social and charitable initiatives, including the building of hospitals, schools, and orphanages. Waqf has so aided in addressing social issues and provided basic services to people in need [12].

Waqf institutions have contributed significantly to the building of mosques, which frequently serve as communities' administrative, cultural, and educational hubs. These mosques are said to have a crucial role in upholding Muslim nations' civilised traditions and religious practices. Additionally, it is clear that waqf actively contributes to the advancement of the educational system and the enhancement of social welfare through the construction of hospitals, libraries, and orphanages [13]. Waqf cultivates social enterprises, which ultimately makes it a useful tool for reducing income disparity and poverty on a systemic level. This helps the domestic economy grow [13].

Furthermore, an efficient performance measuring system is unquestionably important in fostering good governance and moral management of waqf institutions [13]. Many waqf institutions are currently having trouble evaluating their success in a comprehensive way that takes into account qualitative techniques encompassing more important waqf services elements including growth, effectiveness, transparency, and sustainability in addition to economic data. Consequently, some of the Waqf institutions have now started to use performance measurement practices that are rather inconsistent and in serious need of standardisation. In addition, the scope of the assessment is restricted to remuneration-related performance measurement, quality work culture initiatives, and key performance indicators (KPIs) [13].

The performance measurement systems (PMSs) for waqf institutions can also be built on blockchain technology, which is the newest technology being used in the modern economy. A number of industrial problems, such as those involving trust, security, transparency, and the dependability of data processing, can be managed by this technology. The blockchain's design also makes it possible for it to spot any problems and, if necessary, fix them. As a result of this advantage, blockchain technology can be traced, making it a helpful technology for creating an effective PMS for a Waqf institution [14]. The participants of this study have also confirmed the importance of using blockchain-based PMSs for these waqf institutions once the necessary knowledge and maturity have been acquired.

As found in this study, there is no existing blockchain-based

PMS being used by waqf institutions. There are a variety of reasons for these institutions to avoid using this technology. For instance, they do not have much concern about efficiently managing cash waqfs, and do not emphasize promotional activities, while they mainly focus on the administration and management of waqf properties. Many of the waqf institutions have also found to be reluctant to spend enough money to purchase a blockchain-based PMS. The lack of skilled manpower to operate this novel system can also be a major issue in this regard.

Therefore, this study recommends that waqf institutions need to establish a proper process and procedure (P&P) so that appropriate emphasis is given to monitoring the performance of these institutions. For this purpose, they should also prioritize the automation of the performance measurement process, and using blockchain technology can be immensely useful to achieve success in this matter. Proper attempts should be made to digitalize or automate the performance measuring process to make integrating technologies like blockchain simple after the waqf industry matures enough. In the end, this would work to enhance the trust of all the stakeholders in the operation of waqf institutions.

VI. CONCLUSIONS

In identifying the challenges and recommendations in implementing the performance measurement system (PMS), particularly in waqf institutions in Malaysia, we have conducted interviews involving industry experts. We also conducted a thematic analysis from the transcribed data to identify the theme that emerged from the conversation. The outcomes of this study confirm the necessity of using effective blockchain-based performance measurement systems for Waqf institutions once the knowledge and maturity are acquired. Several challenges and recommendations are presented in this study based on the data from the interviews conducted with industry experts. This will be helpful for enhancing the reliability and credibility of waqf institutions. Eventually, this will also play a crucial role in ensuring the efficiency and growth of the entire waqf sector, and more people will benefit from the waqf institutions in the near future.

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