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Research Article

Transformative Trends: Exploring the Nexus of Innovation, Technology, Blockchain, and Islamic Social Finance for Global Sustainability

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Abstract

Global sustainability is a growing concern, with the Islamic finance system playing a pivotal role in addressing this issue. The integration of blockchain technology, which enhances transparency, efficiency, and security, is being explored in the context of Islamic social finance. The study, combining literature review, case studies, and interviews with industry experts, highlights the potential of blockchain to revolutionize zakat management, waqf, and sadaqa processes. This can contribute to global sustainability by promoting fair transactions, wealth distribution, and socioeconomic empowerment. The case study of iBantu's collaboration with the Hidayatullah organization in Indonesia exemplifies the practical application of blockchain in digital philanthropy. The study emphasizes the importance of user-friendly, scalable, and interoperable blockchain solutions for widespread adoption and sustainability. The findings offer valuable insights for policymakers, businesses, and practitioners, suggesting strategic interventions to foster sustainable innovation. By integrating blockchain technology into regulatory frameworks and operations, Islamic social finance institutions can significantly contribute to achieving the Sustainable Development Goals while promoting environmental responsibility and socioeconomic development.

Keywords: Innovation, Technology, Blockchain, Islamic Social Finance, Sustainability

JEL Classification: O31, G23, Q56

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Dönüştürücü Trendler: Küresel Sürdürülebilirlik için Yenilik, Teknoloji, Blockchain ve İslami Sosyal Finansın Bağlantısını Keşfetmek

Öz

Küresel sürdürülebilirlik, İslami finans sisteminin bu sorunu ele almada önemli bir rol oynamasıyla büyüyen bir endüstridir. Şeffaflığı, verimliliği ve güvenliği artıran blok zinciri teknolojisinin entegrasyonu, İslami sosyal finans bağlamında araştırılmaktadır. Literatür incelemesini, vaka çalışmalarını ve sektör uzmanlarıyla yapılan görüşmeleri birleştiren çalışma, blok zincirinin zekat yönetimi, vakıf ve sadaka süreçlerinde devrim yaratma potansiyelini vurgulamaktadır. Bu, adil işlemleri, servet dağıtımını ve sosyoekonomik güçlendirmeyi teşvik ederek küresel sürdürülebilirliğe katkıda bulunabilir. iBantu'nun Endonezya'daki Hidayatullah örgütüyle iş birliğinin vaka çalışması, blok zincirinin dijital hayırseverlikte pratik uygulamasını örneklemektedir. Çalışma, yaygın benimsenme ve sürdürülebilirlik için kullanıcı dostu, ölçeklenebilir ve birlikte çalışabilir blok zinciri çözümlerinin önemini vurgulamaktadır. Bulgular, politika yapımcılar, işletmeler ve uygulayıcılar için değerli içgörüler sunarak sürdürülebilir inovasyonu teşvik etmek için stratejik müdahaleler önermektedir. Blok zinciri teknolojisini düzenleyici çerçevelere ve operasyonlara entegre ederek İslami sosyal finans kurumları, çevresel sorumluluğu ve sosyoekonomik kalkınmayı teşvik ederken Sürdürülebilir Kalkınma Hedeflerine ulaşılmasına önemli ölçüde katkıda bulunabilir.

Anahtar Kelimeler: Innovation, Technology, Blockchain, Islamic Social Finance, Sustainability

JEL Sınıflandırması: O31, G23, Q56

1. Introduction

Innovation and technology have been identified as pivotal drivers of Islamic social finance and sustainability efforts worldwide. It is crucial to understand the importance of these elements in creating solutions that meet the needs of the present without compromising the ability of future generations to meet their own needs. Moreover, the presence of Fintech (Financial Technology) nowadays is an interesting form of technological innovation and development. One of the trends and innovations that has been utilized in the fintech sector is blockchain (Chang et al., 2020). In theory, blockchain technology is pivotal for establishing such a system. The immutable nature of blockchain ensures that data cannot be altered or erased, thereby offering transparency, anonymity, and enhanced security for transactions. Given the current valuation of cryptocurrencies and decentralized finance assets at over \$40 billion, the rapid growth of Ethereum and Bitcoin in 2021 is evident. This trend has significant macroeconomic implications (Sheremetov, 2023).

As advancements in technology progress, blockchain has the opportunity to contribute to the development of Islamic social finance. In short, Islamic social finance is a crucial aspect of the broader Islamic finance system, aiming to enhance social justice by promoting fair transactions and wealth distribution. This system is deeply rooted in the teachings of the Quran and Sunnah, which form the basis for Islamic charity, philanthropy, and social justice (Kunhibava et al., 2023).

Islamic social finance is always essential to discuss, and it would be beneficial to also explore global sustainability as one of its objectives. By adhering to Shariah principles, a Muslim can lead a sustainable life, like how a financial system ensures the sustainability of the ecosystem by pursuing the final objectives (maqāsid). It is crucial to focus on 'istidāma as a fundamental component of a Muslim's life, influencing daily decisions in economics, society, and the environment, to achieve the goals of Shariah (Cattelan, 2020). Emphasizing the social aspects of Islamic finance, which are in line with global sustainability, can guide practitioners towards Islamic social finance, which is essential for fulfilling the objectives of Shariah. Therefore, the significance of Islamic social finance mechanisms in accomplishing sustainability and resolving societal issues globally has recently attracted a lot of academic interest (Tok et al., 2022a, 2022b).

This research aims to explore the intricate relationship between innovation, technology, blockchain, and Islamic social finance, focusing on their correlation with global sustainability. It seeks to understand how these elements intersect and influence each other to drive global sustainability. The study will explore the role of innovation and technology through blockchain implementation in Islamic social finance in promoting sustainable practices within the Islamic finance system.

The significance of this research lies in its potential to provide a comprehensive understanding of the transformative potential of blockchain and Islamic social finance in achieving global sustainability. This study aims to contribute to the discourse on sustainable finance and development. It offers insights that could guide policymakers, businesses, and practitioners in leveraging these technologies to foster a more sustainable and equitable financial ecosystem. Furthermore, the findings could inspire future research in the field, encouraging further exploration of the intersection between technology and Islamic social finance in the pursuit of global sustainability.

This paper is structured into two main parts. The first part provides a literature review, presenting a comprehensive overview of blockchain in fintech and Islamic social finance, and global sustainability. The second part delves into discussions with industry experts about the role of blockchain in Islamic social finance and the contribution of Islamic social finance through blockchain implementation in achieving global sustainability. It will discuss the application of blockchain technology in digital philanthropy, focusing on its potential to enhance the security and transparency of transaction records in the collection and distribution of funds. The paper will also explore case studies on blockchain implementation in Islamic social finance. Finally, the last section concludes the paper by summarizing the findings and their implications for the fusion of Islamic social finance with blockchain in the global sustainability landscape.

2. Literature Review

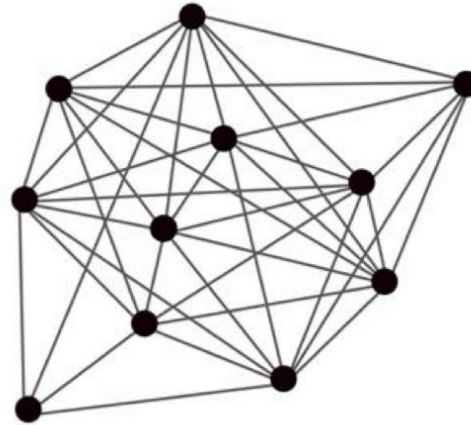
2.1 Blockchain in Fintech

Blockchain technology, particularly within the fintech sector, has appeared as a transformative force in the financial industry. This technology has been particularly relevant in the context of Islamic finance which we will shortly elaborate in Islamic social finance sector in the findings section. It can provide a decentralized and transparent platform for transactions, thereby aligning with the principles of Islamic law (Qudah et al., 2023).

2.1.1 Overview of Blockchain

Blockchain is a decentralized digital ledger that records transactions in a secure and immutable manner, without the need for a central authority like a bank or government. It runs on a network of computers, where each transaction is grouped into blocks, ensuring that the information is secure and cannot be altered once recorded (Tapscott & Tapscott, 2018). A study by Khairi et al., (2023) introduces blockchain as a network of nodes, which can be servers, laptops, or computers, that are part of the blockchain. These nodes verify, record, and store data blocks that are linked together in a chain. Each block holds multiple transaction records, and each record is named by a unique hash, a string generated by a mathematical function from a set of characters. This hash includes details about the transaction, such as the sender, recipient, other participants, date, time, and other relevant information encoded into the blockchain algorithm. Once a block is created, it is also hashed, linking it to the previous block, forming the chain. This hash also contains the transaction hashes recorded within the block. A block is only added to the chain after it has been verified by the network's participants as authentic, using a consensus mechanism. This process is ongoing without an end, and in theory, there is no upper limit to the number of blocks that can be added to the network.

Figure 1: Decentralized and distributed network of blockchain nodes



Source: (Khairi et al., 2023)

2.1.2 Blockchain Types (Consensus Algorithms)

The challenge of scalability in blockchain technology is a growing concern as more users join the network. However, by employing appropriate consensus algorithms, these scalability issues can be mitigated to a manageable level. There are several consensus algorithms recognized, including Proof-of-Work (PoW), Proof-of-Stake (PoS), Proof-of-Activity (PoA), and Proof-of-Vote (PoV). Each consensus algorithm has unique characteristics, making it difficult to determine which is superior in terms of specific criteria. Bitcoin for instance, the most renowned and influential cryptocurrency, initially introduced the Proof-of-Work consensus algorithm (Fahim et al., 2023).

However, in the case study on the finding section, we will use PoA as a consensus algorithm. Proof of Authority (PoA) is a consensus algorithm that ensures the security of private blockchains by requiring machines to undergo a thorough vetting process before creating new blocks. This process involves pre-approved participants verifying blocks and transactions, ensuring only trustworthy validators can protect PoA blockchains. PoA is less decentralized, requires low energy consumption, and has no technical rivalry between validators. It allows for more simultaneous transactions and consumes less computational power than PoW and PoS. PoA also guarantees defense against 51% of network attacks, making it a significant initiative for private blockchain networks (Fahim et al., 2023).

2.2 Understanding Islamic Social Finance

Islamic social finance is a critical component of the broader Islamic finance system, aiming to enhance social justice by promoting fair transactions and wealth distribution. Islamic social finance also promotes socioeconomic empowerment through social tools like Zakat (almsgiving), Sadaqa (voluntary), and Waqf (endowment), which have been adopted and applied even outside the Islamic world (Kunhibava et al., 2023).

Zakat is a third pillar and very crucial for the welfare of the impoverished. It is obligatory for Muslims, especially those who are wealthy, and involves a fixed rate and beneficiaries. Zakat serves as a meaningful and sustainable social security scheme by providing material support to the poor, needy, and destitute within society, enabling them to meet their basic needs and become self-reliant. It also helps those facing unemployment, insufficient medical expenses, and other hardships, including the elderly, disabled, and those in need of financial support to maintain their lives (Kuanova et al., 2021).

Waqf (Wakaf) refers to a voluntary act of charity that falls under the broader categories of Sadaqah and Infaq, which involve giving without expecting a return. This can include both tangible and

financial contributions, all of which are dedicated to specific purposes. The utilization of waqf is strictly limited to the objectives set by the donors (Global Islamic Finance, 2017).

Sadaqa is a form of Islamic Social Finance that plays a crucial role in mitigating poverty and supporting those in need. The Quran encourages giving to the poor, stating, "Who among you is willing to lend to Allah?" (Chapter 57, Verse 11), indicating that all are considered poor and that giving to the poor is equivalent to giving to Allah. This act is voluntary and can be done in any amount (no limit), unlike Zakat, which is obligatory and limited to 2.5 percent of one's wealth. This distinction allows for Sadaqa to be given without limit, making it a significant act of generosity for committed Muslims (Abdul Razak et al., 2021).

2.3 Global Sustainability

To achieve global sustainability, the United Nations (UN) has established a framework known as The Sustainable Development Goals (SDGs), which are integral to the UN Agenda 2030 and serve as the primary objectives for global socioeconomic development. The UN encourages all nations, regardless of their economic status, to strive for the betterment of humanity and the environment, combat climate change, and preserve biodiversity. Both developed and developing countries are urged to contribute to the achievement of the SDGs. The SDGs were established by the UN in 2015 with the aim of enhancing various regions worldwide. The 17 distinct goals, collectively referred to as the development goals or global goals, are mandatory for UN members to achieve by 2030 (United Nations, 2015).

The 17 SDGs represent a global call to action to eradicate poverty, safeguard the planet, and ensure peace and prosperity for all. These goals encompass ending hunger and malnutrition, achieving gender equality, providing quality education, reducing inequality, promoting economic growth, protecting the environment, ensuring access to clean water and sanitation, building resilient infrastructure, promoting peaceful and inclusive societies, and fostering partnerships for sustainable development. The SDGs are a universal call to action by all countries, regardless of their wealth, to address the world's most pressing challenges and create a better future for all while preserving the environment (Dirie et al., 2023).

Currently, there is a concerted effort by scholars, practitioners, and other intellectuals to align Islamic (social) finance with the SDGs, as well as Environmental, Social, and Governance (ESG) considerations. It is widely recognized that Islamic social finance along with Islamic finance generally, have the potential to make a significant contribution to the SDGs (Center of Islamic and Middle Eastern Law & SOAS University of London, 2020) while also by considering the ESG framework.

Despite the recognized potential of blockchain technology in the fintech sector and its alignment with Islamic finance principles, there is a notable gap in the literature regarding its practical implementation in Islamic social finance, particularly within the context of zakat management systems. While blockchain offers promising features such as transparency, security, and efficiency, its application in Islamic social finance remains underexplored. Specifically, there is a lack of comprehensive studies examining how blockchain can be effectively integrated into zakat institutions to enhance the collection, distribution, and overall management of zakat funds.

This research addresses this gap by employing an exploratory approach to investigate the practical implementation of blockchain technology in Islamic social finance. This study will provide insights into the integration of blockchain within zakat management systems in Malaysia and Indonesia. By focusing on real-world applications and outcomes, this research aims to contribute valuable knowledge to the literature, highlighting the potential of blockchain to improve the effectiveness and transparency of zakat institutions, thereby supporting global sustainability.

3. Methodology

Since blockchain technology is relatively new and still actively being studied, exploratory research is the preferred method for analyzing its application in Islamic social finance. Due to the inquisitive nature of qualitative research, Nazeri et al. (2023) utilized an exploratory research design to investigate this phenomenon, as recommended by Creswell (2009). Thus, a comprehensive exploratory approach, with interviews as the primary tool, is essential to implement blockchain in Islamic social finance.

This research uses in-depth interviews to thoroughly observe and analyze the implementation of blockchain technology in Islamic social finance, specifically within the zakat management system. Additionally, it employs an exploratory approach in a case study of iBantu and Hidayatullah in Indonesia to examine how blockchain technology has been integrated into zakat management and how it enhances zakat collection and distribution.

By overcoming the limitations of prior research methodologies, this approach enhances the reliability of the findings on how the implementation of blockchain technology in Islamic social finance can contribute to achieve global sustainability.

In conducting the interview sessions with the industry experts related to the study, we will provide several questions that can contribute to the findings as follows:

Question 1: How does blockchain technology enhance the efficiency and transparency of transactions within the Islamic social finance sector?

Question 2: Based on your experience in the industry, what are the key factors that determine the success of blockchain implementation in Islamic social finance, and how can these factors be leveraged to achieve global sustainability?

4. Findings and Discussions

4.1. The Role of Blockchain in Islamic Social Finance

Islamic social finance is a form of finance that complies with Islamic principles. E1 from Singapore believe that blockchain technology can enhance Islamic social finance by offering secure and transparent platforms for transactions, reducing costs, intermediaries, and etcetera.

“Blockchain has the potential to enhance efficiency and transparency of transactions within the Islamic social finance sector in several ways. First one is to enhance transparency. Blockchain enables transparent and immutable record keeping of transactions on a decentralized ledger. This transparency aligns with the principles of Islamic finance, which emphasizes fairness, justice, accountability, which is why we look into transparency. Our stakeholders also can access real-time information about transactions, and this can ensure greater transparency and trust within the financial system when it is used in its application. Number two, reduce intermediaries. That means less middlemen Blockchain eliminates the need for middlemen or intermediaries such as banks or financial institutions to facilitate transactions. It can go directly to the counterparty or peer-to-peer, as we say. This reduces transaction cost. It streamlines the process. Because it streamlines the process, it makes the process flow much shorter and faster, and it also increases efficiency in Islamic social finance applications. Additionally, the decentralized nature of blockchain reduces the dependency on centralized authorities to enhance financial inclusion and accessibility. Thirdly and lastly is the improved traceability. Blockchain allows you to trace the funds throughout the transaction life cycle. This is beneficial to Islamic social finance and as well to other financial transactions, not only in Islamic social finance, because when you are moving funds from one place to another, it is good to be able to trace it

so that the receiver of the funds is accountable to where the money ends up. With blockchain, stakeholders can trace the flow of funds from donors to beneficiaries, ensuring compliance with Sharia guidelines.”

(E1- Singapore)

This argument is also supported by E2 from Australia.

“The benefits of blockchain technology for finance, generally, will also apply to the Islamic finance sector. The main benefits are that blockchain technologies or distributed ledger have a number of core properties, and they lead to outcomes that are more dependable and which are also more robust. So, it enhances data integrity. And the reason it does that is because the information that is updated onto a distributed ledger must be updated in accordance with a set of rules. And those rules are operated across a network of different computers. The rules can not be changed by one player acting by themselves.”

(E2 – Australia)

4.2. The Contribution of Islamic Social Finance through Blockchain Implementation in achieving Global Sustainability

Blockchain technology's ability to provide transparency, security, and efficiency makes it a powerful tool for sustainable development. By combining blockchain with Islamic social financing mechanisms, such as Zakat, Infaq (Sadaqa) in voluntary charity, Wakaf (charitable endowment), can help accomplish the sustainability because they aim to improve communal or individual well-being by giving monetary assistance (Dirie et al., 2023).

E1 highlighted that to be sustainable, it must be very useful, it also must be able to scale and be interoperable to be a system that is completely sustainable globally.

“In order for anything to be sustainable. It must be very useful. It is like in the startup world, we call it traction. So, in order for you to get more users, it must be useful. It must be easy to use. It must be, make sense to them user friendly and all that. So, once you have achieved all of that, you will get a lot more people using it. When a lot more people using it, the system becomes very sustainable because everybody is using it. So, for me, it will be user friendliness, and then logic, and easy to use. Not efficiency, cost reduction, those kinds of things, but it must be a link to an app blockchain, like a depth decentralized application which is built on top of the blockchain with AI features and then you can make it into an app. So, if you know, everybody's know using apps, if you can build in an app which is integrated to blockchain and AI and is user friendly, it looks attractive, the page movements, the buttons make sense where it's supposed to be easy to find, it has all the features and functions that the customers are you looking for the users are looking for. Then we gain a lot of traction, and it will become sustainable, then there is the most important first part. Second part is it must be able to scale and be interoperable. So that means when you build something so secure on the blockchain. One of Blockchain's most useful features is in scalability. But to be scalable, that means all other systems need to be able to connect to this particular blockchain. So, as you know, there are different blockchain protocols. There is ethereum, there is so many, right? Different ledgers are the decentralized ledger system we call it, and so many different systems. So, how do we make it scalable? We make it interoperable. How do you make it interoperable in the software will we use? That what we call as API (Application Programmable Interface). So, when you have

two enterprise systems, they are built on different protocols or different programming languages, python, or C++ (C plus plus), or whatever whatsoever. But what makes the two enterprises system that is built differently be able to communicate with each other is the API. So, API is to put it simply, like when you travel, you have that adapter plug for your electricity. So, in Indonesia you may have the 2 PIN plug, in Singapore we have the 3 PIN plug, and all that. So, it is like a multiple plug that allows you to communicate between the different systems. So, the second more important one is the interoperability so that you can leverage on the scalability. Once you get traction, everybody is using it, then you try to integrate more services built by other people so that you don't have to rebuild it, then it becomes interoperable and scalable. Then you will be a system that is completely sustainable globally, because everyone will be wanting to use it because it is easy to use and user friendly.”

(E1- Singapore)

E2 added the key success to enable its implementation, he believes:

“The key to success with introducing anything new is to be able to, firstly, explain it clearly. But secondly, to also be able to listen to the users within a community and understand what their objectives are and what their challenges are, and then together design a solution that makes the most out of the technology. So, just like any other change process, introducing anything new, it must be done with a clear purpose. So, our experience is trying to help people to be ready for change so that if they are forced to change, they can do it. But also, if they are not forced to change, they can take the proactive steps to begin their own digitalization and innovation journeys using these technology tools to improve services, to improve transparency, and to improve data integrity.”

(E2 – Australia)

In addition to be sustainable, beside Islamic finance itself, E1 added that there is a need to level up and develop Islamic principles and implications into modern applications.

“They are kinds of trying to give you a broad understanding of what sustainability is from an Islamic perspective with what the conventional has already done. I think that is another besides Fintech. Finance is lagging, and we need to level up and get to it. Because we have two groups of people that you have the non-Muslims who already understand sustainability from the conventional segment. And then we are trying to understand what Islamic sustainability is. Okay, so there is one group to address, and then the other group is the Muslims. Who thing that, “Oh, Islam already covers sustainability.” But they do not understand net zero target goals, they do not understand NDC (Nationally Determine Contributions), they do not understand what the conventional world is using as metrics to reach the sustainable goal and all that. So, because they say, “Islam already covered this, we have Zakat-Wakaf, we know this one will cover everything. But we know Zakat and Wakaf is social institutions. But when you talk about sustainability, you have ESG as this is globally everybody agrees on the ESG framework. Environment, Social, and Governance. “S” social, we have covered with Wakaf and Zakat. “G” Governance we cover with our sharia guidelines, Sharia principles and Sharia compliant procedures and everything. But what about “E” environment? So, we need to develop that we cannot just this means by saying, “Oh, Islam has everything.” Yes, Islam has everything. But just like Islamic finance. We did not approach Islamic finance by saying, “Oh, yeah, Islam, cover this finance.” Islam is that we did not mean we took the time to develop financial system, economic system, financial tools, great piece of Islamic law contracts, we learn about

debt, we learn about speculation, we learn about derivatives, that what is halal, what is not halal, and then we learn about definition of money. So, it takes time to develop. We cannot just say that “Oh, Islam has everything.” Yes, Islam is everything, but it is up to us as Muslims to understand what Islam is. What do you call this, develop (Islamic) principles and implications that is grounded by what Islam says into modern applications.”

(E1- Singapore)

4.3. Case Study of Blockchain in Islamic Social Finance: Finalising the Work in Progress - iBantu with Hidayatullah and Blockchain Implementation for Digital Philanthropy in Indonesia

This exploration of the nexus between innovation, technology, blockchain, and Islamic social finance is supported by our own case study in iBantu. This case study has revealed the practical application of blockchain in the Islamic social finance sector, it could be as the implementation of the world's first blockchain in digital philanthropy in Indonesia.

iBantu is a specialist in Islamic finance and a technology partner for Web3.0 Blockchain, providing training and consultancy, and solutions to corporations and individuals. Recently, iBantu is actively engaging with Baitul Mal Hidayatullah (BMH) and Baitul Wakaf under the Hidayatullah organization to pioneer the use of blockchain technology in zakat management in Indonesia. This initiative aims to revolutionize the recording on the collection and the distribution of zakat, facilitating transactions through the use of tokens for zakat, waqf, and infaq (sadaqa) payment as well as reducing their operational cost, enhance transparency, security and efficiency for both donors and Hidayatullah organization. The enthusiastic response from BMH Hidayatullah underscores a growing interest and readiness to embrace blockchain technology in zakat management.

To give a better understanding for the case study, we will explain further the transaction scheme. The donor begins the donation process by using the iBantu platform or customize platform as for Hidayatullah, either creating an account or logging in. Next, the donor chooses the donation project(s) and specifies the donation amount. The donation, in the form of fiat money, is then transferred to the registered bank account of Hidayatullah or an authorized payment gateway. This action triggers the Wakalah (agent) contract, which includes its Terms and Conditions (T&C) and is encoded into a smart contract.

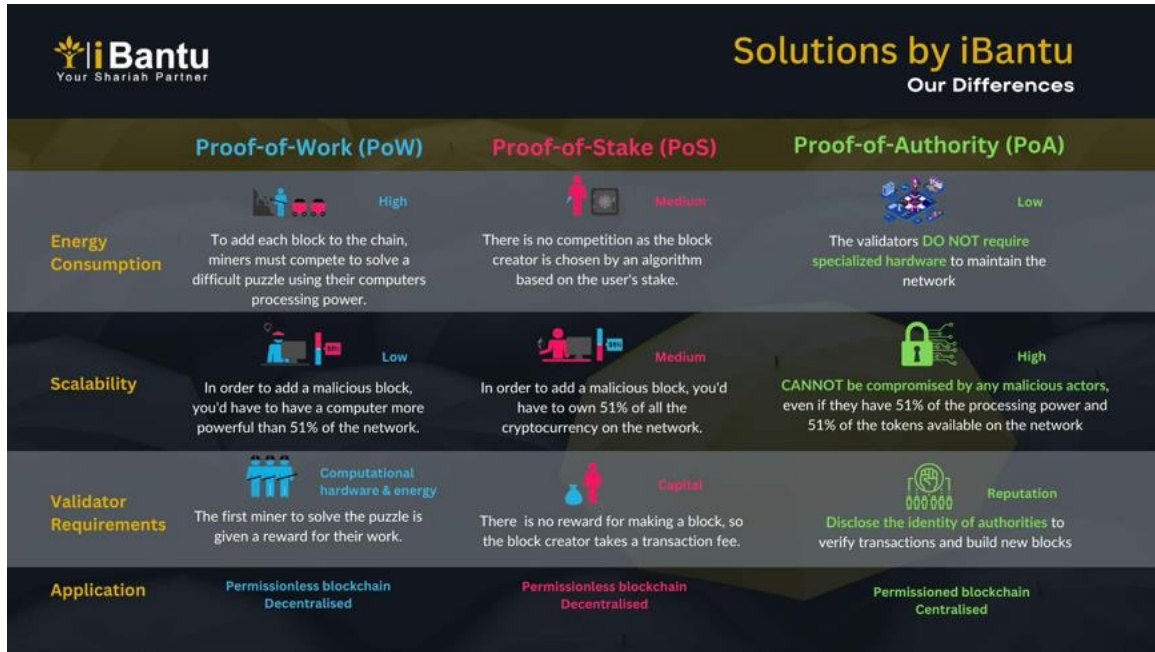
Following the transfer, the donated amount is converted into tokens through a process known as tokenization. This conversion takes place on a blockchain that operates on the Proof-of-Authority (PoA) consensus mechanism. For each fiat money donation, an equivalent number of donation tokens are issued to a dedicated digital wallet and a multi-signature (multi-sig) signer. These tokens are ERC20 tokens, custom tokens on the Ethereum blockchain or any Ethereum-compatible blockchain, such as Polygon.

In the PoA-based blockchain (figure 2 and 3), authorized verifiers or committees manage the tokens in the digital wallet and organize the distribution of tokens to the donation targets. The Wakalah contract is executed at this stage, with the committee acting as the wakil and adhering to the assigned T&C. The donation tokens are distributed to three categories:

1. Zakat beneficiaries, who are individuals represented by charity organizations or foundations, without involving vendors or suppliers.
2. Project financing, which includes vendors or suppliers for projects such as schools or scholarships, disaster relief, construction, and medical expenses for hospitalized individuals.
3. Operations expenses of the Charity Organization.

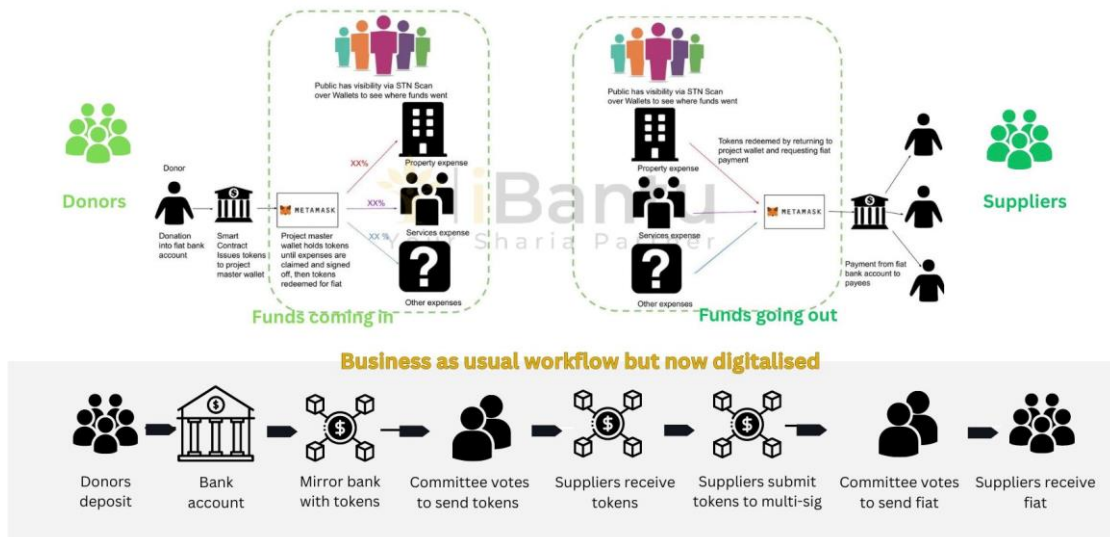
Suppliers or individuals represented by organizations submit tokens to multi-sig signers, where the committee votes to release the fiat money. Finally, suppliers or individuals receive the fiat money (figure 4).

Figure 2: iBantu choose PoA (Proof-of-Authority)



Source: Author's own (iBantu)

Figure 3: Transaction Scheme (Donation Journey) with Multi-sig Signer Verification



Source: Author's own (iBantu)

This case study demonstrates the feasibility of integrating Islamic social finance with blockchain technology. Initially, it shifts trust from human-operated entities to machine-operated ones, eliminating the risk of deception in transactions. Additionally, the smart contract, which encodes the contract terms and is stored on the blockchain, automatically settles transactions upon the occurrence

of a specified event. Finally, the immutable nature of the blockchain allows for the verification of transaction details at any time, ensuring that once a transaction is recorded, it can not be hacked by human intervention (Kunhibava et al., 2023).

5. Conclusion and Recommendation

The integration of blockchain technology within the Islamic social finance sector represents a transformative trend with significant implications for global sustainability. By leveraging the inherent characteristics of blockchain, such as decentralization, immutability, and transparency, Islamic social finance institutions can enhance the efficiency, security, and accountability of their operations. This not only aligns with the Islamic principles but also contributes to the broader objectives of the Sustainable Development Goals (SDGs) by promoting fair transactions, wealth distribution, and socioeconomic empowerment. The case study of iBantu's collaboration with the Hidayatullah organization in Indonesia exemplifies the practical application of blockchain in digital philanthropy, demonstrating the potential for blockchain to revolutionize zakat management, waqf, and infaq processes.

The insights gained from this exploration have profound implications for policymakers, businesses, and society at large. Although, our contribution remains within the limits of existing literature analysis, case study and discussions with two industry experts only. There is a clear need for strategic interventions to foster sustainable innovation. Policymakers should consider incorporating blockchain technology into regulatory frameworks to support Islamic social finance initiatives. Businesses as Islamic social finance institutions, on the other hand, should explore the implementation of blockchain in their operations to improve transparency, security, and efficiency, thereby contributing to global sustainability.

AUTHORS' CONTRIBUTION

The contributions of the authors to this article are equal.

CONFLICT OF INTEREST DECLARATION

There is no financial conflict of interest with any institutions, organization or person, and there is no conflict of interest between the authors.

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APPENDIX 1

Table 1: A Brief Background of the Participants

Experts	Institutions and Backgrounds
<i>Singapore</i>	
Expert 1	<p>He is the Managing Director of Stellar Group in Singapore, where he has provided Islamic Finance, Fintech and Sustainability implementation consulting services to businesses and national offices, including multi-lateral organizations such as the ASEAN Secretariat and the UNCDF.</p> <p>He also runs IBF-funded Fintech and Digital Transformation courses in Singapore and is the author of three internationally renowned books: "Beyond Fintech: Technology Applications for the Islamic Economy" (World Scientific, 2021), "Blockchain, Fintech, and Islamic Finance: Building the Future in the New Islamic Digital Economy" (De G Press, 2019; 2d Edition, 2022). He holds a BSc in Engineering, a MSc in Finance and received his PhD in Islamic Finance from INCEIF.</p>
<i>Australia</i>	
Expert 2	<p>He is a Chairman at Smart Trade Networks, Author of China, Trust & Digital Supply Chains and Research Leader in Value Flows. His specialties including in Economic digitalisation & 4th Industrial Revolution, Decentralised or distributed ledger technologies, blockchain, digital assets design and implementation & Blockchain-enabled supply chain integration, Internet of Things, Big Data, China and international political economy, social impact analysis, Industry and community development innovation and finance, Regional Development, Public policy impact analysis, international affairs, trade, and political economy.</p>