Blockchain zakat: An integrated financial inclusion strategy to manage Indonesia’s potential zakat funds

Afifah Nur Millatinaa, Risanda A. Budiantorob, Rahmad Hakimc, Febrianur Ibnufi

a Faculty of Islamic Studies, University of Muhammadiyah Malang, Malang, Indonesia; afifahmillatina@umm.ac.id
b Faculty of Economics and Business, Dian Nuswantoro University, Semarang, Indonesia; risanda.abe@gmail.com*
c Faculty of Islamic Studies, University of Muhammadiyah Malang, Malang, Indonesia; rahmadhakim@umm.ac.id
d Faculty of Economics and Business, Dian Nuswantoro University, Semarang, Indonesia; Febrianur3@gmail.com

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ABSTRAK

Penelitian ini bertujuan menganalisis strategi inklusi keuangan terintegrasi dana zakat potensial di Indonesia melalui blockchain. Metode pendekatan yang digunakan adalah penelitian kualitatif dengan alat analisis berupa business model canvas. Teknik pengumpulan data menggunakan studi pustaka. Inti dalam pengelolaan dana zakat menunjukkan agar harta zakat tidak mengendap tanpa ada hasilnya. Semakin banyak dana zakat yang dikumpulkan, dikelola dan didistribusikan maka semakin besar juga kebermanfaatannya bagi mauquf alayh. Selain itu, semakin besar pula pahala kebaikan yang akan mengalir kepada pihak wakif dan semakin besar dana yang diterima nazhir. Hasil penelitian mengindikasikan bahwa program zakat blockchain membantu agar target atau sasaran dari pengelolaan zakat dapat tercapai, yaitu meningkatkan kebermanfaatan dari harta zakat; melakukan integrasi antarlembaga sehingga tidak saling tumpang tindih dalam mengembangkan zakat secara sistemik; menjalankan peran sebagai pengawas dalam perencanaan, pengorganisasian, pelaksanaan hingga evaluasi nazhir zakat; dan berkontribusi dalam pencapaian tujuan sosio-ekonomi pembangunan nasional baik dalam jangka pendek, menengah hingga panjang. Hal ini karena blockchain memfasilitasi transaksi yang lebih terdesentralisasi dan tanpa batas. Secara garis besar, penelitian ini menyimpulkan bahwa sifat desentralisasi dan borderless dari blockchain semakin meningkatkan potensi pengumpulan dan pemanfaatan zakat di Indonesia.

*Corresponding Author
**A B S T R A C T**

The research aims to analyze the potential of using blockchain to promote integrated financial inclusion through Indonesian potential zakat funds. We use a qualitative approach (the business model canvas) as the analysis tool. We generate the data using the literature study. The essence of the zakat funds management implies that zakat assets should not be left idle. Further, greater zakat funds collected, managed, and distributed will deliver more benefits to mauquf alayh, greater divine rewards to the wakif, and greater funds received by nazir. Our results indicate that the zakat blockchain programs offer various benefits because blockchain facilitates more decentralized and borderless transactions. The benefits include achieving targets more effectively; avoiding overlap; developing zakat more systematically; monitoring more effectively in planning, organizing, actuating, and evaluating nazhir zakat; and contributing to short, medium, and long-term national socioeconomic objectives. In sum, we conclude that more decentralized and borderless blockchain-facilitated transactions potentially enhance Indonesian zakat funds' potential collection and utilization.

**INTRODUCTION**

Poverty remains a serious socioeconomic problem faced by many countries, including Indonesia. It is also closely related to unequal income distribution and growth that countries exhibit relatively high growth but with fewer benefits to their citizens (Nurzaman, 2016; Todaro & Smith, 2011). Consequently, poverty rate, poverty gap index (P1), and poverty severity index (P2) indicate countries’ development quality.

| Period       | Poor People (million) | Percentage (%) | Poverty Gap Index (P1) | Poverty Severity Index (P2) | Gini Ratio |
|--------------|-----------------------|----------------|------------------------|-----------------------------|------------|
| March 2015   | 28.59                 | 11.22          | 1.97                   | 0.53                        | 0.408      |
| September 2015 | 28.51                | 11.13          | 1.84                   | 0.51                        | 0.402      |
| March 2016   | 28.01                 | 10.86          | 1.94                   | 0.53                        | 0.397      |
| September 2016 | 27.76                | 10.7           | 1.74                   | 0.44                        | 0.394      |
| March 2017   | 27.77                 | 10.64          | 1.83                   | 0.48                        | 0.393      |
| September 2017 | 26.58                | 10.12          | 1.79                   | 0.46                        | 0.391      |
| March 2018   | 25.95                 | 9.82           | 1.71                   | 0.44                        | 0.389      |
| September 2018 | 25.67                | 9.66           | 1.63                   | 0.41                        | 0.384      |
| March 2019   | 25.14                 | 9.41           | 1.55                   | 0.37                        | 0.382      |
| September 2019 | 24.78                | 9.22           | 1.55                   | 0.37                        | 0.379      |

Source: Central Bureau of Statistics Indonesia (2019a)

Table 1 suggests that the Indonesian government can reduce poverty effectively, as indicated by the whole indicators declined annually. Specifically, the
declining numbers of poor people and the poverty rate imply that people living below the poverty line have declined. The poverty gap index (P1) in rural and urban areas also declines, suggesting that poor people have improved their conditions and approached the poverty line. Similarly, the poverty severity index (P2) in rural and urban areas also declined, indicating that expenditure gaps between poor people in cities and villages have narrowed. The Gini ratio has also declined, suggesting lower aggregate disparity. Despite declining poverty indicators in Indonesia, poverty remains a serious problem (Rashid, 2018).

In this respect, Islamic financial instruments, including zakat, infaq, sadaqah, and waqf funds, potentially offer solutions to the poverty problem. Several studies, such as Adnan et al. (2021); Sari et al. (2019); Shirazi (2014), suggest that zakat funds as an Islamic financial instrument can reduce the number and percentage of low-income families, poverty gap index (P1), and poverty severity index (P2). Professional zakat management (productive management and investment) is the key to effective zakat utilization. Prior studies document that some countries can utilize their zakat potentials effectively to mitigate their socioeconomic problems (Kasri, 2017; Medias, 2017). The zakat concept is also in line with the Sustainable Development Goals (SDGs), especially in economic terms, that stipulates the provision of decent works and inclusive and sustainable growth (goal 8); infrastructure, innovation, and industrial development (goal 9), and the reduction of economic disparity (goal 10) (Ayuningtyas, 2010).

However, zakat funds as an Islamic financial instrument have not been managed optimally due to lack of popularity and several managerial problems. The argument is empirically supported by the fact of declining Indonesian licensed ZMOs (Zakat Management Organizations – Organisasi Pengelola Zakat) that consist of BAZNAS and LAZ. at national, provincial, or municipal levels. According to the Pusat Kajian Strategis BAZNAS (2020), the number of ZMOs has declined from 617 (2018) to 572 (2019), potentially expanding the gap between zakat potentials and actual revenues. Furthermore, although the collected ZIS (zakat, infaq, shadaqah) has increased, but the growth fluctuated with a declining trend (see Figure 1).

According to Hoque et al. (2015), zakat fund management’s main problem is related to less supportive regulations, lack of political will, muzakkis’ lack of trust on public and private Z.M.O.s, and internal problems such as lack of accountability and transparency and managerial problems. These problems widen the gap between zakat potentials and realization significantly.

Effective zakat fund management is crucial for the usefulness of zakat fund management for the greater public interests (Othman et al., 2015). Consequently, it is crucial to managing zakat funds professionally, transparently, and accountably (Budi, 2015).
Thus, this study’s urgency is the management of zakat fund management through blockchain zakat or the creation of a crowdfunding platform through a blockchain system (Hasan et al., 2020). This issue is important to enhance the efficiency of the digital Indonesian zakat fund management (collection and management) system. The blockchain system enables ZMOs to collect and utilize zakat funds for specific purposes more effectively and accountably that stakeholders can monitor the effectiveness of the funds. The crucial factor in blockchain zakat fund management lies in the distribution process because zakat will empower more precisely and optimally for the ummah (Shariff et al., 2011).

Based on the introduction above, we seek to develop an integrated financial inclusion strategy in managing Indonesian zakat funds more productively. Thus, this study aims to: (1) analyze the reasons for suboptimal zakat fund management, (2) analyze the application of optimal blockchain system in zakat fund management, and (3) analyze the impacts of the application of blockchain system in zakat fund management.

LITERATURE REVIEW

Zakat Fund Management – A General Description

Zakat fund management as a philanthropic instrument consists of several interrelated components, including:

![Graph of ZIS Fund Collection and Growth](source: Pusat Kajian Strategis BAZNAS (2020), modified)

Figure 1
ZIS. Fund Collection (Rupiah and Growth)
Zakat fund management scheme will generate significant multiplying socioeconomic effects for the public when each scheme element performs its intended activities (Hussain, 2019). Nevertheless, it is worth noting that zakat fund management requires regulators that enact regulations and supervise amil’s process (Shulthoni & Saad, 2018). Amil’s consultative deliberation determines the disbursement of zakat funds to avoid overlaps by directly giving the zakat to eight prioritized groups and financing investment projects that offer the greatest benefits to the ummah (Rédha et al., 2016).

The centralization of zakat fund management has been introduced since Rasulullah saw and his companions (sahabah). Nevertheless, the system needs some character and condition adjustments to achieve zakat targets by strengthening zakat’s institutional regulations through the following actions (Rehman & Pickup, 2018): (1) enhancing zakat wealth’s usefulness; (2) performing inter-organizational integration to avoid overlaps in systemic zakat development; (3) assuming the roles in the planning supervision, organization, implementation, and evaluation of ZMOs and LAZ; and (4) contributing to the achievement of short, medium, and long-term
socioeconomic development goals.

The Blockchain Work System

Blockchain work system consists of the ledgers of all transactions that are decentralized into the P2P networks that enable participants to transfer an expected amount (Rabbani et al., 2020). Besides, blockchain technology represents digital records that record each transaction distributed in many computers (nodes). The blockchain system enables transaction processing without involving third parties or specific organizations, potentially improving efficiency (see Figure 4).

![Blockchain Diagram](source.png)

Source: Thottathil (2018), modified

**Figure 4**
The Blockchain Work System Mechanism

The system starts when a user submits a transaction request (1) that is forwarded to the P2P networks that consist of several other users or computers (commonly known as nodes) (2). The node network is then validated or authenticated to ensure the validity of transactions and users’ status by using specific algorithms with the cryptography system (3). Validity can be in the form of transactions, contracts, records, or other information (4). Cryptocurrency consists of the following specifications: (a) no intrinsic values (cannot be redeemed with other commodities, including gold, (b) no physical form (only networks), (c) fully decentralized networks and offerings that are not determined by central banks (5). After verification, transactions are grouped with other transactions to create larger data blocks (6). New data blocks are then added to the blockchain structure consisting of other existing blockchains. The networks involve unique, permanent, and interrelated parameters that cannot be modified and rechanged because of their permanency characteristic (7). Transactions have been completed (8).
RESEARCH METHODS

Research Approach

This study employs a qualitative approach with the business model canvas analysis to illustrate and develop the zakat blockchain concept to improve the management of potential Indonesian zakat funds. This approach is crucial due to massive yet suboptimally managed zakat fund potentials. This study proposes more productive zakat fund management for ummah’s greater benefits, especially the eight prioritized asnaf groups.

According to Osterwalder & Pigneur (2010), the business model canvas will illustrate an entity that comprehensively creates, delivers, and captures produced values. Conceptually, the business canvas model implementation consists of two sides (the right-hand side represents creativity and the left-hand side reflects logic) containing nine components, including (1) customer segment, (2) customer relationship, (3) customer channel, (4) revenue structure, (5) value proposition, (6) key activities, (7) key resource, (8) cost structure, and (9) key partners (see Figure 5).

![Business Model Canvas](image)

Source: Kurniasari & Kartikasari (2018); Priyono (2015); Tjitradi (2015)

**Figure 5**
Nine Main Components of Business Model Canvas

Research Flow and Conceptual Framework

This research is based on systematically and sequentially organized research flows to arrange appropriate strategies in managing blockchain-based zakat fund management. The research flow scheme starts with the Indonesian socioeconomic problems and suboptimal zakat fund management. Nevertheless, this Islamic financial instrument can reduce existing socioeconomic problems if utilized optimally. The rapid development of financial digitalization also potentially facilitates blockchain-based management of potential zakat funds.

The implementation can be an ideal financial inclusion strategy in optimizing
Indonesian zakat fund management that offers accountability, transparency, effectiveness, and monitorability. In this respect, more professional and modern zakat fund management systems arguably improve ummah’s socioeconomic welfare.

![Research Flow Diagram]

**Data Type and Source**

This study uses secondary data to formulate ideal strategies for developing Indonesian blockchain-based zakat fund management. We generate data from various sources, including relevant literature, documents, and reports issued by ZMOs.

The conceptual framework demonstrates that the blockchain-based zakat projects involve three parties (Zainal et al., 2016): (1) muzakki (donors), (2) ZMOs consisting of BAZ and LAZ that manage zakat and need better managerial and entrepreneurial skills in optimizing zakat projects, and (3) mustahiq (beneficiaries). Zakat funds management should focus on eight entitled community groups to improve
ummah’s economic conditions and welfare by utilizing various program alternatives that combine social, economic, and environmental factors.

RESULTS AND DISCUSSION

General Description of Blockchain Zakat in the Management of Potential Zakat Funds

Historically, the instruction to perform zakat started with the revelation of QS at-Taubah: 103 when in 10th of Hijri year, the Prophet delegated his companions, including Mu’adz bin Jabal, to collect zakat from rich people and distribute the fund to the poor and other mustahiq in nearby locations. In a similar vein, one of the Prophet’s companions, Khalifah Abubakar Ash Shiddiq (11-13 Hijri or 632-634 AD), issued an ultimatum for muzakki who had reached the nishab but refused to perform their zakat duties. He simply assumed that these people did not recognize his authority.

The blockchain system will arguably improve the professionalism of zakat fund management. The blockchain system adopts the technology used by bitcoin currency that has existed for the last decade. Blockchain results from IR 4.0-era innovation that the public has warmly accepted. According to Anggraito (2020), the blockchain platform recently focuses on zakat fund management but will potentially offer broader financial services to other entities, including zakat fund management. For example, Finterra, a Singapore-based financial technology, has developed a blockchain-based crowdfunding platform to manage waqf funds more efficiently and transfer the funds for specific social projects.

As suggested by Sukmana (2020), blockchain-based zakat fund management is arguably more optimal and effective (in terms of transparency and affordability). In this respect, ZMOs, mustahiq, and muzakki belong to the same blockchain system that promotes better access and ease of monitoring. Furthermore, the blockchain system can reach muzakki borderless and globally, enabling muzakki in a certain country to donate their funds to other countries, thus potentially accumulating greater funds,
wider scope, and greater multiplier effect.

Blockchain refers to a technology resembling ledgers where each transaction is recorded, forming a coherent unit. The system employs cryptography signatures and public key infrastructure that ensure safe recording processes (Lemieux, 2016). It records each transaction and forms certain blocks as the databases that will be accumulated from the entire transactions. Each block is provided with a time-stamp to avoid duplication. Each block is connected using a cryptographic algorithm that will form chains. Each user will store digital transaction evidence because the transactions are replicated and distributed to the user accounts. Thus, each user can check their transactions.

Blockchain-based zakat fund management has several objectives, including (1) becoming the center of sharia economy-based community that develops sustainably, (2) enabling Indonesia to be the center of zakat platform, (3) stimulating openness in zakat management (muzakki receive information about the use of their zakat funds that enhance ZMOs’ credibility), and (4) facilitating zakat fund monitoring (muzakki can monitor the impacts of their zakat funds and select the monitoring methods of zakat management funds).

Blockchain consists of ledgers of all transactions decentralized into P2P networks that facilitate participants to transfer intended amounts. Besides, blockchain technology is a digital record that records each transaction scattered in many computers (nodes). The blockchain system processes transactions without involving any party or specific organization to enhance transaction-processing efficiency. The following figure illustrates how blockchain technology can optimize zakat fund management.

Source: Rashid (2018), modified

**Figure 8**
The Scheme of Blockchain-based Zakat Fund Management
The following explanation illustrates the above figure:

1. Regulated and monitored Indonesian ZMOs (BAZ and LAZ).
2. BAZ and LAZ prepare zakat chain based on an open-source development environment through tokens to generate funds in smart project contracts.
3. Muzakki, who have achieved nishab buy token and the accumulated funds are managed by ZMOs. Muzakki can select the payment methods (cash and other asset zakat) depending on the zakat type.
4. After zakat funds from various muzakki sources have been accumulated, ZMOs are fully in charge of managing the zakat funds according to the existing akad in the blockchain mechanism.
5. The distribution of zakat funds is expected to improve the socioeconomic conditions of mustahiq or the eight prioritized zakat beneficiaries.
6. When zakat fund management has been effectively accomplished, independent auditors evaluate the blockchain-based zakat fund management.
7. ZMOs are in charge of preparing the amount of zakat funds they have managed.

The optimal use of blockchain platforms in managing zakat funds requires synergy between stakeholders. The development of zakat fund management model refers to stakeholders’ roles and responsibilities, as indicated by the fact the muzakki, amil, and mustahiq affect and are affected by the processes of zakat fund accumulation and distribution (see Figure 9).

![Figure 9](image-url)  
**Figure 9**  
The Synergy in Blockchain-based Zakat Fund Management

The synergy of the Indonesian blockchain-based zakat fund management is represented in three parts, namely: (1) the red line illustrates the two-way, direct and
indirect, interactions between muzakki and ZMOs; (2) the blue line represents the two way, direct and indirect, interactions between mustahiq and ZMOs, and (3) the black line illustrates the two way, direct and indirect, interactions between mustahiq, muzakki, and ZMOs. However, the success of zakat fund management depends not only on these three actors’ roles, but also on their cooperation with regulators who facilitate the legal protection of zakat fund governance and mass media to socialize the zakat fund management the public. Zakat fund management is expected to improve mustahiq’s conditions to become muzakki and socioeconomically self-reliant.

The scheme informs that amil holds the central role that they need to have reliable human resources, institutional and governance resources, SOP, work plans, and knowledge of the blockchain platform to facilitate more transparent and accountable zakat fund management. Such management will arguably optimize zakat fund management.

Muzakki plays their role by paying their zakat obligation when they have achieved nishab, supported by amil’s performance in preparing, auditing, and publishing their zakat fund management (accumulation and distribution). Both will create multiplier effects that improve the trust in amil’s performance and increase zakat fund accumulation and distribution. Meanwhile, from the mustahiq’s perspective, zakat fund management should focus on zakat fund management through various activities, including grant, financing, and empowerment, to improve mustahiq’s socioeconomic conditions.

The Business Model Canvas in the Development Strategy of Blockchain Zakat

Highly potential – yet suboptimally managed - zakat funds require the blockchain system to develop zakat management more modern and professional to alleviate socioeconomic problems more effectively. Hence, it takes a comprehensive analysis of this issue, including the business canvas model, to maximize the zakat potentials in Indonesia.

The Potentials of Blockchain Zakat

Blockchain arguably offers a novelty to optimal zakat fund management. Nevertheless, the success of replicating the blockchain platform largely depends on complying with the legal foundations of zakat fund management (Al-Quran, Hadits, and other formal rules such as Act No. 23 of 2011 concerning Zakat Management, Government Regulation No. 14 of 2014 and Presidential Instructions No. 3 of 2014. Further, Financial Services Authority (FSA) and Bank Indonesia also regulate digitally based zakat management through FSA Regulation No. 13 /P.O.J.K.02/2018 concerning digital financial innovation in the financial service sector and Circular of Bank Indonesia No. 18/22/DKSP regarding operation of digital financial services.

However, these regulations have not specifically regulated financial technology using zakat instruments, although several startup firms have offered digitally based
zakat fund activities to optimize zakat fund management. Blockchain-based zakat management seeks to modernize zakat management by offering easier transactions, improving access to sharia financial products (especially zakat), and enhancing financial literacy to generate multiplier effects for the national economy.

Nevertheless, Indonesia has huge potential zakat funds, as indicated by its Muslim population of around 270 million, accounting for 87.18% of its total population. Besides, the Indonesian population exhibit increasing per capita income. This fact is crucial because muzakki has to donate their assets that meet the requirements set in Islam, including (Afiyana et al., 2019): (1) assets must be fully owned, (2) assets can grow in the future, (3) assets have reached nishab, and (4) assets are the excess of basic needs (see Table 2).

| Year | Total Indonesian Muslim Population (People) | Per Capita Income (Rp) |
|------|---------------------------------------------|------------------------|
| 2014 | 199,967,101                                 | 28,890,800             |
| 2015 | 200,133,823                                 | 31,360,300             |
| 2016 | 207,176,162                                 | 47,960,000             |
| 2017 | 209,100,000                                 | 51,890,000             |
| 2018 | 225,250,000                                 | 56,000,000             |
| 2019 | 276,185,010                                 | 65,644,650             |

Source: Badan Amil Zakat Nasional (2019); Canggih et al. (2017); Central Bureau of Statistics Indonesia (2019b), modified

The hugely potential zakat fund is due to the Muslim population that accounts for the majority population. In particular, eligible Muslims are instructed to donate 2.5% of their per capita income. Table 3 below presents the amount of the potential zakat fund in Indonesia.

| Year | Potential National Zakat Receipt (Rp) * |
|------|----------------------------------------|
| 2014 | 72,203,238,039,270                     |
| 2015 | 78,505,668,235,673                     |
| 2016 | 248,404,218,238,000                    |
| 2017 | 271,254,975,000,000                    |
| 2018 | 315,350,000,000,000                    |
| 2019 | 400,856,469,108,320                    |

*2.5% x per capita income x number of Muslim population
Source: Afiyana et al. (2019)

Meanwhile, Pusat Kajian Strategis BAZNAS (2021) estimates the potentials of the entire zakat funds, including agricultural, animal husbandry, money, corporate, and income zakat, as illustrated by the following figure.
The Mapping Indicator of Zakat Potentials estimates the Indonesian zakat potentials of Rp 233.8 trillion or 1.72 percent of Indonesia’s GDP (Pusat Kajian Strategis BAZNAS, 2020). From this figure, the income zakat account for the most (Rp 139.07 trillion or 59.50 percent), followed by money zakat, agricultural zakat, animal husbandry zakat, and corporate zakat. Another study by Pusat Kajian Strategis BAZNAS (2020) maps potential zakat in 34 Indonesian provinces as presented in the following table.

Huge zakat potentials require applicable technology to ease and accelerate access from the receipts, recording, and distribution of zakat, including the blockchain platform that can modernize zakat management. In particular, the platform facilitates easier transactions, better access to sharia-based financial products (especially zakat instruments), and improved financial literacy. The combination of zakat and blockchain enables muzakki, mustahiq, and muzakk to be better focused and organized in managing zakat (Hamdani, 2020). Zulfikri et al. (2021) propose using blockchain technology to improve trust in ZMOs because of its transparency and auditability. Blockchain can propose tokens developed in a certain platform for each project that requires donation. Further, tokens will be verified and accumulated with other donors (Lushi, 2019). Thus, blockchain enables stakeholders to select projects and track donation allocation from ZMOs.

Blockchain technology is a novel one introduced and used since the 2008 financial crisis (Nakamoto, 2008). It is a digital record of each block transaction executed and distributed to each user. Each block illustrates transactions that will be connected to other blocks. According to Faccia & Mosteanu (2019), each transaction...
will be inserted into two keys and cryptographed into a ledger distributed to each node to prevent hackers’ illegal access (see Figure 11).

Further, Farooq et al. (2020) propose using cryptocurrency as a digital currency through Charity Coin (CC). The proposed framework will facilitate the conversion of conventional currencies into CC, the sale and purchase of CC, and CC transfer to targeted individuals. CC can be transferred through zakat instruments that can create a framework that makes zakat fund management more transparent and auditable using blockchain technology (see Figure 12).

Blockchain technology can serve as a platform to detect zakat fund usage through bitcoin (Saleh et al., 2019). This blockchain-based technology will offer transparency for donors, ZMOs, and beneficiaries. The platform presents transparent donation routes that enable donors to track and monitor zakat fund distribution’s timing and beneficiaries.
The Potentials of Blockchain Zakat Application

The introduction of the blockchain system is a breakthrough in optimizing zakat fund management. Hence, all stakeholders can manage zakat funds better to improve ummah’s socioeconomic welfare through more effective, efficient, and optimal zakat management.

Amil can leverage blockchain technology in managing zakat funds more innovatively to the public (Fanning & Centers, 2016). Several studies demonstrate the benefits of financial technology implementation revolution into the sharia financial industry, including blockchain-based zakat fund management, such as improving the effectiveness and efficiency of amil’s operation (Gomber et al., 2017, 2018), amil services’ more focus on ummah’s welfare (Lee & Shin, 2018), and more optimism toward amil’s role to reduce the gap between zakat potentials and realization (Loo, 2018). Referring to Malaysian experience in having integrated zakat fund management in its financial system, all stakeholders should strengthen and preserve compliance to Islamic values, especially in transparency, accountability, and integrity (Haddad & Hornuf, 2019; Shariff et al., 2011) that are crucial in managing public (ummah) funds.

Zakat fund management is a form of soul and asset sanctification with social dimensions. In other words, zakat reflects muzakki’s social responsibilities toward mustahiq. Higher accumulated zakat funds will deliver greater social benefits to mustahiq (zakat recipients) and greater divine rewards to muzakki (zakat donors). Thus, zakat funds require more professional management from amil as the central actor of Indonesian zakat fund management (Aji, 2015). Accordingly, nazhir must be competent and skillful in managing zakat fund management through halal instruments to deliver greater social benefits (Romdhoni, 2017).

Unfortunately, existing zakat fund management remains suboptimal (Mintarti et al., 2012) mainly due to amil’s lack of professionalism in managing zakat funds because they do not focus on managing zakat funds (part-timer and unpaid). Specifically, zakat fund management’s classical problems are affected by Huda et al.
(2014): (1) unproductive (idle) zakat assets, (2) amil’s unprofessional capacity, and (3) mustahik’s consumptive tendency. Such conditions represent unprofessional zakat fund management. However, zakat fund management’s problems are not entirely amil’s faults, but also because of muzakki’s lack of concerns and awareness of zakat obligations. Nevertheless, muzakki, who are aware of their zakat funds arguably monitor amil’s performance in managing zakat funds more optimally. Hence, the blockchain system will arguably improve zakat fund management’s accountability and transparency and facilitate more effective monitoring of the usefullness of zakat funds.

CONCLUSIONS, LIMITATIONS, AND SUGGESTIONS

Blockchain technology has gained widespread public acceptance as an IR 4.0 era innovation. Accordingly, the blockchain zakat program seeks to answer existing social problems by improving zakat fund management transparency to enhance public trust. Thus, this program offers more modern and comprehensive zakat management by facilitating easier transactions and access to financial products and enhancing financial literacy, which will eventually create multiplier effects on the economy.

Blockchain zakat programs improve transparency by locating amil and muzakki in the same blockchain system that enables monitoring and improves affordability. The blockchain system can reach amil globally and facilitates muzakki in a certain country to donate to other countries, especially those that need more funds. Thus, blockchain-based zakat fund management contributes to sustainable development, especially socioeconomic aspects. Besides, the system has other advantages, including (1) becoming sharia economy-based community growth centers to facilitate sustainable development, (2) promoting Indonesia as the zakat platform center for amil, (3) improving transparency in zakat management (muzakki receive information of recipient partners who have received zakat funds and amil are informed of their zakat fund growth and distribution), and (4) promoting effective monitoring on zakat fund management.

Thus, blockchain zakat fund management helps amil as planning and evaluation tools that offer optimal zakat benefits modeling framework. Regulators can also use it to leverage zakat funds as an Islamic financial instrument to overcome existing socioeconomic problems and transfer knowledge and applicable technology on zakat fund management to ZMOs.

Based on our results, this study offers the following recommendations. First, competent human resources, especially those who manage zakat, are crucial in optimizing zakat assets. Hence, nazhir development and advocacy are important to promote zakat as a pillar of the Islamic economy and an ideal socioeconomic instrument. Second, the Indonesian government needs to develop a national zakat development blueprint to strengthen the zakat fund management ecosystem. The blueprint must contain visions, missions, development policy direction, expected
phases, and concrete steps to realize the visions and missions. Third, despite centralized zakat fund management that focuses on amil’s roles, collaborations among regulatory and technical stakeholders remain crucial to synergize programs, harmonize regulations, and interconnect cross-authority policies that will facilitate national and regional implementation of blockchain zakat management. Fourth, the Indonesian government must create a conducive climate to promote zakat inclusion and literacy movements and zakat program growth. Such a climate will arguably encourage and facilitate public zakat participation.

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# APPENDIX

## KEY PARTNERSHIP
1. Regulator
   a. Government (Ministry of Religion)
2. Universities
3. Amil (BAZ and LAZ.)
4. Muzakki (donors)
5. Sharia financial institutions (sharia banks, sharia insurance)

## KEY ACTIVITIES
1. Developing or maintaining the zakat platform
2. Strengthening amil’s roles as zakat manager
3. Building or maintaining business with sharia financial institutions.

## VALUE PROPOSITION
1. Openness (traceability and transparency) in zakat fund management
2. Monitoring of zakat fund usefulness (according to muzakki’s intention)
3. Improving zakat object’s productivity

## CUSTOMER RELATIONSHIP
1. Human
2. IT (platform)
3. Socialization on zakat benefits

## CUSTOMER SEGMENTS
**Muzakki**
- Individuals, 25-55 years old
- Business units/ legal institutions/ nazhir / CSR / donor institutions
- Concerns on zakat fund management for sustainable development

**Mustahiq**
- Eight groups according to Islamic sharia
- Amil’s fostered groups

## KEY RESOURCES
1. IT infrastructure and internet
2. Human resources’ managerial skills (fund management, risk management, and business analysis)
3. Improving zakat object’s productivity

## CHANNELS
1. Amil networks
2. Sharia financial institutions
3. Taqlim majlis community
4. Investment managers

## REVENUE STREAMS
1. Percentage of zakat fund amount placed by waqif
2. Profit-sharing from investment management

## COST STRUCTURE
1. Costs of platform and infrastructure development and maintenance
2. Human resource costs
3. Operational costs

Source: modified by the authors (2020)

**Figure 10**
The Business Model Canvas in the Blockchain-based Zakat Fund Management
Table 4
Potential *Zakat* Funds in Indonesia, by Province

| No | Province          | *Zakat* Potentials | Percentage to GDP | Rank |
|----|-------------------|--------------------|-------------------|------|
| 1  | Aceh              | 2,826.9            | 2.33              | 15   |
| 2  | North Sumatera    | 8,928.7            | 1.83              | 5    |
| 3  | West Sumatera     | 3,654.3            | 2.34              | 12   |
| 4  | Riau              | 8,414.9            | 1.79              | 6    |
| 5  | Jambi             | 3,047.0            | 2.23              | 13   |
| 6  | South Sumatera    | 6,440.0            | 2.29              | 9    |
| 7  | Bengkulu          | 1,219.2            | 2.90              | 25   |
| 8  | Lampung           | 5,124.9            | 2.32              | 11   |
| 9  | Bangka Belitung   | 1,317.9            | 2.64              | 24   |
| 10 | Riau Islands      | 3,022.6            | 1.82              | 14   |
| 11 | D.K.I. Jakarta    | 58,339.2           | 3.57              | 1    |
| 12 | West Jawa         | 26,845.7           | 2.00              | 3    |
| 13 | Central Jawa      | 20,530.0           | 2.30              | 4    |
| 14 | DI Yogyakarta     | 2,275.6            | 2.47              | 18   |
| 15 | East Jawa         | 35,806.7           | 2.42              | 2    |
| 16 | Banten            | 7,608.8            | 1.86              | 7    |
| 17 | Bali              | 1,426.8            | 0.98              | 23   |
| 18 | West Nusa Tenggara| 2,699.8           | 2.85              | 17   |
| 19 | East Nusa Tenggara| 374.2              | 0.60              | 33   |
| 20 | West Kalimantan   | 2,104.7            | 1.69              | 19   |
| 21 | Central Kalimantan| 1,758.9            | 1.96              | 21   |
| 22 | South Kalimantan  | 2,740.5            | 2.25              | 16   |
| 23 | East Kalimantan   | 5,934.1            | 1.31              | 10   |
| 24 | North Kalimantan  | 586.0              | 1.07              | 29   |
| 25 | North Sulawesi    | 695.7              | 0.88              | 26   |
| 26 | Central Sulawesi  | 1,968.5            | 2.02              | 20   |
| 27 | South Sulawesi    | 7,130.2            | 2.47              | 8    |
| 28 | Southwest Sulawesi| 1,683.9            | 2.03              | 22   |
| 29 | Gorontalo         | 674.9              | 2.69              | 27   |
| 30 | West Sulawesi     | 614.7              | 2.09              | 28   |
| 31 | Molluca           | 444.7              | 1.60              | 31   |
| 32 | North Maluku      | 407.0              | 1.75              | 32   |
| 33 | West Papua        | 369.7              | 0.65              | 34   |
| 34 | Papua             | 561.4              | 0.38              | 30   |
| Total |                | 233,846.6          | 1.72              |      |

Source: Pusat Kajian Strategis BAZNAS (2020)