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

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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 blockchai 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 desentraliasi dan borderless dari blockchain semakin meningkatkan potensi pengumpulan dan pemanfaatan zakat di Indonesia.

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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.

Table 1
Number and Percentage of Poor People, Poverty Gap Index, Poverty Severity Index, and Gini Ratio in Indonesia, 2015-2019

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

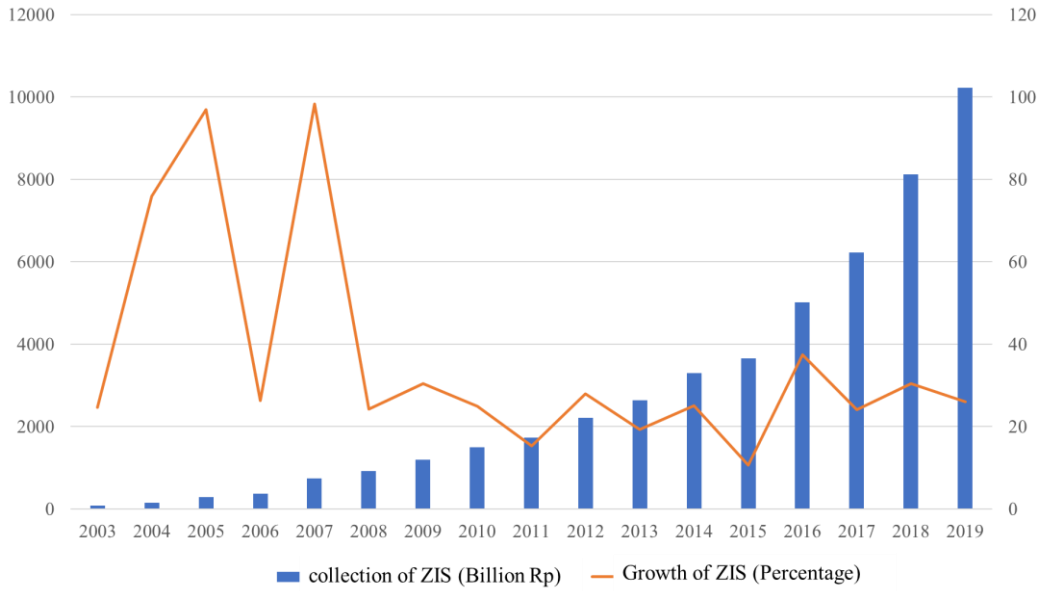
declining numbers of poor people and the poverty rate imply that people living below the poverty line have declined. The poverty gap index (P1) in rural and urban areas also declines, suggesting that poor people have improved their conditions and approached the poverty line. Similarly, the poverty severity 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* fungs professionally, transparently, and accountably (Budi, 2015).



Source: Pusat Kajian Strategis BAZNAS (2020), modified

Figure 1
***ZIS.* Fund Collection (Rupiah and Growth)**

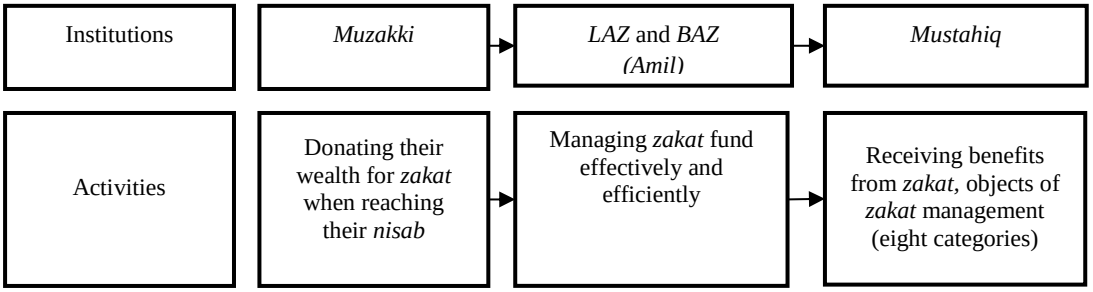
Thus, this study's urgency is the management of *zakat* fund management through blockchain *zakat* or the creation of a crowdfunding platform through a blockchain system (Hasan *et al.*, 2020). This issue is important to enhance the efficiency of the digital Indonesian *zakat* fund management (collection 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

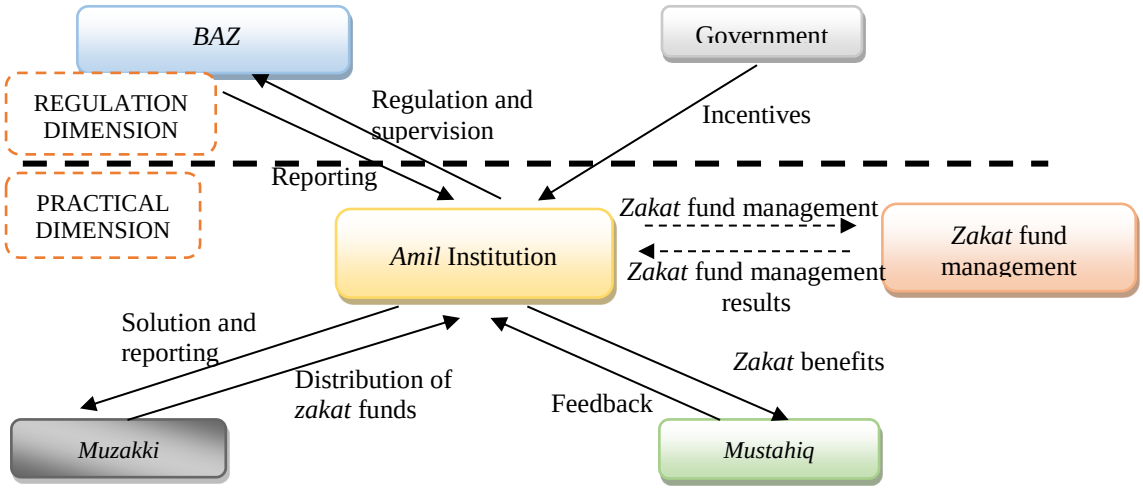
Zakat fund management as a philanthropic instrument consists of several interrelated components, including:



Source: Putri *et al.* (2019), modified

Figure 2
***Zakat* Fund Management Scheme**

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).



Source: Saleh *et al.* (2019)

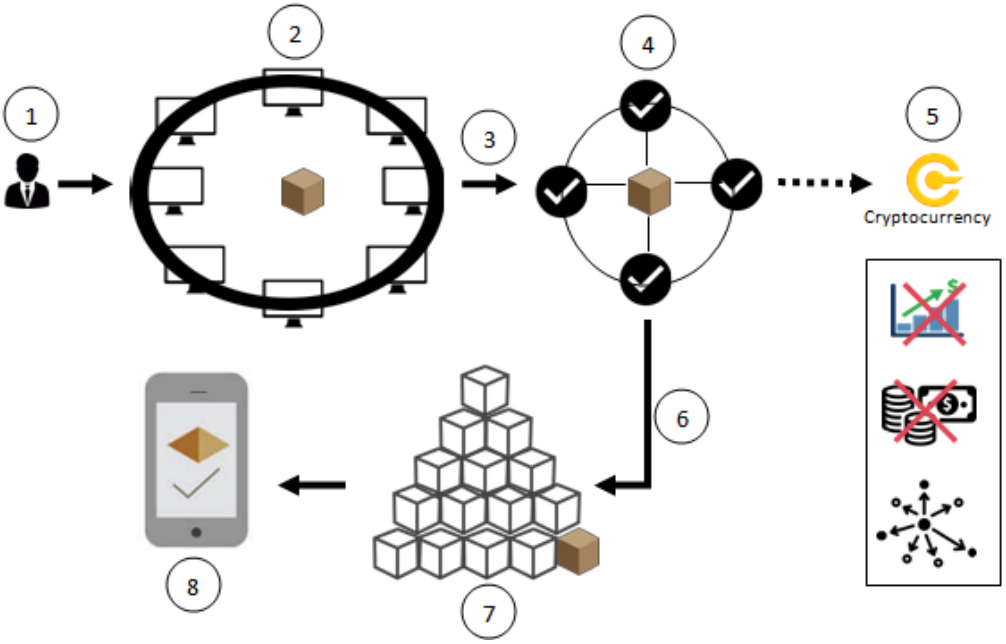
Figure 3
The Indonesian *Zakat* System

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).



Source: Thottathil (2018), modified

Figure 4
The Blockchain Work System Mechanism

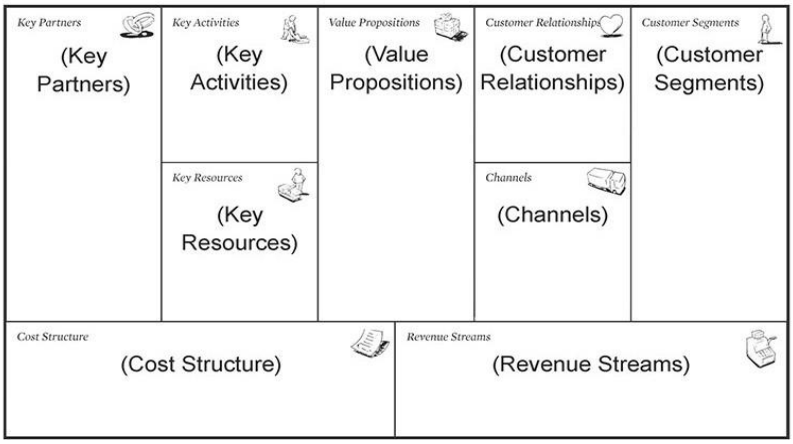
The system starts when a user submits a transaction request (1) that is forwarded to the P2P networks that consist of several other users or computers (commonly known as nodes) (2). The node network is then validated or authenticated to ensure the validity of transactions and users' status by using specific 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).



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.

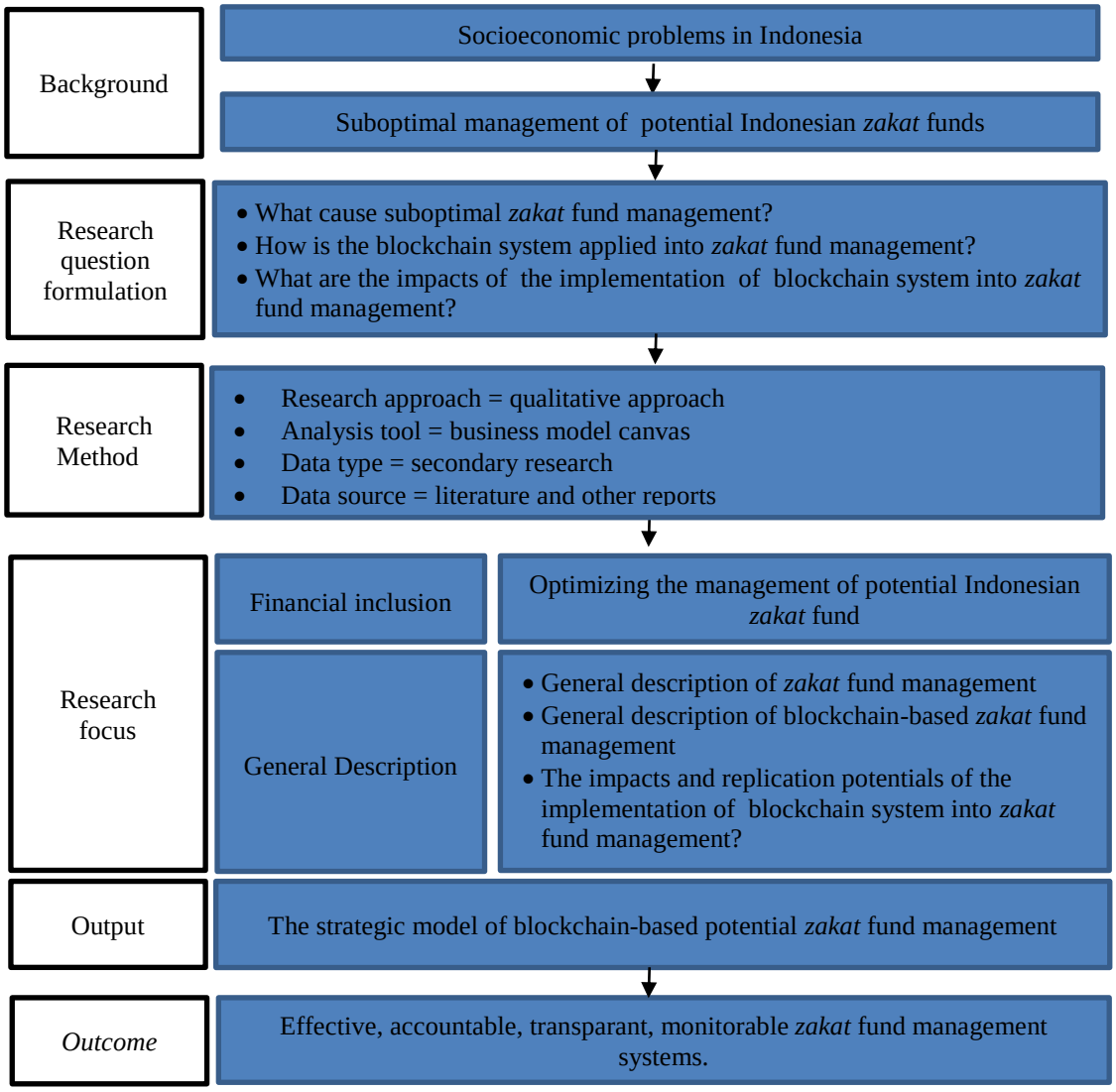


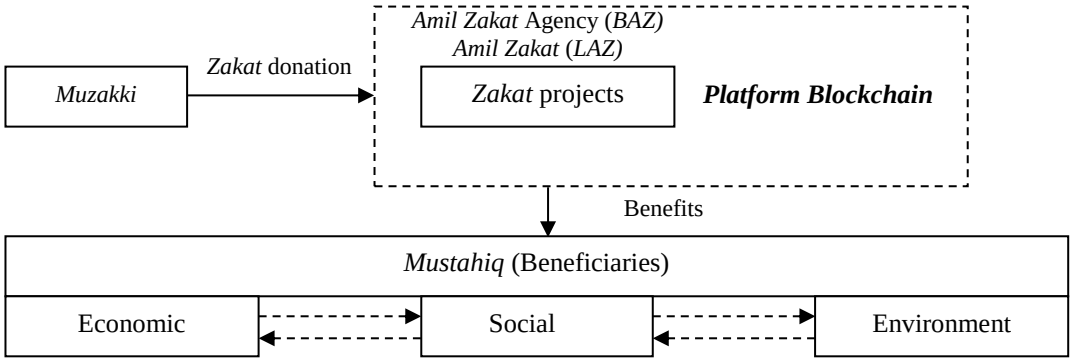
Figure 6
Research Flow

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.



Source: Sukmana (2019), modified

Figure 7
Blockchain-based *Zakat* Fund Management

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.

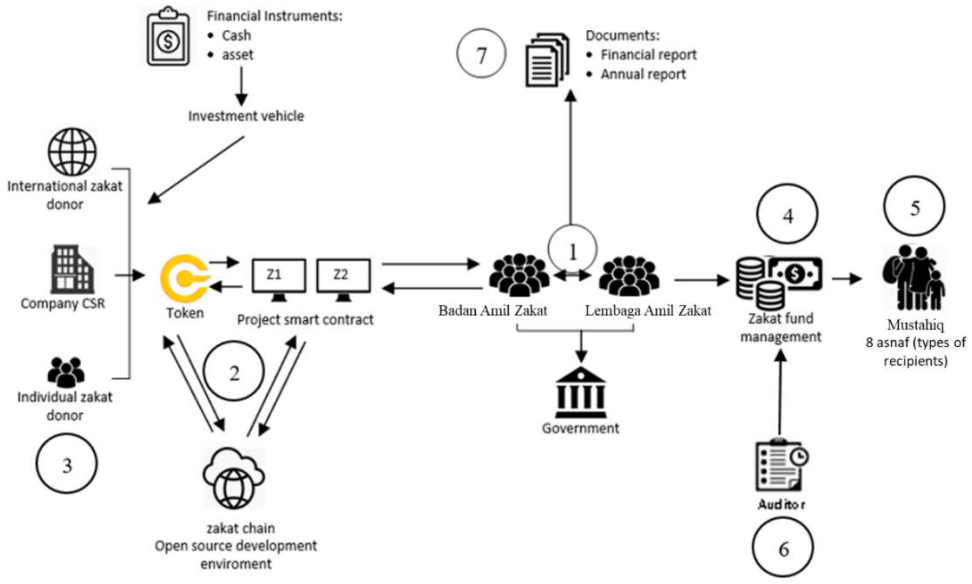
As suggested by Sukmana (2020), blockchain-based *zakat* fund management is arguably more optimal and effective (in terms of transparency and affordability). In this respect, ZMOs, *mustahiq*, and *muzakki* belong to the same blockchain system that promotes better access and ease of monitoring. Furthermore, 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).

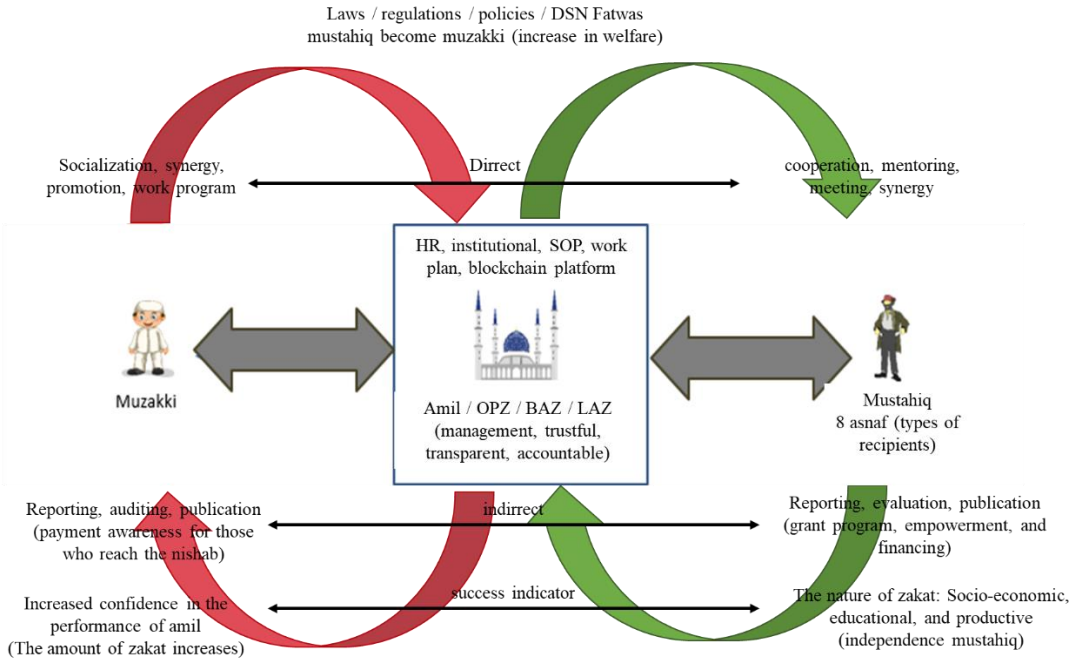


Figure 9
The Synergy in Blockchain-based *Zakat* Fund Management

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).

Table 2
Potentials of Indonesia's *Muzakki*, 2014-2019

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

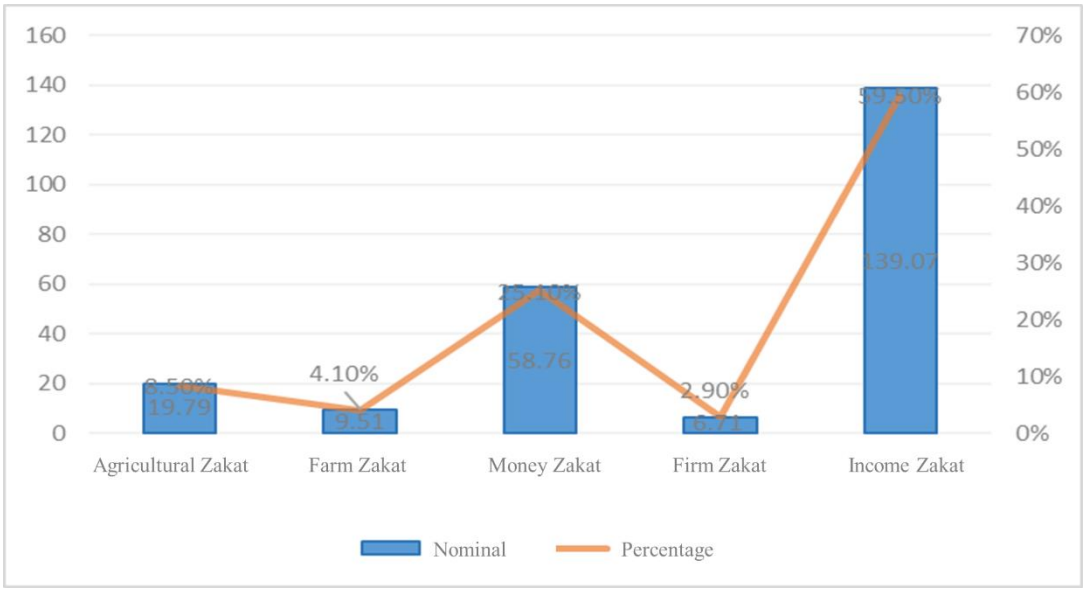
The hugely potential *zakat* fund is due to the Muslim population that accounts for the majority population. In particular, eligible Muslims are instructed to donate 2.5 percent of their per capita income. Table 3 below presents the amount of the potential *zakat* fund in Indonesia.

Table 3
Potential Money *Zakat* Fund

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.



Source: Pusat Kajian Strategis BAZNAS (2021)

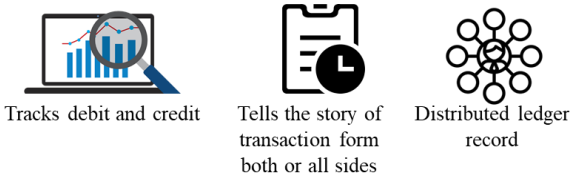
Figure 11
Potential Indonesian *Zakat* Fund

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 *muzakki* 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

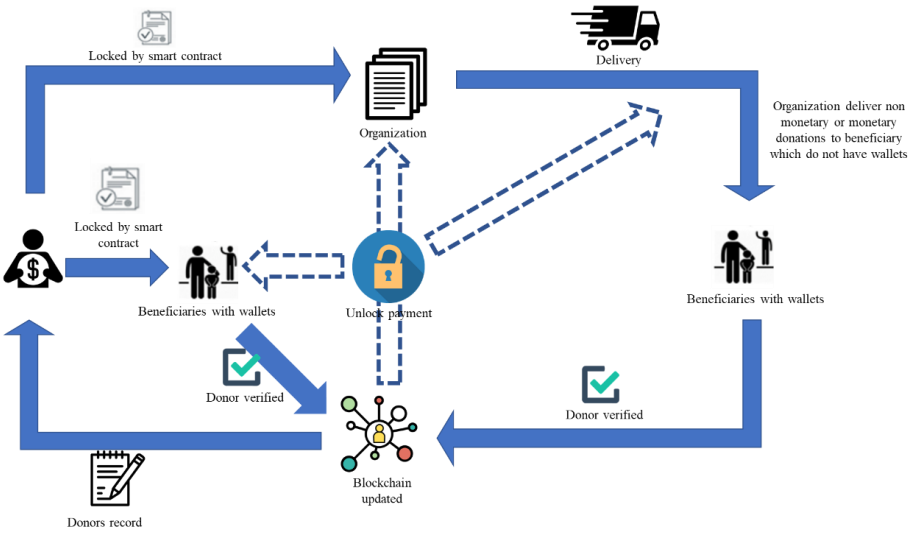
will be inserted into two keys and cryptographed into a ledger distributed to each node to prevent hackers' illegal access (see Figure 11).



Source: Faccia & Mosteanu (2019), modified

Figure 11
How Blockchain Promotes Transaction

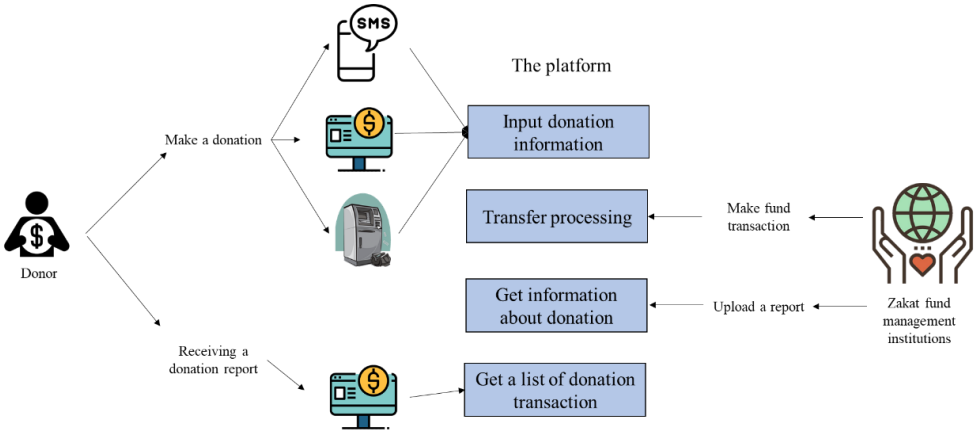
Further, Farooq *et al.* (2020) propose using cryptocurrency as a digital currency through Charity Coin (CC). The proposed framework will facilitate the conversion of conventional currencies into CC, the sale and purchase of CC, and CC transfer to targeted individuals. CC can be transferred through *zakat*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



Source: Farooq *et al.* (2020), modified

Figure 12
The Framework of More Transparent and Auditable *Zakat* Fund Management through Blockchain Technology

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.



Source: Saleh et al. (2019), modified

Figure 13
Blockchain-based Platform Functionality to Monitor *Zakat* Fund Management

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 facilitae 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.

REFERENCES

Adnan, N. I. M., Roselam, M. A. C., Hamat, Z., & Furqani, H. (2021). The distribution of zakat fund to the poor entrepreneurs using micro finance. *International Journal of Academic Research in Business and Social Sciences, 11*(2), 231–240. https://doi.org/10.6007/IJARBSS/v11-i2/8666

Afiyana, I. F., Nugroho, L., Fitrijanti, T., & Sukmadilaga, C. (2019). Tantangan pengelolaan dana zakat di Indonesia dan literasi zakat. *Akuntabel: Jurnal Akuntansi Dan Keuangan*, *16*(2), 222–229. https://doi.org/10.29264/jakt.v16i2.6013

Aji, A. M. (2015). Optimalisasi peran strategis amil zakat dalam perspektif hukum Islam dan hukum positif Indonesia. *SALAM: Jurnal Sosial Dan Budaya Syar-I, 1*(1), 33–44. https://doi.org/10.15408/sjsbs.v1i1.1523

Anggraito, S. (2020). *Blockchain WAQF usecase: Telkom blockchain wakaf (kerjasama Telkom & BWI)*. dipresentasikan pada Forum Kajian Wakaf Seri 01 Tahun 2020, Pengelolaan Wakaf Berbasis Blockchain: Peluang dan Tantangan, Selasa, 21 April 2020, 10.00 – 12.00 WIB.

Ayuningtyas, D. P. S. D. (2010). *Kekuatan hukum dan perlindungan hukum terhadap pemberian wakaf atas tanah di bawah tangan (Studi pada Kecamatan Kedungwuni Kabupaten Pekalongan)*. Universitas Diponegoro.

Badan Amil Zakat Nasional. (2019). Statistik zakat nasional 2019. In *Badan Amil Zakat Nasional*. https://pid.baznas.go.id/statistik/

Bank Indonesia. (2016). *Surat edaran Bank Indonesia no 18/22/DKSP tahun 2016 tentang penyelenggaraan layanan keuangan digital*.

Budi, I. S. (2015). Revitalisasi wakaf sebagai penggerak ekonomi masyarakat. *Al-Iqtishadiyah: Jurnal Ekonomi Syariah Dan Hukum Ekonomi Syariah, 2*(2), 1–20. https://doi.org/10.31602/iqt.v2i2.373

Canggih, C., Fikriyah, K., & Yasin, A. (2017). Potensi dan realisasi dana zakat Indonesia. *Al-Uqud : Journal of Islamic Economics*, *1*(1), 14–26. https://doi.org/10.26740/al-uqud.v1n1.p14-26

Central Bureau of Statistics Indonesia. (2019a). *Tabel/indikator kemiskinan dan ketimpangan*. Badan Pusat Statistik. https://www.bps.go.id/subject/23/kemiskinandan-ketimpangan.html

Central Bureau of Statistics Indonesia. (2019b). *Tabel/indikator neraca sosial ekonomi*. Badan Pusat Statistik. https://www.bps.go.id/subject/104/neraca-sosialekonomi.html

Faccia, A., & Mosteanu, N. R. (2019). Accounting and blockchain technology: From double-entry to triple-entry. *The Business and Management Review*, *10*(2), 109–117.

Fanning, K., & Centers, D. P. (2016). Blockchain and its coming impact on financial services. *Journal of Corporate Accounting & Finance*, *27*(5), 53–57. https://doi.org/10.1002/jcaf.22179

Farooq, M. S., Khan, M., & Abid, A. (2020). A framework to make charity collection transparent and auditable using blockchain technology. *Computers & Electrical Engineering*, *83*, 106588. https://doi.org/10.1016/j.compeleceng.2020.106588

Gomber, P., Kauffman, R. J., Parker, C., & Weber, B. W. (2018). On the fintech revolution: Interpreting the forces of innovation, disruption, and transformation in financial services. *Journal of Management Information Systems*, *35*(1), 220–265. https://doi.org/10.1080/07421222.2018.1440766

Gomber, P., Koch, J.-A., & Siering, M. (2017). Digital finance and fintech: Current research and future research directions. *Journal of Business Economics*, *87*(5), 537–580. https://doi.org/10.1007/s11573-017-0852-x

Haddad, C., & Hornuf, L. (2019). The emergence of the global fintech market: Economic and technological determinants. *Small Business Economics*, *53*(1), 81–105. https://doi.org/10.1007/s11187-018-9991-x

Hamdani, L. (2020). Zakat blockchain: A descriptive qualitative approach. *EkBis: Jurnal Ekonomi Dan Bisnis*, *4*(2), 492–502. https://doi.org/10.14421/EkBis.2020.4.2.1270

Hasan, R., Hassan, M. K., & Aliyu, S. (2020). Fintech and Islamic Finance: Literature Review and Research Agenda. *International Journal of Islamic Economics and Finance (IJIEF)*, *3*(1), 75–94. https://doi.org/10.18196/ijief.2122

Hoque, N., Khan, M. A., & Mohammad, K. D. (2015). Poverty alleviation by Zakah in a transitional economy: A small business entrepreneurial framework. *Journal of Global Entrepreneurship Research*, *5*(1), 7. https://doi.org/10.1186/s40497-015-0025-8

Huda, N., Anggraini, D., Ali, K. M., Mardoni, Y., & Rini, N. (2014). Prioritas solusi permasalahan pengelolaan zakat di Propinsi Banten dan Kalimantan Selatan

dengan metode AHP. *Al-Iqtishad: Jurnal Ilmu Ekonomi Syariah*, *6*(2), 223–238. https://doi.org/10.15408/aiq.v6i2.1232

Hussain, A. baker R. (2019). Zakat institutions and universities strategic partnership for poverty alleviation. *International Journal of Zakat*, *4*(2), 73–88. https://doi.org/10.37706/ijaz.v4i2.172

Kasri, R. A. (2017). Determinants of poverty amongst zakah recipients in Indonesia: A household level analysis. *International Journal of Islamic Economics and Finance Studies*, *3*(3), 30–40. https://doi.org/10.25272/j.2149-8407.2017.3.3.03

Kurniasari, R., & Kartikasari, D. (2018). Penerapan model bisnis kanvas terhadap bisnis jasa angkut penumpang pada Pt Internasional Golden Shipping. *Journal of Applied Managerial Accounting*, *2*(1), 6–14. https://doi.org/10.30871/jama.v2i1.631

Lee, I., & Shin, Y. J. (2018). Fintech: Ecosystem, business models, investment decisions, and challenges. *Business Horizons*, *61*(1), 35–46. https://doi.org/10.1016/j.bushor.2017.09.003

Lemieux, V. L. (2016). Trusting records: Is blockchain technology the answer? *Records Management Journal*, *26*(2), 110–139. https://doi.org/10.1108/RMJ-12-2015-0042

Loo, R. Van. (2018). Making innovation more competitive: The case of fintech. *UCLA Law Review*, *65*, 232–279.

Lushi, T. (2019). Charity token - improving trust on charity organizations through blockchain technology. *18th International Conference Perspective of Business and Entrepreneurship Development: Digital Transformation for Business Model Innovation*.

Medias, F. (2017). Bank wakaf: Solusi pemberdayaan sosial ekonomi Indonesia. *Indonesian Journal of Islamic Literature and Muslim Society*, *2*(1), 61–84. https://doi.org/10.22515/islimus.v2i1.749

Mintarti, N., Beik, I. S., Tanjung, H., Haryono, A. R., Tsani, T., & Kasirin, U. (2012). *Indonesia zakat and development report 2012*.

Nakamoto, S. (2008). *Bitcoin: A peer-to-peer electronic cash system*. Bitcoin.Org. https://bitcoin.org/bitcoin.pdf

Nurzaman, M. S. (2016). Evaluating the impact of productive based zakat in the perspective of human development index: A comparative analysis. *Kyoto Bulletin of Islamic Area Studies*, *9*, 42–62.

Osterwalder, A., & Pigneur, Y. (2010). *Business model generation: A handbook for visionaries, game changers dan challengers*. John Wiley & Sons, Inc.

Othman, A., Noor, A. H. M., & Salleh, A. M. (2015). An analysis relationship between social exclusion and non-recipients asnaf of zakat fund (NRAZF). *Australian Journal of Sustainable Business and Society*, *1*(2), 41–46.

Otoritas Jasa Keuangan. (2018). *Peraturan Otoritas Jasa Keuangan Republik indonesia nomor 13 /POJK.02/2018 tentang inovasi keuangan digital di sektor jasa keuangan*.

Priyono, F. (2015). Analisa penerapan business model canvas pada Toko Moi Collection. *AGORA: Jurnal Mahasiswa Manajemen Bisnis*, *3*(2), 358–363.

Pusat Kajian Strategis BAZNAS. (2020). *Outlook zakat Indonesia 2021*. https://puskasbaznas.com/publications/books/1418-outlookzakat-indonesia-2021

Putri, S. A. M., Firmansyah, E. J. R., & Hamid, H. (2019). The mustahiq empowerment model: A collaboration between sharia bank and OPZ in optimizing zakat funds. *Humanities & Social Sciences Reviews*, *7*(2), 276–281. https://doi.org/10.18510/hssr.2019.7232

Rabbani, M. R., Khan, S., & Thalassinos, E. I. (2020). Fintech, blockchain and Islamic finance: An extensive literature review. *International Journal of Economics and Business Administration*, *VIII*(Issue 2), 65–86. https://doi.org/10.35808/ijeba/444

Rashid, S. K. (2018). Potential of waqf in contemporary world. *Journal of King Abdulaziz University Islamic Economics*, *31*(2), 53–69. https://doi.org/10.4197/Islec.31-2.4

Rédha, B. M., Larbi, G., & Karima, R. M. (2016). The impact of zakat fund in reducing poverty case of Algeria. *Mediterranean Journal of Social Sciences*, *7*(3), 256–264. https://doi.org/10.5901/mjss.2016.v7n3p256

Rehman, A. A., & Pickup, F. (2018). *Zakat for the SDGs*. Undp.Org. https://www.undp.org/blog/zakat-sdgs

Republik Indonesia. (2011). *Undang-undang nomor 23 tahun 2011 tentang pengelolaan zakat*.

Republik Indonesia. (2014a). *Instruksi Presiden nomor 3 tahun 2014 optimalisasi pengumpulan zakat di Kementerian/Lembaga, Sekretariat Jenderal Lembaga Negara, Sekretariat Jenderal Komisi Negara, Pemerintah Daerah, BUMN, dan BUMD melaui Badan Amil Zakat Nasional*.

Republik Indonesia. (2014b). *Peraturan Pemerintah Republik Indonesia nomor 14 tahun 2014 tentang pelaksanaan Undang-Undang nomor 23 tahun 2011 tentang pengelolaan zakat*.

Romdhoni, A. H. (2017). Zakat dalam mendorong pertumbuhan ekonomi dan

pengentasan kemiskinan. *Jurnal Ilmiah Ekonomi Islam*, *3*(01), 41. https://doi.org/10.29040/jiei.v3i01.98

Saleh, H., Avdoshin, S., & Dzhonov, A. (2019). Platform for tracking donations of charitable foundations based on blockchain technology. *2019 Actual Problems of Systems and Software Engineering (APSSE)*, 182–187. https://doi.org/10.1109/APSSE47353.2019.00031

Saleh, M., Sulistiyo, A. B., Hisamuddin, N., & Roziq, A. (2019). Reconstruction of profit sharing scheme and cooperation model between sharia rural bank and zakat management organization for micro enterprises financing in Indonesia. *International Journal of Scientific & Technology Research*, *8*(10), 732–737.

Sari, D. F., Beik, I. S., & Rindayati, W. (2019). Investigating the impact of zakat on poverty alleviation: A case from West Sumatra, Indonesia. *International Journal of Zakat*, *42*(2), 1–12.

Shariff, A., Jusoh, W. N. H. W., Mansor, N., & Jusoff, K. (2011). A robust zakah system: Towards a progressive socio-economic development in Malaysia faculty of business. *Middle East Journal of Scientific Research*, *7*(4), 550–554.

Shirazi, N. S. (2014). Integrating zakat and waqf into the poverty reduction strategy of the IDB member countries. *Islamic Economic Studies*, *22*(1), 79–108. https://doi.org/10.12816/0004131

Sukmana, R. (2019). *Wakaf era 4.0*. Perpustakaan Universtias Airlangga.

Sukmana, R. (2020). *Peluang dan tantangan penggunaan blockchain dalam perwakafan nasional*. dipresentasikan pada Forum Kajian Wakaf Seri 01 Tahun 2020, Pengelolaan Wakaf Berbasis Blockchain: Peluang dan Tantangan, Selasa, 21 April 2020, 10.00 – 12.00 WIB.

Thottathil, M. (2018). *Blockchain solution for social impact in the Islamic world*. Arabiangazette. https://arabiangazette.com/blockchain-solution-social-impact-finterra/

Tjitradi, E. C. (2015). Evaluasi dan perancangan model bisnis berdasarkan business model canvas. *Agora: Jurnal Mahasiswa Manajemen Bisnis*, *3*(1), 8–16.

Todaro, M., & Smith, S. C. (2011). *Economic development*. Person Education Limited.

Zainal, H., Basarud-din, S. K., Yusuf, R. M., & Omar, S. N. Z. (2016). Managing zakat fund in Malaysia. *Journal of Global Business and Social Entrepreneurship*, *1*(2), 46–53.

Zulfikri, Z., Hj Kassim, S., & Hawariyuni, W. (2021). Proposing blockchain technology based zakat management model to enhance muzakki's trust in zakat agencies: A conceptual study. *Journal of Accounting Research, Organization and Economics*, *4*(2), 153–163. https://doi.org/10.24815/jaroe.v4i2.20467

APPENDIX

<table>
<tr>
<td rowspan="2">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)</td>
<td>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.</td>
<td rowspan="2">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</td>
<td>CUSTOMER RELATIONSHIP
1. Human
2. IT (platform)
3. Socialization on zakat benefits</td>
<td rowspan="2">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</td>
</tr>
<tr>
<td>KEY RESOURCES
1. IT infrastructure and internet
2. Human resources' managerial skills (fund management, risk management, and business analysis)</td>
<td>CHANNELS
1. Amil networks
2. Sharia financial institutions
3. Taqlim majlis community
4. Investment managers</td>
</tr>
<tr>
<td colspan="3">REVENUE STREAMS
1. Percentage of zakat fund amount placed by waqif
2. Profit-sharing from investment management</td>
<td colspan="3">COST STRUCTURE
1. Costs of platform and infrastructure development and maintenance
2. Human resource costs
3. Operational costs</td>
</tr>
</table>

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)