



# Proposing Blockchain Technology Based Zakat Management Model to Enhance *Muzakki*'s Trust in Zakat Agencies: A Conceptual Study

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## Abstract

**Objective** – This study proposes a conceptual framework of Zakat based management model using blockchain technology with its transparent, secure, auditable, and efficient system in order to enhance the trust in zakat agencies.

**Design/methodology** – This study is based on literature and theoretical reviews. This study took BAZNAS as the model of the Indonesian zakat agency to use Blockchain-based zakat payment on which zakat payers can track the fund allocated to the beneficiaries directly.

**Results** – This research demonstrates the importance of Blockchain and smart contract technologies in zakat management by developing a model that combines zakat management agencies with the components of Blockchain and smart contract technologies.

**Research limitations/implications** – The proposed model can contribute to the sustainability and efficiency of zakat agencies and is in line with the poverty eradication effort in Indonesia.

**Keywords:** Zakat, Blockchain Technology, Trust, Transparency

## 1. Introduction

Poverty is one of the many problems in Indonesia. Zakat is proven effective to reduce or eradicate poverty, with prominent examples from the era of the Second Caliph of Islam, Hazrat Umar bin Khattab (R.A), and of Umar bin Abdul Aziz, who was the First Caliph of Islam only for over one year (99-101H) (Hidayati & Tohirin, 2010). Thus, Zakat is an example of Islamic philanthropy with great impact of alleviating poverty besides Infaq, Waqf and Sadaqah. Referring to Law No. 23 of 2011, the agency or institution that manages Zakat in Indonesia is BAZNAS (*Badan Amil Zakat Nasional*/ Amil Zakat National Agency).

As the most prominent Muslim country globally, Indonesia has the potential to collect a large amount of Zakat fund. According to the BAZNAS's 2017 report, Indonesia boasted a potential zakat fund of Rp286 trillion. BAZNAS collects many types of zakat, including from households, private companies, state enterprises, deposits, and savings. However, the amount collected by the entire zakat agencies was only Rp3.7 trillion in 2015, which means there was a significant difference between the actual and potential zakat funds in Indonesia (Parisi, 2017). This amount was lower than 1.3% of its full potential. Meanwhile, according to the research conducted by Firdaus et al. (2012), the potential amount of zakat fund was up to Rp 217 trillion. This amount was equal to 11.45% of the Indonesia's national income in 2018. However, the Amil Zakat National Agency's (BAZNAS) 2017 statistic book shows that the collected zakat fund in 2016 was only Rp5 trillion.

Several studies show that trust and transparency greatly influence zakat collection. According to Nikmatuniayah et al. (2017), the quality of accounting, accountability, and transparency affect the level of zakat fund collection. Similarly, as cited by Owoyemi (2020), The Star newspaper reported in 2015 that over three thousand people resigned from further contribution to zakat agencies. This issue arose when a zakat agency in Malaysia mismanaged its fund by spending the agency's fund for leisure activities and giving themselves and their family members with false salary. The crisis of trust in zakat agencies made zakat payers prefer giving zakat directly to the beneficiaries. Another study conducted by Perbawa & Abdullah (2018) shows that perceived corporate credibility of zakat agencies affects people's awareness of paying zakat. This means that transparency, competency, and trustworthiness in zakat management are the most critical factors to zakat payers (*Muzakki*) and affect the public intention to pay zakat through zakat agencies. Meanwhile, Nasri (2019) suggests zakat agencies to improve their transparency and professionalism in order to improve their future financial performance.

According to Samir & Fadili (2019), people prefer donating directly to eligible beneficiaries since some zakat payers have a degree of personal satisfaction in their direct interaction with the counterparty that they do not feel when they pay it on a centralized manner. When zakat is paid directly to an individual, the payer can observe the effects immediately. However, when zakat is paid to a zakat agency, the payer only receives an annual report on how the money was spent.

Based on the facts above, if zakat collection and distribution are enhanced and managed professionally with higher transparency presented to *Muzakki*, it will enhance zakat payers' level of trust in paying via zakat agency instead of paying directly to the beneficiaries. Furthermore, it will increase the collected zakat fund significantly. As a result, the amount of zakat fund will be raised, closer to its potential amount. When the amount of fund increases, it will certainly have a more significant impact on poverty eradication.

Zakat agencies in Indonesia can improve their management performance, especially with regard to transparency, security, and cost-effective transaction. It is necessary to make significant measures to study and formulate a model for zakat agencies to use. It is also crucial that zakat agencies engage new technology to maintain zakat payers' satisfaction by presenting certain traceability of the fund to zakat payers with which they can track the impact of their payment on the society.

Digital technology has greatly supported human life, making every activity have never been easier. Digital Technology exists in every aspect of life, including in the banking and financial sectors. The technology is called the financial technology or simply called Fintech. Fintech comes as a significant innovation in effort to increase the efficiency and effectiveness of financial services. Thus, with this technology developed, it is essential for zakat agencies to use it to improve zakat management.

The latest invented technology in financial services is comprised of Bitcoin and Blockchain. Bitcoin is one digital currency, referred to as cryptocurrency, which gained a big success in the capital market (coindesk, 2014), while Blockchain is the core mechanism for Bitcoin. Blockchain works as a ledger to record all transactions and helps peer to peer transactions. It is open, secure, and easily accessible to all people. Therefore, Blockchain serves as Bitcoin's ledger and takes care of all Bitcoin transactions of (coindesk, 2016). Although Bitcoin is one of Blockchain's popular applications, the Blockchain itself can be operated in various applications other than cryptocurrencies since it allows completion of payment without any intermediary. Other financial services that Blockchain accommodate are digital assets, remittance and online payment (Peters & Panayi, 2016). Besides, Blockchain is likely to transform the current virtual business, with its capability of reducing the cost and no third party involved. Since Blockchain can protect essential data or change ownership, it is advantageous to the public with minimized risk (Ølnes, 2016).

Given the issues above, the researcher believes that it is necessary to propose a Blockchain-based zakat model in Indonesia to present better transparency to zakat payers, directly enhancing their trust in zakat agencies. The use of Blockchain will present detailed and transparent movement of zakat fund. Blockchain technology is capable of tracking the fund throughout the whole process from collection to the point of distribution. Accordingly, total zakat collection and its distribution to those in need may be increased. Moreover, once the level of transparency and traceability is enhanced, it will then affect the public trust in donating zakat through zakat agencies to betterment. Most payers currently only receive annual report for assessment of how the money they have paid is allocated (Samir & Fadili, 2019).

Based on the Indonesian central statistics body's report, the percentage of poverty level in Indonesia in March 2019 was 9.41%, with a population of about 25.14 million. Indonesia, boasting the largest Muslim population, indeed has a great capacity to raise the fund. Currently, the amount of zakat fund collected is still far from the potential amount, thus the amount of fund distributed to the eight *Asnaf* (Mustahiq) is automatically not optimized. There are many factors causing non-maximal collection of fund by BAZNAS, one of which is *Muzakki's* distrust in zakat agencies (Baznas, 2017).

Based on the above phenomena, this study aims to propose a conceptual framework of Zakat based management model using blockchain technology with its transparent, secure, auditable, and efficient system in order to enhance the trust in zakat agencies. The rest of this paper is structured as follow. Next section reviews the literature followed by explanation of research method. The following section describes the findings of this study and finally ended with the conclusion section.

## 2. Literature Review

### Definition of Zakat

Zakat in Arabic means rising or increasing, and with regard to people, it means changing or developing (Qardawi, 1999). In sharia, the term zakat refers to God's command to share resources and allocate them for the appropriate categories. Islam teaches that everything belongs to God; property must then be purified by giving some of it to those who are in need. Some Islamic scholars claim that zakat cleanses the inner soul, increases diversity and helps the poor develop (Qardawi, 1999). Islam, a religion teaching a balance, considers suffering as a social and ideological challenge. It is a global issue and its consequence is found in the entire society. This is also an ethical issue since it affects the performance of one's socio-religious obligations for the society and Islam and can even lead to kufr. A hadith reports that Prophet Muhammad (p.b.u.h.) sought refuge from poverty.

*"O Allah! I seek refuge with You from laziness and geriatric old age, from all kinds of sins and from being in debt; from the trial and affliction of the grave and from the punishment in the grave; from the affliction of the Fire and from the punishment of the Fire; and from the evil of the affliction of wealth; and I seek refuge with You from the affliction of poverty, and I seek refuge with You from the affliction of Al-Mesiah Ad-Dajjal. O Allah! Wash away my sins with the water of snow and hail, and cleanse my heart from all the sins as a white garment is cleansed from the filth, and let there be a long distance between me and my sins, as You made East and West far from each other."*

(Hadith – Sahih al-Bukhari)

Overall, the zakat paid is expected to purify the payer's income, reconcile payer and *Asnaf's* heart, fulfill the basic needs of the poor and those in need, and solve social problems such as poverty, unemployment, indebtedness, and uneven income distribution (Dogarawa, 2012; Qardawi, 1999). Since the early period of Islamic community in Mecca, Zakat had historically been practiced aiming at helping the

poor and those in need (Qardawi, 1999). Muslims are strongly encouraged to take care of the poor in their community following the Islamic concept of brotherhood. As stated in Surah Al-Muddaththir verses 38-45, one of the reasons that people are sent to Hell is that they lack of feeding the poor and those in need. Although Zakat was previously practiced in Mecca, it was not compulsory to the people in Medina until hijrah.

It is mandatory for Muslims to pay zakat, one of Islam's five "pillars." It is payable at a rate of 2.5% on business profit and property, gold, (business) capital and saving (Gambling & Karim, 1986; Hamid et al.1993). Akhtar (2007) argues that Islam obliges its followers to pay zakat to support the poor for them to have their basic life needs ready. Unlike traditional taxes, Muslims see zakat as something to 'cleanse' instead of simply an obligation (Gambling & Karim, 1986).

#### *The Blockchain Technology*

Bitcoin is a digital currency developed in 2008 by Satoshi Nakamoto based on cryptography (Abubakar et al., 2018). However, Kamaruzaman et al. (2018) argue that Satoshi Nakamoto is a fictitious name. Nakamoto published a paper entitled "Bitcoin: A Peer-To-Peer Electronic Cash System" to describe a peer-to-peer version of electronic cash that will allow online payment to be made directly from one party to another without a financial institution or intermediary (Crosby et al., 2016).

That Bitcoin is thrilling and ground-breaking innovation is because the mechanism behind it makes it work flawlessly. Soon after its white paper was released, it was then obvious that the core mechanical invention was not the digital currency, but the technology on which it was operated. As part of Bitcoin operation, Nakamoto also developed the ledger 'A chain of Blocks', that was later named Blockchain (Morkunas et al., 2019). Therefore, the connection between Blockchain and Bitcoin is that Blockchain is used as the public ledger for Bitcoin currency (Zubaidi & Abdullah, 2017).

With Blockchain's function as decentralized transaction ledger, it can be used to create, authorize and make transfer transaction to other nodes existing in the same network (Tama et al., 2017). Blockchain is a combination of basic cryptography, peer-to-peer networking, and game theory. Blockchain was created to track the database on which the cryptocurrency, Bitcoin, was based, but now it is commonly known as a distributed ledger with a software algorithm to record transactions as a chain of blocks with trustworthiness and anonymity (Laroiya et al., 2020).

Although Blockchain is generally related to Bitcoin, however, many other Blockchain's applications have been developed ever since Nakamoto first introduced it. Despite its function as a ledger for digital currencies, the Blockchain's applications extended further, affecting the economy, financial sector, and many other things (Crosby et al., 2016; Zubaidi & Abdullah, 2017). According to Lakhani & Iansiti (2017), Blockchain has gained a status of the next internet, enabling organizations to modify how they generate and take values.

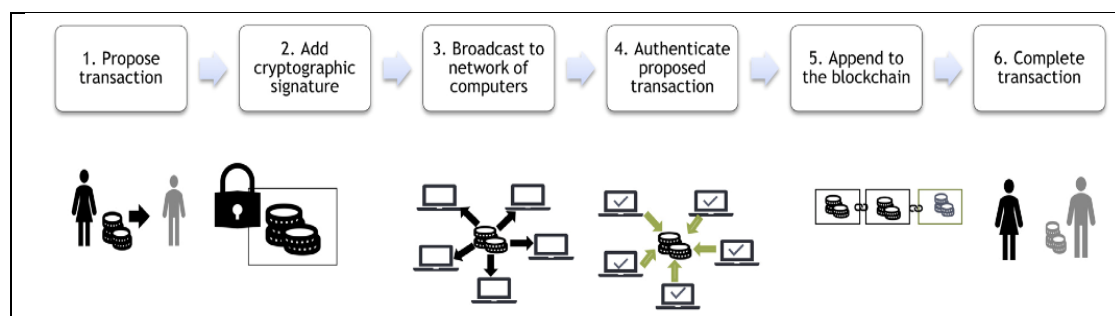
Since then, Blockchain was more popular as an instrument of decentralized transaction ledger with its operation to register, confirm and send payment or contract. The Blockchain technology has been widely used in other than financial transactions and applications, such as in healthcare, utilities, real estate sectors and by the Government (Christidis & Devetsikiotis, 2016). Wang et al., (2018) state that although Blockchain is famous for Bitcoin, Blockchain can be applied to diverse applications other than cryptocurrencies as it allows payment to be completed without any bank or intermediary. Therefore, Morkunas et al., (2019) state that Blockchain is expected to disrupt the existing business models and propose creation of new value.

### How the Blockchain Technology Works

Morkunas et al. (2019) explain that Blockchain maintains a decentralized digital database, commonly known as distributed ledger, which is maintained and updated by a network of computers that verify any transactions before they are approved and added into the ledger. Blockchain allows every party to exchange ownership of a digital asset in a real-time and immutable peer-to-peer system without any intermediary. Immutable means the data cannot be deleted or edited. According to Christidis & Devetsikiotis (2016), although the transacting parties do not trust each other, Blockchain enables *trustless* networks which means that the participants involved do not need to know or trust each other for the system to function.

The absence of trusted intermediary means faster reconciliation between the transacting parties. According to Wang et al. (2018), Blockchain works in a decentralized environment built by advanced technologies such as cryptographic hash, digital signature and distributed consensus mechanism. With Blockchain, transactions can take place in a decentralized manner. As a result, Blockchain can maximize cost-saving and efficiency. There are three main activities in Blockchain: Validate Entries, Safeguard Entries and Preserve Historic Record (Crosby et al., 2016).

According to Morkunas et al. (2019), there are six steps of transaction between two parties using Blockchain. (Step 1), as a transaction is initiated by two parties, it will be changed as hashed transaction bid and as a participant to be written on the ledger. The information contains basic information such as date and time, sender, receiver, asset type, and quantity. The proposed transaction is equipped with a unique cryptographic signature that has the record integrated and authenticated. (Step 2), it broadcast the proposed transaction to a network of computers for processing and verification. (Step 3), computers in the network authenticate the transaction. (Step 4), when the transaction is verified and authenticated, the transaction is added into the digital ledger. (Step 5), completion of asset transfer between the two parties. (Step 6), each of new transactions is connected to and recorded in the previous transaction, providing a thorough, non-modifiable and verifiable history of transaction made on the Blockchain. All of these steps are illustrated in figure 1 below.



**Figure 1.** The six steps of asset exchange using blockchain

Source from 'How blockchain technologies impact your business model' by Morkunas et al. (2019)

### Smart Contract Implementation

Smart contract will be used in each of zakat collection and distribution processes. According to Sillaber & Wlatl (2017), Nick Szabo introduced the term smart contracts and the first to describe how contracts between two parties were secured on computers without requiring intermediation by a third party:

"A set of promises, including protocols within which the parties perform on the other promises. The protocols are usually implemented with programs on a computer network, or in other forms of digital electronics, thus these contracts are 'smarter' than their paper-based ancestors."

Kosba et al. (2016) state that smart contracts shall be presented as programs run by all miners, allowing the parties, who are not required to be aware of and trust each other, to perform transaction securely with each other. A consensus protocol enforces correct implementation of these programs.

Consequently, a smart contract is composed of three distinct components: contractual agreement between the parties, governance of the preconditions required for the contractual obligations to be fulfilled, and actual execution of the contract (Koulu, 2016).

#### *Contractual Arrangement between the Parties*

The requirements of the contract are negotiated and implemented as a program. Via their Blockchain accounts (wallet), the parties are known as peers. They are bound by logical relation and conditions, so one must consider all recommendations to make any decisions. When the code is distributed and enforced, the Blockchain record is updated.

#### *Governance of Preconditions*

All nodes, including miners, are able to participate in any Blockchain transactions. The preconditions are therefore checked.

#### *Contract Execution*

If the conditions for execution of the contract are met, the contract is completed, the transactions are dealt with by the participating nodes, and the contract is considered executed. The consensus protocol guarantees correct execution. Therefore, smart contracts ensure what they are contracted for, making them self-regulating. This means that digital assets are distributed according to pre-negotiated conditions.

We will use a smart contract for zakat collection, which will be self-executed if the conditions for zakat payment are met (a minimum amount of hisab must be met for a particular category of zakat).

#### *An Overview of BAZNAS*

The Amil Zakat National Agency (BAZNAS) was formed in 2001 by the Indonesian Government under the Presidential Decree of the Republic of Indonesia No. 8 of 2001. BAZNAS is the only official agency assigned by the Government to collect and distribute Zakat, Infaq and Sadaqah (ZIS) in Indonesia. The role of BAZNAS as an authorized agency in zakat management in Indonesia is also supported by Law no. 23 of 2011, which explicitly state that BAZNAS is an independent non-structural governmental agency responsible to the President through the minister of religious affairs. Therefore, BAZNAS, under the Government, is responsible for overseeing zakat management based on sharia, trustworthiness, expediency, justice, legal certainty, integration and accountability principles.

### **3. Research Method**

This study is based on literature and theoretical reviews. This study took BAZNAS as the model of the Indonesian zakat agency to use Blockchain-based zakat payment on which zakat payers can track the fund allocated to the beneficiaries directly.

### **4. Result and Discussion**

#### *Proposing Blockchain Technology Based Zakat Model for Fund Traceability*

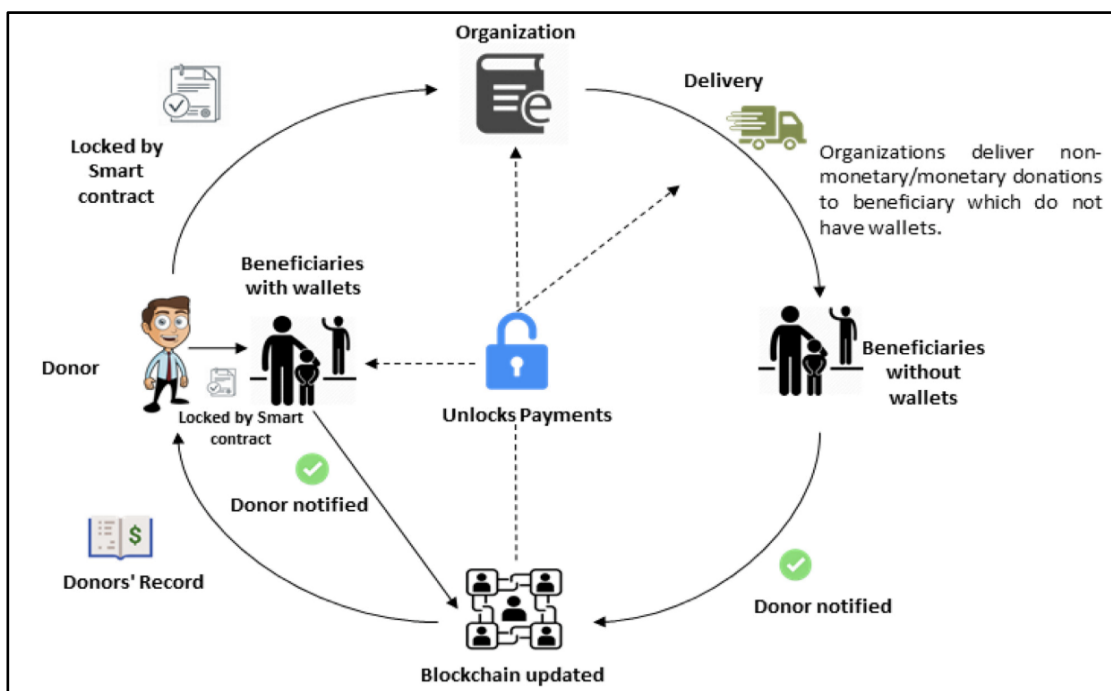
Previous studies propose Blockchain technology as an instrument to enhance the trust in Charity Organizations that Blockchain technology is able to present transparency and auditability in charity collection, and it works almost in the same way with Zakat. Lushi (2019) proposes Blockchain technology be used in Charity Organization since it is able to present transparency and possible traceability of any transactions. In her paper, Lushi (2019) proposes charity token to develop a

platform on each project needing donation will generate a verification token and offer donors with the opportunity to keep updated of which project they are exactly donating to and track the donation allocation.

Meanwhile, Farooq, Khan, & Abid (2020) propose a new cryptocurrency as a digital currency, namely CharityCoin (CC). Smart contract is used in the system including converting conventional currencies to CC, purchasing and selling CC and transferring CC to individuals and organizations demanding donation. The proposed framework is presented in the figure 2.

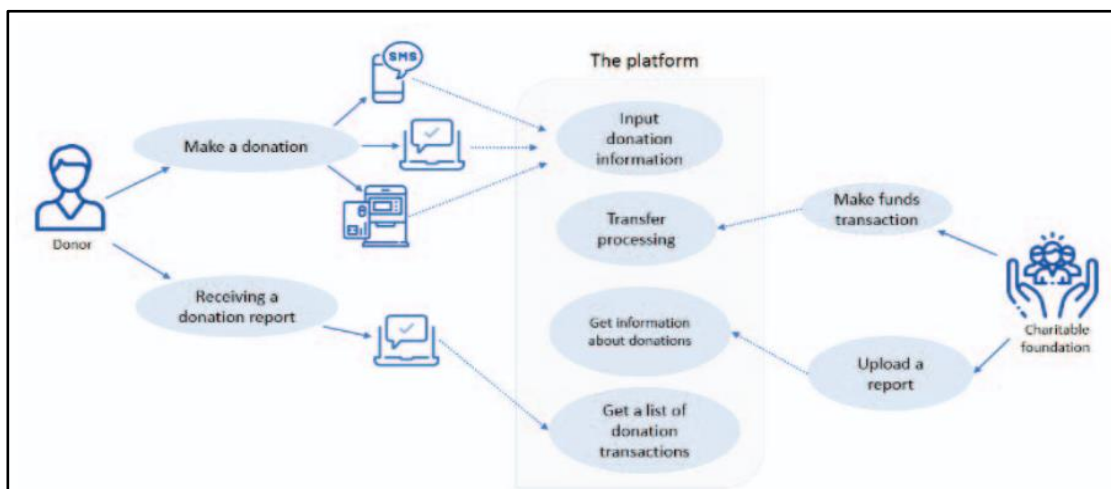
Conceptually, similar work has also been conducted by Saleh, Avdoshin, & Dzhonov (2019), proposing the Blockchain technology as a platform to track donation for charity organizations using Bitcoin. The mechanism offers Blockchain based technology, and the system presents transparent accounting of donors, charitable foundations, and beneficiaries. Additionally, the charitable platform can present a transparent donation route, allowing public users and donors to track and monitor where, when, and whom charity funds are distributed to. The mechanism is illustrated in the figure 3.

Zakat,  
Blockchain  
technology,  
Trust,  
Transparency



**Figure 2.** The framework of making charity collection transparent and auditable using blockchain technology

Source: Farooq et al. (2020)



**Figure 3.** The functionality of Blockchain technology-based platform for tracking donations of charitable foundations

Source: Saleh et al. (2019)

Having the various Blockchain based charity models reviewed, the author proposes a model for zakat collection using a token to enhance *Muzakki*'s trust in zakat agencies. The token can be acquired by purchasing it from zakat agencies. The concept of using token and exchanging them through charity organizations for fiat money for it to be used in Blockchain technology was proposed by Lushi (2019). The coin value is equal to the amount of money that *Muzakki* is going to pay.

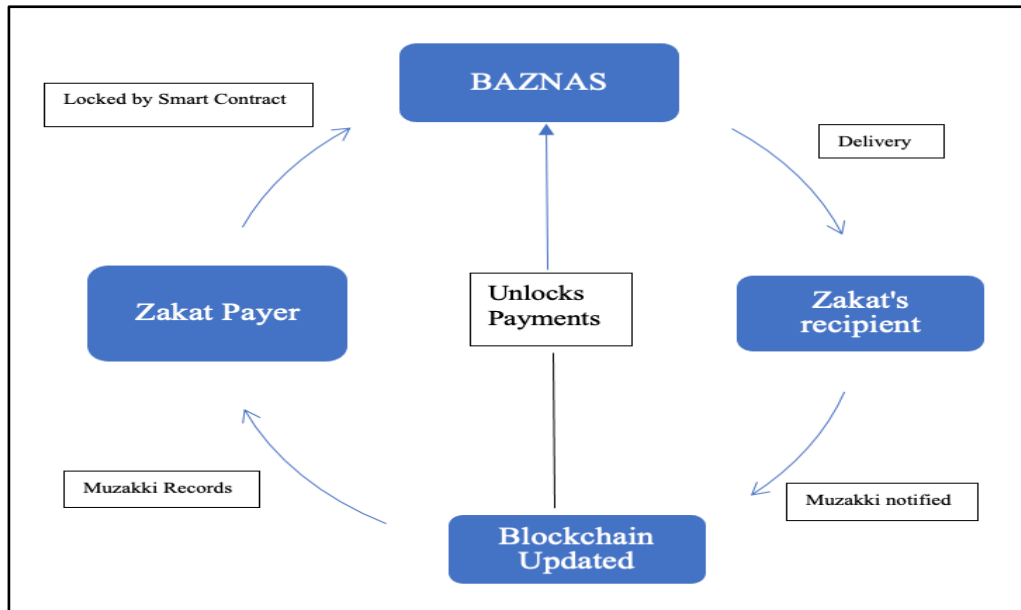
Smart contract will be used in special cases and to transfer Bitcoin from zakat agency to *Asnaf*. According to Yasmin et al., (2014), 38% of philanthropists surveyed for poor bookkeeping and negligence involved in religious organizations, the majority of are related to the Abrahamic traditions, covering Muslim and Christian charities. Just like the previous explanation, many *Muzakki* want to pay directly to *Asnaf* since they lack of trust in zakat agencies. The main reason of this issue is the lack of transparency in the charity collection process.

The current system's other problem is that donors or even the intermediaries are not directly familiar with the beneficiaries, leading to inefficient subsystems and beneficiary's vague claims for donations. The donors, consequently, have no idea of where their donations are allocated to Farooq et al., (2020). This issue can be solved through a Blockchain-based system that basically presents a platform that removes intermediary's role (Salah et al., 2019). This makes zakat collection and allocation processes transparent and helps win *Muzakki*'s trust.

Technically, the decentralized characteristics of Blockchain makes it tamper-proof that the whole data are stored in the Blockchain database, preventing any unauthorized access to the data in the Blockchain through secured cryptographic algorithms (Yang, 2019). Not only does Blockchain ensure security, but there are many miners (peer to peer computer process) in the Blockchain system to double-check the security of transactions made through the Blockchain. The supporting parts, including smart contracts, help implement business logics and consensus protocols for feedback and transparency, as well as speed, cost-effectiveness, security and trustworthy infrastructure (Jayasinghe et al., 2018).

Zakat collection process, therefore, requires strong security and user privacy. Secured identity and privacy is a major part of the Blockchain ecosystem, making it fit the best for charity process (Farooq et al., 2020). The use of Blockchain in zakat collection and distribution will present a secure, transparent, and efficient framework of zakat fund management to *Muzakki*. That technology adds transparency into the system allows *Muzakki* to observe where the fund go to using Blockchain tracing facilities and receive notification when it has reached the beneficiary. Once a donor makes donation using digital money, it will be locked by smart contracts, providing with a secure transaction along with proof of the work.

Payments locked under smart contracts cannot be hacked, and donor will be able to track the donation by tracing the supplier/organization and the final beneficiary (*Asnaf*). BAZNAS can also give cash to *Asnaf* out of digital money and distribute the money as per beneficiary's necessity. Once the fund is distributed, the donor will be notified, and the Blockchain nodes are updated with each entry. Zakat payment is locked by smart contracts, while smart contract is nothing more than a computer program enabling Blockchain to perform credible transactions without any party in the distribution system. Zakat fund will remain locked and non-consumable unless it is approved by the authorized sources, including the beneficiary. To ensure that donations are not spent for wrong purpose, they can simply be defined as a delivery payment. The entire system is transparent and is ready for tracking of any transactions by external authorities such as the Government, that can take some action against the person responsible for that transaction if they notice something unusual. During the process, this study proposes charity coin /charity coin act as a digital wallet. The mechanism is illustrated in figure 4.



Source: Author's work

Zakat,  
Blockchain  
technology,  
Trust,  
Transparency

**Figure 4.** Proposed Blockchain-based zakat framework

#### 4. Conclusions

This research attempts to demonstrate the importance of Blockchain and smart contract technologies in zakat management by developing a model that combines zakat management agencies with the components of Blockchain and smart contract technologies. This study took BAZNAS as the model of the Indonesian zakat agency to use Blockchain-based zakat payment on which zakat payers can track the fund allocated to the beneficiaries directly. This system presents traceability that will satisfy zakat payers and lead to the level of trust in BAZNAS. This zakat model of using Blockchain application is expected to help BAZNAS present higher transparency and enhance *Muzakki's* trust in BAZNAS and other zakat agencies, increasing the fund collected from *Muzakki* for the sake of *Asnaf* using Blockchain technology, so that *Muzakki* will be able to trace the zakat they have paid and aware of the specific *Asnaf* receiving their zakat funding.

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