



## Blockchain Waqf: Enabling Access to Social Islamic Finance

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# **BLOCKCHAIN WAQF: ENABLING ACCESS TO SOCIAL ISLAMIC FINANCE**

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## **ABSTRACT**

Waqf as means to help the needy persons and sustain economic development in Muslim society have now seen low contribution due to cumbersome procedures. An innovative technology has spread in fast manner known as Blockchain has given a hope to activate and revival the idle Waqf which lead to enhance its income and reflect on well-being of the populations. This paper aims to discuss the utilisation of innovative financial technology as Blockchain in Waqf. The objective of this paper is to overcome the hindrance and consider certain new techniques of managing awqaf in new digital arena. With this in view, this conceptual paper reviews both terms Waqf and Blockchain with special focus on Finterra waqf-chain as case study. This paper uses online desk research as sources of data to scrutinise waqf-chain. This paper proposes putting digital process through waqf chain to enable transparency for the institutions of waqf, beneficiary and donators in order to improve more performance and efficiency in managing waqf. This study is limited to focus on clarifying waqf chain process and does not discuss regulatory issues or how it can be implemented in different regions or any other aspect as shariah compliance. It is strongly believed that a new practical thinking about embedding innovative Blockchain and Waqf will encourage the parties intervene in waqf to trust in waqf chain to raise funds and sustain the development of the Islamic society.

**Keywords:** waqf, Blockchain, waqf chain, philanthropy finance, Islamic innovative technology.

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## INTRODUCTION

Waqf has played enormous role to enhance the welfare of margin population through waqf institutions. Waqf institution objectives as manager entity is to improve the social welfare of less-privileged people especially the needed poor persons in isolated area through funding different religious activities. Also, waqf has been contributed into establishment of many public assets for instance building hospitals, schools, roads, and others services (Mohsin 2019). In the distant past, Waqf as means to help the needy persons and sustain economic development in Muslim society was used in efficient manner to improve society life of Muslim individual and reduce poverty among. However, many contemporary waqf have now seen low contribution due to cumbersome procedures and inefficient management. In fact, waqf has numerous kinds to fulfil every needed party such as waqf 'āmm is open to all the public or public waqf, waqf khāṣṣ is special or private waqf, waqf khayrī relate to charitable waqf, waqf dhurrī or family waqf, and waqf al-nuqūd means cash waqf (Rashid 2018).

The key element that leads the donators to put movable or non-movable assets as waqf is the presence of good governance and transparency in waqf institutions (Elasrag 2019). Therefore, they have less impact on the development of poor people. Waqf assets worldwide almost reach 1 trillion USD which could reduce poverty to many group of people. (Finterra, 2018). However, many Muslim countries have become less developing society due to the idle waqf which is not being utilized in efficient manner by the administrator of waqf, waqf institutions, or lack of financing (Habib and Ahmad 2020).

In recent times, the incorporation of digital technology into Islamic finance has created new solutions for many waqf stakeholders. An innovative technology has spread in fast manner known as Blockchain has given a hope to activate and revival the idle Waqf which lead to enhance its income and reflect on well-being of the populations, reduce poverty among Muslims, and optimism to waqf institutions to manage assets and raise funds. The advanced Blockchain technology is running through trusted intermediaries used in large decentralised networks. The reason is high trust in virtual programme result from fast transaction and minor fees even when parties don't trust each other. Also, the absence of authority helps a lot to spread this network.

The objective of this paper is to overcome the hindrance and consider certain new techniques of managing awqaf in new digital arena. This paper will focus on exploring the concept of Blockchain and smart contracts as a new technology innovation that can add value to finance domain and Islamic finance in particular. The exploration of waqf chain model will clarify the how to benefit from technology in Islamic finance too. From a methodological point of view, this conceptual paper reviews both terms Waqf and Blockchain in the literature with special focus on Finterra waqf-chain as case study. This paper uses online desk research as sources of data to scrutinise waqf-chain and to reach our objectives for this study.

The paper is structured as follows. In Section 2 the study examines Blockchain concept and features in FinTech framework. Firstly, the clarification of the concept of Blockchain technology its benefit and how it works. Further in section 3, it examines the concept of Smart Contract in the context of Blockchain and its characteristics. Then in section 4, Blockchain in Islamic finance application is discussed. After that, the section 5 exposes waqf and its concept in shariah with more detail on its development, waqf institutions and what are the main issues facing its improvement. Finally, in section 5, the paper illustrates the WaqfChain and sustainability in Islamic society development with explanation of this new model, also, Finterra WaqfChain experience is discussed as developed technological platform. Then, it ends with conclusion.

## 1. BLOCKCHAIN CONCEPT AND FEATURES IN THE FINTECH FRAMEWORK

### 1.1. The Concept Of Blockchain

Blockchain technology or Distributed Ledger Technology offers consensus validation mechanism using many computers spread into network. It facilitates any transaction peer-to-peer without any intervention of third party or controlled by centralised authority to validate the exchange of information generated. Blockchain is composed of blocks one after the other. They are chained with logical manner which lead to protect the different blocks from any immutability or removed (Rennock, Cohn, and Butcher 2018). The first article published by Satoshi Nakamoto in October 2008 introduces a new concept based on connecting the digital asset and peer to peer payment system in his famous paper *Bitcoin: A Peer-to-Peer Electronic Cash System* (Nakamoto 2008, Giancaspro 2017). Blockchain, or Distributed Ledger

Technology (“DLT”), is a virtual platform. It stores and controls all the history of transactions dealing among users, who are connecting with the network. From a technical words, Blockchain is “a distributed peer-to-peer<sup>3</sup> system of ledgers that utilizes a software”(Utamchandani Tulsidas 2018). Also, it is a form of database contains blocks which encompasses sets of transactions against which any proposed transaction can be tested with assurance in the integrity of any particular block. (Kakavand, Kost De Sevres, and Chilton 2017). It can be said that Blockchain is the decentralized transparent ledger where the transactions are recorded by the intervenes and the database is updated in all network nodes by miners, monitored and owned by no one(Swan 2015).

## 1.2. Characteristics Of Blockchain

On Blockchain uses ledger to record and store multiple Transactions shared among parties and this need efficient performance of a Blockchain architecture. The main characteristics shape Blockchain are described as below:

- **Decentralizing:** Decentralized ledger means that the database of all blocks available to all users and participant and are not centralized in one region or one computer such as banks. The storing of the transaction data is in each node on the network. The blocks are chained sequentially and updated instantly in real time which makes it accessible to track and verify information on the all nodes (Alam, Gupta, and Zameni 2019, Grewal-Carr and Marshall 2016).
- **Security:** security of Blockchain network requires a threat model that defines the types and scope of adversaries and attacks on the system. Also, the decentralized architecture of the Blockchain design makes it more resistant to any cyber-attack (MICHAEL, COHN, and BUTCHER 2018).
- **Transaction and block immutability:** means that Blockchain technology gives more security to the entities to create permanent, unchallengeable transaction records and immune the network from any suspect fraud (MICHAEL, COHN, and BUTCHER 2018).
- **confidentiality and user anonymity:** anonymity provides trust by using encryption -binary values- and does not need of the trust of a middleman (Utamchandani Tulsidas 2018), where confidentiality transaction on a Blockchain appear when other nodes cannot "know" the contents of the transaction and in some cases may not want other nodes to even "know" their identity (Kakavand, Kost De Sevres, and Chilton 2017).
- **A Blockchain is programmable:** according to the needs of the parties determining the information to use, based on instructions that follow logical structures like “*if this, then that*” or “*else*” another outcome, as actions to be executed when certain conditions are met (Utamchandani Tulsidas 2018).

## 1.3. Benefits Of Blockchain

Blockchain offers a number of benefits (Ream, Chu, and Schatsky 2016):

- Speed and real-time updates. Blockchain can use software code to automate tasks which leads to faster business processes validation.
- Accuracy. Using computer programming helps to execute automated transactions not only faster but also less prone to human error.
- Lower execution risk. Decentralized execution virtually removes the possible risk of manipulation, non-performance, and errors, because the transaction is automatically executed by the network rather than an individual participant.
- Fewer intercessors. Blockchain not only build participants’ confidence but also eliminate any intermediaries such as bankers or brokers or any third party.
- Lower cost. As presented just in the above point of ‘Fewer intercessors’ and reducing numerous manpower to come up with less cost when remarkably using the new processes.
- New business or operational models. Based on the features of Blockchain mentioned earlier, the widespread of Blockchain will support different kinds of businesses since the transactions are reliably performed. Also, some businesses benefit from Blockchain such as(McWaters, Galaski, and Chatterjee 2016):

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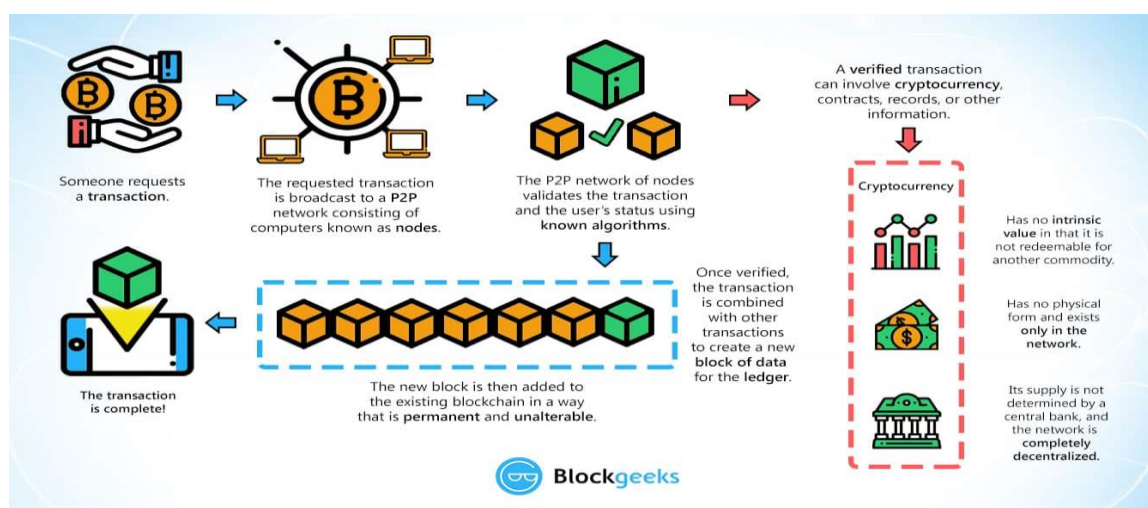
<sup>3</sup> Peer-to-peer (P2P) is the way of communication data used in Blockchain because it is decentralised, and each node keeps a copy of the ledger. It is also possible to talk about *white-listed* servers that operates the same why but restricted to certain nodes. (UTAMCHANDANI, 2018)

- a. Trade finance it enables real time multi party tracking and management of letter of credit with faster settlement.
- b. Global payments Blockchain accelerate the transaction between parties and settle in less time.
- c. Asset rehypothecation Blockchain provides market participations with liquidity and capital improvement and reevaluate risk with efficient.

#### 1.4. How Does Block Chain Work?

Blockchain works on network which uses internet and several computers distributed in all the world. The figure 1 below illustrates the process of working (“What is Blockchain Technology? A Step-by-Step Guide For Beginners,” 2019).

Figure 1: how does Blockchain Work?



The steps to run transaction on Blockchain are as follows(Nakamoto 2008):

- 1) New transactions are broadcast to all nodes that person A want to transfer money to person B.
- 2) Each node collects new transactions into a block.
- 3) Each node works on finding a difficult proof-of-work for its block.
- 4) When a node finds a proof-of-work, it broadcasts the block to all nodes.
- 5) Nodes accept the block only if all transactions in it are valid and not already spent.
- 6) Nodes express their acceptance of the block by working on creating the next block in the chain, using the hash of the accepted block as the previous hash.

## 2. SMART CONTRACTS IN THE CONTEXT OF BLOCKCHAIN

### 2.1. The Concept Of Smart Contract

Contract in traditional meaning is an agreement between two or more to fulfil its obligations based on trust among the different parties. however, smart contracts use Blockchain-based technologies to act automatically without reliance on a centralized authority and remove the need to trust the third party(Swan 2015, Levy 2017). Smart contracts can be termed as the most utilized application of Blockchain technology in the current times. smart contracts are self-execution program which contains certain legal effects, embodies binding expression and uses distributed ledger technology to implement automated transactions agreed among parties(Governatori et al. 2018). Nick Szabo<sup>4</sup> developed the term of smart contracts in the early 90s in his paper *Smart Contracts* appeared in 1994 gives a simple definition “A smart contract is a set of promises, specified in digital form, including protocols within which the parties perform on these promises.”(p.2). However, this definition is not very clear with regard to automated execution (Savelyev 2017). Smart contracts are a complex set of software codes with components designed to automate execution and settlement of contractual agreements(Elasrag 2019).

<sup>4</sup> Nick Szabo is one of the pioneers of the analysis of automated self-enforced agreements.

Vitalik Buterin gives a meaning to smart contracts as “cryptographic boxes” that contain value and only unlock if certain conditions are met” (Buterin 2014). In essence, Smart contracts are merely a computer program with set of procedural rules and logic. It means, in other words, a set of codes shared to all computers on Blockchain network which is decentralized and trusted. The smart contracts contain all the details relate to contractual agreement among the signing parties, conditions of breach of contract, liability for breach of contract. Then the contract is automatically executed and far from any central agencies(Wang et al. 2018).

## **2.2. Characteristics Of Smart Contract**

It is necessary to outline the features of smart contracts, which could be used for finding its place in the existing contractual concepts. it is possible to enlist the following ones (Savelyev 2017, Wang et al. 2018):

- 1- Solely electronic nature. Classic contracts may exist in various forms, e.g. in oral form or in writing. However, smart contracts can exist only in electronic form. This characteristic may relate to digital assets such as cryptocurrency, or to digital manifestations of offline assets, titles to which are registered on the Blockchain.
- 2- Software implementation: Smart contracts are not only computer code but also comprise of contractual terms or documents governing the contractual relations of the parties. This means that each smart contract is legally also a computer program within the context of intellectual property law.
- 3- Increased certainty: Smart contract terms are stated in one of the available computer languages, which are formal languages with precisely defined semantics and syntax, and are interpreted by the machine according to Boolean logic.
- 4- Conditional nature: It is computer languages using condition possibility to draft Smart contract terms. The computer code is based on accurate conditional statements. Like the rule “*if this, then that*” is in harmony with contractual terms and conditions to minimise ambiguity.
- 5- Self-enforceability: once the smart contract is accepted by the parties and added to the Blockchain, no party can modify or change or breach the conditions and agreed terms. In other words, technically smart contract is binding on all participants.
- 6- Trust or self-sufficiency<sup>2</sup> the data transferred are encrypted on a sharing ledger.
- 7- Autonomy after creating and launching the contract on Blockchain, the execution of contracts is autonome from any changing or modification.
- 8- self-sufficient in their ability to marshal resources e.g., gain processing power or storage.
- 9- Decentralisation: after launching the contracts on Blockchain, the contracts are distributed and self-executed in all computers on network.

## **2.3. How do Smart Contracts work?**

A smart contract is program embedding a set of rules that includes agreement between two parties or more to execute the transaction. The manner of working a smart contract is as follow (Beklemysheva, 2018).

- 1- Identify agreement among parties to seize desired opportunity and design the business processes.
- 2- Set conditions that lead to realise the smart contract by satisfaction of certain conditions such as natural disaster or financial market indices.
- 3- Code the business logic, smart contract will be automatically executed when certain conditional parameters s are met.
- 4- Encryption of the data. Blockchain provides the security to parties to authenticate and verify the messages.
- 5- Executing and processing. Blockchain write the content of smart contract into blocks and execute the smart contract when conditions are realised.
- 6- Network updates. After acceptance of smart contract on Blockchain, the ledgers are updated automatically on all computers and they will be immutable.

### **3. BLOCKCHAIN IN ISLAMIC FINANCE APPLICATIONS**

Smart contracts powered by a Blockchain could provide customers and insurers with the means to manage claims in a transparent, responsive and irrefutable manner. Contracts and claims could be recorded onto a Blockchain and validated by the network, ensuring only valid claims are paid. For example, the Blockchain would reject multiple claims for one accident because the network would know that a claim had already been made. Smart contracts would also enforce the claims. For instance, triggering payments automatically when certain terms and conditions are met depending on the formula set for the transaction execution and enforcement.

### **4. WAQF AND ITS CONCEPT IN SHARIAH**

Waqf is regarded as an important tool for financial inclusion and financial finance it has always recorded a great and significant contribution to the society throughout the history of Islamic civilization.

#### **4.1. Waqf Development And Sustainability In Islamic Development Through Waqf**

The nature of waqf structure and its Shariah rules nature make it convenient and relevant for sustainability development because its principles (the amount or asset given as waqf) does not deplete and cannot be consumed and but only utilize with the condition of its sustainability and preservation, meaning only its return and profit will be used, hence the sustainability is an important ingredient in waqf sttucture.

#### **5.2. Role Of Waqf And Waqf Institutions To Develop Islamic Society**

The importance of waqf is not debatable and its great role is acknowledged, however to make the story of waqf successful that produce result, IFI, organizations, government link agencies and institution along with other stakeholder should play a great role to push the boundaries of waqf to the maximum limit to have its significant impact on the society. Without the significant roles of the institutions waqf will not go very far, however the impact will be more if the technology and other modern techniques are integrated in the promotion waqf. Among the important aspects that can contribute to the waqf as follows:

- Proper funding by the institutions
- Proper fund management and waqf management through advance IT systems
- Proper governance structure in the waqf portfolio
- Proper integration of technology in the waqf project
- Modern management system for waqf
- Financial inclusion projection and vision in the waqf project

With the above aspects and other major points that can be added the waqf can contribute significantly to the society at large.

#### **4.2. Waqf Issues And Challenges**

Waqf from inception till now has been struggling to rejuvenate its past glory place among Muslim society. Multiple reasons are behind and responsible for this retrogression. For example, the problems facing waqf today are in the area of waqf itself and waqf institutions. There is no traceable records or the historical comprehensive information register due to many factors one of them is colonialism destructions of Waqf and its records(Mohsin 2019) . The main issues and challenges appear as hindrance to waqf thriving in developing Muslim society are as follow. I) almost the Muslim countries have centralised waqf administration, ii) manpower are unsuitable, iii) incompetency of the existing organization and the administrative employees, iv) traceability of waqf properties in land administration record, v) lack of provisions and regulations govern waqf properties or even separate waqf law(Rashid 2018), vi)absence of social awareness, vii) occupation of waqf properties without legal authorisation, viii) lack of efficiency in managing and operating of waqf properties in many Muslim countries where the managers were interesting merely on receiving their wages in the end of each month or neglect that they manage waqf assets at all(AZGANIN 2019) , ix) shariah supervision is less present to control waqf operation(Habib and Ahmad 2020).

## 5. WAQF-CHAIN AND SUSTAINABILITY IN ISLAMIC SOCIETY DEVELOPMENT

### 5.1. Waqf And Blockchain Integration

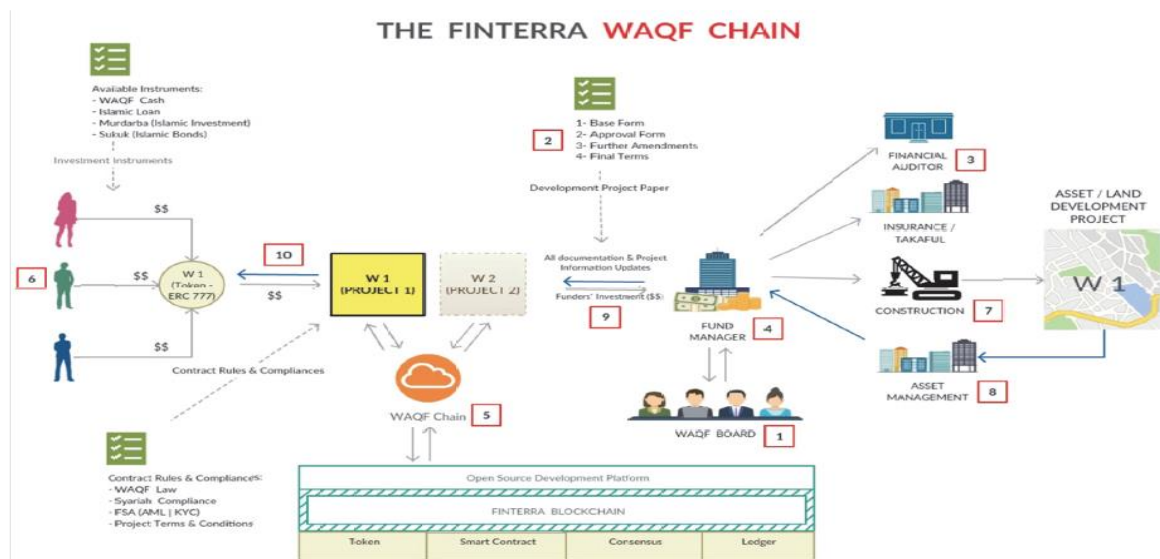
In this model, waqif can track the status of their donation and see its impact on a worthy cause. This system is full transparency about how a donation is used to support their cause. On the fund's trip, donors are notified when an update is posted to their platform tracking page. Another advantage on this platform, waqif profiles are presented in visual form that grows with every donation. Easily shareable on social media platforms and manage one-time and recurring donations seamlessly. This model described as the following paths (Beik, Zaenal, and Rizkiningsih 2019):

- The donation process has been initiated by the *waqif*, with a fiat money medium sending to *the waqf institution –nazir*.
- The amount of donation will be listed as a Code. Based on the Blockchain platform used by waqf institution, this code is processed from the waqif –donator- to process of putting the funds to use to the needed causes.
- *Nazir, waqif and beneficiaries-donee-* have knowledge of using the fund from waqif to support a worthy cause.

### 5.2. Waqf Chain - Finterra As Case And Business Model –

In the distant past, this Sharia precept was used throughout the Muslim world to improve societies and reduce poverty. Yet, many contemporary Awqaf are poorly managed, and thus have little impact on poverty. The key to improving trust in Awqaf is good governance, and transparency with stakeholders. Finterra is a new company which announced developing a crowdfunding platform that uses Blockchain to create smart contracts tied to specific waqf projects. It is hoped that this can provide a more efficient way to raise money, manage and transfer ownership of waqf.

Figure 2: the Finterra WaqfChain model to develop idle Waqf.



The Finterra Waqf Chain platform permit any participant in the world to propose development of any project on top of waqf properties which required capital. When the project is accepted and all the required elements are met, the project proposal will be allowed to penetrate the platform, other individuals or financial institutions can adhere to finance these project proposals via fiat money or cryptocurrency. Finterra WaqfChain platform generate tokens which are created and distributed to the participating funders. These tokens represent right into indivisible project that produce benefit b (Elasrag 2019).

The work of this platform to raise funds to invest into development of idle waqf is illustrated as follow (Rashid 2018).

- 1- The waqf board identifies and makes available a land asset for development.



- 2- A development project paper is written that covers land title, feasibility study, building architecture, building project plan, project costing, project profit and loss, and recommended instruments of financing.
- 3- An independent auditor reviews and endorses the development project paper.
- 4- A licensed fund manager is then engaged to launch an ICO for the development of the specific waqf development project, via the sale of crypto tokens to pre-qualified investors globally.
- 5- The platform 'WaqfChain' created on-top of Finterra Blockchain sells Special tokens to investors in counterpart of raising funds needs to develop the waqf project.
- 6- The Finterra WaqfChain uses different instruments to collect the required capital such as cash waqf, Islamic loan, Muḍārabah and Sukuk.
- 7- When the required capital raised the fund manager appoint a constructor to construct and develop the waqf asset.
- 8- When the required capital raised the fund manager appoint an operator to manage and maintain the asset.
- 9- The fund manager functions are to collect revenues comes from the operation of asset.
- 10- Revenues collect by the fund manager are shared with investors based on the underlying contract.

## 6. CONCLUSION

The study showed the importance of Blockchain as platform to develop Islamic finance application such as waqf. The same model and technology could be used to promote other Islamic finance application by using the same underlying technique and technology. Blockchain may give waqf great opportunity to further enhance and develop the idle asset of waqf. The model could be applicable to various jurisdiction in the Muslim world to maximize the potential and benefit of waqf for the benefit of the Ummah at large.

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