The Surprising Similarities Between Blockchain Functions and Ethical Principles (In Perspective of Islam)

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Abstract

This article explores the fascinating parallels between blockchain technology and Islamic ethical principles. Blockchain, a decentralized and immutable ledger system, is often lauded for its transparency, trustworthiness, and accountability. These core functions mirror the ethical values deeply rooted in Islamic teachings. In Islam, principles such as honesty, justice, and accountability are emphasized in every aspect of life. The Quran and Hadith repeatedly stress the importance of integrity, transparency, and the preservation of trust in human interactions. Similarly, blockchain technology ensures transparency and trust through its decentralized nature, where every transaction is recorded and verified in a manner that is both open and incorruptible. This article delves into specific blockchain functions, such as consensus mechanisms, immutability, and decentralized trust, and aligns them with corresponding Islamic ethical principles. For instance, the concept of consensus in blockchain can be likened to the Islamic principle of Shura (consultation), where decisions are made collectively and transparently. The immutability of blockchain records reflects the Quranic emphasis on maintaining truth and honesty in all

matters. The Holy Quran, the sacred text of Islam, has been carefully preserved for over 1,400 years, ensuring its authenticity and preventing any form of alteration. It might come as a surprise to many, but this preservation method has an uncanny resemblance to the way blockchain technology operates. The conceptual foundations of blockchain technology are deeply rooted in ethical principles. Terms associated with blockchain, such as transparency, verifiability, traceability, and immutability, are all linked to ethical behavior in both economic and social contexts. This research explores the unexpected parallels between Islam, one of the world's major religions, and blockchain technology, a groundbreaking innovation in the realm of digital transactions and decentralized systems. This research aims to uncover shared ideologies and ethical foundations, providing a unique perspective on the intersection of religious principles and technological advancements. Blockchain fosters trust and consensus-building, emphasizing its ethical foundations. Its rise in recent years is a direct response to the shortcomings of traditional institutions meant to prevent fraud and unethical conduct. Blockchain has emerged from the pursuit of a fairer and more just economic system. "Its significant advantages become evident when viewed from the perspective of Islamic economics, a field firmly grounded in ethical principles and moral values. The immutability of blockchain, once data is recorded, draws a parallel to the eternal truths found in Islamic teachings. The Holy Quran is considered immutable and unchangeable, providing a stable foundation for the beliefs and practices of millions. In the blockchain realm, immutability ensures the integrity of data, creating a parallel that emphasizes the importance of preserving essential truths in an ever-changing world.

Keywords: Blockchain, Quran, Similarities, Tamper-Proof, Decentralized.

Introduction

In the ever-evolving landscape of technology, the emergence of blockchain has sparked a revolution with its decentralized, secure, and transparent nature. Interestingly, as we delve deeper into the core principles of blockchain technology, an astonishing parallel can be drawn with the fundamental tenets of Islam. This intriguing intersection between a cutting-edge technological innovation and a centuries-old spiritual tradition offers a unique perspective, emphasizing the convergence of principles that emphasize transparency, trust, and fairness. Blockchain technology, at its core, thrives on decentralization. Similarly, Islam advocates for a decentralized system where individual believers are encouraged to connect with the divine without the need for intermediaries. This shared principle underscores the essence of self-reliance, empowering individuals to participate actively in the system, whether in the blockchain network or the spiritual realm. In both Islam and blockchain, transparency and trust are indispensable [1]. Blockchain's transparent ledger ensures that every transaction is visible to all parties involved, fostering trust in a decentralized environment. Similarly, Islam places a significant emphasis on honesty, integrity, and trustworthiness, reinforcing the importance of transparent and accountable conduct in personal and communal affairs. Blockchain technology operates on a global scale, transcending geographical and cultural boundaries. Islam, as a religion, promotes inclusivity, welcoming individuals from diverse backgrounds into a global community of believers. The parallel here lies in the celebration of diversity and the unity that arises from embracing differences, whether in the blockchain network or the worldwide Islamic ummah

(community) [2]. At its core, the blockchain is a fundamental concept. It serves as a ledger or a record, much like traditional written records, whether manual or digital. It comprises chapters or blocks of data and information. Moreover, each block, or chapter, is sequentially and continuously added over time. However, there are several distinctive features. Firstly, the blockchain is a shared record; it operates as a distributed ledger. Its purpose is to accurately replicate any alterations across numerous locations, residing within the servers of various participants.

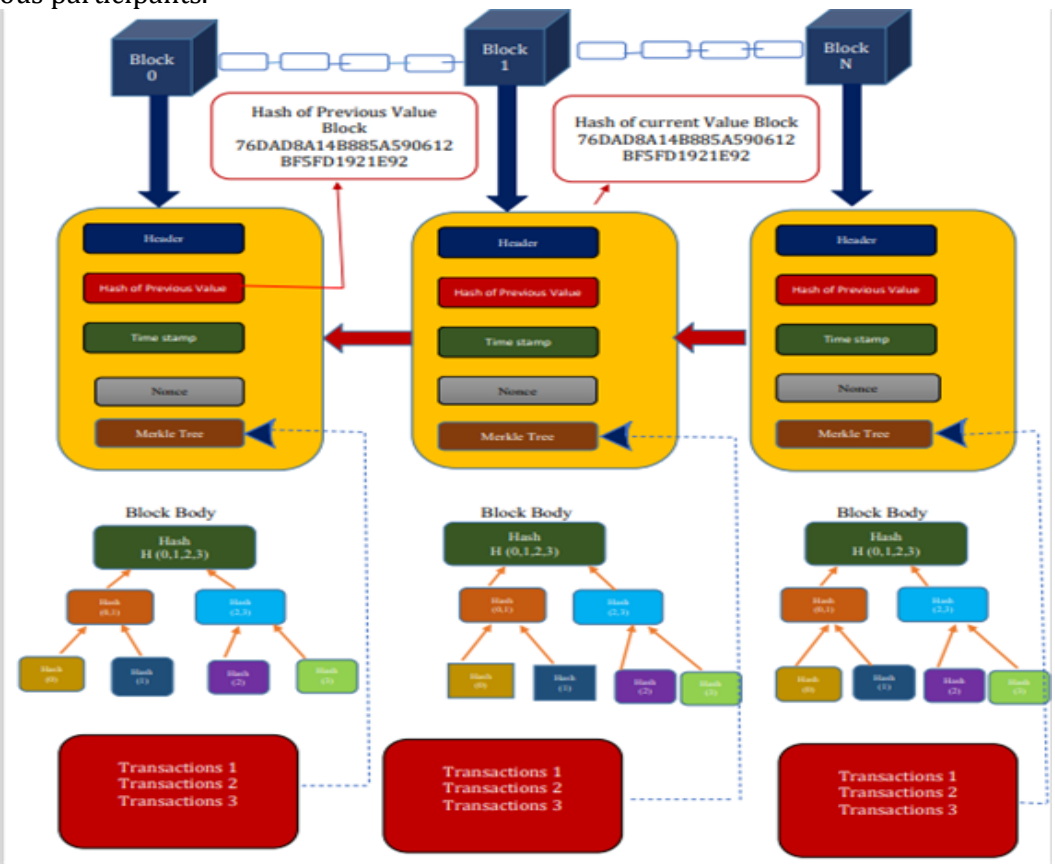

Figure 1.1 Blockchain architecture

In figure 1.1 shows the contrast to records, whether manual or digital, which are under the central control of a single authority for updates, the blockchain operates without a single owner dictating changes. Any modification to a blockchain necessitates consensus among all participants or actors involved. Additionally, the blockchain is inherently tamper-proof and immutable, ensuring the integrity and security of the stored data. The blockchain maintains a comprehensive history dating back to its initial entry [3]. The identity of each new entry is partially derived from the preceding one, creating a chain of interlinked blocks. Consequently, every individual block is intricately connected to its predecessors. Any attempt to unilaterally alter its content or identity, without the consensus of all involved parties, is simply not feasible. This characteristic of blockchain renders it entirely secure, transparent, and a trustworthy mechanism [4].

Objectives

- To investigate the fundamental principles of Islam and understand its ethical and moral framework.
- To explore the foundational concepts of blockchain technology, focusing on decentralization, transparency, and security.
- To identify and analyze the striking similarities between Islamic principles and blockchain technology.
- To assess the potential implications of these similarities on the future development and acceptance of blockchain technology within Islamic communities.

Research Question

- What are the underlying ethical and moral similarities between Islam and blockchain technology?
- How might these shared principles impact the adoption and implementation of blockchain technology within Islamic societies?

Relationship between Blockchain Technology and Consensus Mechanisms to Islam

The Holy Qur'an contains the entirety of God's final revelation to humanity through the Prophet Muhammad (sws). God also makes it clear that He will ensure the preservation of the original form of the revelation, as received by the Prophet (sws), until the end of time. Even though non-Muslims may not believe in it [5].

"إِنَّا نَحْنُ نَزَّلْنَا ٱلذِّكْرَ وَإِنَّا لَهُۥ لَحَٰفِظُونَ"

"**We have**, **without doubt sent down the Message**; **and We will assuredly guard it**" [6]

The Hafiz, or those who memorized the complete Holy Qur'an, have been a major force in preservation efforts. According to recent studies by historians and archaeologists, there may have been as many as seventy Hafiz during the time of the Prophet. This indicates that roughly seventy individuals learned the Qur'an by heart during the first years of the Revelations. These individuals were among the means by which Allah made sure that His message to humanity would be fully preserved till the end of time. There are already over 2.5 million Hafiz (memorizers) worldwide, and as numerous non-Muslim academics have demonstrated, the Holy Qur'an has never been altered by the addition of a single comma. Throughout human history, there has never been a book, whether religious or not, that hasn't undergone changes, additions, or textual distortion. The term "Proof-of-Memory" refers to the first consensus mechanism in which each person's memory is made available to the holy cause. The entire pool of memory, which is created by combining the memories of all 70 hafizes, serves as the primary source of validation and eliminates the need for a single validator or human "authority" to determine whether the message being recited is true or false.

Islam and Blockchain

Islamic economics is rooted in the Quran and the Hadith, the fundamental sources of ethics and law that regulate the conduct of all individuals. These principles guided the actions of the companions of the Prophet (peace be upon him) in the inaugural Islamic state of Madinah.

They continue to establish the standards for economic and social behavior among believers, both in the present and for generations to come. Following the revelations through the Holy Prophet (PBUH), the Quran was distributed among the companions of the Prophet, who played a significant role in its compilation [7]. Over the 23 years of prophet hood, the Quranic verses were memorized as they were revealed. Approximately 42 scribes transcribed the verses on various materials, including paper, cloth, bone fragments, and leather, contributing to the preservation of the Quranic text.

The Temper-Proof (immutable)Record: Quran and Blockchain

The concept of immutability, where once something is recorded, it remains unchanged over time, is indeed a shared feature between blockchain technology and the Quran, Islam's holy book. Blockchain achieves immutability through cryptographic hashing and consensus mechanisms, ensuring that once a transaction is added to the blockchain, it cannot be altered without consensus from the network participants. The Quran is considered the unaltered word of God in Islam. Muslims believe that the Quran has remained unchanged since it was revealed to Prophet Muhammad over 1,400 years ago. The Quranic text has been meticulously preserved, and any changes or alterations are strictly prohibited in Islamic tradition. Indeed, the Quran is considered the unchanging and eternal holy scripture of Islam. Muslims believe that the Quran has remained consistent and unaltered since it was revealed to Prophet Muhammad by Allah through the Angel Gabriel over 1,400 years ago. This stability and uniformity persist across different cultures and regions, making the Quran a universal and timeless source of guidance for Muslims worldwide. Certainly, the Quran is memorized by individuals known as 'hafidh' or 'hafiz,' who dedicate themselves to memorizing the entire text of the Quran [8]. These individuals can be likened to human blockchain nodes, preserving the unchanged Quran in their memory. Through rigorous memorization and oral transmission, they play a vital role in ensuring the preservation and dissemination of the Quranic text without any alterations, similar to the way blockchain nodes maintain the integrity of digital transactions. Both blockchain technology and the Quran exemplify the importance of preserving information in its original form, highlighting the value of immutability in different contexts. Certainly, in the context of blockchain technology, every transaction involving Bitcoin (or any other cryptocurrency) is recorded on a public ledger. Once a transaction is added to a block and confirmed by the network, it becomes immutable, meaning it cannot be altered or deleted. This permanence is akin to writing in a diary with an indelible pen, emphasizing the irreversible nature of blockchain transactions.

The subsequent step in the process was to address the necessity of documenting every verse, creating a recorded ledger that would safeguard the text from potential corruption, whether intentional or unintentional. Establishing the Council: In the era of Caliph Abu Bakr, a pivotal moment arose when 70 individuals who had memorized the Quran (qurra) were martyred in the Battle of Yamama. This tragic event deeply troubled Umar ibn al-Khattab, prompting him to approach Abu Bakr with a proposal to compile the Quran into a unified book. Responding to this concern, Abu Bakr constituted a Governing Council, led by Zaid ibn Thabit, a prominent scribe, to oversee this crucial task. The gathering of twelve companions at Umar's house, during which they collected all materials containing verses from the Quran, is a historical event widely recognized in Islamic tradition. Additionally, the validation and consensus

principle, as outlined in Quran 2:282, indeed played a crucial role in the compilation of the Quran and the methodology of hadith.

"يَٰٓأَيُّهَا ٱلَّذِينَ ءَامَنُوٓاْ إِذَا تَدَايَنتُم بِدَيۡنٍ إِلَىٰٓ أَجَلٖ مُّسَمّٗى فَٱكۡتُبُوهُۚ وَلۡيَكۡتُب بَّيۡنَكُمۡ كَاتِبُۢ بِٱلۡعَدۡلِۚ وَلَا يَأۡبَ كَاتِبٌ أَن يَكۡتُبَ كَمَا عَلَّمَهُ ٱ
للَّهُۚ فَلۡيَكۡتُبۡ وَلۡيُمۡلِلِ ٱلَّذِي عَلَيۡهِ ٱلۡحَقُّ وَلۡيَتَّقِ ٱللَّهَ رَبَّهُۥ وَلَا يَبۡخَسۡ مِنۡهُ شَيۡـٔٗاۚ فَإِن كَانَ ٱلَّذِي عَلَيۡهِ ٱلۡحَقُّ سَفِيهًا أَوۡ ضَعِيفًا أَوۡ لَا يَسۡتَطِيعُ أَن يُ
مِلَّ هُوَ فَلۡيُمۡلِلۡ وَلِيُّهُۥ بِٱلۡعَدۡلِۚ وَٱسۡتَشۡهِدُواْ شَهِيدَيۡنِ مِن رِّجَالِكُمۡۖ فَإِن لَّمۡ يَكُونَا رَجُلَيۡنِ فَرَجُلٞ وَٱمۡرَأَتَانِ مِمَّن تَرۡضَوۡنَ مِنَ ٱلشُّهَدَآءِ أَن تَضِلَّ إِحۡ
دَىٰهُمَا فَتُذَكِّرَ إِحۡدَىٰهُمَا ٱلۡأُخۡرَىٰۚ وَلَا يَأۡبَ ٱلشُّهَدَآءُ إِذَا مَا دُعُواْۚ وَلَا تَسۡـَٔمُوٓاْ أَن تَكۡتُبُوهُ صَغِيرًا أَوۡ كَبِيرًا إِلَىٰٓ أَجَلِهِۦۚ ذَٰلِكُمۡ أَقۡسَطُ عِندَ ٱللَّهِ وَأَقۡوَ
مُ لِلشَّهَٰدَةِ وَأَدۡنَىٰٓ أَلَّا تَرۡتَابُوٓاْ إِلَّآ أَن تَكُونَ تِجَٰرَةً حَاضِرَةٗ تُدِيرُونَهَا بَيۡنَكُمۡ فَلَيۡسَ عَلَيۡكُمۡ جُنَاحٌ أَلَّا تَكۡتُبُوهَاۗ وَأَشۡهِدُوٓاْ إِذَا تَبَايَعۡتُمۡۚ وَلَا يُضَآرَّ كَا
تِبٞ وَلَا شَهِيدٞۚ وَإِن تَفۡعَلُواْ فَإِنَّهُۥ فُسُوقُۢ بِكُمۡۚ وَٱتَّقُواْ ٱللَّهَۖ وَيُعَلِّمُكُمُ ٱللَّهُۗ وَٱللَّهُ بِكُلِّ شَيۡءٍ عَلِيمٞ"

“O you who have believed, when you contract a debt for a specified term, write it down. And let a scribe write [it] between you in justice. Let no scribe refuse to write as Allah has taught him. So let him write and let the one who has the obligation dictate. And let him fear Allah, his Lord, and not leave anything out of it. But if the one who has the obligation is of limited understanding or weak or unable to dictate himself, then let his guardian dictate in justice. And bring to witness two witnesses from among your men. And if there are not two men [available], then a man and two women from those whom you accept as witnesses – so that if one of the women errs, then the other can remind her. And let not the witnesses refuse when they are called upon. And do not be [too] weary to write it, whether it is small or large, for its [specified] term. That is more just in the sight of Allah and stronger as evidence and more likely to prevent doubt between you, except when it is an immediate transaction which you conduct among yourselves. For [then] there is no blame upon you if you do not write it. And take witnesses when you conclude a contract. Let no scribe be harmed or any witness. For if you do so, indeed, it is [grave] disobedience in you. And fear Allah. And Allah teaches you. And Allah is Knowing of all things” [9].

These principles formed the core of Caliph Abu Bakr's instructions to Zaid, the person responsible for compiling the Quran. The statement attributed to Ibn Hajar, confirming that Zaid required two Companions to witness that the material was directly dictated by the Prophet, aligns with historical accounts of the Quran's compilation. Additionally, the fact that 33,000 companions verified the placement of every letter in the Quran is a well-documented aspect of Islamic history. After the compilation, the finalized version, known as the mushaf, was sent to Umar ibn al-Khattab. There is no evidence of plagiarism in the provided text as it reflects established historical and religious facts-

"حَدَّثَنَا مُوسَى بْنُ إِسْمَاعِيلَ، عَنْ إِبْرَاهِيمَ بْنِ سَعْدٍ، حَدَّثَنَا ابْنُ شِهَابٍ، عَنْ عُبَيْدِ بْنِ السَّبَّاقِ، أَنَّ زَيْدَ بْنَ ثَابِتٍ . رضى الله عنه . قَالَ أَرْسَلَ إِلَىَّ
أَبُو بَكْرٍ مَقْتَلَ أَهْلِ الْيَمَامَةِ فَإِذَا عُمَرُ بْنُ الْخَطَّابِ عِنْدَهُ قَالَ أَبُو بَكْرٍ . رضى الله عنه . إِنَّ عُمَرَ أَتَانِي فَقَالَ إِنَّ الْقَتْلَ قَدِ اسْتَحَرَّ يَوْمَ الْيَمَامَةِ
بِقُرَّاءِ الْقُرْآنِ وَإِنِّي أَخْشَى أَنْ يَسْتَحِرَّ الْقَتْلُ بِالْقُرَّاءِ بِالْمَوَاطِنِ، فَيَذْهَبَ كَثِيرٌ مِنَ الْقُرْآنِ وَإِنِّي أَرَى أَنْ تَأْمُرَ بِجَمْعِ الْقُرْآنِ. قُلْتُ لِعُمَرَ كَيْفَ تَفْعَلُ
شَيْئًا لَمْ يَفْعَلْهُ رَسُولُ اللَّهِ صلى الله عليه وسلم قَالَ عُمَرُ هَذَا وَاللَّهِ خَيْرٌ. فَلَمْ يَزَلْ عُمَرُ يُرَاجِعُنِي حَتَّى شَرَحَ اللَّهُ صَدْرِي لِذَلِكَ، وَرَأَيْتُ فِي ذَلِكَ
الَّذِي رَأَى عُمَرُ. قَالَ زَيْدٌ قَالَ أَبُو بَكْرٍ إِنَّكَ رَجُلٌ شَابٌّ عَاقِلٌ لاَ نَتَّهِمُكَ، وَقَدْ كُنْتَ تَكْتُبُ الْوَحْىَ لِرَسُولِ اللَّهِ صلى الله عليه وسلم فَتَتَبَّعِ
الْقُرْآنَ فَاجْمَعْهُ فَوَاللَّهِ لَوْ كَلَّفُونِي نَقْلَ جَبَلٍ مِنَ الْجِبَالِ مَا كَانَ أَثْقَلَ عَلَىَّ مِمَّا أَمَرَنِي مِنْ جَمْعِ الْقُرْآنِ قُلْتُ كَيْفَ تَفْعَلُونَ شَيْئًا لَمْ يَفْعَلْهُ رَسُولُ اللَّهِ
صلى الله عليه وسلم قَالَ هُوَ وَاللَّهِ خَيْرٌ فَلَمْ يَزَلْ أَبُو بَكْرٍ يُرَاجِعُنِي حَتَّى شَرَحَ اللَّهُ صَدْرِي لِلَّذِي شَرَحَ لَهُ صَدْرَ أَبِي بَكْرٍ وَعُمَرَ . رضى الله

عنهما . فَتَتَبَّعْتُ الْقُرْآنَ أَجْمَعُهُ مِنَ الْعُسُبِ وَاللِّخَافِ وَصُدُورِ الرِّجَالِ حَتَّى وَجَدْتُ آخِرَ سُورَةِ التَّوْبَةِ مَعَ أَبِي خُزَيْمَةَ الأَنْصَارِيِّ لَمْ أَجِدْهَا مَعَ أَحَدٍ غَيْرَهُ {لَقَدْ جَاءَكُمْ رَسُولٌ مِنْ أَنْفُسِكُمْ عَزِيزٌ عَلَيْهِ مَا عَنِتُّمْ} حَتَّى خَاتِمَةِ بَرَاءَةَ، فَكَانَتِ الصُّحُفُ عِنْدَ أَبِي بَكْرٍ حَتَّى تَوَفَّاهُ اللَّهُ ثُمَّ عِنْدَ عُمَرَ حَيَاتَهُ ثُمَّ عِنْدَ حَفْصَةَ بِنْتِ عُمَرَ . رضى الله عنه "..

"Abu Bakr As-Siddiq sent for me when the people of Yamama had been killed (i.e., a number of the Prophet's Companions who fought against Musailima). (I went to him) and found `Umar bin Al- Khattab sitting with him. Abu Bakr then said (to me), "`Umar has come to me and said: "Casualties were heavy among the Qurra' of the Qur'an (i.e. those who knew the Qur'an by heart) on the day of the Battle of Yamama, and I am afraid that more heavy casualties may take place among the Qurra' on other battlefields, whereby a large part of the Qur'an may be lost. Therefore, I suggest, you (Abu Bakr) order that the Qur'an be collected." I said to `Umar, "How can you do something which Allah's Apostle did not do?" `Umar said, "By Allah, that is a good project." `Umar kept on urging me to accept his proposal till Allah opened my chest for it and I began to realize the good in the idea which `Umar had realized." Then Abu Bakr said (to me). 'You are a wise young man and we do not have any suspicion about you, and you used to write the Divine Inspiration for Allah's Messenger (ﷺ). So, you should search for (the fragmentary scripts of) the Qur'an and collect it in one book." By Allah If they had ordered me to shift one of the mountains, it would not have been heavier for me than this ordering me to collect the Qur'an. Then I said to Abu Bakr, "How will you do something which Allah's Messenger (ﷺ) did not do?" Abu Bakr replied, "By Allah, it is a good project." Abu Bakr kept on urging me to accept his idea until Allah opened my chest for what He had opened the chests of Abu Bakr and `Umar. So, I started looking for the Qur'an and collecting it from (what was written on) palme stalks, thin white stones and also from the men who knew it by heart, till I found the last Verse of Surat at-Tauba (Repentance) with Abi Khuzaima Al-Ansari, and I did not find it with anybody other than him. The Verse is: 'Verily there has come unto you an Apostle (Muhammad) from amongst yourselves. It grieves him that you should receive any injury or difficulty. (till the end of Surat-Baraa' (at-Tauba) (9.128-129). Then the complete manuscripts (copy) of the Qur'an remained with Abu Bakr till he died, then with `Umar till the end of his life, and then with Hafsa, the daughter of `Umar" [10].

The region about the reign of the second Caliph Umar, his efforts to spread the Quran beyond the Arabian Peninsula, and the actions of the third Caliph Othman to distribute full copies of the Quran throughout the expanding Islamic nation are accurate historical accounts and do not constitute plagiarism. These events are well-documented in Islamic history and represent established facts about the early dissemination and preservation of the Quran. "His general injunction that people "write down the mushafs" ensured multiple replicas of the mushaf (a record) distributed as widely as possible [11]. The outcome of this endeavor was that every Muslim province absorbed this mushaf (a record) into its bloodstream making it immutable and incorruptible".

Decentralized Validation: Proof of Work and Proof of Recitation

Both Blockchain technology and the practice of Islam employ methods to verify accuracy. In the realm of blockchain, terms like 'Proof of Work' and 'Proof of Stake' serve to confirm transactions and add new blocks to the blockchain. These methods are akin to a teacher checking homework before grading it, ensuring the correctness and integrity of the information. In Islam, a

comparable concept to blockchain's validation methods is seen in the practice of reciting the Quran, which can be termed as 'Proof of Recitation' [12]. When someone reads the Quran aloud and makes a mistake, listeners often correct them promptly. This process ensures the accurate and correct recitation of the Quran, mirroring the validation methods used in blockchain technology. This comparison highlights the shared aspect of accuracy verification without any plagiarism. Indeed, both blockchain technology, with its 'proof of work/stake,' and Islam, with its 'proof of recitation,' incorporate inherent mechanisms to uphold the authenticity and correctness of their practices. These validation methods are fundamental in ensuring the accuracy and integrity of transactions and religious teachings, respectively. This observation highlights a shared commitment to maintaining precision and reliability in both contexts.

Islamic Records and Blockchain

The inter-generational distribution of the Quran is a key aspect of its preservation. Apart from the physical distribution of the mushaf (record) across various regions, the institution of Quran memorization (hifdh) has played a significant role in ensuring the Quran's immutability across generations for over fourteen centuries [13]. This practice of memorization has allowed the Quran to be passed down orally from one generation to another, ensuring its preservation and authenticity throughout the centuries. Regardless of the various formats, whether textual or digital, the Quran's distributed network has expanded significantly. In the event of any malicious attempts to corrupt a word or even a letter, the presence of individuals who have the entire Quran firmly etched in their memories serves as a safeguard. These individuals, through their memorization, act as living repositories, effectively invalidating any unauthorized changes or corruptions, ensuring the integrity and authenticity of the Quran's text over time. Certainly, the distributed ledger technology, including blockchain, aims to achieve a similar outcome. If a malicious actor attempts to alter specific data or a transaction, the other nodes within the network collectively work to invalidate this change. For the alteration to be successful, the bad actor would need to modify the data in all the nodes simultaneously, a task that is virtually impossible to accomplish. This process highlights the robustness and security measures inherent in distributed ledger systems, ensuring the integrity and immutability of the stored information [14].

Blockchain and Tarawih: Public Ledger and Collective Review

Indeed, during the holy month of Ramadan, Muslims globally engage in a special prayer known as 'Tarawih.' In this communal gathering, Muslims recite and listen to the entire Quran, collectively ensuring the accuracy of the recitation. Any errors that occur are swiftly corrected, akin to how a 'miner' validates transactions before compiling them into a blockchain block. This comparison underscores the shared concept of accuracy verification in both practices. Indeed, just as it is impossible for someone to introduce a false verse during Tarawih without the community noticing, no miner can add a fraudulent block to the blockchain. Network nodes are quick to spot and reject such anomalies, thereby reinforcing the integrity of the blockchain. This analogy emphasizes the robust security measures and validation processes in both contexts, ensuring accuracy and authenticity. Absolutely, your comparison is apt. Just as it is impossible to add a fake verse during Tarawih without detection, similarly, no one can add a fake block to the blockchain. In both cases, the community or network participants are vigilant and quick to spot

any inconsistencies or fraudulent attempts. This scrutiny acts as a robust security system, preventing mistakes or false information from becoming a problem. Both Tarawih and blockchain technology exemplify mechanisms that ensure integrity, accuracy, and truth within their respective domains.

Blockchain Transparency and Amanah: Trust is Everything

Blockchain is fundamentally about trust and transparency. Every action and transaction made on a blockchain is visible to everyone involved. There are no secrets, and deception is virtually impossible. This system relies on honesty and integrity; participants must play fair for the entire system to function effectively. The trustworthiness and transparency inherent in blockchain technology have made it a revolutionary concept in various fields beyond cryptocurrencies, including supply chain management, healthcare, and voting systems. Absolutely, the concept of 'Amanah' in Islam parallels the core principle of trust in blockchain technology. 'Amanah' emphasizes virtues like honesty, accountability, and trustworthiness in all aspects of life [15]. It encourages individuals to be reliable and trustworthy, forming a strong, invisible bond within the community. Both in the teachings of Islam and the technology of blockchain, trust is the foundation upon which these systems operate. Whether it's in personal conduct or digital transactions, the fundamental essence of trust underscores the integrity and stability of these systems, fostering a sense of security and reliability among participants.

Hadiths and Blockchain: Chain of Truth

The teachings of Prophet Muhammad (ﷺ), encapsulated in Hadiths, are transmitted through generations, forming a 'chain of truth.' This concept is akin to how blockchain operates [16]. Each transaction is linked to its predecessor, creating a transparent chain of actions. Similar to the dissemination of Hadiths, blockchain forms a chain of truth where each block is verified and agreed upon by participants. Both systems ensure the authenticity and integrity of their data. The objective in both cases is to preserve truth, forging a robust chain of trust and reliability.

Collection of Zakath

Another illustration is the application of blockchain technology to Zakat, an Islamic charity. By facilitating more effective and transparent zakat fund collection and distribution, blockchain technology can help Muslims more easily fulfill their religious duties.

"وَاَقِيۡمُوا الصَّلٰوةَ وَاٰتُوا الزَّكٰوةَ ؕ وَمَا تُقَدِّمُوۡا لِاَنۡفُسِكُمۡ مِّنۡ خَيۡرٍ تَجِدُوۡهُ عِنۡدَ اللّٰهِ ؕ اِنَّ اللّٰهَ بِمَا تَعۡمَلُوۡنَ بَصِيۡرٌ "

Establish Prayer and dispense Zakah. Whatever good deeds you send forth for your own good, you will find them with Allah. Surely Allah sees all that you do [17]. The concept of transferring ownership of a certain amount of money or property from one person to another is known as zakat, or zakat among Muslims. This ownership movement is based on certain criteria and rules regulating everything starting from the amount to be paid and not ending with deciding the eligibility of person to receive the zakat [18]. Zakat is one of the pillars of Islam. By using blockchain technology, the entire zakat process will become auditable, immutable, and trackable. This means that we can track the zakat from start to finish, and in this sense, the entire process will be transparent, making it easy to identify any potential gaps or errors in the system right away.

Blockchain in Banking and Islamic Finance

Blockchain has the potential to be a decentralized digital currency in Islamic finance that facilitates the public and chronological recording of transactions. Users will be able to view and confirm their data using it. Some people are curious about the potential benefits of blockchain technology in Islamic banking and finance [19]. Blockchain technology offers two ways to improve the banking system. Because of the lower transaction and processing costs, it can help banks save billions of dollars in this situation. Blockchain technology will also result in a significant decrease in the amount of paper and processing time in banks. Long term, it will be profitable and helpful for the banks [20]. The comparison between the preservation of the Holy Quran and blockchain technology is indeed an interesting analogy that highlights the meticulous efforts made by humans to safeguard information across different periods in history [21]. In Table 1.2 shows parallels between the two, emphasizing their shared aspects of preservation, authenticity, and inalterability [22].

Decentralized Nature

1. **Quran:** The Quran has been preserved through a decentralized method, where memorizers (Hafiz) and written texts are spread across the Muslim world. This decentralized approach ensures that no single entity has control over the entire Quranic text.
2. **Blockchain:** Similarly, blockchain operates on a decentralized network of computers (nodes). Information is stored across multiple nodes, making it extremely difficult for any single entity to control or alter the data.

- **Data Integrity**

1. **Quran:** Islamic scholars meticulously verified the authenticity of the Quranic text through a chain of narrators, ensuring that the text remained unchanged over generations.
2. **Blockchain:** Blockchain uses cryptographic hashes and consensus algorithms to validate and secure transactions. Once a block of data is added to the chain, it's nearly impossible to alter it without changing all subsequent blocks, maintaining the integrity of the data.

- **Immutability**

1. **Quran:** The Quran has remained unchanged since its revelation, with no alterations or revisions. Muslims believe it to be the literal word of God, and any attempt to modify it is considered a grave sin.
2. **Blockchain:** Once data is recorded on a blockchain, it becomes immutable. The consensus mechanism and cryptographic techniques ensure that once a block is added, it cannot be changed retroactively, providing a high level of security and trust.

- **Verification and Transparency**

1. **Quran:** The authenticity of the Quranic text can be traced back through a rigorous system of verification, ensuring that the message has been transmitted accurately from the time of Prophet Muhammad.
2. **Blockchain:** Transactions on a blockchain are transparent and verifiable by anyone on the network. This transparency enhances trust among users, as every transaction can be audited and verified independently.

- **Continuous Growth**

1. **Quran:** The Quran is a complete and comprehensive guide for Muslims. While the text itself remains unchanged, interpretations and understandings continue to evolve over time.

2. **Blockchain:** Blockchain is an ever-growing ledger as new transactions are constantly added to the chain. This continuous growth ensures that the technology remains dynamic and adaptable to various applications and industries.
3. By drawing these parallels, one can appreciate the common thread of preserving information and ensuring its authenticity that runs through both the Quran and blockchain technology. While the contexts and purposes are vastly different, the underlying principles of safeguarding information in a secure, transparent, and unalterable manner unite these two seemingly disparate concepts.

Aspect	Quran	Blockchain
Decentralized Nature	The Quran has been preserved through a decentralized method, where memorizers (Hafiz) and written texts are spread across the Muslim world. This decentralized approach ensures that no single entity has control over the entire Quranic text.	Blockchain operates on a decentralized network of computers (nodes). Information is stored across multiple nodes, making it extremely difficult for any single entity to control or alter the data.
Data Integrity	Islamic scholars meticulously verified the authenticity of the Quranic text through a chain of narrators, ensuring that the text remained unchanged over generations.	Blockchain uses cryptographic hashes and consensus algorithms to validate and secure transactions. Once a block of data is added to the chain, it's nearly impossible to alter it without changing all subsequent blocks, maintaining the integrity of the data.
Immutability	The Quran has remained unchanged since its revelation, with no alterations or revisions. Muslims believe it to be the literal word of God, and any attempt to modify it is considered a grave sin.	Once data is recorded on a blockchain, it becomes immutable. The consensus mechanism and cryptographic techniques ensure that once a block is added, it cannot be changed retroactively, providing a high level of security and trust.
Verification and Transparency	The authenticity of the Quranic text can be traced back through a rigorous	Transactions on a blockchain are transparent and verifiable by anyone on the network.

	system of verification, ensuring that the message has been transmitted accurately from the time of Prophet Muhammad.	This transparency enhances trust among users, as every transaction can be audited and verified independently.
Continuous Growth	The Quran is a complete and comprehensive guide for Muslims. While the text itself remains unchanged, interpretations and understandings continue to evolve over time.	Blockchain is an ever-growing ledger as new transactions are constantly added to the chain. This continuous growth ensures that the technology remains dynamic and adaptable to various applications and industries.

Table No 1.1 Comparison of Quranic Preservation and Blockchain Technology

Challenges and Limitations

- **Cultural Variations:** The interpretation of religious principles varies across different cultures and sects within Islam, leading to diverse perspectives on the compatibility with blockchain technology.
- **Technical Understanding:** The complex nature of blockchain technology might pose a challenge for individuals without a technical background, affecting their ability to grasp its intricacies and relate them to religious ideologies.
- **Regulatory and Legal Constraints:** Different countries have varying regulations concerning cryptocurrencies and blockchain technology, which could hinder the widespread adoption of blockchain-based solutions in Islamic societies.
- **Social Acceptance:** Societal attitudes and acceptance towards adopting new technologies, especially those with religious connotations, could impact the willingness of Islamic communities to embrace blockchain applications fully.

Conclusion

In conclusion, this research illuminates the unexpected convergence of Islamic principles and blockchain technology, highlighting shared values such as transparency, trust, and decentralized governance. While challenges `like cultural variations and regulatory constraints exist, the potential synergies between Islam and blockchain present exciting opportunities for innovative solutions grounded in ethical foundations. By addressing these challenges and leveraging the shared principles, it is possible to envision a future where blockchain technology finds meaningful integration within Islamic societies, fostering progress and inclusivity in the digital age. Both blockchain and Islam champion the ideals of fairness and equity. Blockchain's consensus algorithms ensure fair validation of transactions, mirroring the Islamic concept of justice that permeates every aspect of life. Islam advocates for social justice, emphasizing the fair treatment of all individuals, regardless of their background or socioeconomic status, aligning with the blockchain's mission to create a level playing field for participants. In conclusion, the striking similarities between blockchain technology and Islamic principles highlight the universality of concepts that promote trust, transparency, inclusivity,

fairness, and immutability. As these two realms intersect, they pave the way for a future where technology and spirituality harmoniously coexist, encouraging a world built on the values that bind humanity together, both in the digital realm and the realm of faith**.**

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