



APPLICATIONS OF BLOCKCHAIN FOR SECURE BANK TRANSACTIONS

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ABSTRACT

Blockchain technology is an up-to-date method that makes financial transactions between parties easier and more secure. The financial industry is currently the target of the majority of frauds. The most important objective of this effort is to eliminate obstacles associated with financial transactions. Because this team can automatically traverse the network, they are able to concentrate on only one point, which is the computer that serves as the server. To reduce the risk of a server being hacked, the infrastructure supporting the database servers would be removed, and the data would be distributed using blockchain technology. In order to establish a legitimate blockchain, we make use of the SHA256 algorithm to produce a 256-bit hash value that is completely unique, as well as the proof of work consensus mechanism. It is safe to state that blockchain technology through Bitcoin has had and will continue to have a significant impact on the world in the future years. This is especially true given the fact that a large number of people are working relentlessly to overcome the numerous limitations that are preventing blockchains from becoming mainstream. One such drawback is that the Proof-of-Work consensus system incurs substantial processing and electricity expenses. These costs are a direct result of the protocol.

Key Words: Wallet, Public/Private key, Consensus algorithm, SHA256, Proof of Work

1. INTRODUCTION

The term "blockchain" has been increasingly popular over the past several years, which is hardly surprising considering the profound impact the technology is having across a variety of sectors. It is anticipated that

blockchain technology will fundamentally alter the way in which we conduct business, not only in the banking sector but also in other industries like as healthcare, government, retail, and others.

A blockchain is essentially a distributed ledger of records or public database that is publicly shared among a variety of users. This facilitates the production of an immutable record of the transactions that those users have conducted. These transactions have been cryptographically protected to ensure that they can never be altered in any way.

The banking industry stands to benefit significantly from the implementation of blockchain technology, which has the potential to make it more open, efficient, safe, and cost-effective.

The following is a list of numerous ways that the future of the financial system will be affected by blockchain technology:

1. By Expediting International Transfers

The distributed ledger technology known as blockchain has the potential to facilitate faster, more cost-effective, more transparent, and more secure monetary transactions both domestically and internationally. The process of moving money from one nation to another can currently take many days and involve a number of different third parties.

Each of these parties receives a portion of the proceeds from the transaction. This indicates that by the time the money arrives at its destination, the sender may have already suffered a considerable financial loss. Blockchain technology enables peer-to-peer transactions that are faster and easier, making them more effective for both international firms and consumers. One example of this type of transaction is a consumer using a Bitcoin wallet. Blockchain technology also benefits multinational enterprises.

A blockchain is simply an immutable digital ledger that records the financial transactions

that take place between two parties. Each transaction is checked by computers that are part of a network before it is added to the blockchain. Once a transaction is added to the blockchain, it cannot be altered or tampered with in any way.

2. By Increasing Security & Reducing Fraud

Because it generates a transparent audit trail, blockchain technology can also assist in the fight against financial fraud. Due to the fact that it also has several redundancies, it is extremely difficult, if not impossible, to change any information after it has been posted onto this network.

Since the Blockchain network is maintained by hundreds of computers, there is no single point at which hackers might attack the network and change data without leaving any traces behind. This prevents them from being able to hide their tracks. Because of this element of blockchain, it is particularly significant in the present global context of rampant cyber crime and widespread ransomware attacks. These assaults can put critical information at risk and cause victims to lose hundreds of thousands of dollars.

Having said that, you should continue to secure your Windows and make use of a virtual private network (VPN) for additional security. You should also refer to our Ransomware Checklist to make sure that you are equipped with the appropriate cybersecurity plan in the event that you do wind up becoming a victim of a cyber-attack.

3. By Reducing Costs for Banks and Customers

Blockchain technology has the potential to make banking services substantially more

affordable while simultaneously raising the bar for product quality.

Today, financial institutions are searching for ways to apply this technology in order to find solutions to the issues of slowness and expense. When utilizing blockchain, certain operations may be amenable to automation. The blockchain is a decentralized database that is safe, open, and simple to install. It also offers complete transparency. Because of these qualities, it is possible to automate some of the operations that are associated with banking activities (such as payments or the issuance of loans, for example).

4. By Reducing Human Error

Reports from a variety of sources indicate that human mistakes in accounting, record-keeping, and reconciliation are one of the most common reasons for fraudulent activity. When it comes to security operations, it is frequently the case that a simple act of negligence or an honest mistake made by a human being is the root cause of major problems with cyber security.

The transactions that take place on a blockchain are recorded using an automated mechanism that cannot be changed afterwards. The implementation of this technology will result in the elimination of a great deal of manually performed work, which will cut down on the number of errors caused by humans, increase productivity, and lessen the effect of cyberattacks.

2. LITERATURE REVIEW

The appeal of blockchain technology can be attributed, at least in part, to the fact that it is decentralized and can be used anonymously. The transaction history of most of the nodes in a peer-to-peer network is stored in the

framework, which helps prevent "double expenditure." Proof of labor is a consensus-based system that is utilized [1] in order to maintain traditions.

The various approaches and procedures that go into applying the POW (proof of work) to a blockchain might be considered different forms of consensus. Through the use of this technique, many parties determine whether or not a transaction can be added to the blockchain that corresponds to it. It makes it more difficult to answer the cryptographic puzzle, and it's possible to make the total amount of leading zeros in the puzzle more difficult to solve as well. [2].

How users can help each other send cash from one location to another without the participation of any third parties using peer-to-peer electronic cash. The Ethereum blockchain was also integrated into the network of equivalent blockchains, making its use available there. Explains in additional detail how digital signatures and organizations that have been granted digital certificates are both beneficial to and raise questions about the existing centralized structures [3].

Because the server is always accessible, distributed ledger technology provides more protection for users' personal information than centralized data storage does. In addition, in order to compromise the entire blockchain network, we would require access to 51% of it; hence, this task is impossible to do. And a number of operational nodes within the open blockchain's distributed ledger network. The encryption token containing information on the intelligence string that was employed. This is referring, in a broad sense, to the development, transmission, and storage of cryptocurrencies. The data string that really displays the information that goes along with the initial data is what is meant when we talk about the cryptographic token in general.[4].

In order for the task to serve as proof-of-work for cryptocurrencies, it needs to be examined and validated successfully by every node in the network. It is important to keep the primes, such as record breakers, at a reasonable level. As a consequence, Mersenne primes are no longer a possibility, and the main chain must be used to perform the job of the primary coin. This is due to the fact that it is an exponentially more difficult task to discover the primary chain, based on our current theoretical and algorithmic understanding [6].

3. PROPOSED METHODOLOGY

The term "blockchain technology" can apply to any form of digital asset trading that takes place online. In this particular scenario, this technology is applied in order to make banking transactions as secure as possible. Because it is a distributed and decentralized ledger, blockchain makes it simple to validate all transactions and prevents any backup of the ledger from being updated. The transactions that can be carried out using blockchain technology are illustrated in Figure 1.

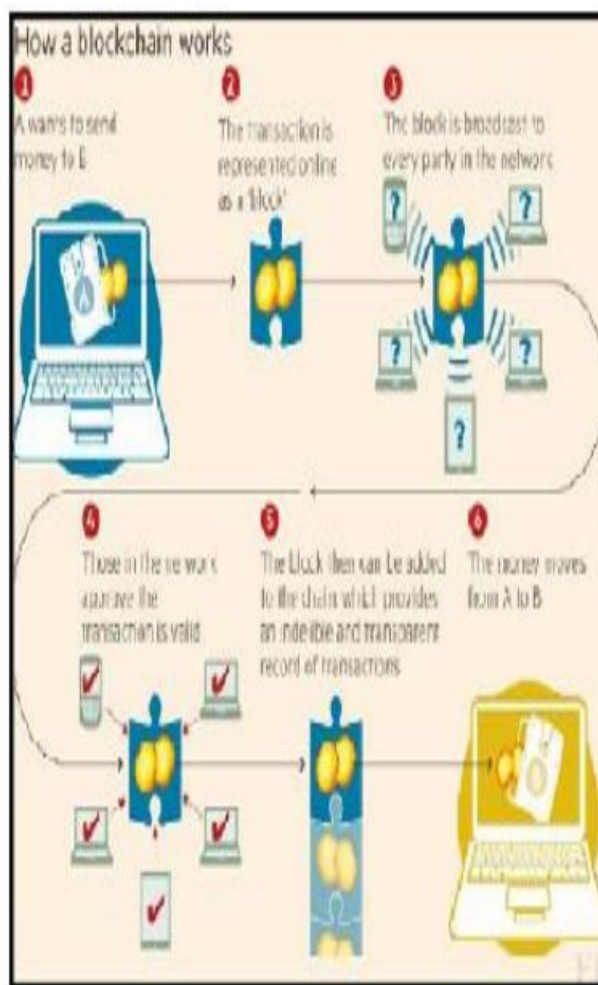


Figure 1. Transaction in blockchain

3.1 BLOCK CHAIN

Blockchain technology offers the possibility of sharing a storage device across all of the participants in a business network. Regarding the introduction of assets into the business

network, this replicated mutual leader would have consensus, provenance, immutability, and intent. The result will be a reduction in both the complexity of the process and the amount of time it takes. Every block in fig(2) has a hash of the block that came before it.



Figure 2. Blockchain

3.2 ALGORITHM

A. Proof of Work

This algorithm is utilized throughout the Blockchain protocol in order to validate transactions and add new blocks. Miners will be able to participate in POW and will be compensated for successfully completing the payment procedure. In the context of a network customer, digital tokens are transmitted. All of the transactions are compiled into one place using a shared registry. Tracking payments and correctly arranging blocks are also two important responsibilities. This responsibility is carried out by unique nodes known as miners, and the activity itself is known as mining.

Working:

POW is put to use in the process of authenticating transactions, and once those transactions have been confirmed, new blocks are added to the ledger. When a transaction is properly processed, a new block is added to

the ledger that is maintained by the blockchain. It requires a greater capability for computational work.

B. SHA256

The Secure Hash algorithm (SHA) is one of the cryptographic hash functions that are available. The cryptographic equivalent of a data gathering signature is called a hash. It's almost like the data has its own unique fingerprints. The algorithm now incorporates a new hash value, despite the fact that it only needs to update a single symbol. A hash that is fast, unique, and 256 bits long that is produced by the SHA256 algorithm. In one sense, the term "hash" refers to a characteristic. Because of this, it is ideally suited for use in applications involving the protection of data integrity, hash encryption, antitampering, digital signatures, and blockchains.

CONCLUSIONS

The consensus algorithms that are considered the industry standard in blockchain are the subject of much discussion. The immutability and openness of Blockchain systems are usually regarded as additional benefits of using them. Maintain a public leader who is decentralized and not subject to direct control or regulation. There will be major obstacles to overcome. In addition, private distributed ledgers and blockchains are able to be created so that problems of this nature can be resolved. Because it demands an enormous amount of computational capacity, which nobody possesses, it would be extremely challenging for an individual to crack the gadget. Transactions can be completed more quickly using blockchain technology since many of the procedures required for traditional transactions are rendered unnecessary. In this instance, we are utilizing blockchain technology to conduct bank transactions in a secure manner.

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