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Use of Blockchain in Banking System

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ABSTRACT

The modern financial revolution, the growth of the internet, and the economic and digital transformation all affect banks. Blockchain and bitcoin's underlying technologies may find application in the financial sector. Consequently, the goal of this paper is to do research on the impact of the Blockchain platform on the banking industry. This research will use the idea and structure of the Blockchain to explore how this technology functions in order to understand it. Four of the research that have been done on consensus algorithms for blockchain technology are described in this article. This study focuses on the advantages and disadvantages of this platform as used by the banking sector.

Introduction

At the same time as they retain cost effectiveness and offer transparency to customers and regulators, banks today are continuously searching for new, creative ways to process transactions more rapidly for better customer service. Today's financial industry needs a critical technology with fascinating application possibilities: blockchain. It has the ability to alter the financial industry and improve operations by making them more transparent, safe, and efficient. Point-to-point transmission, consensus processes, distributed data storage, and encryption techniques are all included in the blockchain system. A decentralised ledger called blockchain effectively recordtransactions between two parties. These parties can change the digital ledger simultaneously, but the mechanism is almost impenetrable. Blockchain will influence for end of money via bitcoin and other cryptocurrencies in Banking industry.The banking system's handling of the end of money via bitcoin and other cryptocurrencies will be impacted by blockchain. 80% of banks anticipate using distributed ledger technology to launch their own blockchain initiatives. Currently, over 90 central banks worldwide are working on blockchain projects. Therefore, the majority of banks are attempting to develop blockchain use cases in order to herald the end of traditional banking and bring about a huge upheaval in the financial sector. An outline of this essay is provided below. The first section's introduction explains how blockchain will change the banking industry. Section II explains the blockchain's model, architecture, and consensus procedure. Section III covers performance and use cases in the banking industry. The discussion in Section VI addresses potential remedies as well as the challenges we ran with when implementing blockchain in Sri Lanka. In Section VII, the article's conclusion, "Blockchain revolution in banking business," is presented.

Classification of the Blockchain system

1). Public BlockchainDecentralized consensus techniques enable users from various financial organisations, including banks, and backgrounds to sign up, conduct transactions, and mine on this open platform. There are no restrictions. As a result, they are known as "Permissionless" blockchains. A blockchain is unique to the user without specified validator nodes. Creating, reading, auditing, and viewing transactions are all possible for all participants.

2) Private Blockchain

These systems enable the exchange of data in a private context between a group of people, selected people, a group of organisations governed by chosen people, or a single organisation. Certain blockchain systems are referred to as permissioned blockchains. [2] Without a special permission, unauthorised access is consequently impossible. Each node maintains a copy of the ledger in order to reach consensus, however unlike public blockchain, writes are constrained.

3) Consortium Blockchain

This blockchain system may be considered a permissioned, partially private blockchain where consensus and block validation are managed by a group of pre-selected nodes[2] rather than a single institution or person. Nodes control who has access to the network and may harvest data. Although this system is not totally centralised, it may have some degree of influence over a few selected validator participants or peers. There are some transactions that only allow for limited reading and writing. These nodes don't offer immutability and irreversibility..

The four ideas that make up the Blockchain architecture are decentralisation, digital signatures, data mining, and data integrity.

1) Decentralization:Blockchain divides control among all users, or peers, and builds a network of shared resources.
2) **Digital signature**: Avalue exchange using public keys through the Blockchain-enabled method of a unique digital signature the decryption key is known to all users of the network. Only the owner is aware of the private keys that are used to generate ownership.
3**) Mining**: Every user in the system mines and digs data which is evaluated according to the cryptographic rules. This is also acknowledging miners for confirmation and verification of the transactions.
4**) Data integrity**:Participants' agreements and algorithms make sure that the transaction data cannot be altered after it has been agreed upon [1]. The system's data storage serves as a single source of truth for all stakeholders, lowering the possibility of fraud.

Proof of Work (Pow): The initial blockchain network consensus algorithm. The algorithm adds a new block to the chain and confirms the transaction. In this method, minors (a group of individuals) compete with one another to finish the network transaction. Mining is the practise of competing with one another. He is compensated as soon as miners have successfully produced a valid block. Bitcoin is the most well-known Proof of Work (PoW) application**.**Proof of work generation can be a low probability, random process. Before a reliable proof of work is produced in this, much trial and error is needed. A mathematical conundrum with an obvious solution serves as the primary tenet of proof of labour. The Hashcash proof of work technology allows for the implementation of proof of work on a blockchain.

Proof of Stake (Po's); Is a category of algorithm that seeks to accomplish distributed consensus in a Blockchain. This method of reaching agreement was initially proposed by a quantum mechanics, and Sunny King and a colleague later published a paper on it. As a result, Proof-of-Stake (Po's)-based Peercoin was created. A stake is the amount of money or value we wager will happen. The procedure is known as staking. Later, a specific definition of "stake" will be provided.

Delegated Proof of Stake;Itis a consensus method that advances the core ideas of Proof Of Stake. As the creator of Bit Shares, Steamed, and EOS, Daniel Larimar created the Delegated Proof of Stake (Dopes) consensus mechanism in 2014. Each token holder in a Proof of Stake system has the opportunity to take part in the "mintage" process, which gives them the ability to choose layer 2 nodes that will further validate blocks and reward them for adding new blocks to the blockchain. A voting method for selecting nodes that validate blocks keeps the Dopes system running. The "witnesses" or "block makers" are these nodes.

What is Byzantine Fault Tolerance?

A distributed network's ability to establish consensus (agreement on the same value) even though some nodes fail to react or provide inaccurate information is known as byzantine fault tolerance (BFT). A BFT mechanism's goal is to prevent system failures by using collective decision-making (both from correct and defective nodes) that seeks to lessen the effect of the faulty nodes. Byzantine Generals' Problem is whence BFT gets its name.
Blockchain technology has tremendous potential for overcoming the difficulties facing the financial sector. There are several use cases for blockchain technology, each having benefits and restrictions.

1. Payments:Transactions made on a blockchain or distributed ledger system are facilitated, processed, and verified via blockchain payment systems. Depending on the use case, these tools may be created for private users, companies, or financial institutions and will have a few different characteristics. Blockchain payment solutions let users conduct transactions on a blockchain fast and securely for all applications.

There are several reasons why businesses opt to employ blockchain payment systems. Smart contracts, or protocols used to facilitate, verify, and enforce transactions, may be created using these technologies. These contracts offer a higher degree of traceability and are thoroughly recorded. These methods of payment are also speedier than conventional ones because they don't require a banking institution and allow for cross-border transactions.

Digital verification:This may be accomplished by leveraging blockchain to replace all current identity, face, and client intent verification systems. Blockchain offers possibilities for users to share their identities with others without having to repeatedly register for financial services. Anyone using the shared ledger system has unrestricted access to information. Consequently, it is not advisable to upload private information to the blockchain.
Lending: Different types of loans are offered by conventional banks. But the procedure is lengthy. Blockchain may be used for lending systems to provide incredibly quick transactions in a transparent manner. Banks offer loans, comply with the Bank Secrecy Act (BSA), and attach each of them to a specific customer block [1]. This technique reduces the cost and wait time associated with the lengthy traditional approach.
Bookkeeping,Accounting and auditing,Most traditional banks continue to use paper-based processes, such as double entry transactions, and are only slowly making the switch to digital records. Banks may readily use the shared ledger system to enter transaction data [7]. With the use of blockchain, all records are transparent and unchangeable. This system's feature of smart contracts makes it possible to automate the payment of bills. A major barrier is the requirement that bank staff have prior knowledge of blockchain.
Crowdfunding:This is a method of internet fundraising where a lot of individuals contribute a little bit of money. Initial Coin Offerings (ICOs) can sell their tokens online and benefit from the decentralisation of blockchain technology. Due of the legal problems with ICOs, there is a danger with this**.**
Smart contracts:The set of code known as smart contracts is kept on the blockchain. When certain criteria are satisfied, these apps run automatically.

Because of the decentralised ledger on the blockchain, they may undertake transparent cryptographic transactions without the involvement of middlemen.

Know Your Customer (KYC): Individually completing the traditional KYC process takes a lot of time in all banks and other financial institutions. Other banks will be able to get independent verification of every customer of one bank using Blockchain [6]. This method reduces administrative work, eliminates duplication, and saves time.

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Limitations of Blockchain Technology

1. High initial cost:Despite having significant initial capital costs, blockchain reduces transaction costs and saves time.

2. Complexity:This technique uses a whole new lexicon. Participants must to be knowledgeable in the technology.

3. Network size:Blockchain requires a big participant network. It is more challenging to reap the benefits if the network grid is not extensively dispersed.

4. Transaction cost:The initial several years of transactions are free. However, the cost of transactions on the network has since increased.

5. Limited scalability and storage issues:Blockchain has a consensus-based transaction verification system. This restricts the volume of transactions that may be carried out within a specific time frame. Blockchain's immutable distributed chain of blocks expands quickly, which might cause storage problems..

6. Unavoidable security flaw: If more than half ofparticipant nodes to service the network a lie, it willbecome a truth.

7. Energy and resource consumption:Blockchain networks require substantial resources. The amount of block validation required by miners increases as the blockchain network expands. Thus, it increased the amount of energy used.

Future improvements of blockchain technology

1 Bitcoin and the blockchain are extremely difficult for people who have never worked in technology or software development. Building tools to facilitate transactions will thus be one of the next improvements.

2.Making a mechanism to store data off-chain and occasionally deliver it to the blockchain is necessary since storing data in the blockchain is fairly costly.

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4. Making regulations requiring the use of blockchain technology in the sector is essential for revolutionising the banking sector.

Conclusion

Blockchain is a decentralised digital ledger that prevents hackers from achieving their goals. Therefore, using technology in Sri Lankan financial sectors like banks is crucial from a security standpoint. Additionally, this improves the efficiency of the financial sector. With blockchain technology, there are several options with incomparable value. By permitting global financial simplicity, this offers a special technique to construct cryptographic transactions. Giants in the banking sector have begun to look for new use cases for blockchain technology that may help them extend their offerings. The underlying industries of credit information systems, payment clearing, lending systems, digital verification, audit keeping systems, crowdfunding, smart contracts, and KYC in banking are all being revolutionised by this technology. For payments and transactions, the PBFT consensus algorithm is the best. Using POW, banks.

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