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THE SCALABILITY REVOLUTION: BLOCKCHAINS'S IMPACT ON THE FINANCIAL INDUSTRY

Shashank C [1], Sandarsh Gowda M [2]

P.G. Student, Master of Computer Applications, Bangalore Institute of Technology, Bangalore, Karnataka, India[1]

Assistant Professor, Master of Computer Applications, Bangalore Institute of Technology, Bangalore, Karnataka, India[2]

Abstract: Blockchain is a virtual ledger of all transactions and contracts that must be independently documented. It is a database with encryption that maintains information statistics. One of the main advantages of Blockchain lies in the fact that this virtual record is dispersed across a number of vast computer networks and isn't necessarily guaranteed to be kept in a single location. The blockchain network has already started to disrupt the financial services industry, and it is this technology that powers bitcoin transactions. The study's objective is to determine how blockchain technology will affect the financial industry. Without a doubt, people throughout the world are interested in seeing how this innovative technology will affect or alter banking in the future. Blockchain offers a decentralized, transparent network infrastructure, improves data storage and transmission security, and drastically lowers operational expenses. Even in a regulated area like the banking sector, blockchain is a highly potential and much-demand solution due to these exceptional qualities.

Keywords: "blockchain applications," "blockchain benefits," "blockchain features," and "blockchain security".

I. INTRODUCTION

Blockchain technology gained popularity following the introduction of well-known digital currencies like Bitcoin and Ethereum, which are just two of the many applications of this technology. Bit Coin and Ethereum have drawn interest from the financial services industry, and other cryptocurrencies known as Alt Coins, such as Prime Coin, Light Coin, Z cash, and Name Coin, are also being developed. They also contributed significantly to the development of the initial coin offering (ICO) mechanism, a radical concept for funding cutting-edge initiatives and goods. There has been an increase in interest in blockchain-based applications outside of cryptocurrencies over the past few years, particularly those that try to use the decentralized nature of the technology's distributed ledgers in conjunction with their antitampering features, transparency, and security. Many applications in the context of permission blockchain infrastructures use these features to give fine-grained authorization and authentication while also eliminating the need for difficult and time-consuming Proof of Work methods.

In order to serve applications that require transaction completion speeds that are faster than those offered by older, more established public blockchains like Bitcoin and Ethereum, the latter is required. Responses have led to the development of technologies to manage permissioned blockchains, such as Hyperledger Fabric and R3/Corda, both of which enable hundreds of transactions per second during that time. Many industries, including business, supply chain management, energy, and healthcare, are now investigating permissioned blockchain-based non-cryptocurrency applications. A handful of these apps are being examined by financial institutions as part of the surge of FinTech innovations.

By employing blockchain technology, financial institutions may be able to resolve a number of critical, enduring problems. Lack of awareness about credit rating, which makes it challenging for consumers and SMEs to obtain loans from financial institutions, is one of the main issues with bank credit. Financial firms struggle to conduct reliable customer profiling due to a lack of complete and accurate data, making it difficult for them to successfully differentiate and personalize their products to different consumer segments. Similar to this, banking organization insurance policies cover a complicated claims process that involves multiple parties before a claim is finally resolved and paid.

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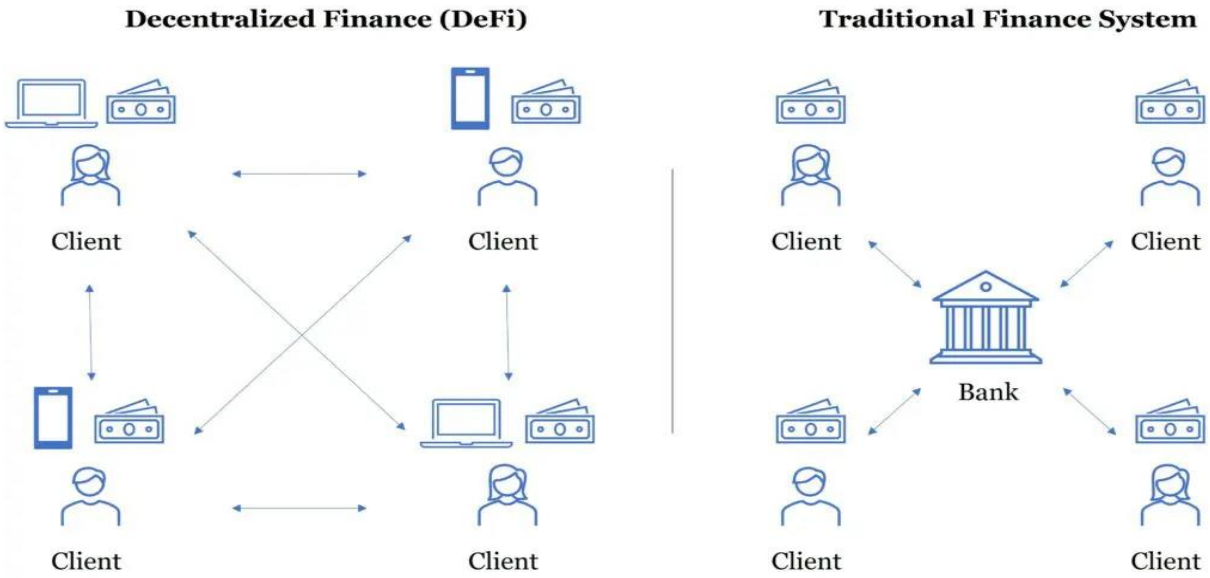

II. LITERATURE REVIEW

A. The establishment of blockchain and its importance:

Using the cryptocurrency Bitcoin, Satoshi Nakamoto unveiled a new technique for peer-to-peer digital cash. This was a big step because cryptocurrencies follow their own set of regulations and aren't produced or controlled by governments. The new blockchain technology, the foundation for the increasing number of certified blockchain applications, was created by this kind of company. With the help of blockchain technology, anyone may pay money straight away and securely without the need for any middlemen. The transfer of assets in corporate networks could benefit significantly from blockchain technology, despite the fact that it is still relatively young. It has been said to be as important as the internet or electricity, ranking among the most revolutionary and promising inventions. Regrettably, the technology is relatively unknown, but extensive social media attention is raising awareness. The distributed ledger technology that powers Bitcoin is among the most promising and advantageous emerging technologies for the future. It provides a fresh approach to data collection, storage, and transfer, and what's even more amazing is how transparent it is and how secure the data is—it can be audited and is impervious to tampering.

B. Bitcoin's underlying technology, blockchain

Bitcoin, a digital money that runs on a decentralized, peer-to-peer network, is powered by blockchain technology. A network of nodes that check and verify the transactions maintains the blockchain, which acts as an open record that records all Bitcoin transactions. Blockchain technology has the potential to transform a variety of industries by enabling safe, transparent, and effective transactions without the need for middlemen, even if Bitcoin is the most commonly recognized application case for it.

III. METHODOLOGY

Smart Contract

Smart contracts can be used with blockchain technology in the banking sector to automate and streamline transaction processes, boost productivity, and cut costs.

This is how it goes:

establishing smart contracts In smart contracts, the details of the contract between the buyer and seller are directly encoded into lines of code. These contracts self-execute. Blockchain technology is used to develop smart contracts that can automatically carry out banking transactions when specific criteria are satisfied.

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Transaction execution: The transaction can occur on the blockchain after a smart contract has been formed. The parties to the transaction will provide their information and concur with the smart contract's terms. Once When the terms of the contract are fulfilled, the electronic agreement will automatically carry out the transaction and send the money from one side to the other.

Security: Using smart contracts and blockchain technology in banking transactions can offer a high level of security. The distributed ledger on which blockchain transactions are kept makes it almost impossible to manipulate with the transaction data. Additionally, the danger of fraud is decreased because smart contracts are self-executing and do not require a mediator or intermediary.

Transparency: Blockchain technology makes banking transactions transparent. Real-time transaction progress can be seen by all parties involved, and since the transaction is stored on the blockchain, it can always be audited.

Efficiency: clever agreements can make banking transactions more effective.

There is no requirement for manual intervention because the agreement executes automatically when the requirements are completed, which can cut down on processing times and expenses.

Overall, employing smart contracts and blockchain technology in banking transactions can have a number of advantages, including efficiency, security, and transparency. To ensure the security and dependability of the smart contracts, it is crucial to make sure they are properly developed, tested, and audited.

Consensus

Smart contracts and consensus procedures are both crucial elements of blockchain technology in the banking sector.

In a decentralized blockchain network, consensus procedures are employed to make sure that all nodes concur on the ledger's present state. There are other methods for reaching consensus, including Delegated Proof of Stake (DPoS), Proof of Work (PoW), and Proof of Stake (PoS). With the help of these techniques, nodes in the network can validate transactions and add additional blocks to the blockchain technology in an anonymous and safe way.

On the other hand, smart contracts are self-executing digital contracts that are kept on a blockchain. They have policies and guidelines that control how parties can trade goods or information. The smart contract automatically executes without the need for middlemen when specific criteria are met.

Consensus methods are employed in the banking sector to guarantee the ledger's integrity and thwart fraud, while smart contracts can automate and streamline a variety of financial procedures, including loan approvals, trade settlements, and asset transfers. A bank, for instance, might use a smart contract to swiftly authorize a loan if specific criteria are satisfied, like as the borrower's income and credit score. This can speed up loan approvals, lower their cost, and improve the efficiency of the banking sector.

In general, the integration of consensus mechanisms and electronic contracts can transform blockchain technology into a potent instrument for the banking sector, enabling safe, open, and effective operations and transactions.

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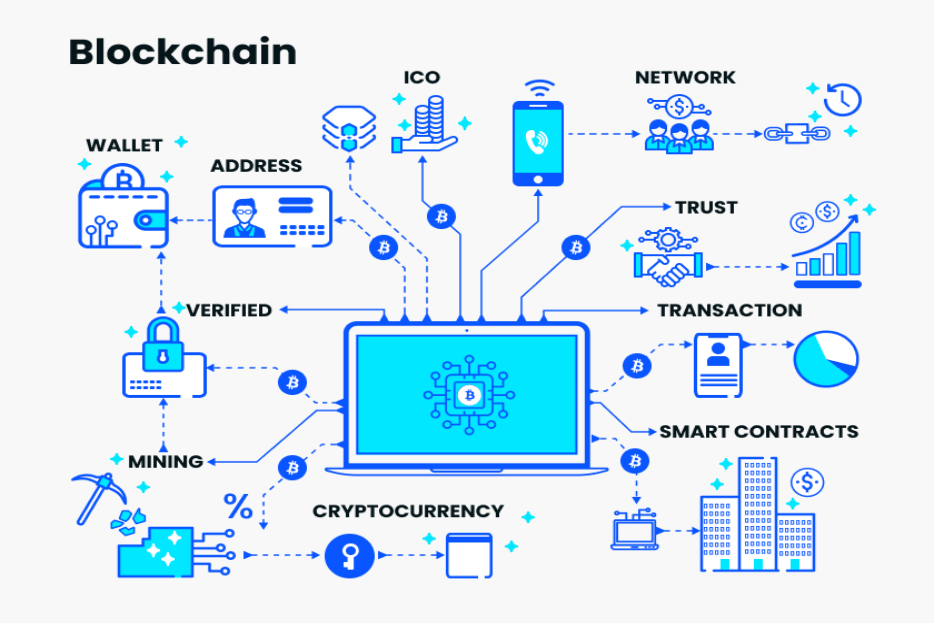

IV. ALGORITHMS

We are utilizing Blockchain technology in financial apps in this project since all present applications rely on a single, centralized server, and if this server is compromised or collapses as a result of a high volume of requests, the services won't be given. Since decentralized Blockchain technology stores data across several servers or nodes, ensuring that users can continue access services even, if one node goes down, we can use it to resolve this issue.

Each block in a blockchain is given a unique hash code and data is stored as blocks or transactions. Blockchain checks the hash codes of every existing block to make sure none have been hacked or altered before putting any new block. Blockchain will only store a new block if this verification is successful.

Since it won't store any new data if the verification process is unsuccessful, blockchain technology is said to be permanent because it cannot be penetrated or have its data changed from the backend. If changed, verification will be invalid.

Businesses are switching from centralized servers to decentralized networks due to the advantages of blockchain technology that have already been stated.

We are building two different categories of users for this project: customers and service providers.

1. **Service providers**: The service provider can then sign up, log in, add new items, and view consumer orders.
2. **Users**: Users may sign up for an account and log in to the application, go over all of the service provider details, contribute money to their wallet, and peruse product descriptions to make orders.

Smart contracts, which are defined using SOLIDITY programming, are utilized by blockchain to store data. On the Ethereum network, SOLIDITY code may be deployed thanks to Truffle. When the contract is ready to be used, it will generate an ADDRESS that a Python application may use to visit it and save and retrieve data from the distributed ledger.

V. CONCLUSION

Banks need to understand the fundamentals of the technology and how it can address current business problems because, on the one hand, the internet enabled the exchange of data while, on the other, the blockchain can involve the exchange of value. Although the potential of blockchain is frequently claimed to be on par with early commercial interest. Banks must recognize opportunities, assess their viability and impact, and run proof-of-concept tests.

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Emulation-related issues, however, will need to be addressed through in-depth dialogue with the right regulatory bodies and assimilation of their thought processes. Further We will continue to look into ways to offer off-chain settlement to banks that are not listed on the platform; one option is to gain access to its database with permission, which would allow for additional transactions to be made (between listed and non-listed banks) and the maintenance of an equal ledger for both.

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