A Proposed Model of Blockchain Technology in Banking System

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APPROVAL

This research based project titled **"A Proposed Model of Blockchain Technology in Banking System"**, submitted by, Md Nishadur Rahman, ID: 191-15-12873, Md Saif Ebna Shahriar, ID: 191-15-12779, Md Hasibur Rahman, ID: 191-15-12735 to the Department of Computer Science and Engineering, Daffodil International University has been accepted as satisfactory for the partial fulfilment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on 26 January, 2023.

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We hereby declare that this research is done by us under the supervision of **Ms. Nazmun Nessa Moon,** Associate professor, Department of CSE & co-supervision of **Asma Mariam,** Lecturer, Department of CSE, Daffodil International University. We also declare that this research has not been submitted elsewhere for award of any degree or diploma.

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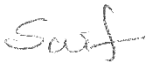

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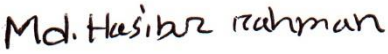

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ACKNOWLEDGEMENT

We begin by sincerely thanking and thanking Almighty God for His glorious mercies, which allowed us to successfully finish the final year thesis.

We are thankful to our respected supervisor **Ms. Nazmun Nessa Moon,** Associate professor, Department of CSE & co-supervisor **Asma Mariam,** Lecturer, Department of CSE.

This project was made possible by her never-ending perseverance, academic guidance, constant encouragement, frequent and energetic supervision, constructive criticism, helpful counsel, reviewing numerous subpar versions and fixing them at all levels.

We would like to extend our sincere gratitude to **Prof. Dr. Touhid Bhuiyan**, Head of the Department of CSE, as well as to the other professors and employees of the CSE department at Daffodil International University, for your kind assistance in completing our research.

We'd like to thank all of our classmates at Daffodil International University who participated in this debate while also attending class.

Finally, we must respectfully appreciate our parents' unwavering assistance and endurance.

ABSTRACT

Our research title "A Proposed Model of Blockchain Technology in Banking System" is focusing on efficiency and security of a banking system in Bangladesh. We have collected the information required for our research from various research papers.

Bangladesh has never had widespread access to financial services. Bangladesh is among the countries in this group where 40% of adults currently have access to formal financial services. The financial system is something Bangladesh is also working to open up to everyone. Customers in Bangladesh's present banking system face a number of difficulties. such as an inadequate risk management system, a lack of accountability and transparency, and poor asset quality. As a result, the objective of this project is to conduct a study on how the Blockchain platform would affect Bangladesh's banking sector. This study explores the architecture and IT anatomy of Blockchain-based functions to better comprehend technology. how the banking sector employs this platform. This study primarily focuses on benefits, drawbacks, and obstacles.

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CHAPTER 1

Introduction

1.1 Introduction

A blockchain is a decentralized and distributed digital ledger that records transactions on multiple computers, rather than being stored in a single location. This makes it difficult to alter or tamper with the data stored on a blockchain.

Blockchain technology was first introduced in the late 1990s as a way to enable the secure exchange of digital assets without the need for a central authority. However, it gained widespread attention in 2009 with the launch of the cryptocurrency Bitcoin, which uses a blockchain to record and verify transactions.

Since then, the use of blockchain technology has expanded beyond the financial sector and is now being explored for a variety of applications, including supply chain management, voting systems, and identity verification.

One of the main benefits of blockchain technology is its ability to provide a secure and transparent record of transactions. By using a decentralized network of computers to verify and record transactions, blockchain technology can reduce the risk of fraud and errors and increase the trust and accountability of the parties involved.

Blockchain technology has the potential to transform a variety of industries in Bangladesh, including the financial sector, supply chain management, and government services.

In the financial sector, blockchain technology can be used to facilitate the exchange of funds and other financial assets, reducing the reliance on intermediaries and lowering transaction costs. It can also be used to improve the security of financial transactions by providing a decentralized and immutable record of data, which can help to prevent fraud and reduce the risk of errors or errors.

In the supply chain management industry, blockchain technology can be used to track the movement of goods and provide real-time visibility into the supply chain. This can help to increase transparency, reduce the risk of fraud, and improve the efficiency of the supply chain. In the government sector, blockchain technology can be used to improve the transparency and efficiency of various services, such as the issuance of identity documents, the tracking of land records, and the management of voting systems.

1.2 Motivation

We are all aware of the cyber-heist on the Bangladesh bank in 2016. where hackers use the most advanced banking and payment channels to steal money from the Bangladesh Bank's reserves with the New York Fed.
Therefore, if blockchain technology is implemented in our banking system, we can avoid the security vulnerability associated with our financial transaction.

1. Compared to using current money transfer services, adopting blockchain for money transactions may be cheaper and faster. This is especially true for international transactions, which are sometimes expensive and delayed. Transferring money between accounts can take days even in the current U.S. financial system, while a blockchain transaction only takes a few seconds.
2. Cost savings: By eliminating the need for intermediaries and automating certain processes, blockchain can help banks reduce operating costs.
3. Increased efficiency: Blockchain can enable faster and more efficient financial transactions by reducing the time and effort required to verify and reconcile them.
4. Improved security: Blockchain provides a secure and immutable record-keeping system, which can help reduce the risk of fraud and errors.
5. Enhanced transparency: Blockchain can provide a transparent and auditable record of financial transactions, which can increase trust and accountability.
6. Increased transparency: By adopting blockchain technology, banks can gain a competitive advantage over their peers and attract new customers.

1.3 Rationale of the Study

The rationale for using blockchain in the banking system is to improve efficiency, reduce the risk of fraud, and lower transaction costs.

Efficiency: Blockchain technology has the potential to streamline many of the processes used in the banking industry, making it faster and easier to send money internationally, finance international trade, verify customer identities, track the ownership of financial assets, and process loan applications.

Fraud prevention: One of the key benefits of blockchain is that it is a secure and tamper-proof ledger. This means that it is much harder for fraudsters to alter transactions or steal sensitive information.

Lower costs: By automating many of the processes used in the banking industry and eliminating the need for intermediaries, blockchain technology has the potential to significantly reduce transaction costs. This could lead to lower fees for customers and increased profitability for banks.

1.4 Research Questions

1. How can blockchain technology be used to improve the efficiency of cross-border payments in the banking system?
2. How can blockchain be used to streamline the trade finance process and reduce the risk of fraud?
3. What are the potential benefits and challenges of using blockchain for identity verification in the banking system?
4. How can banks use blockchain to track the ownership and movement of assets such as securities or loans?
5. How can blockchain technology be used to automate regulatory compliance reporting in the banking system?
6. What are the potential costs and benefits of implementing blockchain technology in the banking system, and how can these be measured?

1.5 Expected Outcome

The use of blockchain technology in the Bangladeshi banking system could potentially bring a number of benefits. Some potential outcomes could include:

1. Improved security: Blockchain technology can help to secure financial transactions by providing a decentralized and immutable ledger. This can help to reduce the risk of fraud and cyber attacks.
2. Increased efficiency: By automating certain processes and reducing the need for intermediaries, blockchain technology could help to speed up financial transactions and reduce operational costs for banks.
3. Greater transparency: The decentralized nature of blockchain technology could help to increase transparency in the banking system, as all participants have access to the same information.
4. Improved access to financial services: Blockchain technology could help to expand access to financial services in Bangladesh, particularly in rural and underserved areas. For example, blockchain-based mobile banking solutions could help to bring banking services to people who may not have access to traditional brick-and-mortar banks.

1.6 Report Layout

Chapter 1: In this section, we've covered the motivation for our task, its goals, and the typical outcome of our work.

Chapter 2: In this section, we've reviewed the theoretical foundations of our research in this section and have also looked at related research, past studies, the size of the difficulties, and challenges.

Chapter 3: In this chapter, we've explained the research methodology and the other functionalities of our work.

Chapter 4: In this chapter, we discuss the summary, the conclusion, and the additional study procedure.

CHAPTER 2

BACKGROUND

2.1 Introduction

It is possible to use blockchain technology in the banking system of Bangladesh. In fact, some banks in Bangladesh are already exploring the use of blockchain for various applications. For example, the Bangladesh Bank, the country's central bank, has announced plans to use blockchain for international remittance payments. Other potential uses of blockchain in the Bangladeshi banking sector include improving the efficiency of financial transactions, reducing the risk of fraud, and increasing transparency and accountability.

However, there are also challenges to the adoption of blockchain in the Bangladeshi banking system. One of the main challenges is regulatory uncertainty, as the government is still in the process of developing guidelines and regulations for the use of blockchain in the financial sector. In addition, there may be challenges related to the integration of blockchain with existing systems and the need to educate and train staff on the use of the technology.

2.2 Related Works

The authors of [1] talk about the potential effects of using the blockchain for banking and finance. The goal was to determine the blockchain's potential utility for administering the account section and for the fund. The author looked at how blockchain-based historical enquiries work. These gaps are being filled by Bitcoin, along with some of the remaining difficulties.

The author of this [2] essay investigates the use of Blockchain technology without tokens to secure information regarding financial exchange specifics. The paper analyzes the assurance elements of appropriated data sets and offers a solution to the problem of maintaining the dependence of the data's uniqueness on blockchain innovation without tokens. The author offers suggestions at the end for how to integrate Blockchain

innovation into conventional financial systems. The cycle of support for the integrity and uniqueness of data on bank exchanges will be considerably improved by a blockchain without mining or tokens, claim the authors.

This study [3] discusses the benefits of blockchain technology for commercial banks from the perspectives of charging activity, cross-line payment activity, and the commercial banks' resource securitization business. Blockchain technology has the ability to lower exchange costs for all parties involved while also improving the efficiency of executives' and corporate banks' daily operations.

The authors of this work [4] present a proposal for the use of blockchain technology in the interaction of lending, checking, and assessing improvement projects at the Brazilian Development Bank. The idea streamlines public cash assignments, enhances manual exercises, lowers operational costs, and produces data to support a comprehensive analysis of the advantages brought about by the bank's credit. After highlighting the challenges of implementing the suggested idea, this article also discusses what should be feasible as a progress cycle using blockchain technology and blueprints that have already been successfully completed.

The authors of this [5] paper examine the challenges and opportunities of using blockchain innovation in the banking industry. Blockchain technology has the potential to modernize the global financial system by achieving economic outcomes while applying more effective frameworks than are now in use. The authors argue that by overcoming the current blockchain challenges brought on by "bitcoin," it will be possible to use blockchain innovation in financial cycles. The high cost of the equipment and the excessive energy consumption are these burdens.

The main goal of the study [6] is to demonstrate how blockchain innovation might interfere with present plans of action and to look at how this might be possible. The formulation of the plan of action may be influenced by recent innovations like the blockchain. In order to prepare for future business interruptions, it is recommended toward the end of this article that users keep up with advancements in this area.

In this examination [7], the authors inspected the Chinese banking field to propose their ideas. They claimed that blockchain technology had the potential to change the banks' credit data and payment clearing systems by modifying its covert technology. Blockchain technologies also facilitate the management of multi-focus, dreadfully average situations, which will increase the effectiveness of the financial sector. It is notable that the topics of rules, competence, and security have consistently created a lively debate during the period spent on each new financial development. But despite these obstacles, history won't be stopped because the technical, organizational, and other problems with blockchain innovation will eventually be resolved. As a result, it is likely that blockchain innovation will be integrated into the financial sector sooner rather than later.

2.3 Research Summary

Blockchain technology has the ability to boost productivity, minimize transaction costs, and lower the risk of fraud in the banking system. The use of blockchain in numerous applications, including cross-border payments, trade finance, identity verification, asset tracking, loan origination and underwriting, and regulatory compliance, is already being investigated by many banks. Although blockchain adoption in the financial sector is still in its infancy, a number of pilot projects and proof-of-concepts have shown the potential advantages of this technology. The widespread implementation of blockchain in the banking sector is, however, also hampered by legal obstacles, security and scalability worries, and the requirement for stakeholder consensus. To address these issues and reap the benefits, more research and development

2.4 Scope of the Problem

The scope of the problem of using blockchain in the banking system depends on the specific research question or hypothesis being addressed. Here are some examples of potential scope of the problem in this area:

1. The potential benefits and challenges of using blockchain in cross-border payments in the banking industry.
2. The feasibility of using blockchain to streamline the process of financing international trade in the banking industry.
3. The effectiveness of using blockchain to verify customer identities in the banking industry.
4. The impact of using blockchain to track the ownership of financial assets on the efficiency and transparency of the capital markets.
5. The potential of using blockchain to automate the loan origination and underwriting process in the banking industry.
6. The role of blockchain in helping banks to meet complex regulatory requirements.

2.5 Challenges

There are several challenges to the widespread adoption of blockchain in the banking industry, including:

1. Regulatory hurdles: Blockchain technology is still in the early stages of development, and there are many regulatory questions that need to be addressed. This includes issues related to consumer protection, data privacy, and money laundering.

2. Security and scalability: Blockchain networks must be secure and able to handle a large number of transactions in order to be practical for use in the banking industry. There are ongoing concerns about the ability of blockchain systems to scale to meet the demands of the banking sector.

3. Consensus building: Blockchain technology requires the participation of multiple stakeholders, and building consensus among these stakeholders can be a challenge. This includes banks, regulators, customers, and technology providers.
4. Integration with existing systems: Implementing blockchain technology in the banking industry will likely require the integration of blockchain systems with existing legacy systems, which can be complex and time-consuming.

5. Lack of standardization: There are currently many different blockchain platforms and protocols being developed, and a lack of standardization could be a barrier to the widespread adoption of blockchain in the banking industry.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

Blockchain technology has the potential to revolutionize the way the banking industry operates by providing a secure, transparent, and efficient platform for recording financial transactions. With its decentralized and distributed nature, blockchain can reduce the need for intermediaries and streamline the process of conducting financial transactions, resulting in faster and cheaper transactions. Additionally, the use of blockchain in the banking industry could enable financial inclusion by providing access to financial services to underserved populations. However, the adoption of blockchain in the banking sector is not without challenges, such as regulatory uncertainty and the need for integration with existing systems. In this research paper, we will explore the potential applications of blockchain in the banking industry, as well as the challenges and opportunities it presents.

3.2 Working Method

3.2.1 General Banking Process

In a traditional banking process shown in Figure 3.1, a customer can perform various financial transactions, such as depositing money, withdrawing money, transferring funds, paying bills, and obtaining loans.

1. Depositing money: A customer can deposit money into their bank account at a bank branch or through an automated teller machine (ATM).

2. Withdrawing money: A customer can withdraw money from their bank account at a bank branch or through an ATM.
3. Transferring funds: A customer can transfer funds from their bank account to another bank account through online banking, mobile banking, or by visiting a bank branch.
4. Paying bills: A customer can pay bills through online banking, mobile banking, or by visiting a bank branch.
5. Obtaining loans: A customer can apply for a loan through a bank branch, online, or by phone. If the loan is approved, the funds will be deposited into the customer's bank account.
6. These transactions are typically processed and recorded by the bank using a centralized database.

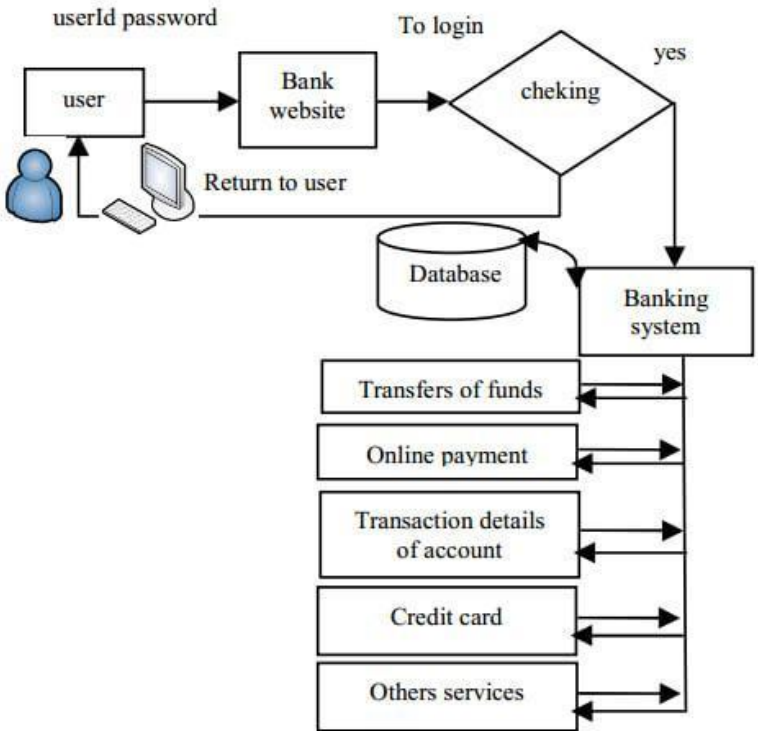

Figure 3.1: Internet Banking System.

3.2.2 Our proposed model

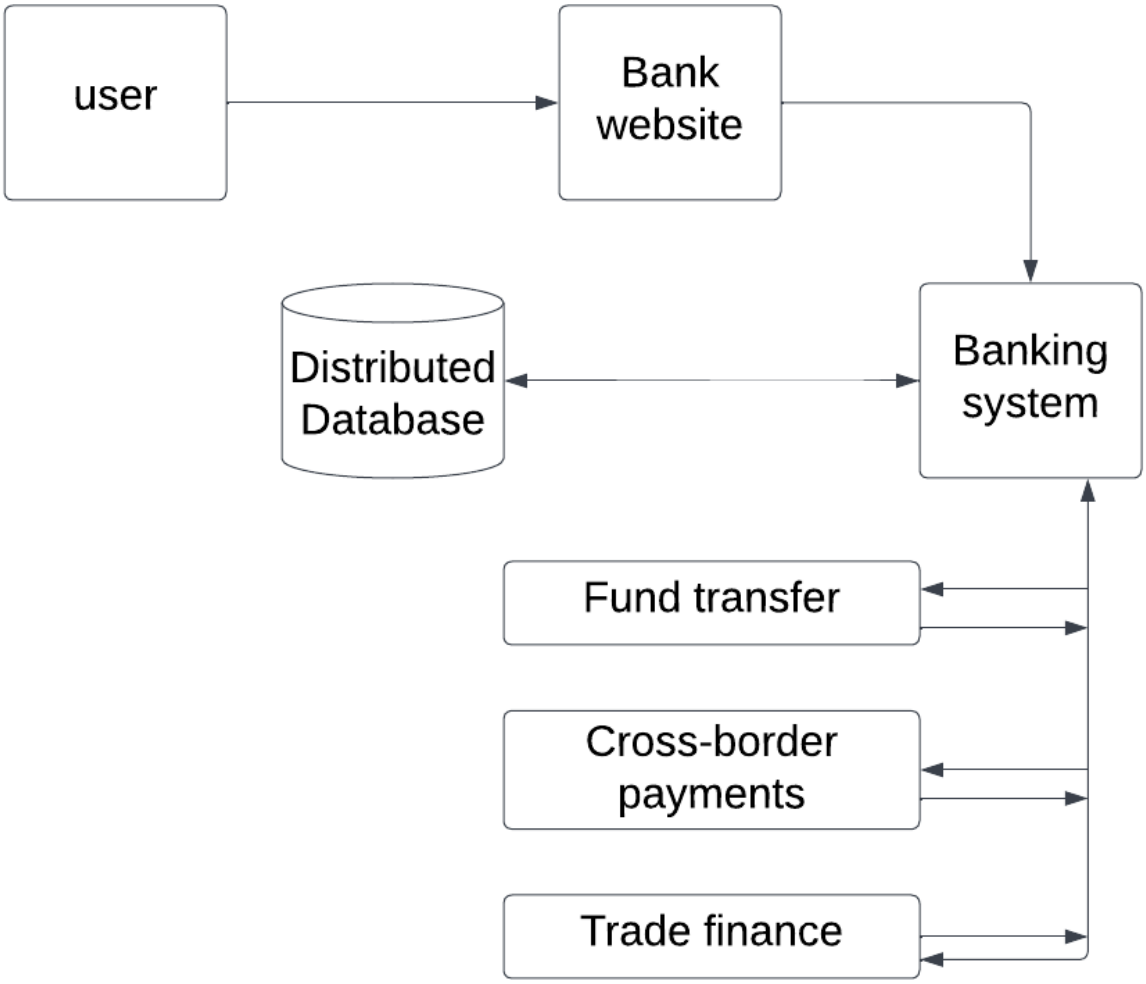

Figure 3.2: Our Proposed Model of blockchain in banking system

This Figure 3.2 describes that,

Users: Customers of the bank who would have access to the blockchain-based banking system through a mobile application or online portal.

Banking Site: The bank's website or mobile application that would act as the interface for users to access the blockchain-based banking system.

Distributed Database: The blockchain network, which would be a decentralized and distributed database that stores and verifies transactions.

Cross-border Payment: The ability for users to make cross-border payments in a secure and efficient manner through the use of smart contracts and real-time currency conversion.

Smart Contracts: Self-executing contracts that would automate the process of cross-border payments, reducing the need for intermediaries and increasing the speed of transactions.

Trade Finance: The use of smart contracts to automate and streamline the process of trade finance, such as Letters of Credit and Invoice Discounting.

3.2.3 Fund transfer process in blockchain

In a blockchain network, transactions are added to the blockchain through a process called mining. Here's a general overview of how a transaction gets into the blockchain which shown in Figure 3.3:

1. A user initiates a transaction, which is broadcast to the network. The transaction includes the sender's address, the recipient's address, and the amount of the transaction.

2. The transaction is verified by nodes (i.e., computers or servers) in the network to ensure that the sender has sufficient funds to complete the transaction and that the transaction is valid.

3. If the transaction is valid, it is added to a block, which is a collection of transactions. Each block also includes a unique code, called a hash, that is generated based on the transactions in the block.

4. The block is then added to the blockchain, which is a linear sequence of blocks. The new block is linked to the previous block by including the hash of the previous block in the new block.

5. The updated blockchain is distributed to all nodes in the network, and each node updates its copy of the blockchain to reflect the new block.

6. The updated blockchain is validated through a consensus process, in which the nodes come to agreement on the state of the blockchain. This ensures the integrity and reliability of the data stored in the blockchain.

In this way, transactions are added to the blockchain through a decentralized and secure process that ensures the integrity and reliability of the data.

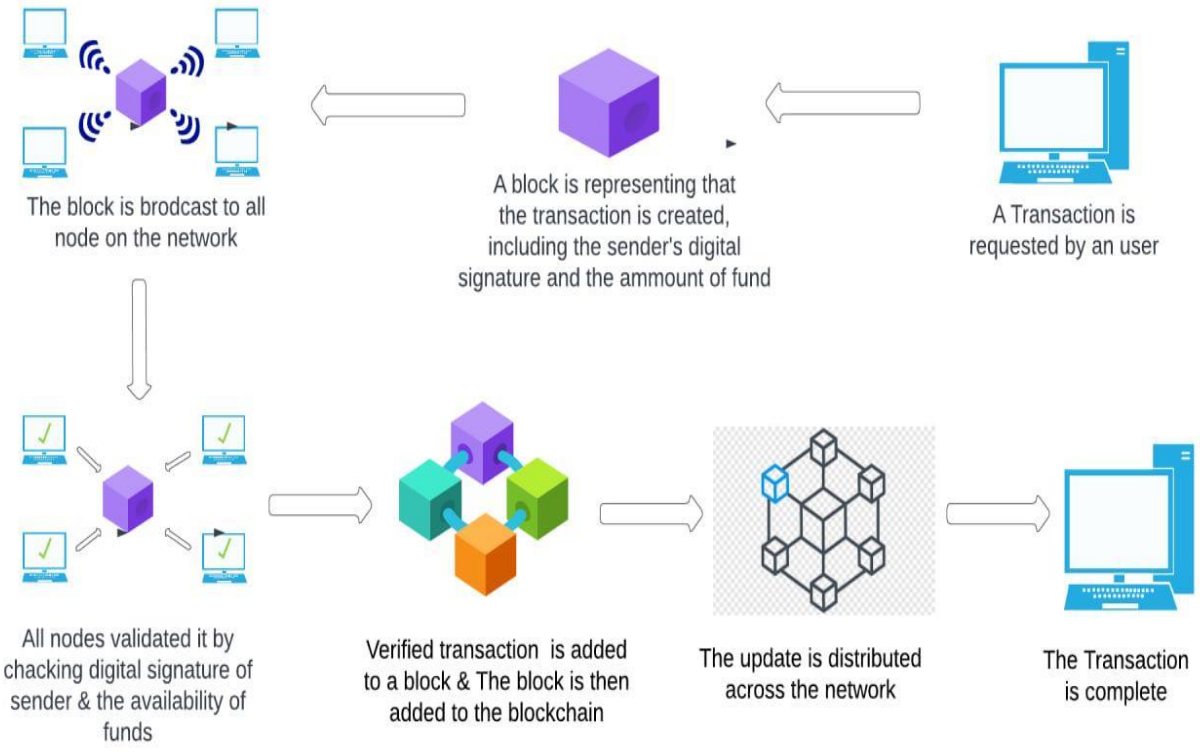

Fig 3.3: Fund transfer process in Blockchain

3.2.4 Distributed database

A distributed database in a blockchain network works through a process called consensus. Consensus is a mechanism by which all of the nodes in the network come to agree on the state of the database.

Here's an overview of how a distributed database works in a blockchain network shown in Fig 3.4:

1. Multiple users or systems can access and update data by using a software program that allows users to interact with databases using SQL.
2. Each node on the blockchain network maintains a copy of the entire database, which contains all the transactions and blocks.
3. When a new transaction is initiated, it is broadcasted to all the nodes on the network for validation.

4. Each node independently verifies the transaction by checking that it is valid and that the sender has sufficient funds to complete the transaction.
5. Once the transaction is verified, it is added to a block along with other verified transactions.
6. The block is then added to the existing blockchain through a process called mining, where specialized nodes called miner validate the block by solving complex mathematical problems.
7. Once the block is added, the transaction becomes a permanent record on the blockchain, and it can't be altered or deleted.
8. The updated database is then distributed to all nodes on the network, ensuring that each node has the most recent version of the database.
9. This distributed database structure ensures that there is no central point of control or failure, making it more secure and resilient.
10. Each node on the network also maintains a copy of the database, making it easy to recover data in case of a node failure.
11. The distributed database also enables transparency and immutability, allowing for easy tracking and auditing of transactions.
12. Each node on the network also allows for the consensus mechanism to take place, where all the nodes must agree on the validity of the transaction, therefore, making the process secure.

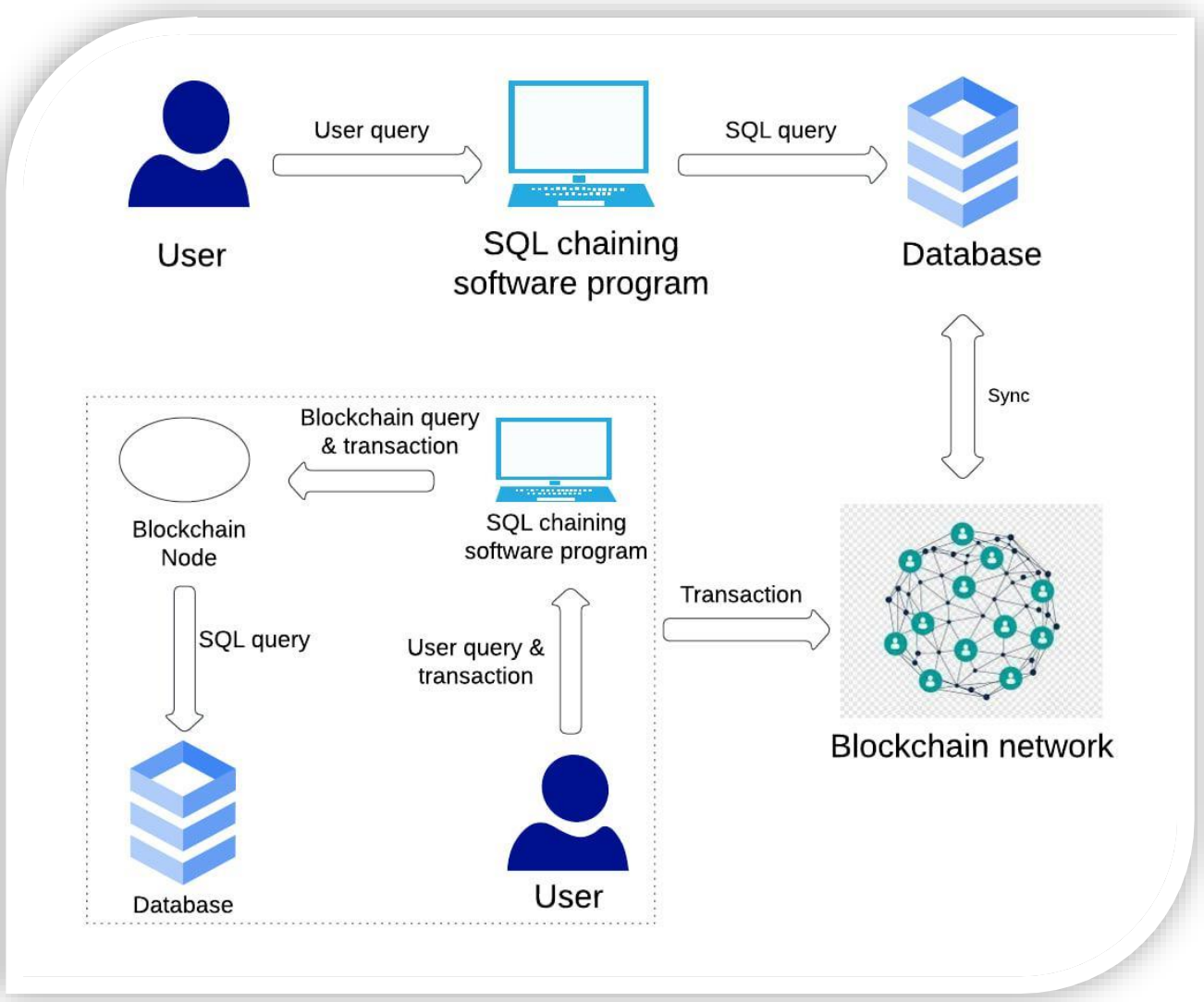

Fig 3.4: Distributed database working process in blockchain network

3.2.5 Smart Contract

To deploy an Ethereum smart contract, you will need to have a development environment set up with the necessary tools, such as a local Ethereum node (such as Geth or Parity) and a compiler (such as Solidity).

Here are the general steps to deploy a smart contract shown in figure 3.5:

1. Write smart contract code in Solidity or another programming language that can be compiled to the Ethereum Virtual Machine (EVM) bytecode.
2. Compile your code to generate the EVM bytecode and the Application Binary Interface (ABI).
3. Connect to your local Ethereum node using a web3 provider, such as MetaMask or Truffle.
4. Use the web3.eth.contract() method to create an instance of your contract, and use the .deploy() method to deploy it to the Ethereum network.
5. Send a transaction with the .send() method to deploy the contract to the Ethereum network, including the necessary gas fee.
6. Once the contract is deployed, you will be able to interact with it using its address and the ABI.

It's important to note that deploying a smart contract to the Ethereum mainnet requires real Ether to pay for the gas fees. Depending on the complexity and the amount of data stored in the contract, the cost can vary.

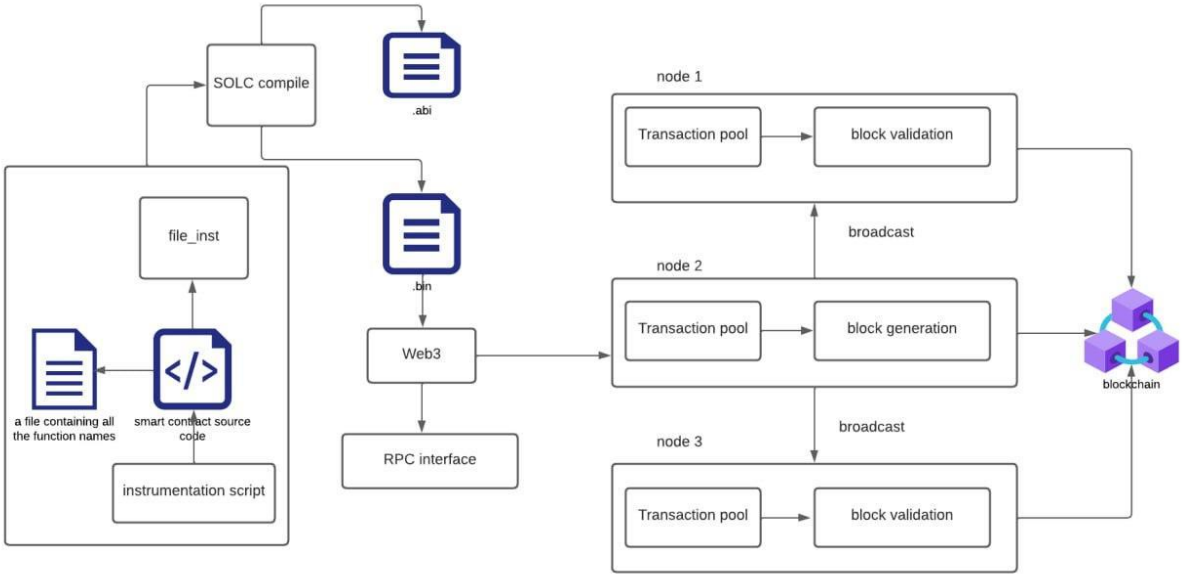

Figure 3.5: Smart Contract

3.2.6 Blockchain in Cross Border Payment System

Cross-border payments are financial transactions involving the transfer of funds between countries. Cross-border payments could become more efficient thanks to blockchain technology, which provides a secure and open way to transmit money. It speeds up the payment process by utilizing encryption technology.

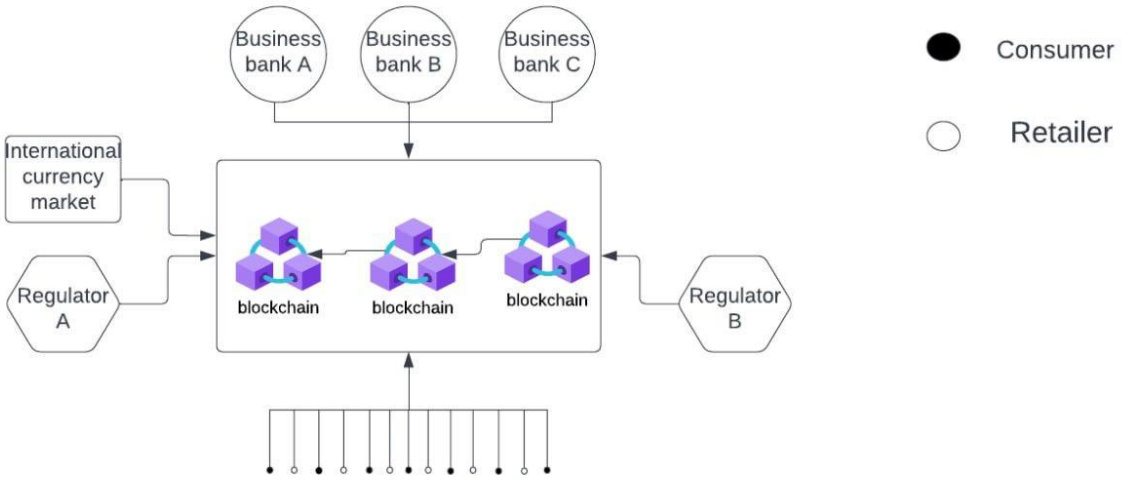

Figure 3.6 : Blockchain in cross border payment system

From the above Figure 3.6 -

1. A, B, and C business banks would participate in the system, each having their own node on the blockchain network.
2. A and B regulators, such as a central bank or government agency, would also have nodes on the blockchain network to oversee and regulate the transactions.
3. The international currency market would be connected to the blockchain network, allowing for real-time conversion of currencies.
4. Consumers and retailers would also have access to the blockchain network, either through a mobile application or online portal.
5. A consumer wishing to make a cross-border payment to a retailer would initiate the transaction through their mobile application or online portal.
6. The transaction would be recorded and validated on the blockchain network by the participating banks and regulators.
7. The funds would then be transferred to the retailer's account in their local currency, with the conversion taking place on the international currency market.
8. The retailer would then receive the funds in their local currency and the transaction would be recorded on the blockchain network as complete.

3.2.7 Blockchain in Trade Finance

From the figure shown in 3.6, in Conventional Trade Finance-

Trade finance refers to the process of financing international trade transactions, such as the import and export of goods. In a conventional trade finance arrangement, an importer and an exporter may use a range of financial instruments and services to facilitate the trade transaction.

Here's an overview of how a conventional trade finance arrangement may work for an importer and an exporter:

1. The importer and exporter agree to the terms of the trade transaction, including the price and quantity of the goods, the delivery date, and the payment terms.
2. The importer may request financing from a bank or other financial institution to cover the cost of the goods. The bank may require the importer to provide collateral, such as a letter of credit or a guarantee, to secure the financing.
3. The exporter may also request financing from a bank or other financial institution to cover the costs of producing and delivering the goods. The bank may require the exporter to provide collateral, such as a letter of credit or a guarantee, to secure the financing.
4. Once the financing has been secured, the importer and exporter can proceed with the trade transaction. The importer may pay for the goods through a letter of credit, which is a financial instrument issued by a bank that guarantees payment to the exporter once the goods have been shipped and delivered.
5. The exporter ships the goods to the importer and provides the necessary documents, such as a bill of lading or an invoice, to the importer's bank.
6. The importer's bank verifies the documents and releases the payment to the exporter once the terms of the letter of credit have been met.

Overall, trade finance can help to facilitate international trade transactions by providing the necessary financing and security to both the importer and the exporter.

Trade Finance in Blockchain Technology:

Blockchain technology has the potential to transform the trade finance industry by improving efficiency, reducing the risk of fraud, and lowering transaction costs. Here's an overview of how trade finance could work using blockchain technology:

1. The importer and exporter agree to the terms of the trade transaction, including the price and quantity of the goods, the delivery date, and the payment terms.
2. The importer and exporter can use smart contracts, which are self-executing contracts with the terms of the agreement written into lines of code, to automate the process of financing and executing the trade transaction.
3. The importer and exporter can use blockchain-based platforms, such as trade finance marketplaces, to facilitate the trade transaction. These platforms can provide a secure and transparent record of the transaction and can automate the process of exchanging documents and making payments.
4. The exporter can use blockchain-based supply chain management systems to track the progress of the goods and provide real-time updates to the importer.
5. The importer and exporter can use blockchain-based identity verification systems to verify the identities of the parties involved in the trade transaction in a secure and transparent manner.

Overall, the use of blockchain technology in trade finance has the potential to significantly improve the efficiency, security, and transparency of international trade transactions.

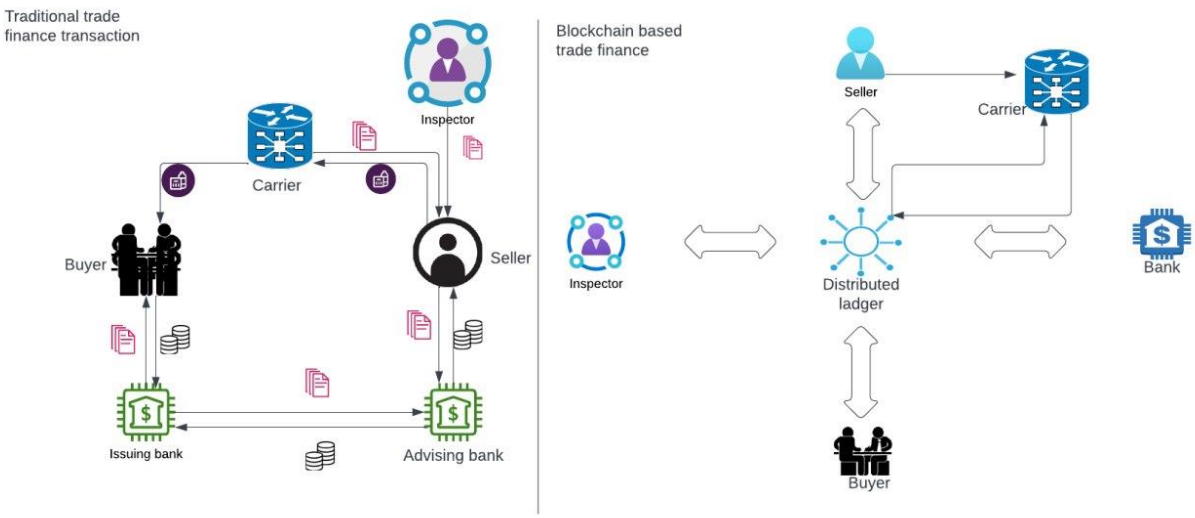

Figure 3.6: Trade Finance in Blockchain

CHAPTER 4

SUMMARY, CONCLUSION, RECOMMENDATION, IMPLICATION FOR FUTURE RESEARCH

4.1 Summary

Using blockchain in the banking system has the potential to improve efficiency, reduce the risk of fraud, and lower transaction costs. However, there are also challenges to the widespread adoption of blockchain in the banking industry, including regulatory hurdles, concerns about security and scalability, and the need to build consensus among stakeholders. Further research and development are needed to address these challenges and realize the full potential of blockchain in the banking system.

4.2 Conclusion

Blockchain technology has the potential to revolutionize the banking industry by providing a secure, transparent, and efficient platform for recording financial transactions. In this research paper, we will explore the potential applications of blockchain technology in the banking sector, as well as the challenges and opportunities it presents.

One potential use of blockchain in the banking industry is in the area of cross-border payments. Currently, cross-border payments can be slow and expensive due to the need for intermediaries to facilitate the exchange of currencies and the inherent risks involved. By using a decentralized, distributed ledger system like blockchain, banks can reduce the reliance on intermediaries and streamline the payment process, resulting in faster and cheaper transactions.

Another area where blockchain could be useful in the banking industry is in the provision of financial services to underserved populations. In many developing countries, large segments of the population do not have access to traditional banking services due to a lack of infrastructure or identification documents. By using blockchain to create a decentralized, self-sovereign identity system, banks could enable these individuals to access financial services and participate in the global economy.

One challenge that must be overcome in the adoption of blockchain in the banking industry is regulatory uncertainty. Blockchain technology is still in its early stages of development, and many governments are still trying to understand its implications and how to regulate it. As a result, banks may be hesitant to adopt blockchain technologies until there is more clarity on the regulatory front.

In conclusion, blockchain technology has the potential to revolutionize the banking industry by providing a secure, transparent, and efficient platform for recording financial transactions. While there are challenges to its adoption, the potential benefits of blockchain in the banking sector are significant and could lead to a more inclusive and efficient financial system.

4.3 Recommendation

Conduct pilot projects and proof-of-concepts to test the feasibility and potential benefits of using blockchain in various applications in the banking industry. This will help to identify any issues that need to be addressed and provide valuable insights for future development.

Engage all stakeholders, including banks, customers, regulators, and technology providers, in the development and implementation of blockchain solutions in the banking industry. This will help to build consensus and ensure that the needs of all parties are taken into account.

Consider the legal and regulatory implications of using blockchain in the banking industry, and work with regulators to develop clear guidelines and best practices.
Address issues related to interoperability and standardization in order to facilitate the widespread adoption of blockchain in the banking industry.

Invest in research and development to address the challenges to the widespread adoption of blockchain in the banking industry, including regulatory hurdles, security and scalability concerns, and the need for consensus building.

4.4 Implication for Further Study

There are several implications for further study in the area of using blockchain in the banking industry. Some potential areas of research could include:

1. Developing and testing new blockchain platforms and protocols that are specifically designed for use in the banking industry.

2. Conducting more pilot projects and proof-of-concepts to assess the feasibility and potential benefits of using blockchain in various applications in the banking industry.
3. Studying the legal and regulatory implications of using blockchain in the banking industry, and working with regulators to develop clear guidelines and best practices.
4. Investigating the potential for using blockchain to improve the efficiency, transparency, and security of the financial system as a whole.

5. Examining the economic impacts of using blockchain in the banking industry, including the potential to reduce transaction costs and increase profitability.
6. Investigating the potential for using blockchain to expand financial inclusion by providing access to financial services for underserved populations.

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