Trusted Financial Transaction System using Blockchain Technology

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Abstract—**As more and more deals and funds are made online, security is still the most important thing in the digital economy. Blockchain technology, especially Ethereum, comes up as an answer because it makes financial activities safe and clear. Using Ethereum's smart contracts, this study suggests a blockchain-based system for safe money exchanges and investments. During the investment process, these self-executing contracts make sure that everything is clear, can't be changed, and is safe. An easy-to-use dashboard lets users interact with the system, which allows for safe fund purchases and tracking. Ethereum wallets make it easy to connect with the blockchain, giving users more control over their money. The suggested method has many advantages, including more openness, lower trade costs, and less chance of losing money to another party. The system wants to change the way money works by using blockchain technology to make the environment for investments and transfers safer and more efficient.**

Keywords—Blockchain, Smart Contracts, Solidity, Ethereum, Bitcoin, Cryptocurrency

I. INTRODUCTION

Due to the new possibilities of blockchain technology, the financial world is going through a big paradigm shift. Traditional financial systems have problems that can't be fixed easily, like not being open about their fees and charges and being prone to scams and data theft. In answer to these problems, blockchain has come up as a potential option. It will lead to a new era of safe, quick, and clear financial activities.

The main goal of the "Blockchain Based System for Money Investment & Secure Transactions" paper is to make the current financial system completely different. The paper wants to build a strong financial system that puts security, speed, and openness first [1]. It will do this by using blockchain, a decentralized and distributed ledger system.

People have long said that traditional financial systems are opaque, which makes it hard for people to fully understand how deals work. Users often don't trust each other because of this lack of openness, which raises the risk of scams [2]. In addition,

traditional financial deals involve a lot of middlemen, which leads to very high fees that are especially hard for small investors and lowers total profits [3].

One of the biggest problems with standard banking systems is that deals are settled very slowly. It can take days or even weeks to finish. Not only does this wait add extra risk, it also limits liquidity, which is especially bad in fast-paced markets where payment on time is very important [4]. In addition, scams, hacking, and data breaches can happen in centralized a financial system, which greatly affects the safety and reliability of financial operations and assets [5].

To deal with these problems, the paper proposes to use blockchain technology to change the way people spend and trade money. Blockchain has many benefits over standard financial systems, such as processing transactions quickly, protecting privacy, and making sure that data security can't be changed [6]. The paper uses secure hashing (SHA-256 in this case) to ensure that each transaction has its own unique hashcode. This protects the accuracy and safety of the data in the blockchain [7].

The main idea behind the paper is to use Ethereum, which is a popular blockchain platform, as the base technology. Ethereum's smart contracts, which are written in Solidity, are very important for handling financial tasks based on conditions that have already been set [8]. These self-executing contracts make many tasks easier, like payments, trades, and cash swaps, by executing actions instantly when certain conditions are met. The paper makes financial activities safer, faster, and more accurate by deploying smart contracts on the Ethereum blockchain [9].

In conclusion, the "Blockchain Based System for Money Investment & Secure Transactions" paper represents a significant stride towards reshaping the dynamics of money. The paper aims to enhance the safety, openness, and efficiency of the banking system through the utilization of blockchain technology. It endeavors to empower individuals and entities

worldwide by facilitating transparent, swift, and secure transfers. This initiative is poised to unlock new opportunities for economic advancement and foster financial inclusion.

II. LITERATURE SURVEY

For this paper, a literature review was done that looks at important works and reliable sources in the field to learn more about blockchain technology and how it can be used in the banking industry.

Nakamoto's important Bitcoin paper [1] introduced the idea of blockchain, an autonomous ledger system that lets people send money to each other electronically. Bitcoin's creative use of blockchain technology set the stage for a new era of open banking and led to more study and development in the area.

The book "Blockchain Revolution" [2] by Tapscott and Tapscott gives a full picture of how blockchain technology, which was first created for Bitcoin, is changing money, business, and the world as a whole. The book talks about how blockchain could significantly change many fields, such as healthcare, supply chain management, and banking.

The "Global Findex Database 2017" [3] from the World Bank is a great resource for learning about the state of financial inclusion and how fintech can help close the gap. The study talks about how important it is to use technology like blockchain to bring financial services to people around the world who don't have access to them. This will help people get ahead financially and reduce poverty.

The "Blockchain in Insurance" [4] study from McKinsey & Company looks at the pros and cons of using blockchain technology in the insurance business. The study talks about how blockchain can speed up insurance processes make them more open, and cut down on scams, which will help both insurers and customers in the long run.

Swanson's study on "Consensus-as-a-service" [5] looks at the rise of permissioned, distributed ledger systems. These are different from Bitcoin and other public, permissionless networks in how they manage the blockchain. The study talks about the possible benefits of permissioned blockchains in terms of privacy, being able to grow, and following the rules.

Antonopoulos's book "Mastering Bitcoin" [6] is a complete guide to learning how Bitcoin and blockchain technology work on a scientific level. The book talks about things like cryptography, how to process transactions, and smart contracts. It gives you useful information about how independent systems work.

The book "Blockchain Enabled Applications" [7] by Dhillon and Metcalf goes into more depth about how blockchain technology can be used for things other than coins. The book talks about how blockchain can be used to make decentralized apps (DApps) that can be used for many things, like managing supply chains, verifying identities, and running vote systems.

Buterin's work on Ethereum [8] describes a new type of blockchain technology that adds smart contracts to Bitcoin and makes it more useful. Developers can use Ethereum's customizable blockchain to make autonomous apps that can do many things, such as financial transactions, digital identity management, and decentralized finance (DeFi).

It goes into more detail about the design and construction of the Ethereum platform, with a focus on security, freedom, and scale in Wood's paper on Ethereum [9]. The paper talks about how Ethereum uses a safe decentralized generalized transaction log to keep track of and carry out smart contracts. It shows how Ethereum could change many fields besides finance.

In conclusion, the literature review shows how blockchain technology has the ability to change everything, not just the financial world. From Nakamoto's groundbreaking work on Bitcoin to the creation of Ethereum and the study of permissioned blockchains, researchers and professionals are always looking for new ways to use blockchain to make transfers safe, quick, and clear.

III. METHODOLOGY

A. Proposed Work

The suggested system would use blockchain technology, especially the Ethereum Blockchain [1], to make an autonomous and open platform for safe money exchanges and investments. This would help fix the problems with the current standard financial system.

The rules and conditions of deals in the system are set by smart contracts that are written in Solidity or a similar computer language. These self-executing contracts make sure that things like business deals, asset transfers, and transaction payments are clear, safe, and can't be changed.

On the Ethereum blockchain, all transactions in the system are clear and can be checked by anyone. All transaction info is available to everyone and can't be changed, which builds trust among players.

By getting rid of middlemen and automating tasks with smart contracts [2], the suggested system lowers the fees that are normally attached to financial transactions.

The suggested method encourages financial inclusion by giving people and groups that standard banks don't normally service access to business opportunities.
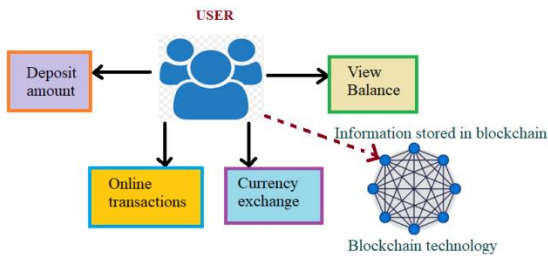
B. System Architecture

Fig. 1. Proposed Architecture

The suggested system design combines human functions with blockchain technology to make sure that financial operations are safe and clear. Users connect with the system in different ways, such as by adding money, checking their accounts, making online purchases, and exchanging currencies.

The system handles the deposit safely and records it on the Blockchain[1] when a user makes a payment. This makes sure that the deal can't be changed, is clear, and can't be hacked. In the same way, when users check their account balances or make purchases online, the system gets the information it needs from the blockchain and changes account balances and transaction records in real time.

When people trade currencies, the system uses blockchain technology to make sure that the deals are safe and that they are recorded. The blockchain stores information about transactions and exchange rates, making sure that everything is clear and correct.

One of the most important parts of the system is blockchain technology, which is an independent and spread record system. Multiple nodes in the blockchain network store data about user activities, account amounts, and exchange rates. This makes sure that the data is reliable and easy to access.

Overall, the system design combines user functions with blockchain technology in a way that doesn't cause any problems. This gives users a safe, quick, and clear way to make financial deals. By using the immutability and digital security of blockchain, the system makes sure that all transactions are honest and correct, which boosts user faith and happiness.

C. Modules

To implement this paper, we used the following modules are New User and Existing User

These modules description given below:

1) New User Signup:

Fig. 2. Accessing the Sign-Up Screen

People can sign up for the blockchain-based system through the "New User Signup" feature. To make an account, users enter basic information like their name, contact information, and login information like a username and password. This process makes it easier to make new user accounts, which give people safe access to the platform's features and services.

2) User Login:

Fig. 3. User Login Screen

The "User Login" feature makes it easy for registered users to get into the system safely. When users enter their login information, the system checks it to make sure they are who they say they are. Once users have been verified, they can use the platform's features and functions. This program makes sure that the login process is safe, which improves the general security of the system and makes it easier for users to get to their accounts.

Fig. 4. User Dashboard

i) Deposit Amount:

Fig. 5. Deposit Amount Screen

The "Deposit Amount" feature lets users add money to their account in the blockchain-based system. This can be standard cash or cryptocurrency. Transactions are handled and stored safely on the blockchain, which makes sure that the whole payment process is open and safe.

ii) Online Transaction:

Fig. 6. Online Transaction Details Screen

The "Online Transaction" part lets users do a variety of online transactions, such as moving money, paying bills, or investing in financial goods that the site offers. These transactions are safely saved on the blockchain, which gives users an unchangeable and clear record of the transaction history.

iii) *View Balance:*

Fig. 7. View Balance Screen (Sender)

Fig. 8. View Balance Screen (Receiver)

The "View Balance" section lets users see how much money they have in their account and see a log of all the transactions they've made. The blockchain safely records information about payments, withdrawals, swaps, and business wins or losses that users can look at. This function gives people a full picture of all the financial activities going on in the system.

iv) *Currency Exchange:*

Fig. 9. Currency Exchange Screen

The "Currency Exchange" feature lets users change one type of cash into another within the blockchain-based system. This could be regular currency or cryptocurrency. The blockchain

records exchange prices and transaction details. This makes sure that the whole exchange process is clear and accurate, which is good for users' safety and ease.

D. Blockchain Integration

1) All payments, online purchases, and currency trades are recorded as blocks on the Ethereum blockchain in the Blockchain-Based System for Money Investment & Secure Transactions. When a block is put to the Blockchain, the information in it can't be changed or removed. This is what "immutable" means. Because of this feature, the transaction data is kept safely and can't be changed, which gives users a lot of trust in the system.

2) Solidity is a computer language for making smart contracts on Ethereum. Smart contracts made in Solidity are a key part of automating financial tasks in the system. These contracts are put into action on the Ethereum Blockchain and have rules and conditions that have already been set. The smart contract does things instantly when certain conditions are met. For example, it transfers money or updates account amounts. By cutting out middlemen and possible mistakes, this technology makes financial processes faster and more accurate.

3) The Ethereum blockchain works on a network of computers called nodes that are not controlled. Every node keeps a copy of the whole Blockchain, which has all the transaction information. This decentralized approach makes it more reliable and easier to use because if one node goes down or isn't available, other nodes still have a full copy of the Blockchain. Users can still view transaction info and complete deals even if some nodes are down for a short time. This autonomous method helps make the system more stable and reliable.

IV. EXPERIMENTAL RESULTS

In contrast to conventional methods of financial transactions, the proposed model relies on the Ethereum blockchain network, renowned for its resilience and adaptability, as the foundation for its implementation in financial transactions. Ethereum's support for smart contracts, which are pre-programmed agreements executing automatically upon meeting specific conditions, serves as a central feature. Leveraging Ethereum's smart contracts, the proposed model simplifies financial processes like payments, trades, and currency exchanges, significantly reducing computational time.

Anchored on the Ethereum blockchain network, the proposed model distinguishes itself through efficiency, security, and cost-effectiveness. Unlike conventional systems dependent on centralized processing and intermediaries, Ethereum's decentralized structure and smart contracts automate transactions, leading to notable reductions in processing durations. Ethereum's built-in SHA-256 encryption and decentralized ledger further enhance security and reliability, mitigating risks associated with fraud and data breaches. Eliminating intermediaries also diminishes transaction costs, making financial activities more accessible and economical for users.

Additionally, Ethereum's global reach fosters financial inclusion, enabling individuals worldwide to access crucial services. The platform's adaptability and potential for innovation empower developers to tailor solutions to specific requirements, ensuring resilience in the face of changing market dynamics. Ultimately, the proposed model offers a superior alternative to traditional methods, furnishing a secure, efficient, and globally accessible framework for contemporary financial transactions.

V. CONCLUSION

Finally, the addition of blockchain technology to the paper marks the start of a new era of safe, quick, and clear financial activities. Blockchain's digital security and ability to not be changed protect deals from fraud and hacking. Every transaction is hashed using cryptography and kept in a block. This makes sure that the transaction is honest and correct. Additionally, Blockchain [1] greatly speeds up and improves the efficiency of deals, especially those that happen across borders, by getting rid of the need for middlemen and simplifying procedures. This efficient method cuts down on the time it takes to handle transactions, which improves the user experience and lowers costs. Additionally, the paper achieves a fine balance between transaction privacy and openness, protecting privacy while allowing openness through fake names. Cryptographic [3] methods hide the names of the author and receivers while letting users see the details of a transaction. Using the autonomous nature of blockchain, the paper makes sure that data is safe and easy to access. Data is spread out among many network hubs, which keeps the system safe and available even when there are problems. This decentralized method makes the system more stable, giving people safe and dependable access to banking services without a single point of failure. Overall, the paper is a big step toward making the blockchain-powered financial environment safer, more open, and more efficient for everyone.

VI. FUTURE SCOPE

In the future, AI and machine learning could be added to the suggested paper to make it even better by analyzing market data and making personalized investing suggestions. Decentralized identity solutions, such as self-sovereign identity systems, could also be added to make sure that identity proof is safe and can be checked without having to rely on central agencies. These improvements would make the system much more useful, easier

to use, and in line with regulations. They would pave the way for a more complex and user-focused financial environment.

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