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# BLOCK CHAIN FOR SECURE BANK TRANSACTIONS (ETHEREUM)

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## ABSTRACT

This project presents a blockchain-powered banking application that enables users to create and manage decentralized accounts (DApp accounts) using Ethereum smart contracts. The application facilitates secure user registration, fund deposits, and peer-to-peer transfers through Solidity-based contracts deployed on the Ethereum network. The addUsers function stores user details, while bankAccount manages transactions securely on the blockchain. Python's Web3 API is used to interact with these smart contracts, enabling seamless operations such as account creation, deposits, and fund transfers. A Django-based web server provides an intuitive interface for users to register, log in, view balances, and conduct transactions.

By leveraging blockchain technology, the system ensures decentralized, transparent, and secure banking operations, eliminating intermediaries to reduce transaction costs and processing times. Users can transfer funds directly between accounts without reliance on traditional financial institutions, minimizing risks associated with centralized banking. This application demonstrates the potential of blockchain in revolutionizing financial systems, empowering users with enhanced security, financial autonomy, and efficient transaction management.

**Keywords:** Peer-to-Peer Transactions, Blockchain, Ethereum, Smart Contracts, Web3 API, Decentralized Banking, Solidity, Django.

## INTRODUCTION

Blockchain technology has transformed the financial sector by providing decentralized, secure and transparent solutions for managing transactions. Traditional banking systems rely on centralized intermediaries, which often result in high transaction fees, delays in processing and increased security risks. This project introduces a blockchain-based financial management system that enables users to transfer money, view transaction histories, and manage their profiles in a highly secure and efficient manner. By leveraging blockchain's decentralized architecture, all transactions are immutable, transparent, and traceable, ensuring that financial activities remain secure and verifiable. Users can initiate peer-to-peer money transfers without the need for intermediaries, reducing both transaction costs and processing times. Since every transaction is recorded on the blockchain, both the sender and the receiver have direct access to transaction records, improving trust and eliminating the possibility of fraud or unauthorized modifications.

Additionally, the platform incorporates a robust profile management system that allows users to update their financial details securely while ensuring data integrity. The implementation of smart contracts automates various financial processes, such as transaction validation, fund transfers, and record-keeping, significantly reducing human errors and operational inefficiencies. Unlike traditional banking systems, where transactions require third-party approvals, smart contracts execute predefined rules autonomously, enhancing both efficiency and reliability. The blockchain-powered system offers improved security by preventing data breaches and fraudulent activities through cryptographic

 

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encryption and distributed ledger technology. By eliminating reliance on centralized financial institutions, this project provides a transparent, cost-effective, and highly secure alternative to conventional banking, demonstrating blockchain's potential to reshape the future of financial services.

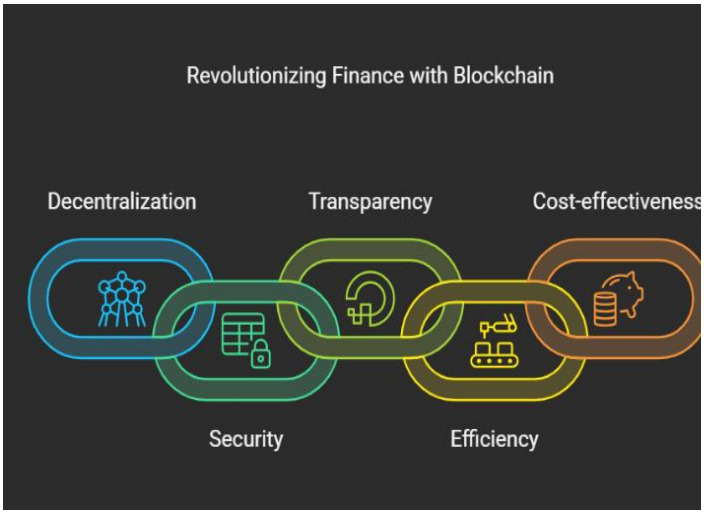


Fig 1: Introduction

## LITERATURE SURVEY

**[1]Aabhas Sood and Rajbala Simon. Implementation of Blockchain in Cross Border Money Transfer. November 21-22, 2019.**

The focus of the paper is to conduct research on the implementation of blockchain in the cross-border money transfer. The problem being faced in the current scenario in overseas money transfer is remittance that results in high transaction fees, no 24*7 availability, lack of transparency and name a few. Blockchain provides a platform which vanishes these problems providing a stable and scalable platform for cross border asset transfer. The distributed ledger is promising in every aspect for these transactions which provide a better benefit to the financial sector.

**[2] Sincy Joseph, Smitha Karunan || A Blockchain Based Decentralised Transaction Settlement System in Banking Sector || 18-19 November 2021**

Emerging technology means the Blockchain technology behind the Bit-coin. It democratizes, makes transparent, secure, efficient the existing business processes. The very early movers have been the Banks which now realize the tremendous disruptive potential of this technology. One of the fastest evolving and very complex bank payment systems in the world is the Indian banking system. At present, there is a real-time gross settlement system based infrastructure in the Indian banking system that is centralized architecture. Due to this centralized architecture the processing of transactions are slow and cum-bersome. It also causes large amount for security and recovery purposes. The real time gross settlement based system demands high need The ability to confer and maintain security, resilience, and high performance are all fundamental needs. The transition from traditional systems to blockchain platforms is not the priority; rather, creating a system that is secure, confidential, and provides a decentralized means of money lending is the principal idea. An innovative system toward a decentralized Banking System and services on the Ethereum blockchain platform is proposed here. The system supports a range of services such as deposit money, transfer money, check loans, etc., using distributed ledger technology.

**[3] Siddharth Rajput, Archana Singh, Smiti Khurana, Tushar Bansal, and Sanyukta Shreshtha || Blockchain Technology and Cryptocurrenices || 04-06 February 2019.**

Thus a blockchain can be considered a trusted collection of transactions, whether physical, i.e. a house or a phone, or nonphysical, such as shares of an affiliate. It should include records or mutual accounts among the parties sharing the benefits. Each transaction is first confirmed by all parties involved in the transaction. Once the information is recorded in the blockchain, the accessing can never be rewritten. Thus, it can be called a journal of all transactions carried out. Besides being used in cryptocurrences like decentralized bitcoin called ethereum, that is further termed as peer-to-peer cash, blockchain technology is also used in this paper. The paper includes the history behind bitcoin, a few other literary reviews, the working of the blockchain and its application.

**[4] Nurul Hidayah Arrifin; Ulaganathan Subramanian || Blockchain in Banking || 08-09 November 2022**

Blockchain technology is one of the innovations in financial technology that serves as the backbone of Bitcoin and Crypto currency. A blockchain is a secure ledger of all data transfer activities that eliminates the need for third-party involvement. It is a technology that records transactions using distributed databases and cryptography. There are

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three types of blockchain which are public, private, and Consortium or Federated blockchain. Many industries have used blockchain technology. Blockchain in banking is one of the industries that use blockchain the most and require by the country and organization. Several use cases on blockchain in banking, for instance, Know Your Customer (KYC), clearing, and settlement.These use cases could see the impact of implementing blockchain in banking.

**[5]. Harsh Bhat; Gourab Bank; Yash Jawale; Ruturaj Wairkar; Sanjay Mirchandani || Decentralized Banking Services using Blockchain Technology || 01-03 June 2023**

Blockchain-based cryptocurrencies have changed the fund transfer mechanism to be more efficient, more straightforward, and more secure. The current banking system has human intervention at various stages, wherein system users modify the bank details and balances in a fraudulent manner. Also, under a conventional banking system, the users can take quite a long time to deposit and withdraw money. This undertaking confers power on users to perform varied transactions in a secure way via the decentralized banking system while managing most of their data. Therefore, under a decentralized banking system, there is no chance for fraudulent activities or capital loss. The proposed system has three functions: user wallet, lending platform, and trading platform. The lending platform holds market funds of all the tokens from which every person can purchase a specific amount of the token. User Wallet has the transaction history with the amount of token sent. The trading platform will have a live price chart of ZB/Eth So users are able to borrow or lend in their own home or workspace in a matter of moments.

| S. No | Author (s) | Remarks | Strength | Weakness |
|---|---|---|---|---|
| 1 | Seybou Sakho et al. | Improving banking transactions using blockchain for better speed and security | Solves processing delays and security issues | Lacks detailed implementation and testing |
| 2 | Swati H.C, H.P Mohan Kumar | Secure bank transaction system with BlockChain | Strong fraud prevention and security | Limited discussion on speed and adoption |
| 3 | N.S. Akhilesh et al. | Blockchain implementation for secure transactions | Practical insights on security improvements | Lacks scalability and cross-platform focus |
| 4 | Varsha Naik et al. | Faster and secure banking using blockchain | Improved transaction speed and decentralization | Lacks regulatory and cost analysis |

Table 1: Literature Survey

## PROPOSED SYSTEM

The proposed system is a blockchain-based financial management platform that allows users to perform secure money transfers, view transaction histories, and manage profiles without the need for intermediaries. This decentralized approach leverages blockchain technology to provide a transparent and tamper-proof record of all transactions, ensuring data integrity and security. Users can initiate peer-to-peer transfers, with both the sender and receiver having access to detailed transaction records. The system also includes a profile management feature, enabling users to update their information while maintaining an immutable log of changes on the blockchain. The platform aims to reduce transaction costs, eliminate delays associated with traditional banking systems, and provide a secure environment for managing financial activities. By using smart contracts, the system ensures automated, rule-based execution of financial operations, further enhancing efficiency.

- Every transaction in Ethereum is **hashed using Keccak-256**, ensuring immutability.
- User authentication and transaction signing are done using **Elliptic Curve Digital Signature Algorithm (ECDSA)**.

**Advantages:**

- By eliminating intermediaries, the system reduces transaction fees and processing times.

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- Blockchain's cryptographic techniques ensure that all transactions are securely recorded, preventing data tampering.
- Users can view a complete transaction history, providing a clear and traceable financial record.
- Assist can guide the user through the dissolution of the marriage insatiably: surficial interest lays between simple questions and possible solutions so that their work appears like ordinary tasks.
  Reduced reliance on third parties lowers the cost of money transfers and financial management.
- Smart contracts enable rule-based execution, minimizing the risk of manual errors.

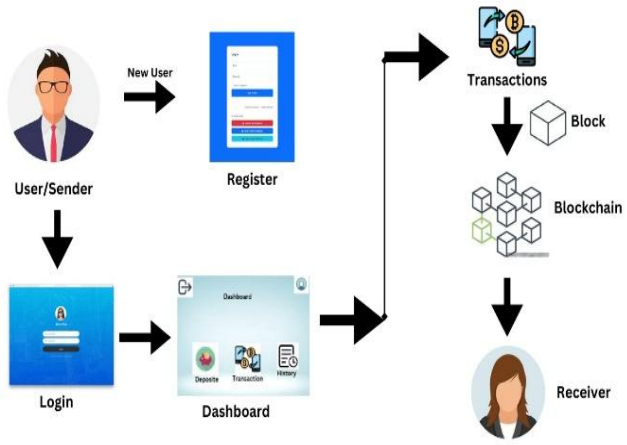


Fig 2: Architecture diagram

This flowchart shows how the transaction functions on the blockchain system. The process begins from the point at which the user has registered on the system. He can then create a user log in, go through a deposit funding, perform transactions, and check transaction history. Each time the user performs a transaction, the transaction details get processed by the system, creating a block with transactional information.

This new block will be added to the blockchain to enhance the security, transparency, and immutability of transactions. Transactions will undergo validation and security checks before being sent to the end user, which is the recipient. Regarding decentralization, the funds or assets involved in the transaction will ultimately reach the receiver safely and efficiently, concluding the process.

## METHODOLOGY

The methodology for the blockchain-based supply market management platform integrates decentralized blockchain technology, smart contracts, and cryptographic hashing with Keccak to ensure security.

**Smart Contracts:** Smart contracts form the core of the platform's automation. These self-executing contracts encode business logic and predefined rules for transactions, such as inventory updates, order fulfilment, and payment processing. When the conditions specified in a smart contract are met, the contract executes automatically, reducing the need for intermediaries, minimizing costs, and decreasing transaction delays. For example, upon confirming a payment, a smart contract can trigger inventory updates and initiate shipping procedures.

**Keccak Hashing**:
The platform uses the Keccak hashing algorithm (the basis of SHA-3) to enhance data security and integrity. Keccak generates a unique cryptographic hash for every transaction, which is stored on the blockchain. This ensures that transaction data is tamper-proof, as any alteration would produce a different hash, making it detectable. Keccak's robust hashing mechanism adds an extra layer of security to the decentralized system, ensuring that records remain immutable and traceable. User functionalities include registration, logging in, adding items to a cart, and managing profiles, while admins manage inventory, monitor activities, and oversee transaction history. Future enhancements could involve integrating IoT for real-time monitoring and smart contracts for predictive analytics and compliance.

**Formula 1: Keccak-256**

$$\text{Hash} = \text{Keccak-256}(\text{input})$$

Input=transaction data (including from Email, to Email, amount, status, etc.)
The resulting hash=256-bit unique hash value

**Formula 2: ECDSA Algorithm**
Signature generation:

$$r, s = kG, (z + r.d).k^{-1} \bmod n$$

Verification:

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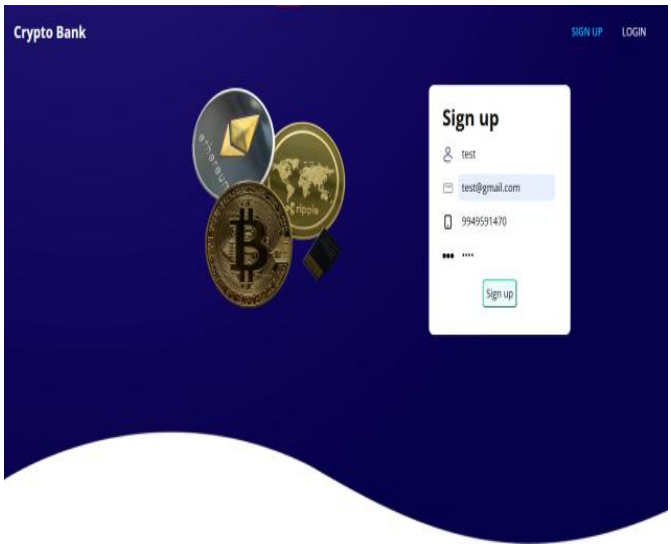
**sG=zG+rP**
k=random number
G=generator point
d=private key
P=public key
z=message hash

## MODULES AND RESULTS

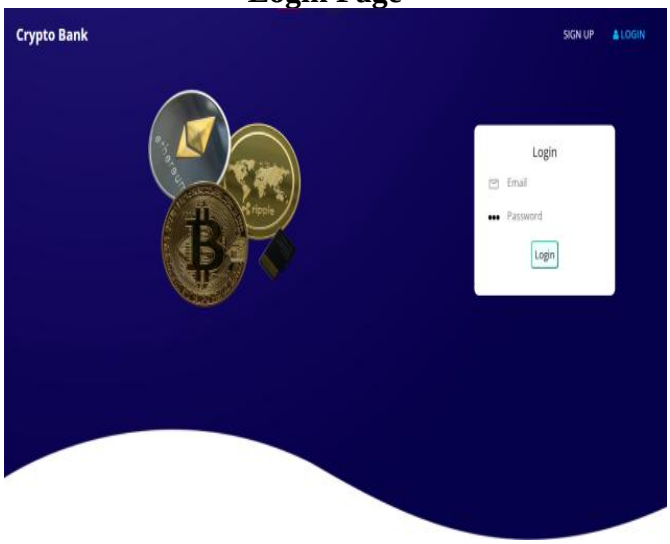
**User:**
The User Module allows users to register and log in securely, manage their profiles, and initiate peer-to-peer money transfers. It provides access to a complete transaction history, ensuring transparency through blockchain records. Users can update account settings, including security preferences. All changes and transactions are securely logged on the blockchain. The module emphasizes data integrity, security, and a user-friendly experience.



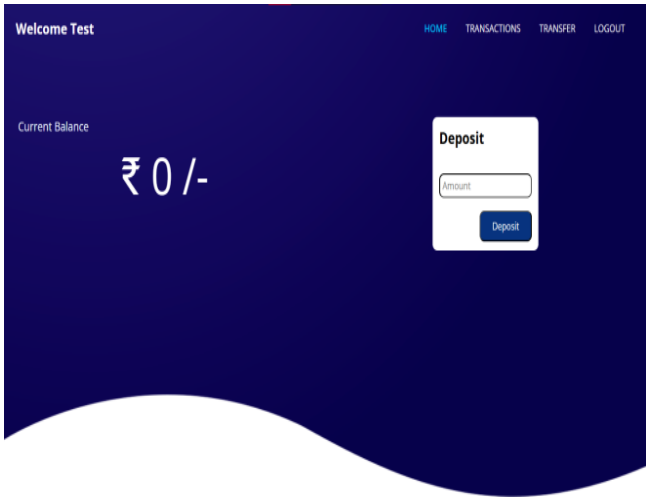

**User Dashboard**
Here users can view their balance and deposit there virtual amount

## Output Screens

**Login Page**




**Sign up**




**Transaction**
Here the users can view the transaction

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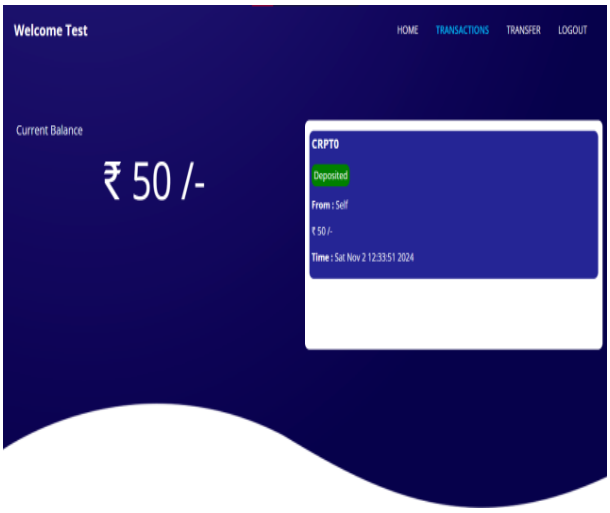
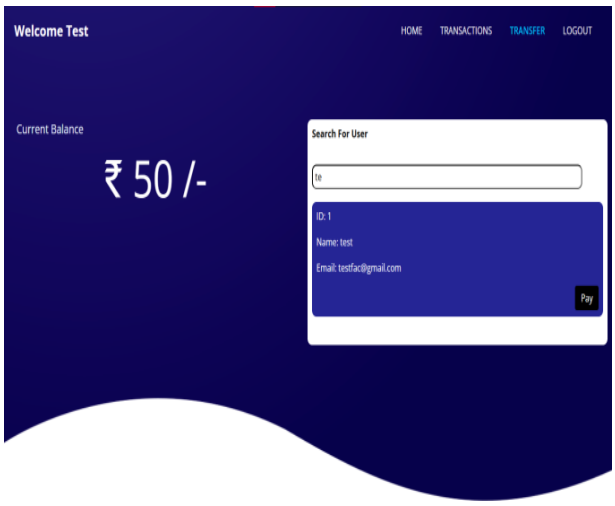


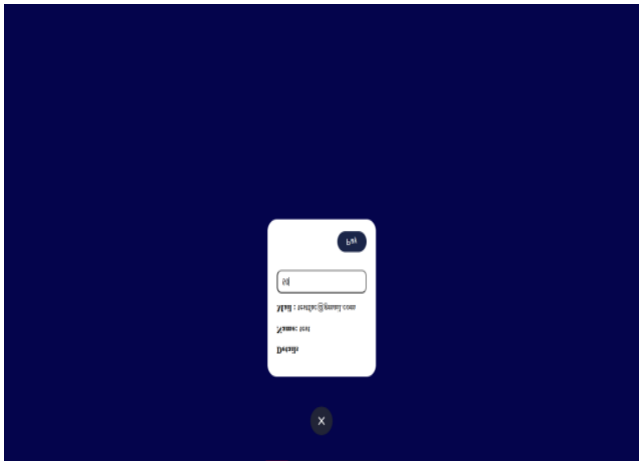

**User search**

Here user can search for other users for transferring amount




**Details Entering**

Entering the amount for sending



## CONCLUSION

In conclusion, the blockchain-based supply market management platform offers a transformative approach to enhancing supply chain efficiency through secure, transparent, and traceable transactions. By integrating smart contracts and a decentralized framework, the platform reduces costs, eliminates intermediaries, and fosters trust. The system's modular design ensures scalability and future adaptability for technologies like IoT and predictive analytics. Thorough unit and integration testing guarantee a reliable and cohesive user experience. Ultimately, the platform stands poised to revolutionize supply chain operations, delivering significant economic and operational benefits to businesses and stakeholders.

## FUTURE ENHANCEMENT

Future enhancements for the blockchain-based platform could include integrating predictive analytics for demand forecasting and optimizing inventory management. IoT devices can be incorporated to provide real-time tracking of goods, further improving transparency and efficiency. Expanding smart contract capabilities could automate more complex business processes and compliance checks. Additionally, incorporating AI-driven insights for fraud detection and supply chain optimization can boost security and performance. These advancements will make the platform even more robust and adaptive to evolving industry needs.

## REFERENCES

**1.** 1. Siddharth Rajput; Archana Singh; Smiti Khurana; Tushar Bansal; Sanyukta Shreshtha. Blockchain Technology and Cryptocurrencies. 4 February 2019.

2. Natalia A. Popova; Natalia G. Butakova Research of a Possibility of Using Blockchain Technology without Tokens to Protect Banking Transactions. 3 March 2019.

3. Yining Hu; Ahsan Manzoor; Parinya Ekparinya; Madhusanka Liyanage; Kanchana Thilakarathna; Guillaume Jourjon A Delay-Tolerant Payment Scheme Based on the Ethereum Blockchain. 6 March 2019.

4. Aabhas Sood, Rajbala Simon. Implementation of

ISSN: 2583-6129
DOI: 10.55041/ISJEM02761

Blockchain in Cross Border Money Transfer. 21 November 2019.
5. Masum Bakaul; Nipa Rani Da; Madhabi Akter Moni; The Implementation of Blockchain in the Banking System using Ethereum. 21 February 2020.
6. Seybou Sakho; Zhang Jianbiao; Firdaous Essaf; Khalid Badiss Improving Banking Transactions Using Blockchain Technology. 13 April 2020.
7. Secure Bank Transaction using Blockchain, Swathi H.C.; H.P. Mohan Kumar; Aug 2020.
8. N.S. Akhilesh; M.N. Aniruddha; K.S. Sowmya Implementation of Blockchain for Secure Bank Transactions. 22 September 2020.
9. Varsha Naik; Riya Pejawar; Rishabh Singh; Anagha Aher; Sneha Kanchan Expeditious banking using Blockchain Technology. 5 October 2020.
10. Nabilah Aziz; Rodiah Rodiah; Heru Susanto Encrypting Digital Banking Transaction Records: A Blockchain Cryptography Security Approach. 24 March 2021.
11. Sincy Joseph, Smitha Karunan. A Blockchain-Based Decentralized Transaction Settlement System in the Banking Sector. 18 November 2021.
12. Sanket A. Adhav; Nisar R. Shaikh; Kiran S. Tarate; Rote R. R.; Secure Banking Transaction Using Blockchain Technology. November 2022.
13. Harsh Bhat; Gourab Bank; Yash Jawale; Ruturaj Wairkar; Sanjay Mirchandani. Decentralized Banking Services Using Blockchain Technology. 01-03 June 2023.