E Wallet using Blockchain

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Abstract. This project focuses on the development of a decentralized e-wallet system that utilizes blockchain technology to enable secure and transparent cryptocurrency transactions. The e-wallet allows users to store, send, and receive cryptocurrency without relying on third-party intermediaries. The system is built on the Ethereum blockchain with Ganache serving as the local blockchain development and testing environment. User data, such as profiles and transaction history, is managed using MySQL. This project does not implement smart contracts or additional security features, instead relying on JavaScript for both frontend and backend operations. The results from testing indicate that the system is efficient, scalable, and provides secure peer-to-peer transaction capabilities.

Keywords. Blockchain, Cryptocurrency, Decentralized, Ganache, MySQL, JavaScript, Peer-to-Peer Transactions.

1 INTRODUCTION

The advent of blockchain technology has brought a revolutionary shift in the way digital financial transactions are conducted, offering decentralized systems that promise security, transparency, and immutability. Traditional e-wallet systems rely on centralized servers, exposing users to risks such as hacking, data breaches, and loss of funds. In contrast, blockchain-based e-wallets offer a decentralized alternative, where users have full control over their assets and transactions occur directly between peers.

The primary aim of this project is to develop an e-wallet system that leverages blockchain to provide a secure, decentralized platform for cryptocurrency transactions. By using Ganache as the local Ethereum blockchain environment, this system simulates real-world transactions without needing a public blockchain network, making it ideal for development and testing. MySQL is employed to store user data and transaction histories, and the system is built using JavaScript for both frontend (React.js) and backend (Node.js).

2 RESEARCH METHODOLOGY

The development of the e-wallet system followed a structured approach to ensure the integration of blockchain technology with a user-friendly interface. The following technologies and tools were utilized:

Blockchain Environment: Ethereum blockchain with Ganache for local simulation

Backend: Node.js for handling server-side operations and interaction with the blockchain

Frontend: React.js for developing the user interface, allowing users to interact with the e-wallet

Database: MySQL for managing user data, such as account profiles and transaction logs

Development Tools: Ganache (to simulate a local blockchain environment), MetaMask (for wallet and transaction management)

3 RESULTS AND DISCUSSION

After implementing the e-wallet system, several tests were conducted using the Ganache local blockchain environment. The results from these tests demonstrate the system's ability to handle secure peer-to-peer transactions efficiently. Users are able to create accounts, load their wallets, send cryptocurrency, and view transaction history seamlessly.

4 KEY RESULTS

4.1 Transaction Processing

Cryptocurrency transactions were executed efficiently on the local blockchain using Ganache. Users were able to transfer cryptocurrency between wallets with minimal delays, and transaction verifications occurred in real-time.

Decentralization:

The e-wallet system operated on a peer-to-peer basis, ensuring that no centralized entity had control over the transactions or user funds. This decentralization enhanced the security and transparency of the system, as users had complete control over their cryptocurrency.

System Scalability:

The system demonstrated the potential for scalability. While it currently operates on a local blockchain environment, it can be extended to a public Ethereum network, allowing for broader use and interaction with other blockchain platforms.

Objective	**Achievement**
Develop a decentralized e-wallet	Successfully using Ganache and implemented Ethereum blockchain.
Simulate cryptocurrency transactions	Transactions were tested and executed efficiently on the local blockchain.
Execute secure peer-to-peer transactions	Peer-to-peer cryptocurrency transfers were successfully conducted.

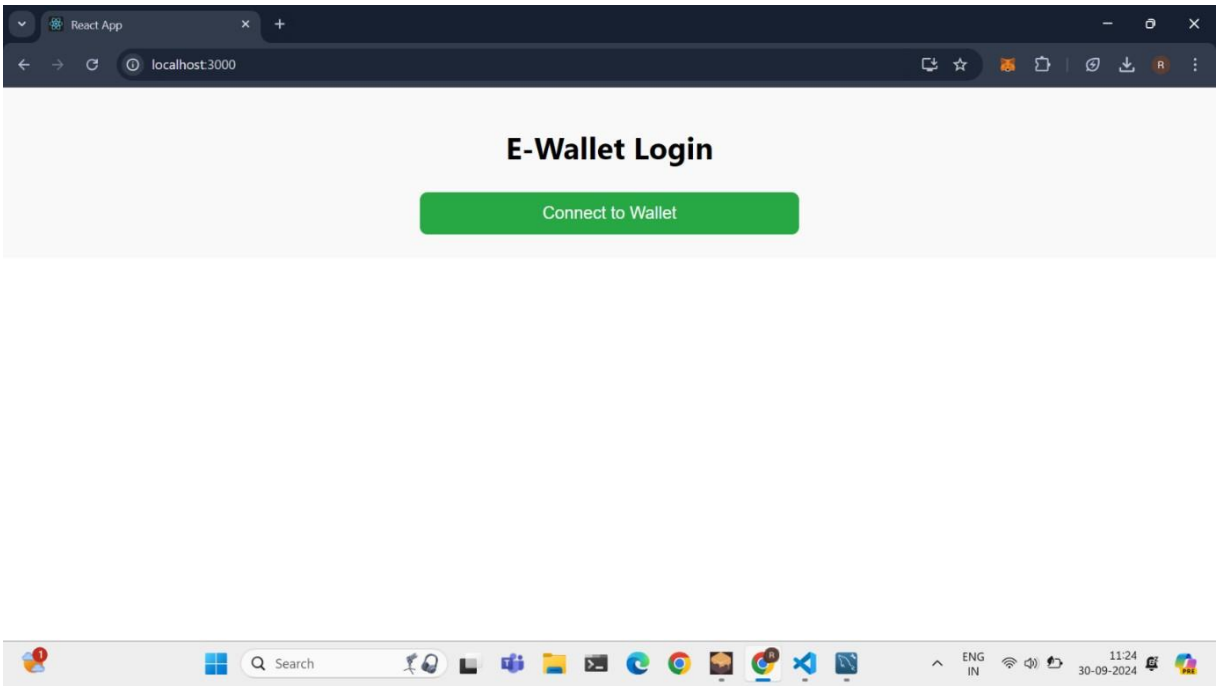

Fig 1. Login Page

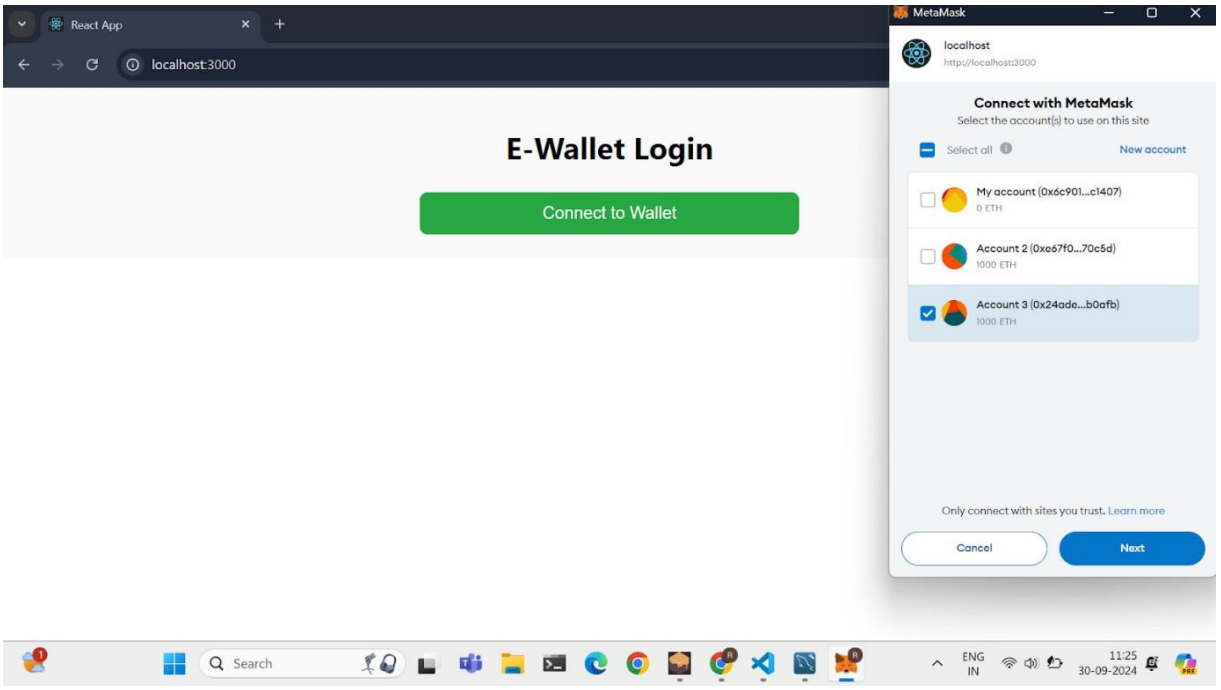

Fig 2. Connecting with MetaMask

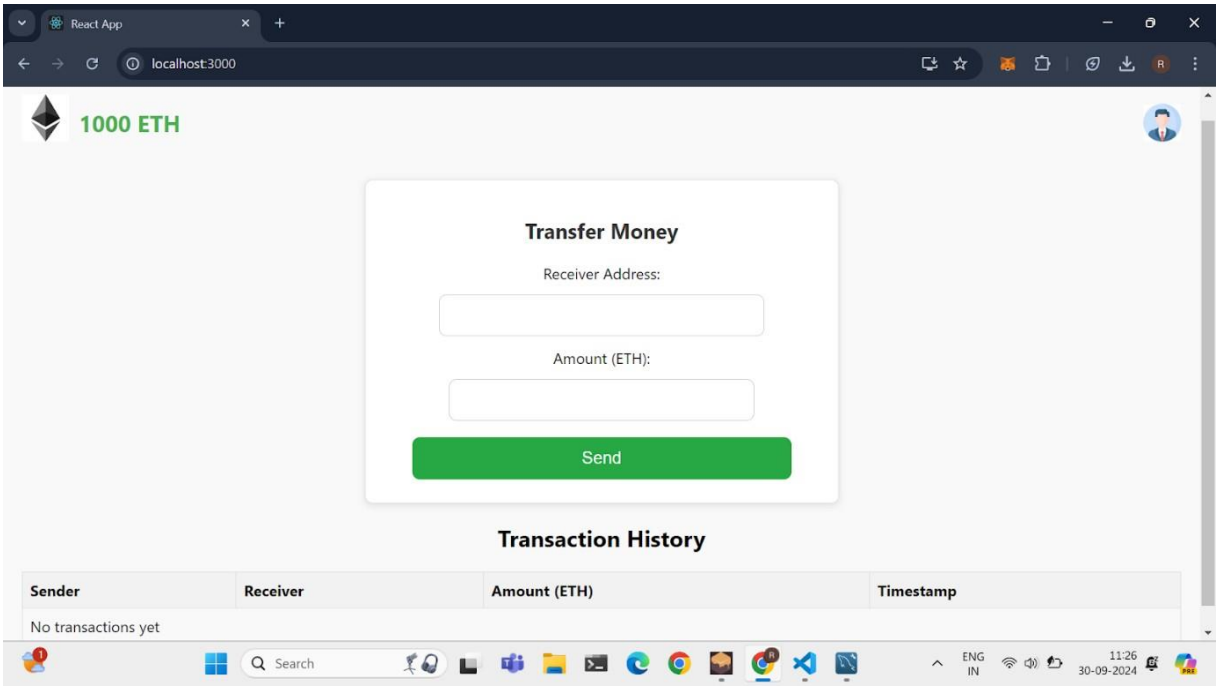

Fig 3. Transfer Page

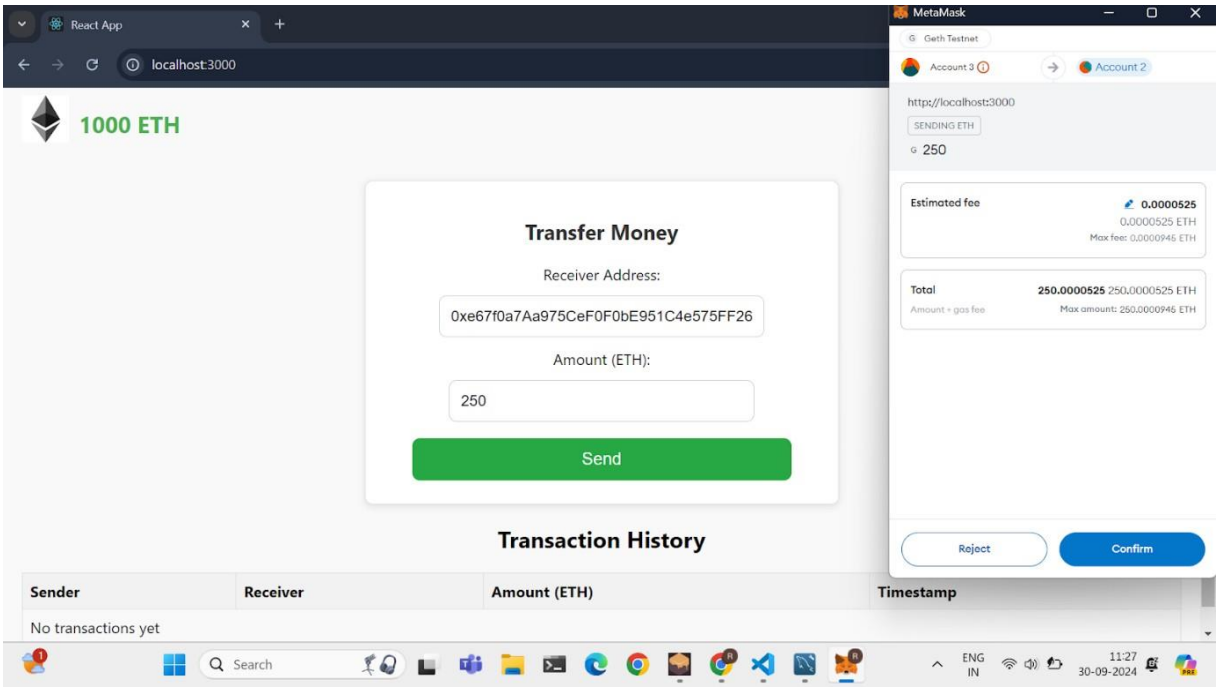

Fig 4. Transferring Money

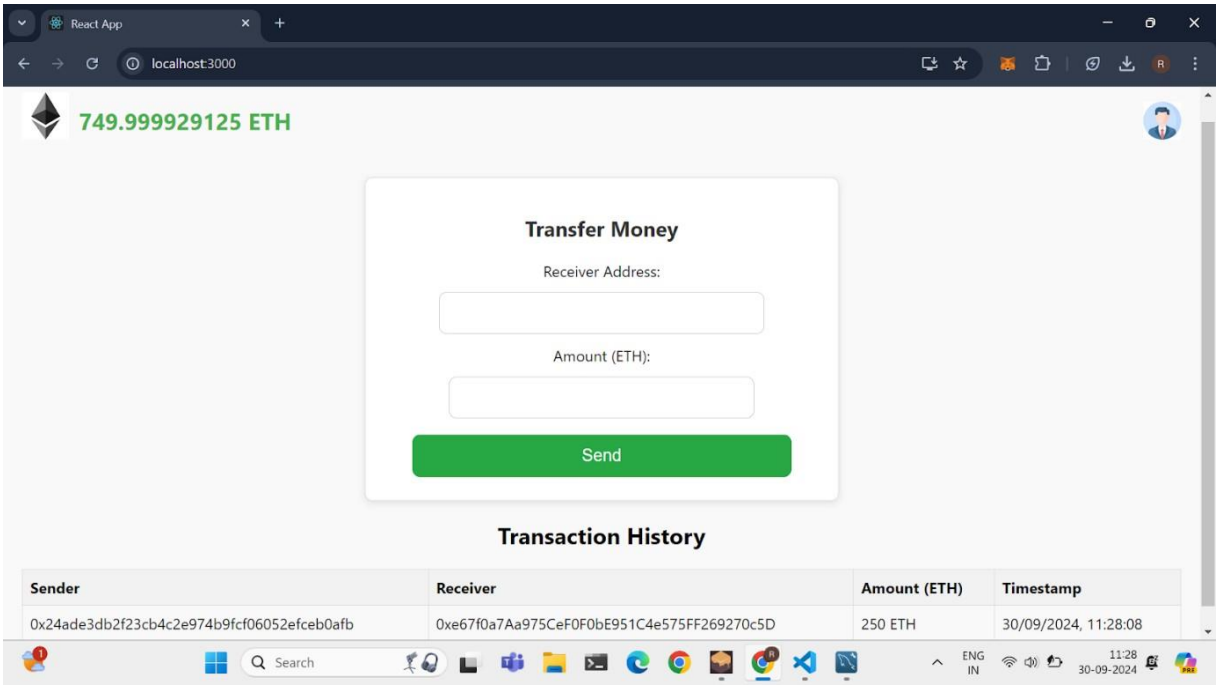

Fig 5. Transaction Completed

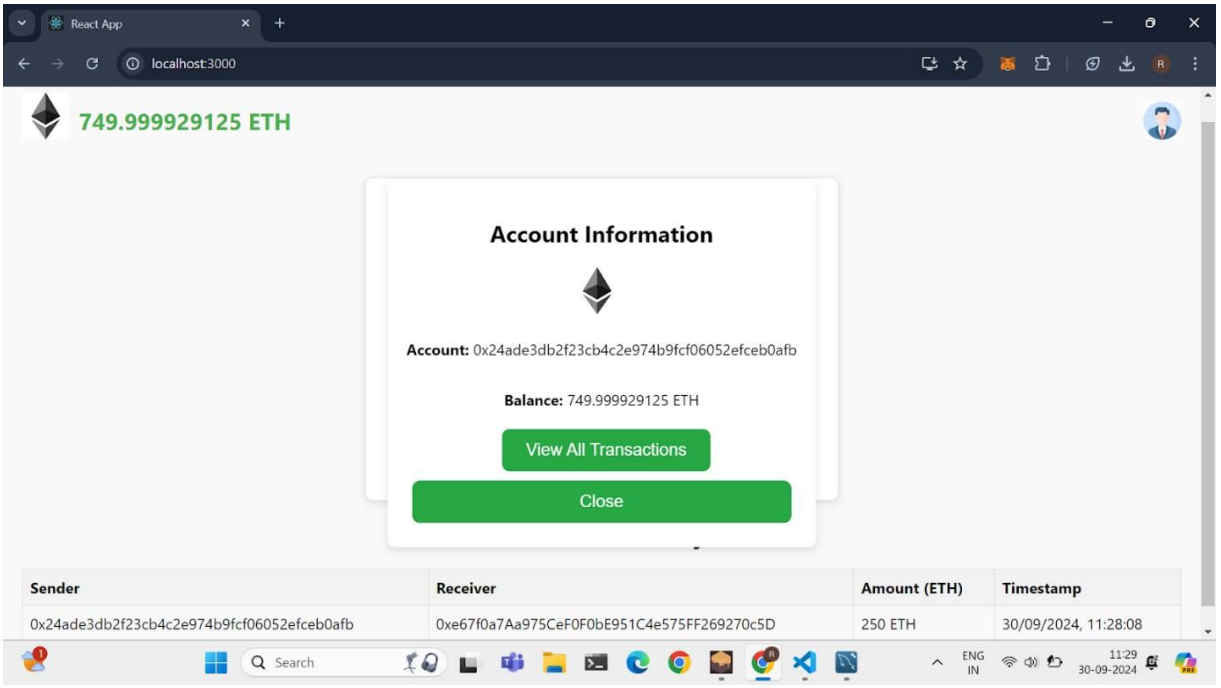

Fig 6. Transaction Information

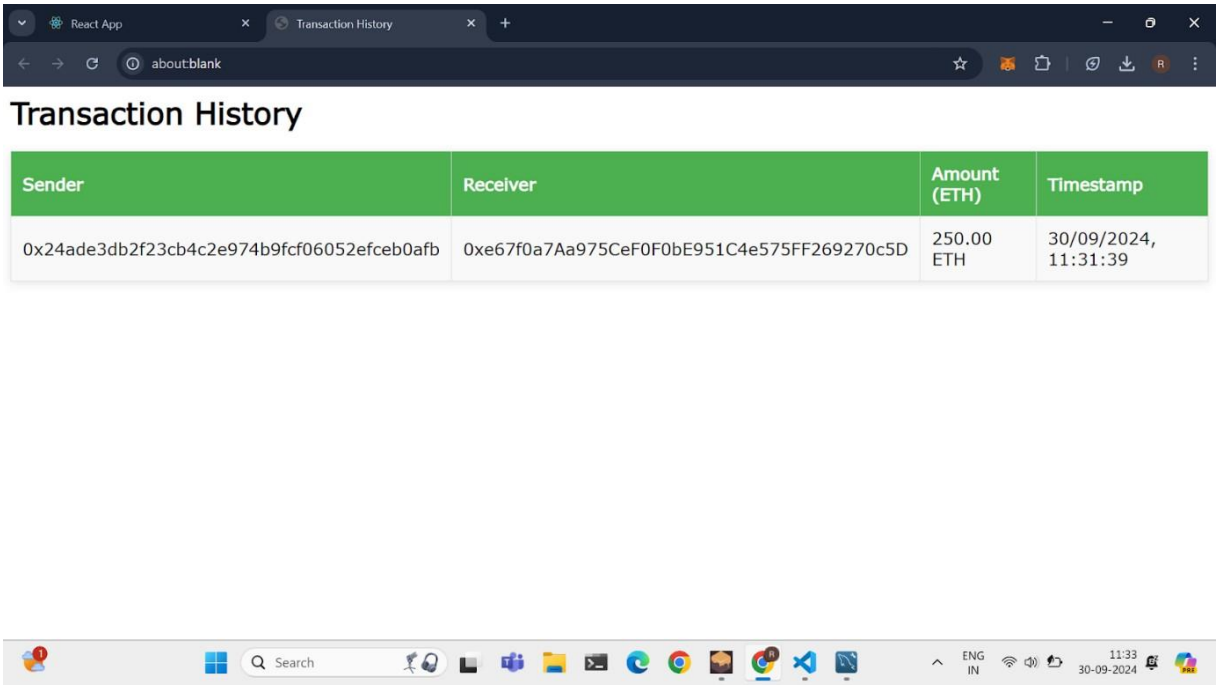

Fig 7. Transaction History

5 CONCLUSION

This e-wallet project successfully demonstrates the potential of blockchain technology in creating a secure, decentralized system for managing cryptocurrency transactions. By utilizing Ganache for local blockchain simulation, the project effectively showcases the benefits of a decentralized platform, including enhanced security and transparency. The integration of MySQL for user data management ensures that the system can scale to accommodate more users and larger transaction volumes in the future.

6 DECLARATIONS

6.1 Study Limitations

The current implementation of the e-wallet focuses on basic cryptocurrency transactions and does not include advanced features such as smart contracts or multi-currency support. The project was tested on a local blockchain environment using Ganache, and scalability to public blockchain networks has not yet been addressed.

6.2 Acknowledgements

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6.3 Funding source

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6.4 Competing Interests

The authors declare no competing interests.

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