National University
Of Computer and Emerging Sciences

CS3002 Information Security

Project Report

Seamless Transactions with Multi-Chain Authentication

ABDUL GHANI	21K-3598
ABDULLAH	21K-4783
ABDUL SAMI	21K-3589

BS Cyber Security

Supervisor: Dr. Fahad Samad

1. Introduction:

In today's fast-paced commerce world, security and efficiency are top priorities. Seamlines transactions using blockchain technology, ensuring trust and reliability.

By securely storing user information like usernames, passwords, and roll numbers on the blockchain, This project guarantees data integrity and protection against unauthorized access. Transparency is at the core of TrustChain Commerce, as every transaction detail is recorded, fostering accountability and trust.

With automated authentication processes and fast coin assets, TrustChain Commerce enables swift and hassle-free transactions. Powered by MultiChain technology, It provides a user-friendly experience through a simple GUI.

2. Objectives:

Seamless Transaction Facilitation: The project aims to streamline transactions between buyers and sellers by employing blockchain authentication mechanisms, fostering a smooth and efficient exchange process.

Authentication via MultiChain: Utilizing MultiChain's robust blockchain infrastructure to fortify authentication processes, ensuring the sanctity of user credentials and bolstering transaction security.

Individualized Identification: Implementing unique identification methods, such as roll numbers, to discern between users, mitigating the risk of identity duplication and ensuring precise authentication and record-keeping.

Transparency and Reliability: Leveraging blockchain's inherent transparency, the project seeks to instill trust in transactions by meticulously recording all transaction details on an immutable ledger, fostering accountability and reliability.

3. Working:

The system operates on a decentralized network facilitated by MultiChain, where each participant, be it a buyer or a seller, possesses a unique identity stored on the blockchain. Here's an overview of how the system works:

User Registration: Buyers and sellers register on the platform by providing their credentials, including username, password, and unique roll number. These credentials are encrypted and stored on the blockchain, ensuring tamper-proof authentication.

Transaction Initiation: When a buyer initiates a transaction, the system verifies their identity by fetching the credentials stored on the blockchain. Similarly, the seller's identity is also authenticated using blockchain records.

Transaction Execution: Once both buyer and seller identities are authenticated, the transaction proceeds seamlessly. The asset of exchange, in this case, "Fast Coin," is transferred securely between the parties, with transaction details recorded on the blockchain for transparency and auditability.

MultiChain GUI Demonstration: The system's functionality and transaction flow are demonstrated using the MultiChain GUI, providing stakeholders with a user-friendly interface to interact with the blockchain network. This GUI showcases the transparency and efficiency of transactions facilitated by MultiChain authentication.

4. Tools:

Python Programming: The project is implemented using Python programming language, leveraging its versatility and simplicity for blockchain integration and transaction processing.

MultiChain Blockchain Platform: MultiChain is utilized as the blockchain platform for its scalability, permissioning features, and compatibility with the project requirements.

Tailored Authentication Protocols: Designing customized authentication protocols that incorporate unique identifiers, such as roll numbers, to accurately authenticate users and prevent identity clashes, ensuring a robust authentication framework.

Intuitive MultiChain GUI Display: Demonstrating the system's operations and transaction flows through an intuitive graphical user interface provided by MultiChain, offering stakeholders a visually comprehensible depiction of blockchain-powered transactions.

5. Conclusion:

In conclusion, this project showcases the immense potential of blockchain technology in revolutionizing transactional processes. By securely storing user credentials and transaction data on the blockchain, the system ensures transparency, immutability, and heightened security throughout the transaction lifecycle. The utilization of "**fast coin**" as a digital asset further enhances the versatility and efficiency of exchanges within the ecosystem. Through the demonstration of functionality via the MultiChain GUI, users can experience firsthand the seamless interaction between blockchain technology and traditional transaction processes. Moving forward, the integration of MultiChain authentication holds promise for enhancing the integrity and reliability of transactions across various domains, ushering in a new era of secure and seamless commerce.

6. References:

Books:

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[2] Tapscott, D., & Tapscott, A. (2016). Blockchain Revolution.

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[1] Nakamoto, S. (2008). Bitcoin: A Peer-to-Peer Electronic Cash System. https://bitcoin.org/bitcoin.pdf

[2] Buterin, V. (2014). A Next-Generation Smart Contract and Decentralized Application https://github.com/ethereum/wiki/wiki/White-Paper