Blockchain-Based Voting System

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ABSTRACT-

Elections, a democratic process, frequently encounter challenges with traditional voting methods, which are, vote manipulation, transparency deficits, delayed results, and security vulnerabilities. Although Electronic Voting Machines (EVMs) have enhanced efficiency, concerns persist regarding trust and data security. Blockchain technology presents a secure and decentralized server mechanism. Its important features are, transparency, immutability, decentralization, and distributed data storage, it saves voting data from unauthorized access. Our project develops a blockchain-based voting system, implementing in an Android application, leveraging programming technologies to provide secure and safe digital voting. Our system ensures single voter participation through blockchain verification and token- based authentication. This method enhances transparency, boosts security, and avoids vote tampering risks. Our paper further discusses and represents the advantages, limitations, and practical implementation of blockchain technology in electoral systems.

Keywords: Blockchain, Voting System, XML, Java, Database.

INTRODUCTION-

Blockchain technology is evolving as an unique solution for increasing security and transparency in digital systems for elections. Traditional electoral processes face the issues like, selection of polling places, vote tampering, votes manipulation, use of muscular power during elections, etc. Even with Electronic Voting Machines (EVMs), challenges such as vote tampering, transparency deficits, and trust concerns arise.

A blockchain-based voting system avoids these limitations by providing a decentralized and tamper-proof platform. Data in blockchain systems is stored cryptographically, distributed across multiple nodes. Once data is entered in a blockchain, it cannot be altered. Hence, a voter has only one chance to vote for their candidate.

Implementation of blockchain technology in voting apps can gains voters trust by ensuring transparency and security. Every vote is stored in a blockchain system, preserving it from unauthorized access. By using this technology, even if a server fails to fetch the data, another parallel server can be used to declare the results of elections.

This project represents a blockchain-based voting system, implemented using an Android application. Our voting system enables voters to register, authenticate, and securely cast their votes.

LITERATURE SURVEY-

Al-Madani et al. [1] proposed a decentralized voting system leveraging blockchain technology, focusing on enhancing transparency and security in electronic voting systems while mitigating vote manipulation risks.

Thakkar et al. [2] highlighted the limitations of centralized voting systems, proposing a blockchain-based model to ensure secure, transparent, and tamper- proof voting.

Rathee et al. [3] discussed the integration of blockchain with IoT technologies to enhance security in smart city electronic systems, including voting applications.

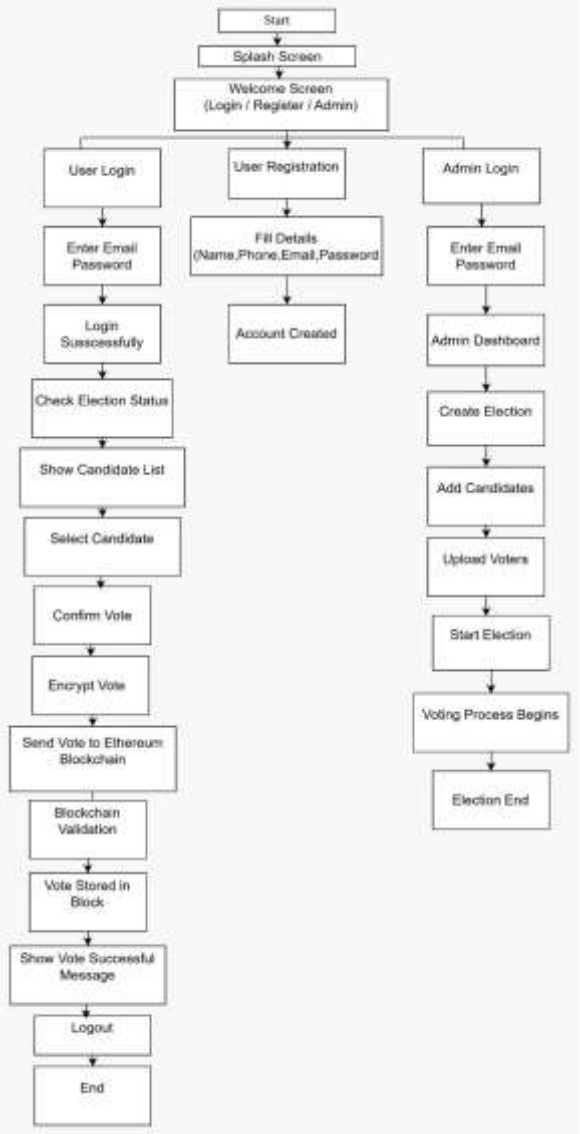
METHODOLOGY-

Firstly, requirements for our application will be identified. Our system will ensure that, only a single voter can cast their ballot, providing with high security, voter identification will be hidden, transparency will be maintained, and secure authentication will be served.

Secondly, the architecture for our blockchain-based voting system will be designed. Then, it will consist of, Authentication module, User Interface(UI), Network of blockchain-based voting, and Smart Contracts. After voters' registration, once the elections are conducted, the voters can cast their votes.

The votes are then saved in the nodes of the blockchain network, then, they are validated by the blockchain network. This main step ensures that, votes are not repeated and they cannot be modified either. Validated votes according to the blockchain network are then grouped into a single block and multiple validated votes are connected through blockchain.

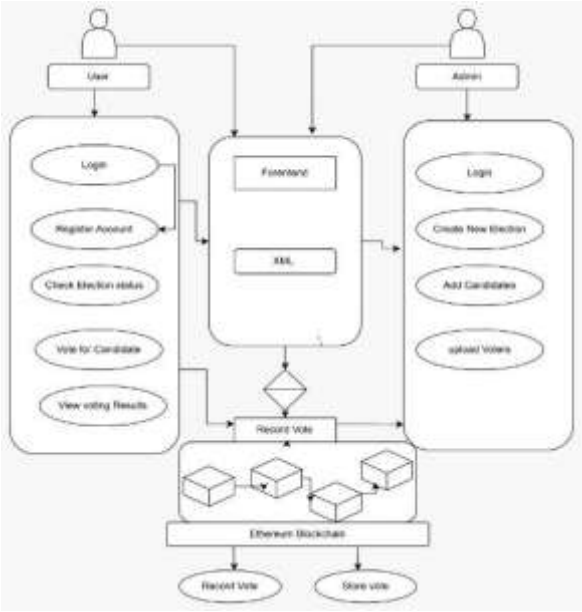
As we are using smart contracts, they will now automatically count the votes of validated users, avoiding vote manipulation, mistakes, and irregularities. When all these processes come to an end, the votes are calculated and displayed. Those votes maybe then viewed publicly or by the authorized persons from the organization. In this, using smart contracts ensures correct voting results, avoids tampering, and encryption techniques plays a vital role in vote security.



CONCLUSION-

Our blockchain-based voting system provides a secure and transparent voting platform for digital elections. By using decentralized blockchain technology, it mitigates risks, information manipulation, and unauthorized access. Each vote

is securely stored inside a node, ensuring the integrity and reliability. Compared to traditional voting systems, blockchain technology increases transparency, builds



trust of voters on the digital elections platforms, and improves efficiency. Therefore, implementation of blockchain technology in e-voting platforms can ensure data and voter identity security, and transparency.

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