

ONLINE VOTING MANAGEMENT

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ABSTRACT

Modern democracies rely heavily on elections, yet outdated voting procedures frequently suffer from problems including fraud, tampering, and lack of transparency. Blockchain technology has become a viable answer to these problems in recent years. Blockchain is a distributed, decentralized ledger that provides security, immutability, and transparency, making it the perfect basis for electronic voting. This research paper offers a thorough examination of a blockchain-based electronic voting system, examining its features, benefits, and drawbacks. The article provides an overview of blockchain technology, analyses the advantages of utilizing it for electronic voting, and identifies crucial factors to take into account when putting into place a safe and transparent blockchain-based e-voting system.

I. INTRODUCTION

Elections are an essential feature of democratic societies because they guarantee public representation and participation in decision-making. Traditional voting procedures can have some drawbacks, though. Election integrity can be harmed by problems like voter fraud, election tampering, and a lack of transparency, which can also reduce public confidence in the democratic system. A new paradigm for safe and transparent voting systems has been offered by blockchain technology, which has the potential to completely change how elections are conducted.

Blockchain is a distributed and decentralized ledger that is transparent, irreversible, and secure. It was initially created as the foundational technology for cryptocurrencies. The blockchain forms a chain of blocks that cannot be changed or tampered with without the network's consent since each transaction or record is cryptographically connected to the one before it. Due to these characteristics, blockchain is the best foundation for creating transparent, safe, and verifiable electronic voting systems.

This study intends to examine the idea of a blockchain-based electronic voting system, highlighting its essential characteristics, benefits, and difficulties. The paper presents critical factors for developing a safe and transparent blockchain-based e-voting system, explores the possible advantages of adopting blockchain for e-voting, and gives an overview of blockchain technology.

II. LITERATURE SURVEY

1. "Online Voting Management " by Ali Mustafa Qamar et al. (2021): Literature Review This paper proposes a smart contract-based blockchain-based electronic voting system. The system guarantees transparency and is safe from tampering. The performance of the suggested system was simulated by the authors and reported.

2. Hussein Al-Zubaidy and colleagues' "A Survey of Blockchain-Based e-Voting Systems" (2021) This article provided a thorough analysis of the current blockchain-based electronic voting methods. The authors outlined the problems with blockchain-based electronic voting systems and contrasted the advantages and disadvantages of each method. The study also offered a list of standards for rating blockchain-based electronic voting platforms.

III. BLOCKCHAIN TECHNOLOGY

Blockchain is a peer-to-peer network of nodes that functions as a distributed and decentralized ledger. Every node in the network keeps a copy of the blockchain, and records or transactions are added to the blockchain by the network through a consensus method. It is impossible to change or remove a transaction or record from the blockchain after it has been added, making it visible and immutable.

Several crucial characteristics of blockchain technology make it suited for e-voting systems

Transparency: Because blockchain is transparent, every member of the network can see the transactions or records that are being added to it. Through this openness, the voting process is made open and verifiable so that all participants may audit the results and confirm the system's integrity.

Immutability: A transaction or record that has been added to the blockchain cannot be changed or removed without network consensus. The integrity of the election results is protected by this immutability, which guarantees the security and immutability of the voting records.

Security: Blockchain is extremely safe against fraud and tampering because it uses cutting-edge cryptography to secure transactions or records. Consensus among network users verifies transactions or records in the blockchain, offering another level of security to the system.

Decentralization:

Blockchain's decentralized network of nodes allows it to run without the requirement for a single central authority to oversee the system. Due to this decentralization, there is less chance of manipulation and a fair and transparent voting process because the electronic voting system is not under the authority of a single institution.

Benefits of Using Blockchain for Electronic Voting

The possible advantages of using blockchain technology into electronic voting systems include:

In this review of the literature, we look at the research on blockchain-based electronic voting systems and the difficulties they provide.

IV. PROPOSED WORK

A blockchain-based electronic voting system that guarantees voting process transparency, security, and immutability is the goal of the proposed study. Smart contracts will be used in the system's development to automate voting and do away with third-party intermediaries.

The following functionalities will be present in the system:

User authentication: The voting procedure will only be open to eligible voters. Voters' individual identification numbers and biometric information will be used by the system to verify their identity.

Transparency: By keeping track of every transaction on the blockchain, the system will guarantee transparency. All participants will be able to see the voting process, preserving its integrity.

Security: Using cutting-edge cryptographic techniques, the system will be protected. To avoid tampering and guarantee data confidentiality, the vote data will be encrypted.

Immutability: Voting is immutable once it is recorded on the blockchain; it cannot be changed or discarded. By doing so, fraud will be avoided and the voting process will be unchangeable.

Results Tabulation: To ensure a prompt and precise outcome, the system will automatically tabulate the results and display them in real-time.

We'll use the Ethereum blockchain platform to implement this system, and the Solidity programming language will be used to create smart contracts. The Truffle framework will also be used to deploy and test the smart contracts.

Performance indicators such as transaction speed, security, and scalability will be used to assess the proposed system. In order to evaluate the system's usability and user satisfaction, we will also perform a user study.

V. HARDWARE AND SOFTWARE REQUIREMENT

Hardware Requirement:

- The operating system must be Windows 10.
- Visual Studio is the framework.
- Localhost is the server.
- MS-SQL Server 2012/2014 as the database

Software Requirement:

- Processor: Intel quad-core processor running at 1.7 GHz or above.

- HD: 10 GB of minimum HD.
- RAM: 8 GB or more recommended

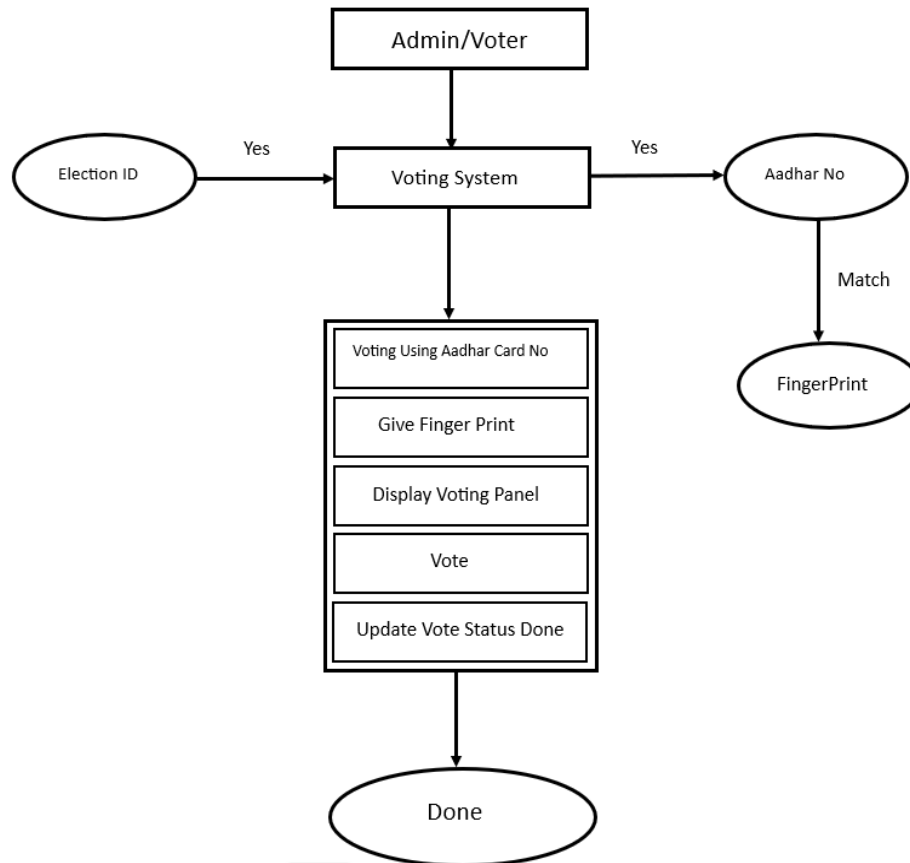
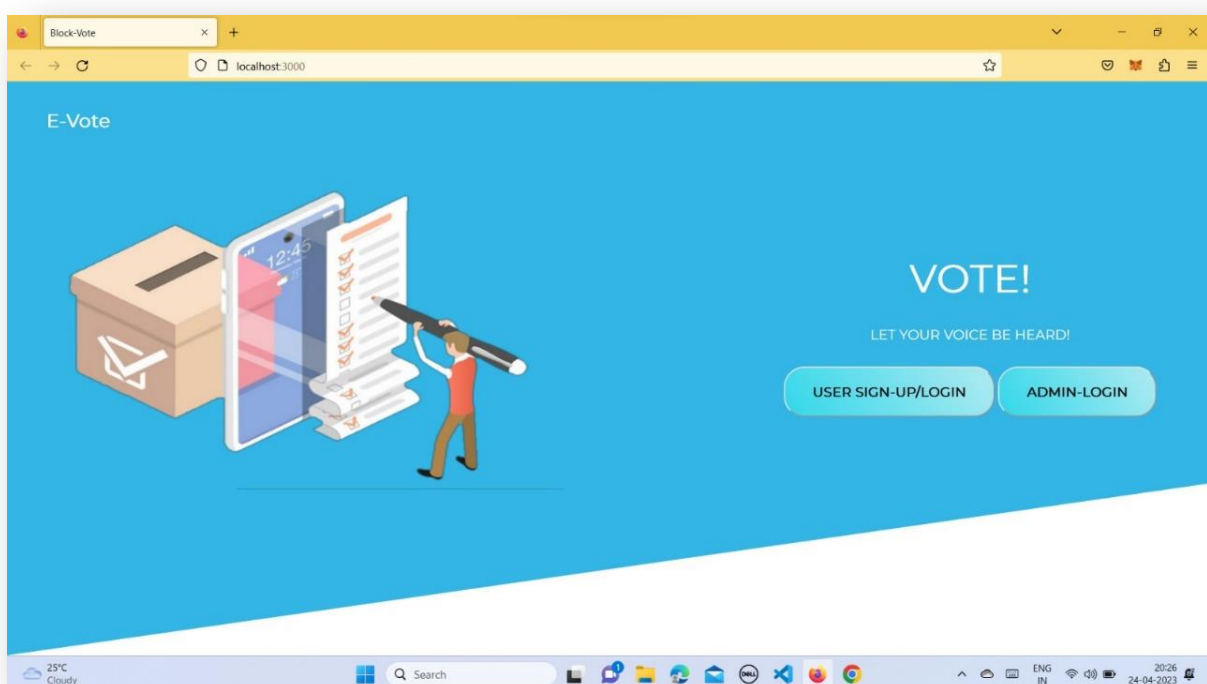
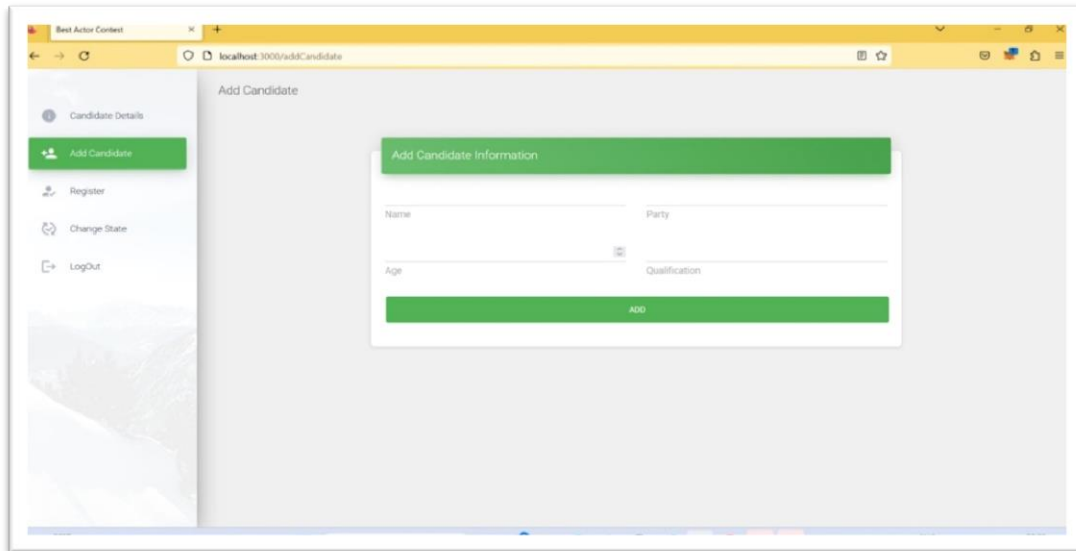


Figure 1: Block Diagram of Blockchain based E Voting System

Images Related to Blockchain Based E-Voting System:





VI. CONCLUSION

In comparison to conventional voting systems, a blockchain-based electronic voting system has the potential to offer a voting procedure that is more secure, transparent, and effective. With the use of blockchain technology, the voting process may be permanently and transparently recorded on a distributed ledger. Voter authentication, vote confidentiality and privacy protection, and automated vote counting are all possible with the right system design.

The implementation of a blockchain-based electronic voting system is not without its difficulties, however, including managing scalability issues, assuring system security, and addressing legal and regulatory obstacles. Additionally, the system needs to be user-friendly in order for voters to cast their ballots quickly and effectively. Overall, due to the potential advantages of a blockchain-based electronic voting system, there is significant study and development in this field. Many academics and professionals are investigating the viability and efficiency of such systems. To solve the difficulties in establishing such systems and to guarantee their security, usability, and regulatory compliance, more research and development is required.

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