Project Report

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E-Voting System using BlockChain

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Abstract

Decentralized voting using Ethereum blockchain is a secure, transparent and tamper-proof way of conducting online voting. It is a decentralized application built on the Ethereum blockchain network, which allows participants to cast their votes and view the voting results without the need for intermediaries. In this system, votes are recorded on the blockchain, making it impossible for anyone to manipulate or alter the results. The use of smart contracts ensures that the voting process is automated, transparent, and secure. The use of the blockchain technology and the implementation of a decentralized system provide a reliable and cost-effective solution for conducting trustworthy and fair elections.

Introduction

A decentralized voting system on the Ethereum blockchain could change the way we conduct elections. This system can use the security, transparency, and immutability of blockchain technology to eliminate many of the challenges and risks associated with traditional voting systems. In a decentralized voting system, each voter has a unique digital identity, and their vote is recorded on the blockchain, ensuring that the vote is tamper-proof and cannot be altered. Decentralized voting systems also eliminate the need for intermediaries, such as government agencies, to oversee the election process, making it more efficient and less susceptible to corruption or manipulation.

Project Overview

Will of people forms the basis of democracy. However, it is of utmost importance to protect the anonymity of voters and allow complete privacy to cast their votes. The current methodology may sometimes fail to protect the fundamental right of privacy of the voters. The master key to build an electronic voting system is to find out a secure underlying platform which provides the required features that overcomes the drawbacks of the current system.

Key Features:

- High Availability
- Verifiability
- Transparency
- Immutability
- Distributed Ledgers
- Decentralised
- Enhanced Security

Technology Stack

- Metmask Wallet
- Ganache
- Remix IDE
- Solidity

Challenges & Considerations

- Security Concerns: Ensuring the security of the e-voting system is very important. Protecting against cyberattacks, data breaches, and unauthorized access is a big challenge. The integrity of the blockchain and the system's security mechanisms must be strong.
- Privacy and Anonymity: Balancing the need for transparency with the requirement for voter privacy can be difficult. Ensuring that votes are anonymous while still being verifiable on the blockchain is a delicate task.
- User Authentication: Developing a secure and user-friendly authentication system to prevent unauthorized access to the voting platform is necessary. Implementing multi-factor authentication may be required.
- Scalability: As the number of voters and elections increases, the system must handle the scalability challenge effectively. Ensuring that the blockchain can accommodate a growing number of transactions without compromising performance is vital.
- Voter Education: Users need to understand how to use the system, the benefits of blockchain technology, and the importance of secure voting. Providing adequate voter education and support can be challenging.

Benefits and Objective

1. Security: The proposed system aims to provide a secure platform for conducting elections, eliminating the possibility of tampering with votes, and ensuring that the election results are transparent and verifiable.
2. Transparency: The proposed system aims to provide complete transparency to the voters, allowing them to view the entire voting process, including the vote counting and results.
3. Accessibility: The proposed system aims to make the voting process more accessible to all eligible voters by eliminating the need for physical presence at a polling station, thus increasing voter turnout.
4. Efficiency: The system aims to increase the efficiency of the voting process by reducing the time and resources required to conduct elections. Since the system is automated and eliminates the need for intermediaries, it can significantly reduce the cost and time associated with traditional voting methods.
5. Trust: The proposed system aims to increase trust in the voting process by providing a transparent and tamper-proof mechanism for recording and tallying votes.

Conclusion

Decentralized Voting with Ethereum Blockchain provides a secure and transparent solution for elections. It uses blockchain technology to ensure the accuracy of votes and create a tamper-proof platform. With ongoing improvements, such as better user experience, scalability, and integration with other advanced technologies, it has the potential to transform the democratic process and enable citizens to participate in a reliable and efficient voting system. This is a significant advancement towards creating a more democratic and responsible society.