A Secure and Decentralized Method of E-voting using Blockchain and Smart Contracts

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Abstract:
Blockchain has already been used in developing many applications, including cryptocurrencies and NFTs. With the help of blockchain and smart contracts, a Decentralized E-Voting System can be developed. A Decentralized E-Voting System is used for activities like voting, verifying the user's details, adding candidates, starting and ending the election, self-tallying the total number of votes, and giving the results of the elections. A system using blockchain is more secure, faster, transparent, and immutable. The existing systems for voting are less secure as they use EVMs and VVPATs, which can be tampered with. The existing systems are also slower than the proposed model in terms of the time taken to announce the results. There are other problems like Vote Rigging, Polling Booth Capture, and Voting Manipulation. With the increasing risk of cyberattacks, it is of utmost importance to have an online voting system capable of withstanding these attacks. A blockchain-based e-voting system will enable user confidentiality using encryption. The platform is created on the Ethereum network that makes use of smart contracts written in the Solidity programming language. Truffle, Ganache and Metamask are the tools used to create a Decentralized E-Voting System.

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Contents

The adoption of electronic voting systems has been increasing in different parts of the world, with many countries embracing this technology for their national elections. Estonia was the first country to implement an electronic voting system for its national elections, which has inspired other nations to adopt similar systems [1]. Nigeria, Switzerland, and Norway have all adopted electronic voting systems for their state and council elections. However, despite the benefits of electronic voting systems, some traditional electronic systems do not provide anonymity and integrity.

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