Secure Voting and Identity Management System

Using Blockchain Technology

Graduation Project

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Abstract

In today's digital era, the integrity, transparency, and security of the voting process are paramount. Traditional physical voting systems are often subject to manipulation, logistical challenges, and lack of accessibility, necessitating a more dependable and technologically advanced alternative. This project proposes the design and development of a **Secure Voting and Identity Management System** that enhances trust and transparency in digital elections by leveraging decentralized principles and cryptographic security mechanisms.

The system introduces a **hybrid platform** that combines both web and mobile applications to ensure accessibility, usability, and inclusivity for all users. It employs distributed ledger techniques to guarantee the **immutability and verifiability** of recorded votes while preserving voter anonymity and preventing double voting. An integrated identity management module ensures secure authentication and verification, protecting the system from fraudulent activities and unauthorized access.

Design considerations focus on **security, scalability, and cross-platform interoperability**, while constraints include computational costs, data privacy regulations, and synchronization challenges. The system's architecture further allows for future integration of intelligent features such as **AI-based fraud detection** and biometric authentication to enhance overall reliability and user trust.

Ultimately, this project aims to provide a **tamper-resistant digital voting framework** that can be applied across academic institutions, corporations, and governmental organizations, contributing to the evolution of secure and transparent e-governance systems.

Keywords: Secure Voting; Identity Management; Blockchain; Cryptography; Digital Governance