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Decentralized and Secure Online Voting System Utilizing Blockchain and Radio Frequency Identification Technology

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Abstract : In the modern digital landscape, the integrity and security of voting processes are paramount. Traditional voting methods have faced numerous challenges, including fraud, lack of transparency, and administrative inefficiencies. As these issues become increasingly critical, there is a growing need for advanced solutions that can enhance the security and reliability of elections. Blockchain technology, with its decentralized architecture and immutable nature, offers a robust framework for transforming the voting process. By integrating Radio Frequency Identification (RFID) technology, we can further streamline voter authentication and ensure the authenticity of each vote cast. This article presents an IoT online voting system that utilizes blockchain and RFID to create a secure, transparent, and user-friendly voting experience. The proposed decentralized application (DApp) leverages Ethereum's blockchain to manage the voting lifecycle, ensuring that each vote is recorded securely and transparently. By employing RFID tags for voter identification, we eliminate the risks associated with traditional identification methods and enhance the accessibility of the voting process. We will discuss the technical architecture, security advantages, and implementation challenges of this approach, highlighting how it addresses the shortcomings of conventional voting systems. Ultimately, this solution aims to redefine electoral processes, promoting trust and participation in democratic governance.

Keywords : blockchain, authentication, decentralization, cybersecurity, identity management, privacy, RFID
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