SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore – 641 107

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DEPARTMENT OF COMPUTER SCIENCE AND TECHNOLOGY

COURSE NAME: 19OE201-Blockchain Technology

IV YEAR /VII SEMESTER

Unit 5- Blockchain Applications

Case study : Blockchain in Voting System

Limitations of Traditional Voting System

- The current voting system faces numerous limitations and challenges, including issues with security, transparency, and accessibility.
- One of the biggest concerns is the potential for tampering and fraud, which can compromise the integrity of the election results.
- In addition, the lack of transparency in the current system can lead to mistrust and skepticism among voters.
- Finally, the accessibility of the current system can be a challenge for individuals with disabilities or those who live in remote locations.

Introduction to Blockchain

- Blockchain technology is a decentralized, distributed ledger that allows for secure and transparent transactions without the need for intermediaries.
- It was originally developed for cryptocurrencies like Bitcoin, but its potential applications extend far beyond finance.
- One area where blockchain technology can have a major impact is the voting system, which has long been plagued by issues of security, transparency, and accessibility.

How Blockchain Can Improve Voting

- **Transparency**

  Blockchain-based voting can provide a transparent and auditable system, where all transactions are recorded on a public ledger that is accessible to all participants.

- **Security**

  Blockchain-based voting can offer a secure and tamper-proof system, where votes are encrypted and stored in a decentralized network of nodes, making it difficult for any one party to manipulate the results.

- **Accessibility**

  Blockchain-based voting can provide an accessible and convenient system, where voters can cast their ballots remotely using their smartphones or other devices, without the need to travel to a physical polling station.

Security Features of Blockchain-Based Voting

Decentralized and Distributed Network

- Blockchain-based voting systems operate on a decentralized and distributed network, meaning that no single entity controls the entire system.
- This ensures that there is no central point of failure or vulnerability, making it more difficult for hackers to compromise the system.

Security Features of Blockchain-Based Voting

Immutable and Tamper-Proof Transactions

- Blockchain-based voting systems use cryptographic algorithms to create a tamper-proof and immutable record of each vote.
- Once a vote is recorded on the blockchain, it cannot be altered or deleted, ensuring the integrity of the voting process.

Security Features of Blockchain-Based Voting

Encryption and Anonymity

- Blockchain-based voting systems use encryption to secure each vote and ensure anonymity.
- Each vote is encrypted using a public key, and only the person with the corresponding private key can decrypt and access the vote.
- This ensures that each vote is anonymous and cannot be traced back to the voter.

Implementation Challenges and Solutions

Challenge: Accessibility

One challenge of blockchain-based voting is ensuring that the system is accessible to all voters, including those who may not have access to the internet or who may have disabilities that make it difficult to use digital systems.

To address this challenge, some potential solutions include:

1. Providing alternative voting methods for individuals who cannot use the digital system, such as paper ballots or telephone voting.
2. Ensuring that the digital system is designed to be accessible to individuals with disabilities, such as by incorporating accessibility features like screen readers and alternative input methods.

Implementation Challenges and Solutions

Challenge: Security

Another challenge of blockchain-based voting is ensuring that the system is secure and resistant to fraud and hacking. Some potential solutions to this challenge include:

1. Using advanced encryption and security protocols to protect the integrity of the voting data.
2. Implementing multi-factor authentication and identity verification measures to prevent unauthorized access to the voting system.
3. Conducting regular security audits and testing to identify and address vulnerabilities in the system.

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