E-VOTING SYSTEM USING BLOCKCHAIN

PROJECT - I (4IT31)

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Abstract

The paper proposes a new blockchain-based electronic voting system that addresses some of the limitations in existing systems and evaluates some of the popular blockchain frameworks to create a blockchain based electronic voting system. Because the blockchain stores its data in a decentralized manner, the implementation result shows that it is a practical and secure electronic voting system that solves the problem of vote forgery in electronic voting. The blockchain-based electronic voting system can be directly applied to various network applications

Introduction

Blockchain is a technology that is rapidly gaining momentum in era of industry 4.0. With high security and transparency provisions, it is being widely used in supply chain management systems, healthcare, payments, business, IoT, voting systems, etc. Current voting systems like ballot box voting or electronic voting suffer from various security threats such as DDoS attacks, polling booth capturing, vote alteration and manipulation, malware attacks, etc, and also require huge amounts of paperwork, human resources, and time. This creates a sense of distrust among existing systems. So to overcome distrust and making voting system easy here we have implemented online voting system using blockchain.

What is Blockchain ?

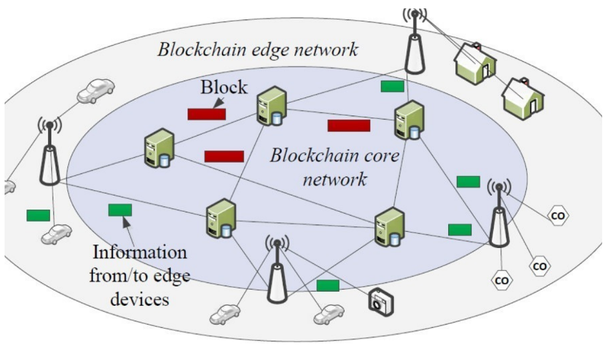

Fig 1. Block Chain Network

A blockchain is a distributed database or ledger that is shared among the nodes of a computer network. As a database, a blockchain stores information electronically in digital format. Blockchains are best known for their crucial role in cryptocurrency systems, such as Bitcoin, for maintaining a secure and decentralized record of transactions.

The innovation with a blockchain is that it guarantees the fidelity and security of a record of data and generates trust without the need for a trusted third party.

Methodology

1) Registration Stage/Login : In this stage user have to log in.

2)Blockchain Technology : This technology is mainly used for its security features. Blockchain encrypts the voter's message (Casted vote) using an asymmetric encryption algorithm.

3)Ethereum: The Ethereum network provides a framework for creating and storing the blockchain.

4)Database: All system data is stored in the MongoDB database. The data will be in the form of voter and candidate names, unique voter IDs, and voting details like time, time slot, region, etc.

5)Admin: Admin will control the entire environment. Verification of voters and candidates will be done by admin. Admin only arranges the voting schedule and also announces the result.

6)Results Phase: The processing and counting of votes take place in the results phase. The results are generated and displayed on the website. Users can verify their votes using their public key. This ensures the transparency of the voting system.

7)Meta Mask: Metamask allows blockchain users to manage their wallets and used for casting their votes.

8)Truffle: Truffle offers an improved environment primarily based totally on the Ethereum blockchain. Truffle is capable of compiling the Ethereum contracts and migrating them.

User Identification

User Identification is done here with the help of face recognition technique.
In order to cast vote to any candidate, user need to first authenticate by using face recognition.
Face Recognition will ensure reliability that the person who is voting is a validate one and no other person is voting inspite of him/her.

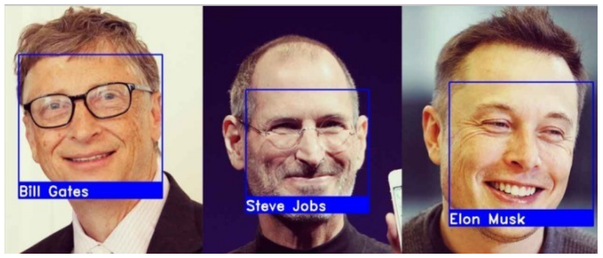

Fig 2. Face Recognition

Storing Mechanisam

As each transaction occurs, it is recorded as a “block” of data in blockchain. Here the votes casted by the user are broken into many smaller chunks and all this chunks are stored over a blockchain network in form of blocks. All this block contains the Hash values of its previous block. So when we retrive the votes, all this blocks makes connection like a chain of blocks with the help of its previous blocks hash value

Fig 3(a). Transaction

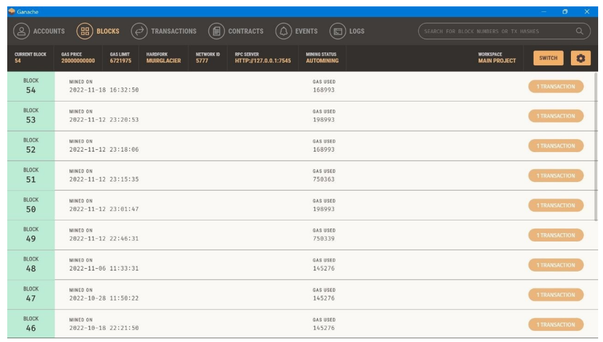

Fig 3(b). Blocks

Results

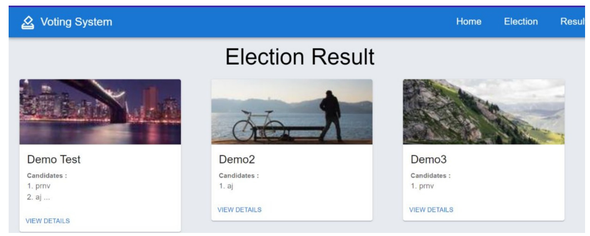

Fig 4(a). Elections Result Page

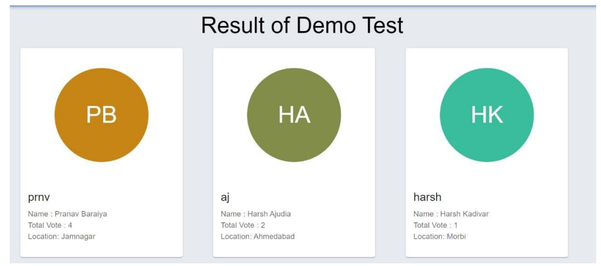

Fig 4(b). Result of Election

Conclusion

The current voting system can be improvised and secured by applying a web-based voting solution using blockchain and also improving the accuracy of the face detection model. The goal is that voters wouldn’t be able to cast invalid votes so, this system uses face-recognition for voter identification which makes it more secure and reliable. Blockchain technology has the potential to be implemented in a far more secure and accessible voting system.

References

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