WWW.IJRPR.COM

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

A Review Paper on Blockchain E-Voting System

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Abstract –

The outdated paper ballot system and the widely used electronic voting devices can both be replaced by online voting. In addition to the openness of votes and the privacy of voters, an electronic voting site should provide security and integrity. This study suggests a blockchain-based electronic voting system that overcomes some of the drawbacks of the current voting methods. The report also discusses the current state of certain blockchain voting frameworks. The implementation that is currently being used is appropriate for small-scale elections held inside of offices, boardrooms, etc. This work proposes a very straightforward method for a fair electronic voting system that ensures anonymity, coercion resistance, correctness, ease of tallying, eligibility, fairness, high availability, integrity, and robustness. It also presents voter authentication, voter confidentiality, vote verifiability, and public verifiability. The blockchain technology is used to attain these characteristics.

***Key Words*:** BLOCKCHAIN, E-VOTING

1. INTRODUCTION

Numerous studies have been conducted on electronic democratic frameworks that enable voters to cast ballots whenever it may be convenient for them via a mobile phone, computer, or other electronic device. Block is a collection of the comparatively large number of exchanges. Block chains include eye-catching features including namelessness, permanence, decentralisation, security, and security. A good candidate for creating a more secure, safe, and simple E-casting a ballot framework is block chain with keen agreements. In a relatively short period of time, block chains have developed into a significant innovation. Using a blockchain to cast your vote is therefore the safest option. An online voting system is a democratic framework that allows any person to exercise their democratic rights from anywhere in the nation.

The arguments on online voting involve a variety of factors, including innovation, social issues, and the organisation of political decision-making. Electronic voting is suitable for replacing the most popular method of casting a ballot since it is simpler and more accessible to voters. The democratic structures can be projected from any PC with a web affiliation, therefore this is acceptable for web projecting a polling form. There is a chance to reduce long lines at inspection stations and improve accessibility for people with disabilities, those who are ill, those serving in the military or living abroad, those on close-up travel, and others who find it challenging to locate the inspection station.

Blockchain is a young technology with untapped potential that is being used in an increasing number of applications. With the development of the Bitcoin system in 2008, it was first used to exchange cryptocurrency. It has been utilised in numerous projects that called for a system to store and share information without going via a Trusted Third Party because of its decentralised, anonymous, and secure nature (TTP).

PROPOSED SYSTEM DESIGN

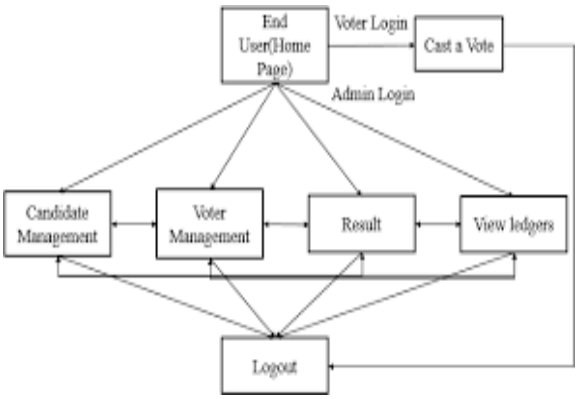

Figure 1. The Proposed System

BLOCKCHAIN FOR E-VOTING

A blockchain is a collection of blocks connected by cryptographic chains. One of the cutting-edge technologies, blockchain has solid cryptographic underpinnings that enable apps to take advantage of these capabilities to produce robust security solutions. Here, the data is broken up into blocks and connected via links. Each block contains a unique hash value that serves as a representation of the block. The connection between each block is created by incorporating the previous block's hash into the current block. A block is made up of the data section, hash, section, hash, and prior hash, to summarise.

The chain of blocks that has been formed no longer gets kept in a single machine. Each user of the blockchain, also known as the Distributed Ledger, has their own copy. When someone tries to alter the data, the hash value is altered, the link is broken, and the hash value is altered. The attacker must modify and recalculate the hashes of succeeding blocks in order for the attack to succeed. Users curate each block once it is made depending on their consensus, and each block can either be accepted or rejected. Consequently, security, immutability, and transparency are provided by blockchains.

PROPERTIES OF BLOCKCHAIN

Decentralized: One of the main characteristics of blockchain development that works brilliantly is its decentralised shared organisation and the meetings of the framework. Without the assistance of a third party, anyone can save a resource and then access it via the internet. Store any trade, including contracts, documents, digital assets, and money in cryptographic form, and later access the exchange using the private key.

Consensus: Before an exchange is added to the chain, it must have the blockchain framework's endorsement and belief. When a transaction conflicts with one of the concurred rules, the transaction will be deemed void. Block chains are communicated in an arrangement-based show, which can be either authorization-based or permission-less. Everyone can attempt to include exchanges and take a stake in agreement, as implied by public agreement.

Unanimous: Before records may be added to the network, all network participants must ratify their accuracy. A node must receive majority vote in order to add a block to the network; otherwise, the block cannot be added. A node is unable to merely add, update, or remove data from the network. Every record is updated at once, and the updates spread swiftly throughout the network. Therefore, no modification can be made in the network without the majority of nodes' approval.

The major advantages that block chain voting system meet are:

- Transparency
- Security
- Anonymity
- Processing time

2. LITERATURE SURVEY

SURVEY EXISTING SYSTEM

1. Dalia, K., Ben, R. , Peter Y. A, and Feng, H. (2012). **"A fair and robust voting system by broadcast**.", 5th International Conference on E-voting, 2012.

This study suggests adding a commitment round to ensure fairness and a recovery round to permit the announcement of the election outcome in the event that voters abort. Furthermore, it offered a computational security proof for ballot secrecy.

2. Chaum, D., Essex, A., Carback, R., Clark,

J., Popoveniuc, S., Sherman, A. and Vora, P. (2008). "**Scantegrity: End-to-end voter-veriable optical- scan voting.**", IEEE Security Privacy, vol.6, no. 3, pp. 40-46, May 2008.

This work introduces Scantegrity, the first independent E2E verification mechanism that keeps optical scan as the underlying voting technology and does not obstruct a manual recount. Scantegrity has a negligible influence on election operations.

3. Adida, B., Helios (2008). "**Web-based open-audit voting.** ", in Proceedings of the 17th Conference on Security Symposium, ser. SS'08. Berkeley, CA,

USA: USENIX Association, 2008.

In this study, linked justifications for an adequate security model and evaluation standards for comprehension are proposed. It also describes the Pretty Understandable Democracy web voting theme, demonstrating that it meets the necessary security model and is significantly more flexible than Pretty Smart Democracy, which is currently the only theme that also meets the intended security model.

4. Bell, S., Benaloh, J., Byrne, M. D., Debeauvoir, D., Eakin, B., Kortum, P., McBurnett, N., Pereira, O., Stark, P. B., Wallach, D. S., Fisher, G., Montoya,J., Parker, M. and Winn, M. (2013). "**Star-vote: A secure, transparent, auditable, and reliable voting system**.", in 2013

Electronic Voting Technology Workshop/Workshop on Trustworthy Elections (EVT/WOTE 13). Washington, D.C.: USENIX Association, 2013.

This paper describes the STAR-Vote design, that may preferably be the next-generation electoral system for Travis County and maybe elsewhere.

LIMITATION OF EXISTING SYSTEM OR RESEARCH GAP

Ancient E-voting system might face following problems:

- **Voting anonymously**: After casting a ballot through the system, which may or may not include a choice for each candidate, voters should maintain their anonymity, including the system administrators.
- **Personalized voting procedures:** It's still up for debate how votes are represented in the relevant databases or web apps. A hashed token is more likely to provide obscurity and integrity than a transparent text message, which is the worst possible strategy. In the meanwhile, the vote should be disreputable because it cannot be secured by the symbolic resolution.
- **High initial setup costs:** Although running and managing online elections is much less expensive than doing so in the past, the cost of initial deployments can be high, especially for enterprises.
- **Growing security issues:** Cyber attacks pose a serious threat to public opinion polls. If an election-related hacking attempt is successful, nobody would accept the blame. DDoS assaults are well-documented and almost never occur during elections.

Software mechanisms that guarantee the following should be used to lessen these risks:

1. Avoiding the elimination of evidence

2. Privacy with transparency.

• **Lack of transparency and trust**: With everything being done online, how can consumers be sure to trust the outcomes? Problems with perception cannot be disregarded.

• **Delays or ineffectiveness in voting due to remote voting**: Timing is crucial in voting systems; in order to enable synchronous distant voting, technical capabilities and infrastructures must be stable and operating at peak performance.

3. METHODOLOGY

Below is the flow chart of the project.

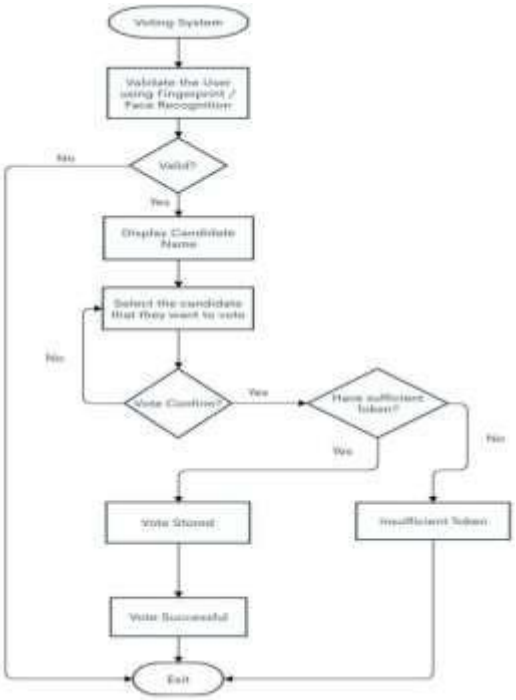

Figure 2. Flow chart of the system

Sequence diagram of the project

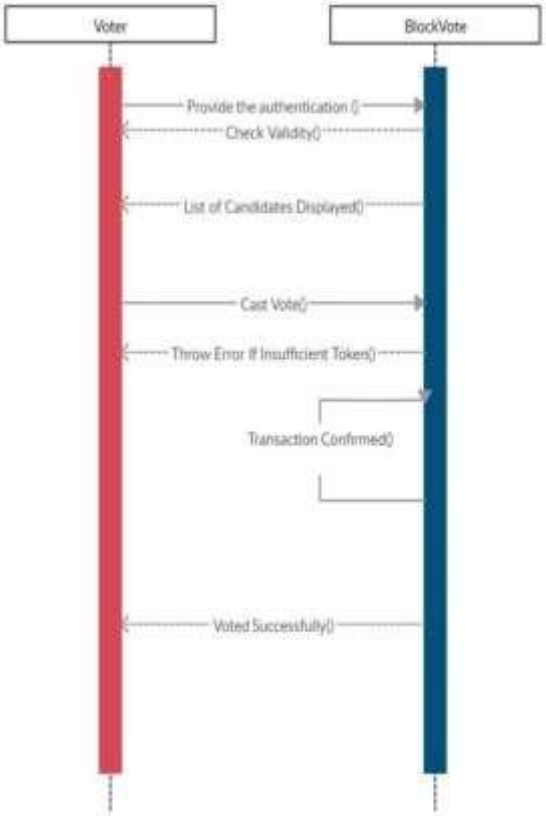

Figure 3. Sequence flow of the project

4. CONCLUSION

This study examines the benefits of the blockchain technology and how it relates to the topic of electronic voting. The blockchain will be distributed in a way that prevents corruption and will be publicly verifiable. As of now, at the conclusion of this paper, we can draw the following conclusions: we have encountered numerous research papers relating to electronic voting systems using block chain technology, and we have ultimately learned that there are numerous ways and approaches to build an electronic voting system with the aid of block chain technology. This project has evolved into a blockchain-based electronic voting system that protects voters' anonymity and makes use of smart contracts to ensure safe and affordable elections.

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