

Electronic Voting System Using Blockchain

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Introduction

Blockchain technology offers a decentralized node for online voting or electronic voting. Recently distributed ledger technologies such blockchain were used to produce electronic voting systems mainly because of their end-to-end verification advantages. Blockchain is an appealing alternative to conventional electronic voting systems with features such as decentralization, non-repudiation, and security protection. Each block contains a hash, timestamp, and transaction data from the previous block.

Core Components of Blockchain Architecture

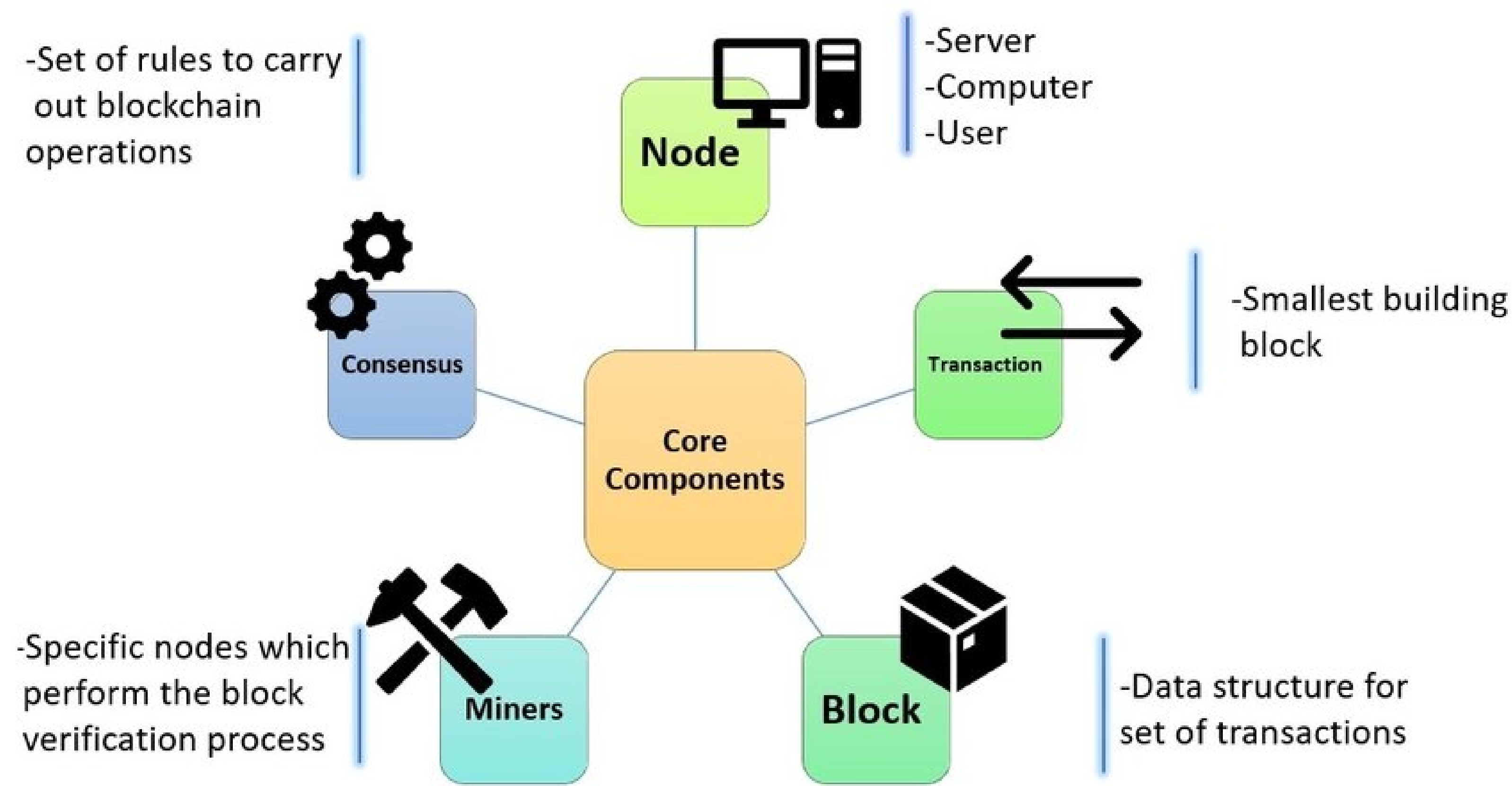


Figure 1. Core components of the blockchain system.

Critical Characteristics of Blockchain Architecture



Figure 2. Core components of the blockchain system.

How Blockchain Can Transform the Electronic Voting System

The implementation of the electronic voting method in blockchain is very significant. Today, there is a viable solution to overcome the risks and electronic voting, which is blockchain technology. In Figure, one can see the main difference between both systems. In Traditional voting systems, we have a central authority to cast a vote. If someone wants to modify or change the record, they can do it quickly; no one knows how to verify that record. One does not have the central authority; the data are stored in multiple nodes. It is not possible to hack all nodes and change the data. Because of the distributed structure of the blockchain, a Bitcoin electronic voting system reduces the risks involved with electronic voting and allows for a tamper-proof for the voting system. If someone wants to modify or change the record, they can do it quickly; no one knows how to verify that record. One does not have the central authority; the data are stored in multiple nodes. It is not possible to hack all nodes and change the data. Because of the distributed structure of the blockchain, a Bitcoin electronic voting system reduces the risks involved with electronic voting and allows for a tamper-proof for the voting system.

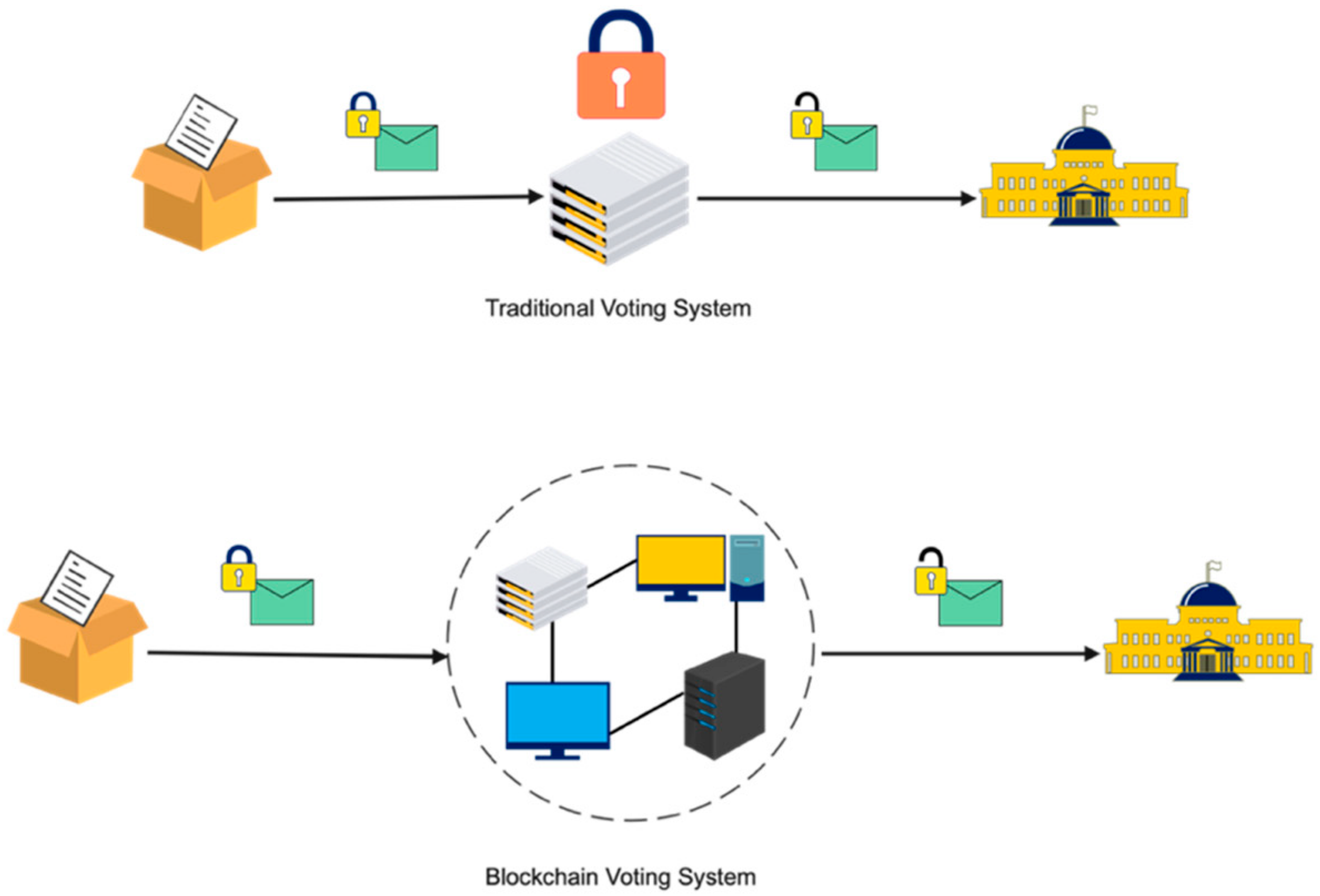


Figure 3. Differences between voting system.

Electronic Voting on Blockchain

The steps for voting in blockchain technology are given below:

- The voter first need to login into the system with the help of voter ID and password.
- The voter is verified by the organizers by using the eligible voter list (voter database).
- The 2nd page opens, which carry the details of contestants. Now the voter will give her/his vote.
- The vote are encrypted by using the public key of EC.
- The encrypted vote are signed by the voter private key.
- Now, the generated voter information is stored into the voter server through the Internet. This is the first block of the blockchain.
- For generation of the block data, steps 3 to 6 repeated continuously until election time is over.

System Security Analysis

- Privacy of the data transmission
- Voter confidentiality
- proposed e-voting system resist the duplication and forgery issue.
- System level threats and attacks

Conclusion

We have mitigated all the possible threats and attacks into the electronic voting system. The proposed work is based on the blockchain technology, which remove all the threats from the communication link. It is a decentralized system, contain hashing and encryption concept for providing the security. After completion of the blockchain no one will do any modification.

References

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[2] K. C. Ashish Singh, "Secevs: Secure electronic voting system using blockchain technology," in *2018 International Conference on Computing, Power and Communication Technologies (GUCON)*, IEEE, 2018, pp. 863–867. DOI: 10.1109/GUCON.2018.8675008. [Online]. Available: <https://doi.org/10.1145/2736277.2741088>.