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Secured E-voting System using Blockchain Technology

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Abstract: ***The emergence of blockchain technology has paved the way for the development of secured e-voting systems that are transparent, immutable, and tamper-proof. In this survey report, we examine the current trends and future prospects of using blockchain technology for e-voting.***
We begin by exploring the key features of blockchain technology, including distributed ledger, cryptographic security, and decentralized consensus mechanisms. Next, we discuss the benefits of using blockchain technology for e-voting, including voter anonymity, transparent voting process, and immutable voting records.
To gain a better understanding of the current state of the field, we conducted a survey of recent literature on blockchain-based e-voting systems. The survey covers research articles, white papers, and conference proceedings published in the last five years. We analyzed the data using statistical software and present our findings on the most commonly used consensus algorithms, cryptographic techniques, and blockchain architectures in e-voting systems.
Our survey also highlights the challenges facing the adoption of blockchain-based e-voting systems, including scalability, usability, and regulatory issues. We conclude by discussing the future prospects of blockchain-based e-voting systems and identifying the areas that require further research and development.
Overall, this survey report provides valuable insights into the current trends and future prospects of using blockchain technology for e-voting, and will be useful for researchers, policymakers, and practitioners working in this field.
Keywords: Blockchain-Based-Voting, distributed-ledger-technology, cryptographic-security, Smart-contracts, Voter-anonymity, Blockchain scalability

I. INTRODUCTION

Electronic voting (e-voting) systems have the potential to revolutionize the way we conduct elections by making the process more efficient, transparent, and accessible to a wider range of voters. However, the use of traditional e-voting systems has been marred by concerns over security, privacy, and transparency. In recent years, blockchain technology has emerged as a promising solution to these issues by providing a secure, decentralized, and transparent platform for e-voting.

Several studies have examined the potential of blockchain technology for e-voting systems. For instance, in their paper "A Blockchain Based Voting System",[1]Böhme et al. (2015) proposed a blockchain-based e-voting system that provides end-to-end encryption and a decentralized verification mechanism to ensure the integrity of the voting process. Similarly, in their paper "E-Voting using Blockchain Technology",[2]Kshetri and Voas (2018) argue that blockchain technology can enhance the security, privacy, and transparency of e-voting systems by using cryptographic techniques to ensure the anonymity and integrity of the voting process. While these studies provide valuable insights into the potential of blockchain technology for e-voting systems, there is still a need for a comprehensive survey of the current trends and future prospects of using blockchain technology for e-voting. In this survey report, we aim to fill this gap by providing a comprehensive overview of the key features, benefits, challenges, and future prospects of using blockchain technology for e-voting systems.

II. MOTIVATION

The Motivation Behind this project is that remote voting systems can be accessed through much secure and decentralized ways and also give each citizen a right to vote from home and have a secure unbiased and clear voting process. As currently we see many times that the opposition parties or the ruling party often blame the machines to have been hacked or manipulated for gaining extra votes to avoid these circumstances, we look at Blockchain based E-voting System.

Here are some motivations that are incorporated in this project: -

1) *Enhanced Security:* Traditional e-voting systems are vulnerable to various security threats, such as hacking, tampering, and double voting. The use of blockchain technology can enhance the security of e-voting systems by providing a tamper-proof and transparent platform for recording and verifying votes.

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2) *Increased Transparency:* The use of blockchain technology can increase the transparency of the e-voting process by providing a decentralized platform for recording and verifying votes. This can increase the trust and confidence of voters in the e-voting process.
3) *Faster Results:* Blockchain-based e-voting systems can provide faster results compared to traditional paper-based voting systems, which can take days or even weeks to tally the votes.
4) *Cost-Effective*: E-voting systems based on blockchain technology can be cost-effective compared to traditional paper-based voting systems, which require extensive resources for printing, distribution, and counting of ballots.
5) *Improved Accuracy*: Blockchain-based e-voting systems can improve the accuracy of the vote tally by providing a tamper-proof and transparent platform for recording and verifying votes. This can reduce the likelihood of errors and disputes in the e-voting process.
6) *Accessibility:* Blockchain-based e-voting systems can be made accessible to a wider range of voters, including those who are physically challenged or living in remote areas. This can increase the participation of voters in the democratic process.

III. PROPOSEDSYSTEM

It is a secured e-voting system using blockchain technology, where the voting data is recorded in blockchain blocks and smart contracts in Solidity are used to execute the voting rules and ensure the accuracy of the vote tally. Additionally, the system has a separate database and admin panel to ensure accessibility and security of the voting data.

Proposed system has several key features including:

1) *Use of Blockchain Technology:* Your system leverages the decentralized and tamper-proof nature of blockchain technology to record and verify votes. By using blockchain blocks to store the voting data, you can ensure that the data is transparent and secure.
2) *Smart Contracts in Solidity:* Your system uses smart contracts in Solidity to execute the voting rules and ensure that the votes are counted accurately. This can help prevent errors and disputes in the voting process.
3) *Separate Database and Admin Panel:* To ensure the accessibility and security of the voting data, your system has a separate database and admin panel. This can help prevent unauthorized access to the voting data and reduce the risk of hacking or tampering.
4) *Manual Review Process:* Your system has a manual review process for dealing with flagged data, which can help ensure the accuracy and integrity of the voting results.

IV. LITERATUREREVIEW

The use of blockchain technology in e-voting systems has gained increasing attention in recent years due to its potential to address the security and transparency concerns associated with traditional e-voting systems. Many researchers have explored the use of blockchain technology to secure e-voting systems and proposed various approaches to implement blockchain-based e-voting systems.

One such approach is proposed by Agrawal et al. (2018)[3], where they propose a blockchain-based e-voting system that uses smart contracts to execute the voting rules and ensure the accuracy of the vote tally.

They also propose a method to verify the eligibility of voters using biometric authentication, which can further enhance the security and accessibility of the e-voting system.

Another study by Kalra and Sharma (2019)[4] proposes a hybrid e-voting system that uses both blockchain technology and homomorphic encryption to secure the voting data and prevent unauthorized access. The authors argue that the use of homomorphic encryption can provide an additional layer of security to the e-voting system by allowing the computation of encrypted data without decrypting it.

In a similar vein, a study by Kshetri (2018)[2] proposes a blockchain-based e-voting system that uses zero-knowledge proofs to verify the eligibility of voters and ensure the privacy of the voting data. The study argues that the use of zero-knowledge proofs can provide a more secure and transparent e-voting system by allowing voters to prove their eligibility without revealing their identity.

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V. SYSTEMARCHITECTURE

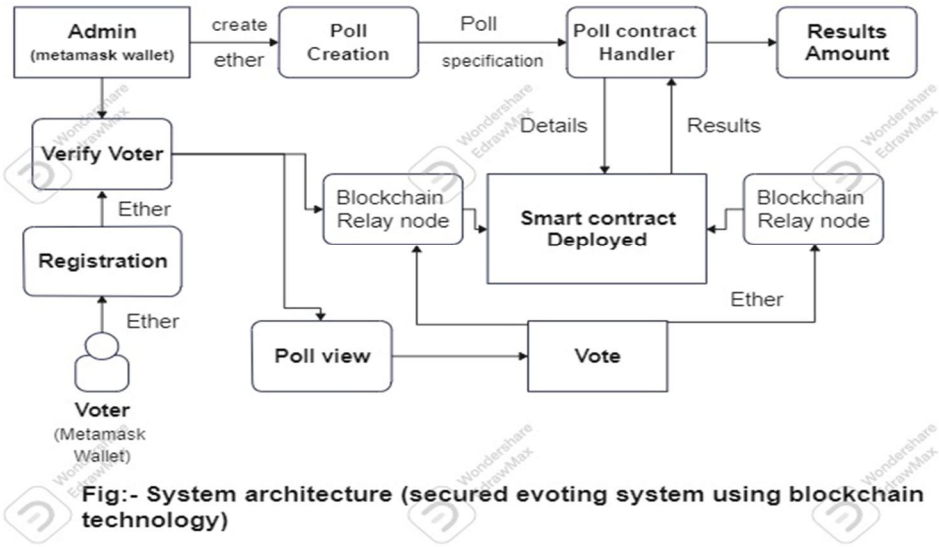

Figure 1 The architecture of the proposed system.

1) *Administrative Interface:* The administrative interface provides access to the system administrators to monitor the system and manage the voting process. The administrative interface can be a web application or a desktop application that is accessible only to the administrators.
2) *Voter Interface:* This component provides the interface for the voters to cast their votes. The voter interface can be a web application or a mobile application that is accessible to the voters.
3) *Smart Contracts:* Smart contracts are self-executing contracts that run on the blockchain network. In the e-voting system, smart contracts are used to execute the voting rules and ensure the accuracy of the vote tally.
4) *Authentication System:* The authentication system is responsible for verifying the identity of the voters and ensuring that only eligible voters are allowed to cast their votes. The authentication system can use various methods, such as biometric authentication, to verify the identity of the voters.
5) *Blockchain Network*: The blockchain network consists of a set of nodes that are connected to each other and communicate using the blockchain protocol. The blockchain network is responsible for maintaining a distributed ledger that records all the votes cast by the voters.

VI. FUTUREWORK

1) *Integration with AI and Machine Learning:* One possible future direction for a blockchain-based e-voting system is to integrate it with AI and machine learning techniques. This can enable the system to learn from previous voting patterns and predict future outcomes more accurately.
2) *Enhanced Security Measures:* Another potential area for future work is the development of more advanced security measures to protect the voting data from cyber-attacks. This can include the use of advanced encryption algorithms, biometric authentication techniques, and multi-factor authentication protocols.
3) *Improved Accessibility and User Experience*: A key challenge with e-voting systems is ensuring that they are accessible and easy to use for all voters. Future work can focus on developing more user-friendly interfaces and providing additional support for voters with disabilities.
4) *Integration with Social Media Platforms*: Social media platforms have emerged as powerful tools for political campaigning and voter mobilization. Integrating a blockchain-based e-voting system with social media platforms can enable campaigns to reach a wider audience and encourage greater voter participation.
5) *International Standardization:* Finally, future work can focus on developing international standards for e-voting systems that can be adopted by governments and election commissions around the world. This can help to ensure the security, transparency, and accuracy of e-voting systems and enhance public trust in the democratic process.

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VII. CONCLUSION

As the project progresses, we can conclude that the development of a secured e-voting system using blockchain technology is a promising solution to the challenges faced by traditional voting systems. By leveraging the features of blockchain, such as security, transparency, and decentralization, we can ensure the integrity and trustworthiness of the democratic process.

We have made significant progress in the development of our e-voting system, including designing and implementing a blockchain-based architecture and creating a Solidity program that ensures the security of the voting data. However, there are still challenges to overcome, such as ensuring accessibility and usability for all voters, and addressing regulatory and legal barriers.

As we continue to progress with the project, we must remain vigilant in addressing these challenges and incorporating feedback from stakeholders and experts. Collaboration and coordination with policymakers, election commissions, and other stakeholders will be critical to ensure that the final product meets the needs and requirements of all parties involved.

Overall, we are confident that our project will contribute to the advancement of the field of e-voting systems and blockchain technology, and we look forward to seeing the impact of our work on the democratic process.

REFERENCES

[1] Böhme, R., Christin, N., Edelman, B., & Moore, T. (2015). A blockchain-based voting system. In Financial Cryptography and Data Security (pp. 556-570). Springer, Berlin, Heidelberg.IEEE, “Missing Data Analysis in Regression,” 2022.

[2] Kshetri, N., &Voas, J. (2018). E-Voting using blockchain technology. In Blockchain and Applications (pp. 219-236). Springer, Cham.

[3] Agrawal, R., Kumar, S., & Sharma, M. (2018). A Blockchain Based E-Voting System for Elections. International Journal of Advanced Research in Computer Science, 9(2), 45-49.

[4] Kalra, A., & Sharma, M. (2019). Hybrid e-voting system using blockchain and homomorphic encryption. Proceedings of the 10th International Conference on Computing, Communication and Networking Technologies (ICCCNT),

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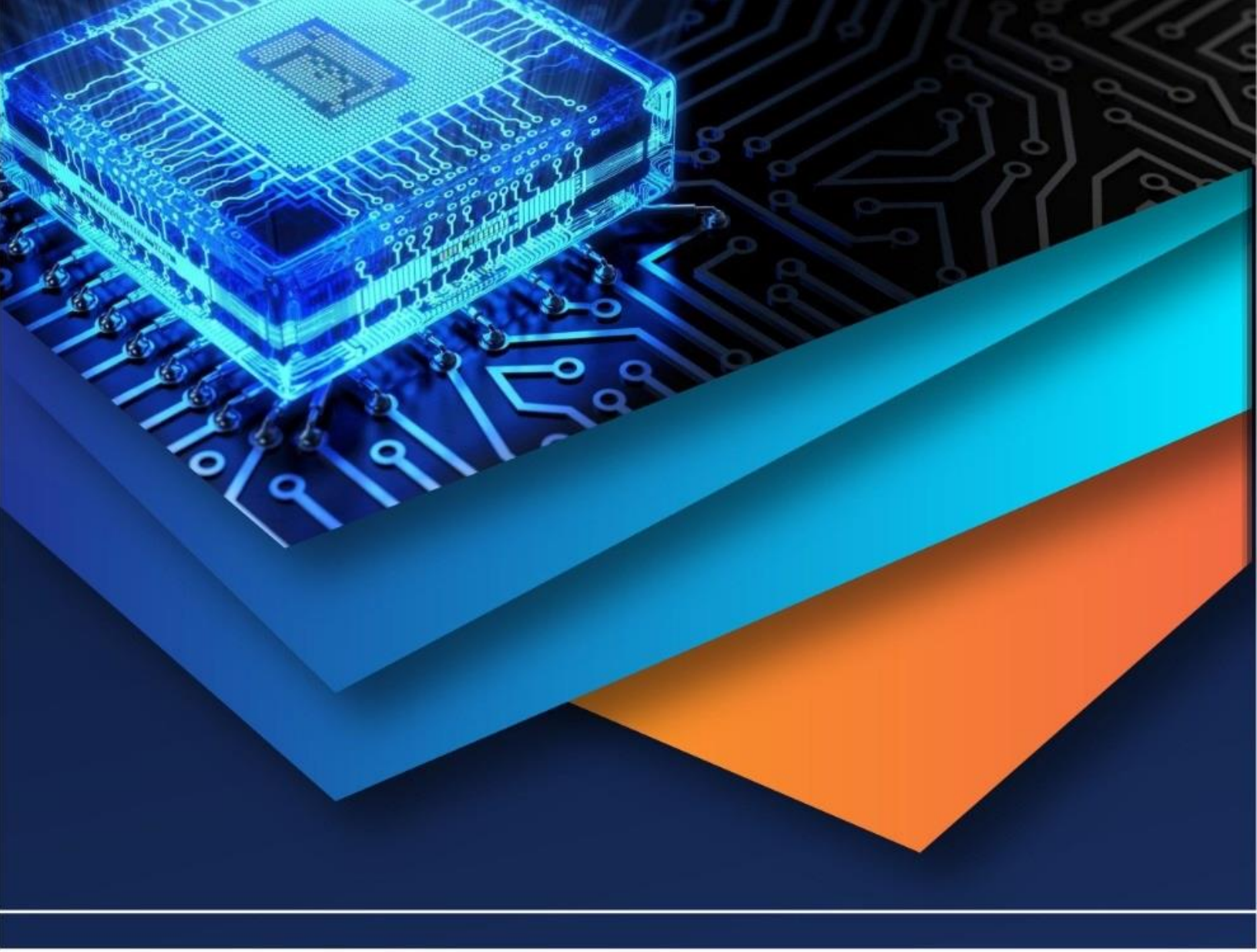

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