# Blockchain Based Voting System

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***Abstract*—**The traditional and digital voting systems in many countries have faced challenges, leading to widespread mistrust and a need for a more secure and transparent solution. Blockchain technology offers a promising approach to address these issues and ensure fair elections with reduced injustice. This article proposes a platform based on blockchain technology to enhance trans- patency, reliability, and trust between voters and election authorities. The platform leverages the immutability and cryptographic proofs of blockchain to create an immutable and secure digital voting system. By utilizing a decentralized network of interconnected nodes, the proposed framework enables a scalable and fault-tolerant voting system. The blockchain's distributed ledger maintains a transparent record of all transactions, ensuring the integrity of the voting process. The system incorporates encryption Techni ques and safeguards against potential attacks, such as the 51 percent attack, to enhance the security of the blockchain-based voting system. The article outlines the methodology for conducting blockchain transactions during the voting process, eliminating the need for physical polling stations. Through the application of flexible consensus algorithms and the Chain Security Algorithm, the proposed framework ensures secure and efficient voting transactions. Performance evaluations demonstrate the feasibility of implementing the system on a large-scale population.

Overall, the integration of blockchain technology into the voting system presents an opportunity to overcome the shortcomings of traditional and digital voting methods. With increased transparency, reliability, and security, the blockchain-based voting system aims to restore confidence in the democratic process and protect the fundamental rights of citizens. By providing a robust and efficient solution, this platform can contribute to fair elections and strengthen democracy in the digital age.

## I. INTRODUCTION

In recent years, the traditional and digital voting systems have faced numerous challenges, resulting in a widespread mistrust among citizens and a critical need for a more secure and transparent solution. The emergence of blockchain technology has provided a promising avenue to address these issues and establish a fair and reliable elec- toral process. Blockchain, originally designed as a decentralized and immutable ledger, has demonstrated its potential for various applications beyond cryptocurrencies, including healthcare, supply chain management, and now, the voting system. The current manual voting system in many countries requires voters to physically visit polling stations, leading to inefficiencies, wastage of time, and a decreased voter turnout. Moreover, traditional digital voting systems have been plagued by concerns regarding transparency and security, making it challenging for governments to gain the trust of their citizens. To overcome these limitations, the integration of blockchain technologyinto the voting system offers a viable solution.

By leveraging the inherent features of blockchain, such as immutability, transparency, and cryptographic security, a blockchain- based voting system can provide an immutable and secure platform for citizens to exercise their democratic rights. Through the use of a decentralized network of interconnected nodes, the voting process can be conducted in a transparent and tamper-proof manner.

The proposed framework aims to revolutionize the voting process by eliminating the need for physical polling stations and reducing the risks associated with human errors and fraudulent activities. Instead, voters can participate in the electoral process through a digital plat- form that ensures the integrity and confidentiality of their votes. The use of online verification mechanisms, such as Identifying Authorities, guarantees the authenticity of voters, preventing the casting of fake or duplicate votes.

By implementing blockchain technology in the voting system, resources allocated to physical infrastructure,

staffing, and security can be significantly reduced. The decentralized nature of blockchain ensures that the data stored on the network remains secure and transparent, mitigating the risks of tampering or manipulation. Additionally, the use of blockchain technology instills confidence among voters, as they can verify that their votes are accurately recorded andcounted.

To validate the effectiveness and feasibility of the proposed system, a pilot implementation can be carried out in smaller-scale elections before expanding to larger populations. This iterative approach allows for refinement and improvement based on real-world testing and feedback. In the following sections, we will explore the related work in the field of blockchain-based voting systems, discuss the proposed framework in detail, and delve into the implementation and evaluation of the system. By leveraging the benefits of blockchain technology, this project aims to contribute to the establishment of a transparent, secure, and trustworthy voting system that safeguardsthe democratic rights of citizens

## II. LITERATURE REVIEW

[1] Vishal B. Khobragade, Priyanka Dhasal, "Internet Voting", International Journal of Science and Research (IJSR): This paper introduces on internet voting system, that have security context or known as entrusted voting system. In this study, the prototype builds based on secured and trusted framework as e-trusted voting system. The system allows the voters to participate by using username and password. Voter can enter the system and votes on existing text during election date and the voter can see the result after the end of election.

[2] J. Hall, "Can Blockchain Technology Solve Voting Issues?": Blockchain has a significant role in maintaining democracy by offering anonymous voting and eradicating hacked voting. Unlike traditional methods where servers are managed by the government, with the help of blockchain, it iseasy to detect and verify if a record is tampered or altered from its original submission. This is possible because all other nodes in the blockchain network maintain a copy of the original record

[3]Nir Kshetri, Jeffrey Voas, "Blockchain-based E-Voting", IEEE Software. : The paper discusses the potential benefits of using blockchain for secure and transparent voting processes. It emphasizes the decentralized and immutable nature of blockchain, which can address challenges such as fraud and lack of transparency in traditional voting systems. The authors present case studies and examples of blockchain-based e-voting systems, analyzing their advantages and limitations. They also highlight the challenges and future directions of implementing such systems, including scalability and privacy concerns

## III. MOTIVATION

Vote at anytime from anywhere: Today's way of living doesn't leave much free time. We have little to no time to do anything or go anywhere. So don't you think that maybe giving the chance to the members of your organization to cast their vote in just a few minutes, without the need to go to a certain place, would be a good option? If your answer is "yes", then you should probably consider online voting. Unlike traditional voting, that makes voters go to a specific place at a specific time in order to vote, online voting allows them to cast their vote at any time of the day and from any place, just with the need of an Internet connection

## IV. PROPOSED WORK

Design and implement an efficient web-based application for a decentralized online voting system using blockchain technology. The objective is to create a secure and transparent platform that allows for decentralized elections and ensures the integrity of the voting process. The proposed system will leverage the immutability and cryptographic features of blockchain to provide a tamper-proof and verifiable voting system. By utilizing a decentralized network of interconnected nodes, the system will ensure scalability, fault-tolerance, and resistance against potential attacks. The web based application will enable voters to securely cast their votes remotely, while maintaining anonymity and preventing unauthorized access. The system will also include mechanisms for verifying and counting votes, generating accurate and auditable results. The ultimate goal is to provide a reliable and efficient solution that restores confidence in the electoral process and strengthens democracy in the digital age.

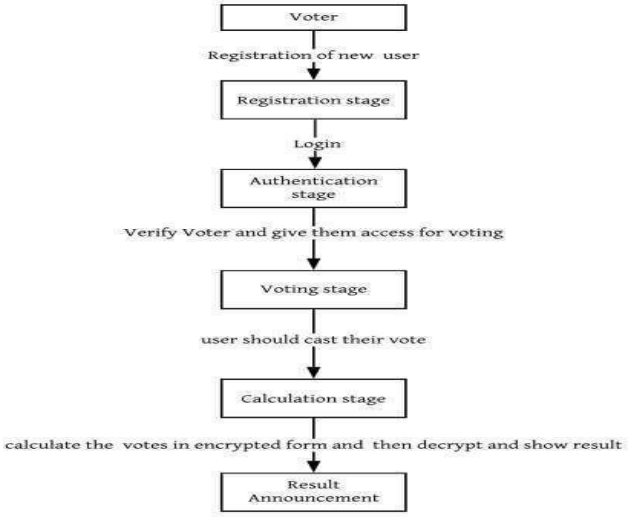
## V. METHODOLOGY

The methodology which we are using is as follows: We are considering two modules that can be completed in three phases.

Phase 1: Front-End

Phase 2: Back-end

Phase 3: Connection of modules



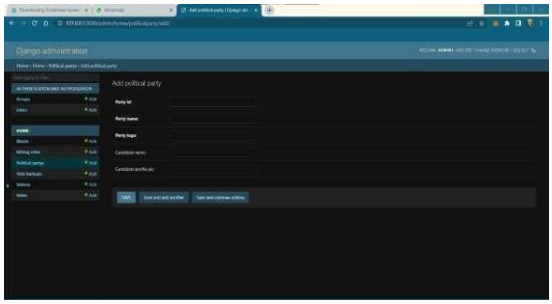


**Fig. 1**: Block Diagram

Admin will be responsible for adding voters. Voters will be authenticated by email associated with their email and by authenticating the user then they should be able to cast their vote. Everyone in the distributed ledger will be able to see live results

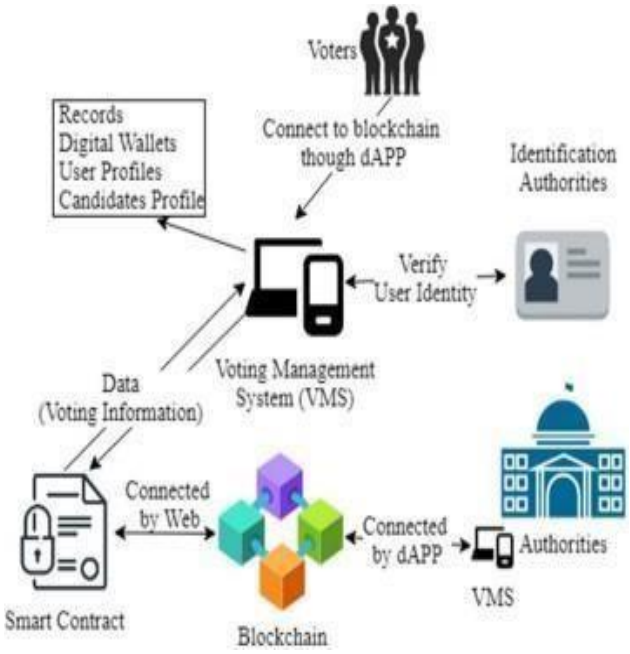



**Fig. 2**: Voting System Architecture

protocols. This fosters trust and encourages greater participation in the electoral process. In conclusion, blockchain-based online voting offers a transparent, inclusive, and trustworthy democratic solution. It has the power to revolutionize the government electoral process, ensuring efficient and secure elections for the future.

## VI RESULTS

1) Admin Pannel

Fig.1 Admin Login

Admin Login :provides dynamic access to the system, it is responsible for sending http requests to the admin login servlet in form of the login data retrieved from the administrator, the page is also used to set the value of the properties of the message Python bean in a tag as shown in figure 1, which displays errors message from the database connection class and admin login class.

Fig.2 UI for Voter

displays the candidate's name in a drop-down box for the voter to select. An execute query method is used to select the name of the candidate who is under a certain party in the candidate table. The result is stored in the results set object "rs" it is then read by the next () method which prints out the result in a while loop. The voter would then be able to select an option from the drop-down box. The option selected is then sent to the vote servlet for processing as shown in figure

3. Political Parties and Result

It used to count and display the voting results to the administrator. The variables Vote1="" and count are declared as strings with null values. The JDBC driver is

registered is registered and a connection is made to the database. The execute. Query method is used to select the vote1 record from the voters table and then count the vote1 record using the SQL COUNT statement, the COUNT statement will only count those records in which the table fields in the brackets is NOT NULL. The result of the query is stored in the Resul test object "rs1". The next () method is then used to read the results. A while loop is used to read the data returned in each record of the group Vote1 and displays the results using the out. print function as shown in figure 8-11. This format is used to display the results for all the elections candidates

## VII Acknowledgement

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## VIII Conclusion

Blockchain-based online voting has the potential to transform the government electoral process. By addressing security concerns and implementing robust internet security measures, it offers a cost- efficient and secure alternative to traditional voting methods. With streamlined operations and increased convenience for voters, blockchain technology ensures the accuracy and integrity of election results. The decentralized nature of the blockchain eliminates manipulation risks, while its immutability guarantees tamper-proof voting records. Additionally, blockchain-based online voting prioritizes voter privacy through cryptographic techniques and secure

## IX Future work

Implementation of this system for all types of voting so that the malpractice free system for voting and there should be no tempering of votes and people should choose the right candidate as there representative along with that the main focus will be on implementing this system for all types of election in future for India this system will make sure that the all-loop holes in voting system will be minimized and making system more effective.

## VI References

[1] Vishal B. Khobragade, Priyanka Dhasal, "Internet Voting", International Journal of Science and Research (IJSR): This paper introduces an internet voting system, that has a security context or known as an e-trusted voting system. In this study, the prototype builds based on a secured and trusted framework as an e-trusted vot- ing system. The system allows the voters to participate by using a username and password. A voter can enter the system and vote on existing text during the election date and the voter can see the result after the end of the election.

[2] Aayushi Gupta1, Jyotirmay Patel2, Mansi Gupta1, Harshit Gupta1 (2017); Issues and Effectiveness of Blockchain Technologyon Digital Voting.

[3] S. Shah, Q. Kanchwala, and H. Mi. (2016). Block Chain Voting System. Economist. [Online]. Available: https://www.economist.com/sites/default/files/northeastern.pdf

[4] S. Park, M. Specter, N. Narula, and R. L. Rivest, "Going from bad to worse: From internet voting to blockchain voting," J. Cybersecurity, vol. 7, no. 1, pp. 1–15, Feb. 2021, doi: 10.1093/cyb- sec/tyaa025

[5]C. K. Adiputra, R. Hjort, and H. Sato, "A proposal of blockchain- based electronic voting system," in Proc. 2nd World Conf. Smart Trends Syst., Secur. Sustainability (WorldS), Oct. 2018, pp. 22–27, doi: 10.1109/WorldS4.2018.8611593

[6] A. Barnes, C. Brake, and T. Perry. Digital Voting with the use of Blockchain Technology Team Plymouth PioneersPly-mouth University. Accessed: Feb. 14, 2022. [Online]. Available: https://www.economist.com/sites/default/files/plymouth.pdf

[7] J. Huang, D. He, M. S. Obaidat, P. Vijayakumar, M. Luo, and K.-K.-R. Choo, "The application of the blockchain technology in vot- ing systems: A review," ACM Comput. Surv., vol. 54, no. 3, pp. 1–28, Apr. 2022, doi: 10.1145/3439725.

[8] F. Fusco, M. I. Lunesu, F. E. Pani, and A. Pinna, "Crypto-voting, a blockchain based e-voting system," in Proc. 10th Int. Joint Conf. Knowl. Discovery, Knowl. Eng. Knowl. Manage., 2018, pp. 223–227, doi: 10.5220/0006962102230227