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Secure and Transparent Voting with Blockchain Technology

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ABSTRACT:

E-voting using blockchain is a novel and innovative approach to revolutionizing the way voting systems are designed and implemented. By leveraging the power of blockchain technology, this project aims to build a transparent, secure, and tamper-proof electronic voting platform that can eliminate the possibility of fraud, manipulation, or hacking. Blockchain technology is a beautiful replacement for traditional electronic voting solutions with distributed, non-repudiation, and security protection characteristics. The proposed system will be decentralized, distributed, and immutable, enabling every vote to be recorded and verified on the blockchain. The system will enable voters to cast their votes remotely while maintaining the integrity of the election results. The implementation of smart contracts will ensure that only eligible voters can cast their votes and that the results are counted accurately. The project will also address concerns around voter privacy, identity authentication, and the prevention of double voting. With the advent of e-voting using blockchain, the democratic process will be more accessible, efficient, and trustworthy, thereby increasing participation and confidence in the electoral system.

KEYWORDS: blockchain, electronic voting

I. INTRODUCTION

Electoral integrity is essential not just for democratic nations but also for state voter's trust and liability. Political voting methods are crucial in this respect. From a government standpoint, electronic voting technologies can boost voter participation and confidence and rekindle interest in the voting system. As an effective means of making democratic decisions, elections have long been a social concern. As the number of votes cast in real life increases, citizens are becoming more aware of the significance of the electoral system. The voting system is the method through which judges judge who will represent in political and corporate governance. Democracy is a system of

voters to elect representatives by voting . The efficacy of such a procedure is determined mainly by the level of faith that people have in the election process. The creation of legislative institutions to represent the desire of the people is a well-known tendency. Such political bodies differ from student unions to constituencies. Over the years, the vote has become the primary resource to express the will of the citizens by selecting from the choices they made .The traditional or paper-based polling method served to increase people's confidence in the selection by majority voting. It has helped make democratic process and the electoral system worthwhile for electing constituencies and governments more democratized. There are 167 nations with democracy in 2018, out of approximately 200, which are either wholly flawed or hybrid . The secret voting model has been used to enhance trust in democratic systems since the beginning of the voting system. It is essential to ensure that assurance in voting does not diminish. A recent study revealed that the traditional voting process was not wholly hygienic, posing several questions, including fairness, equality, and people's will, was not adequately quantified and understood in the form of government .Engineers across the globe have created new voting techniques that offer some anti-corruption protection while still ensuring that the voting process should be correct. Technology introduced the new electronic voting techniques and methods , which are essential and have posed significant challenges to the democratic system. Electronic voting increases election reliability when compared to manual polling. In contrast to the conventional voting method, it has enhanced both the efficiency and the integrity of the process. Because of its flexibility, simplicity of use, and cheap cost compared to general elections, electronic voting is widely utilized in various decisions . Despite this, existing electronic voting methods run the danger of over-authority and manipulated details, limiting fundamental fairness, privacy, secrecy, anonymity, and transparency in the voting process. Most procedures are now centralized, licensed by the critical authority, controlled, measured, and monitored in an electronic voting system, which is a problem for a transparent voting process in and of itself.

On the other hand, the electronic voting protocols have a single controller that oversees the whole voting process . This technique leads to erroneous selections due to the central authority's dishonesty (election commission), which is difficult to rectify using existing methods. The decentralized network may be used as a modern electronic voting technique to circumvent the central authority. Blockchain technology offers a decentralized node for online voting or electronic voting. Recently distributed ledger technologies such as 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. It is used to hold both boardroom and public voting . A blockchain, initially a chain of blocks, is a growing list of blocks combined with cryptographic connections. Each block contains a hash, timestamp, and transaction data from the previous block. The blockchain was created to be data-resistant. Voting is a new phase of blockchain technology; in this area, the researchers are trying to leverage benefits such as transparency, secrecy, and nonrepudiation that are essential for voting applications. With the usage

of blockchain for electronic voting applications, efforts such as utilizing blockchain technology to secure and rectify elections have recently received much attention .

II.LITERATURE SURVEY

[1]Proposed a voting system based on the internet. The system has a login page where the voter can login and enter all its information and this will be stored on a centralized server. The server and database will be owned and maintained by the Election Commission of India. All the information related to the election like voters details and candidates details will be managed by the Election commission. Voters can access the voting link and cast their vote. A code is written in order to evaluate the results inreal-time. According to the paper this will help us in reducing the high cost of voting and time required to conduct the election and also it simplifies the whole process of voting.

[2] Mentioned that the traditional voting system includes many improper practices and breaches and hence the traditional voting system needs to be upgraded to an online voting system. Shifting to online voting solves the problem of consuming a lot of time. The paper suggests development of voting system where a voter can vote from anywhere through the internet using the system that is based on SQL server and Microsoft Azure cloud and C# as the programming language in order to implement functions like admitting voters, casting vote, verifying vote and declaring the results after completion of election. From this paper we have concluded that one of the most important parts of the admin portal is to verify the voter's ID before enrolling them into the system.

[3] Proposed a web based voting system having functions like vote capturing and tallying results over the web. The system will help in saving lots of processing time, avoiding human errors during the process and avoiding vote tampering. Each voter is verified based on the unique ID code which in this case is a student registration ID. As only unique IDs are allowed, this protects the system from proxy voting. The system will be fast to access, low cost and easy to maintain.

[4] Mentioned an online voting system for conducting elections in which a voter can vote from their current location. As the voter doesn't have to go to a polling booth to cast their vote, therefore more voters will participate in the election. The proposed system will be supported on Windows, Android or IOS. Verification of voters is done using QR code and OTP (one time password) and only verified voters will be allowed to cast a vote.

[5] Proposes an electoral system which will be online and automated and makes the process of voting easy, safe and reduces overall time required for conducting the election. The project has two modules. In the first module all the voters are registered into the system and in the second module actual voting takes place. The system will have a database containing voters' unique identification numbers and fingerprints information. Project uses biometric verification in order to identify each voter uniquely.From this paper we have referred – the necessity of the privacy

of voters during voting i.e The confidentiality of the voter should be preserved and there should not be any way to link the voter to the vote casted by the voter.

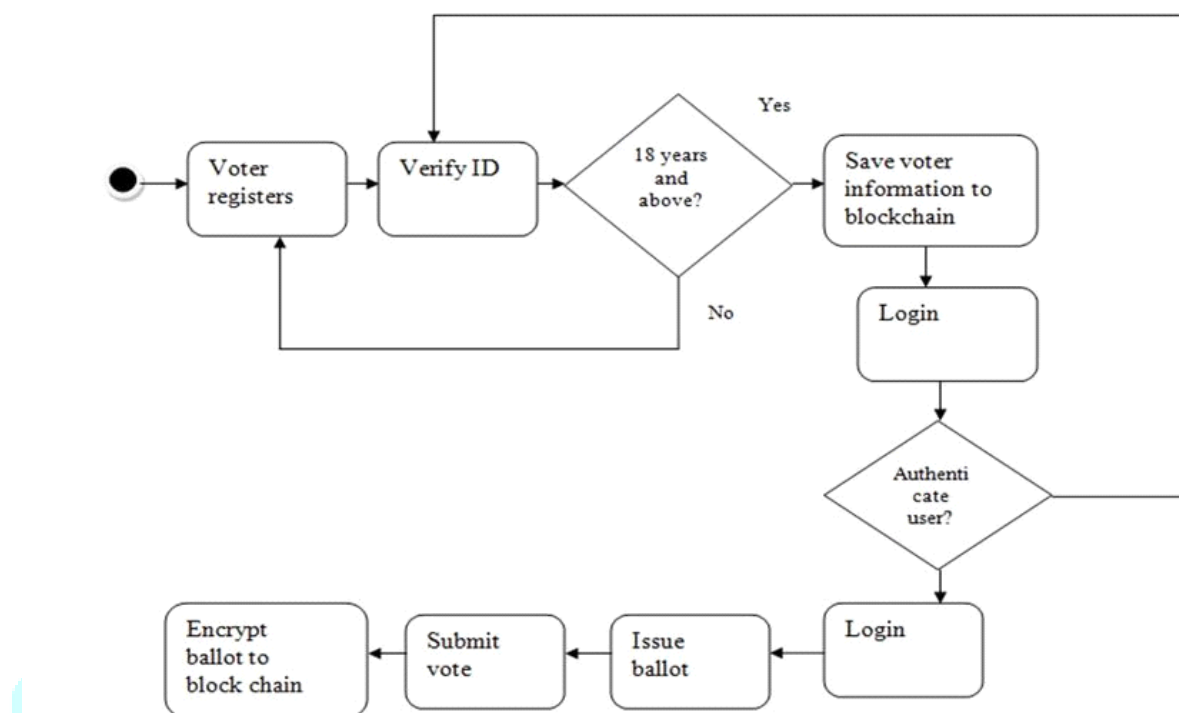
[6] Describes that blockchain serves as a ledger that allows transactions to take place in a decentralized manner. This paper focuses on many applications based on blockchain technology, including those covering numerous fields like financial services, government services, non-financial services, internet of things (IoT), and so on. With Blockchain as it is decentralized it eliminates the need for central authority. In this paper they have discussed in brief about the core structure and working of the blockchain technology i.e it is a public, shared and tamper proof ledger that allows people to share information in a trusted manner. A blockchain database is distributed, shared, fault tolerant and an append-only database that maintains the record in blocks. From this paper we have concluded that Blockchain with its key characteristics, has shown its potential to reshape traditional industries and one of them being Online Voting Systems.

III. PROPOSED SYSTEM

The proposed system has a greater accessibility and possess greater security as authentication, authorization and verification. In this system the voter/user has to first register themselves using the near Blockchain an entry is being made in the centralized database. After the registration the user can log into the application and be apart of the polling process. The user with its valid credentials can log into the system and verify them by entering the one-time password which is valid for a limited period of time. Once the user is logged into their respective account the dashboard contains all the information which is retrieved from the centralized database. Each account is provided with a single token which he will use to cast a vote, casting of vote will take place by transferring the token from the respective user account to the candidate's wallet. A web application is being developed to measure the majority of votes which has the details about the total number of voters, the number of votes cast. Only one vote can be casted from one account.

IV. METHODOLOGY

IV.I. SYSTEM ARCHITECTURE



The system enables voters to cast their vote and is authenticated using OTP sent via phone number and email and will provide a unique ID to voters. Security is the most crucial fundamentals of this blockchain voting system.

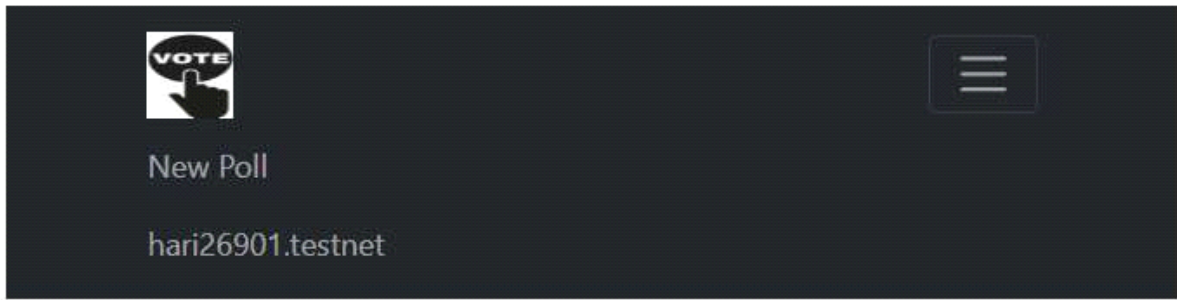
IV.II. NEAR

NEAR is a decentralized application platform with the potential to change how systems are designed, how applications are built and how the web itself works.

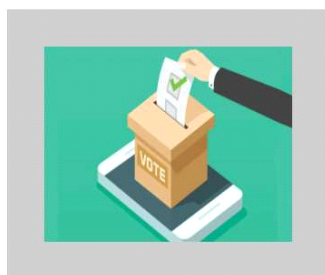
It is a complex technology with a simple goal — allow developers and entrepreneurs to easily and sustainably build applications which secure high value assets like money and identity while making them performant and usable enough for consumers to access.

To do this, NEAR is built from the ground up to deliver intuitive experiences for end users, scale capacity across millions of devices and provide developers with new and sustainable business models for their applications. In doing so, NEAR is creating the only community-run cloud strong enough to extend the reach of Open Finance and power the future of the Open Web.

V. RESULT

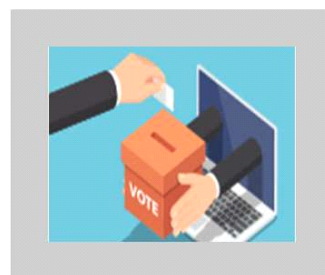


#	List of Polls	Go to Poll
1	who	Go to Poll
2	img	Go to Poll
3	Regular Voting vs E-Voting?	Go to Poll



[Vote](#)

Regular Voting vs E-Voting?



[Vote](#)



Regular Voting vs E-Voting?



1

Vote

1

Vote

Navigation bar with a 'VOTE' button icon on the left and a hamburger menu icon on the right.

Candidate 1 Name

Candidate 1 Image URL

Candidate 2 Name

Candidate 2 Image URL

Prompt

Submit

VI. CONCLUSION

The goal of this research is to analyze and evaluate current research on blockchain based electronic voting systems. The article discusses recent electronic voting research using blockchain technology. The blockchain concept and its uses are presented first, followed by existing electronic voting systems. Then, a set of deficiencies in existing electronic voting systems are identified and addressed. The blockchain's potential is fundamental to enhance electronic voting, current solutions for blockchain-based electronic voting, and possible research paths on blockchain-based electronic voting systems. Numerous experts believe that blockchain may be a good fit for a decentralized electronic voting system. Furthermore, all voters and impartial observers may see the voting records kept in these suggested systems. On the other hand, researchers discovered that most publications on blockchain-based electronic voting identified and addressed similar issues. There have been many study gaps in electronic voting that need to be addressed in future studies. Scalability attacks, lack of transparency, reliance on untrustworthy systems, and resistance to compulsion are all potential drawbacks that must be addressed. As further research is required, we are not entirely aware of all the risks connected with the security and scalability of blockchain-based electronic voting systems. Adopting blockchain voting methods may expose users to unforeseen security risks and flaws. Blockchain technologies require a more sophisticated software architecture as well as managerial expertise. The above-mentioned crucial concerns should be addressed in more depth during actual voting procedures, based on experience. As a result, electronic voting systems should initially be implemented in limited pilot areas before being expanded. Electronic voting over a secure and dependable internet will need substantial security improvements. Despite its appearance as an ideal solution, the blockchain system could not wholly address the voting system's issues due to these flaws. This research revealed that blockchain systems raised difficulties that needed to be addressed and that there are still many technical challenges. That is why it is crucial to understand that blockchain-based technology is still in its infancy as an electronic voting option.

VII. REFERENCES

1. <https://yarnpkg.com/>
2. <https://near.org/>
3. <https://www.blockchain.com/>
4. <https://reactjs.org/>
5. <https://reactrouter.com/>
6. <https://ethereum.org/en/developers/docs/smart-contracts/>
7. <https://www.typescriptlang.org/>
8. <https://www.tutorialspoint.com/typescript/index.htm>

9. <https://www.ibm.com/in-en/topics/smart-contracts>

10. <https://www.geeksforgeeks.org/decentralized-voting-system-using-blockchain/>

11. <https://nodejs.org/api/util.html>

