

Digital Voting Process via Block Chain Technology

M.VAZRALU

Associate Professor, Dept of IT, Malla Reddy
College of Engineering and Technology, Hyderabad,
T.S, India

M.MANIDEEP

UG Student, Dept of IT, Malla Reddy College of
Engineering and Technology, Hyderabad, T.S, India

M.NANDINI

UG Student, Dept of IT, Malla Reddy College of
Engineering and Technology, Hyderabad, T.S, India

M.VIGNESH

UG Student, Dept of IT, Malla Reddy College of
Engineering and Technology, Hyderabad, T.S, India

Abstract: Electronic voting is growing in popularity in today's culture. It has the ability to reduce administrative expenses and boost participation in the electoral process. Voters can cast their ballots from any location with an Internet connection, doing away with the necessity for paper ballots and polling places. Regardless of their merits, online voting solutions are seen with skepticism due to the fact that they present novel security risks. Vote rigging on a massive scale is possible due to a single vulnerability. When used for elections, electronic voting systems must be reliable and secure. However, problems with computerized voting systems may slow their widespread adoption. Electronic voting systems are being developed using blockchain technology due to the end-to-end verification benefits it provides. Electronic voting systems that lack the distributed, non-repudiation, and security features of this technology are missing out. A summary of blockchain-based electronic voting methods is provided here. The primary purpose of this analysis was to look at where things stand with blockchain-based voting research and online voting systems, as well as any problems with foreseeing their future that may exist. This serves as both a conceptual overview of the planned blockchain-based electronic voting application and an introduction to the blockchain's core structure and properties as they pertain to electronic voting. Several of the problems that currently afflict election systems may be solvable with the help of blockchain technologies, it has been found. Yet, concerns about privacy and transaction speed frequently come up when discussing the use of blockchain technology in practical contexts. Secure remote voting is essential for a scalable blockchain-based electronic voting system, and fast transactions are necessary for widespread adoption.

Keywords: Block Chain; Electronic Voting System; E-voting;

I. INTRODUCTION

The method has a very broad application since it may be used in any organization where elections are a significant factor in determining who will serve as representatives in that organization. The system is malleable and may be modified to fit the requirements of the situation as well as the quantity of people that will be using it. Strong encryption methods are utilized by the ideas and techniques used to establish the basis for the system [1]. These methods ensure that the votes are kept private and that the results cannot be tampered with. You are able to make significant choices with the assistance of online voting tools and online election voting systems since they allow you to collect the input of your group in a manner that is methodical and verifiable. In most cases, these choices are made on an annual basis, either at an event (like the annual general meeting of your organization, for example) or at a certain period of the year. You might also conduct continuous polls among the members of your organization (e.g., anonymous employee feedback surveys). India is both a democratic nation and a nation with a democratic government. With the introduction of the Aadhar card, every person in India

is now able to participate in the rapidly developing digital infrastructure of India. The early method of voting, which consisted of counting hands, has given way to more modern methods, which include voting with paper ballots, punch cards, and electronic voting machines. A blockchain is a system that is networked from node to node. Each node is composed of a number of blocks. Each block is made up of three distinct components: the hash, the data, and the previous hash. Each hash is unique to its corresponding data. Hence, in order to modify a specific piece of data, we will need to modify the appropriate hash in the subsequent block. As a hash is data specific, any change in the hash will cause its related data to change, which is essentially impossible since a hash is data specific. It is for the reason that has been outlined above that the blockchain technology is considered to be immutable [2]. The distributed ledger system known as blockchain consists of a network of nodes that are all linked together. A hash was produced for each individual transaction that was executed. The hash that is produced is dependent not only on the transaction that is now being processed but also on the hash of the transaction that came before it. Hence, even a small alteration to the data will have an effect

on the hash of the transaction. It is only possible for a transaction to be included in a block if it is sanctioned by the majority of nodes. Because of this, the users are able to maintain their independence while using the technology. A cursory examination of blockchain reveals that there is reason to believe that it has the ability to make the voting process more trustworthy and secure. The term "online voting method" refers to the "online voting system." There is a database that is kept up to date, and in it is recorded every single name of a voter along with their full contact information. A voter is able to exercise his or her voting rights hassle-free through the use of a technique known as "Internet voting." In order for him or her to cast a vote, he or she must first be registered. Because of concerns about safety, the system administrator is the one who handles registration the majority of the time. Just filling out a registration form is all that is required for the system administrator to register voters on a unique site of the system that he visits [3]. Citizens who are interested in registering are required to make contact with the administrator of the system in order to submit their information. The process of registering a citizen to vote takes place only after the citizen's claim to be a citizen of India has been validated by the administrator of the system, who does this by comparing the details the citizen has provided with information contained in pre-existing databases such as the Registration of Persons. Upon registration, the voter is supplied with a confidential voter ID that he or she may use to enter the system and take advantage of the services that are made available by the system, including voting. If the person provides information that is erroneous or incorrect, then they will not be registered to vote.

II. PROBLEM STATEMENT

The system that was used before is one where information about users and applicants is written down by hand in books. When it comes time to vote, the users have to wait in line for quite some time [4]. There are votes cast that are incorrect and unwelcome. The counting of votes is done by hand, which both takes a significant amount of time and may result in erroneous counting. The preservation of historical data is a highly challenging task. Under the current system, being physically present throughout the election polling process or the counting of votes is a requirement that must be satisfied. Under the existing system, current election procedures are carried out by hand. Since voters have to physically go to polling places in order to cast their votes, there is a significant loss of time. Because of this, a large number of people don't go out to vote, which is one of the most concerning factors since it's one of the

most significant factors. In a democracy, the significance of each individual vote cannot be overstated. It is possible to replace this traditional method with a brand new online system, which would reduce the number of instances of voter fraud while also making the voting process, as well as the counting of votes, more efficient and transparent [5]. If elections are held under the current model of the system during a pandemic, then there would undoubtedly be the spread of illness, such as the case of COVID that occurred during the most recent elections in India. Books provide a challenge when it comes to the storage of vital information. There must be an increase in the number of manual hours spent counting votes. The management of historical data is a tiresome task that requires a large amount of storage space to preserve all of the information on the voters and the candidates. Voters are required to not only travel significant distances but also wait in lengthy lines before casting their ballots [6].

III. PROPOSED METHODOLOGIES

The online voting system is a piece of software that, when used, eliminates the requirement for additional human labor hours to be spent on record keeping and the calculation of votes. Online registration will take place for both the users and the applicants as a result of this. Since the details of the voters and the candidates are saved in the database, the administrator has quick access to the information they contain. Online voting is available to voters, so they don't even have to leave the house to cast their ballot. Just one vote is permitted per user to exclude the possibility of votes being cast more than once. This program maintains the data in a central manner so that it may be accessed concurrently by all of the users. Managing historical data inside a database is a pretty simple process. They have an easy time using the application, which reduces the number of manual hours spent on everyday tasks and, as a result, boosts overall performance. The method that is being presented tries to provide safe digital voting without sacrificing the usefulness of the process. In this context, the system is developed with a web-based interface to enhance user involvement and safeguards such as finger printing to protect against multiple voting. In other words, the system is meant to prevent double voting. Since there is a pressing need to manage the voters, the constituencies, and the candidates for the constituencies, an administrator interface that is pleasant to users has been developed to facilitate easy access. In addition, the approach ensures that all voters are able to participate to the same extent, creating a level playing field that is conducive to a fair and healthy competition among all of the candidates while still protecting the voters'

right to remain anonymous. The goal of the software that is used in the voting process is to make it easier for users of this system to get better information so that they may vote without encountering any difficulties, no matter where they are. Under the method that is being suggested, there is no need for any kind of physical presence throughout the voting or counting process. It is thus quite simple to have elections even in the midst of a pandemic without risking the further spread of the illness or the loss of any human lives. The suggested system features strong authentication, which means that only those who are permitted to vote will be able to do so, and voters won't be able to choose more than one option. The tallying of votes may be completed in a relatively short amount of time, and the results will be shown in only a few minutes.

IV. ENHANCED SYSTEM

The foundation of the design is the E-Voting Transaction Management layer, which is where the transaction for e-voting that was built at the Role Management/Transactions layer is mapped onto the blockchain transaction that will be mined. The most common condition is a transaction, and his mapped transaction also includes the credentials that a voter at layer 1 gave to verify that problem. The voter's fingerprint is one kind of data that might be included in this category. This data is subsequently used to build the cryptographic hash, which is a component of the transaction ID and contributes to its creation. It is anticipated that the User Interaction and Front-end Security layers would be the ones to accomplish the verification of such credentials (layer 1). Manages the financial aspects of the electronic voting system. Mining is the process of getting this transaction to eventually be added to the chain, and it involves a number of different virtual instances of different nodes. This is the category that should be developed the most since it is the most prevalent one where such things might happen. It is possible that this will only occur if the aforementioned values are missing from this problem. A list of the candidates who are competing in the election will be presented to the voters who are qualified to participate. After that, the user may vote for the candidate of his choice by clicking the vote button that is located next to the name of the candidate. As soon as the user submits his vote, a few nodes, also known as miners, will begin to compete with one another in order to finish the transaction. The ethereal crypto currency is known as 'gas,' and the reward is given to the miners who complete the transaction earliest. Miners may win this prize. When the vote has been processed by the smart contract, the result will be updated. When the voter has cast his or her vote for the candidate of

their choice, the logout button will be moved. Now, the voter's record will be removed from the database as soon as the logout button is clicked on by the voter. In the event that the voter attempts to re-login in order to re-cast his vote, an error notice will be shown to him. Along with reducing the amount of space taken up on the data server, this method also stopped voters from logging in more than once. The architecture was chosen with the concept of liquid democracy in mind at all times. A democracy that is considered liquid is one in which voters have the right to see the casting of their ballots to ensure that they are given to the candidate that the voter wishes. Fraud may be cut down using this method.

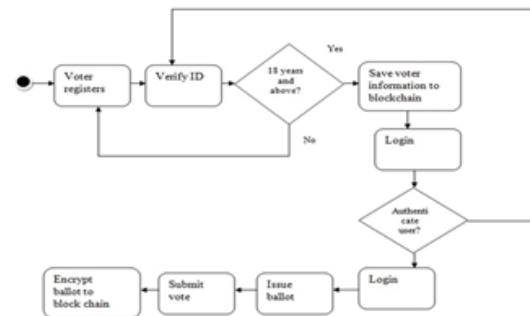


Fig 1: Sequence of System

V. CONCLUSION

Because blockchain is open, more audits and insights can be gained about how elections work. These characteristics go counter to what the law requires. The use of blockchain technology is expanding rapidly. By incorporating blockchain technology into the electoral process, we can have elections that are both trustworthy and economical, all while protecting the privacy of our voters. And because the votes are encrypted, no one can see them unless they control the whole service network, which is almost impossible. These features, originating in redistributive networks, might enrich the democratic processes of elections, particularly those based on direct voter participation. One potential solution based on blockchain technology would make electronic voting more open, transparent, and testable. This article delves into the advantages and disadvantages of blockchain technology for the use case of electronic voting.

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