

Smart Electronic Voting Device using Blockchain Technology

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Abstract—Electronic devices are used for digital voting, in which internet browsers and voting machines are used to cast votes. To overcome that e-voting is introduced during the period we use voting machines and i-voting using browser. E-voting has high-security constraints because it should not be hacked or used by unauthorized personnel. With such a risk factor system has to secure the voting process and it also enhances the speed of the process of the machine. The only easy way to do this is with the help of blockchain technology. Blockchain technology will fasten the system process and also provide high security with cryptocurrency. The system looks like distributed database in which all the transactions are done. A block stores all the transaction values. Blockchain Technology a secure and robust environment is created and stores maximum voting counts through which confidential digital voting is implemented.

Index Terms— Electronic voting machine, Blockchain, i-voting, e-voting.

I. INTRODUCTION

Voting with democracy became serious and crucial act in many countries. The common way to vote easily is done through paper voting process, but it's time to merge voting with modern system in this 21st century. People Will is a well-honored phenomenon for representing opinion in formation of electoral bodies. College union varies from these electoral bodies. Voting is a tool helps people to select their true leader so it is like will of the people over the years. The voting [1] tool improved its trust among people over the selection to gain vote of majority. This helped in democratization of the voting system and value to elect the parliaments and governments. IN 2018, there were 167 counties out of 200 who had their democracy, full, flawed, or hybrid etc., [2]. Since people trust on democracies is increasing people they believe deeply on voting system it is important to safeguard their belief. With the help of emerging trust on the democratic institutions, the voting system introduced as a platform to support people to elect their representatives and form government [3]–[6]. People were empowered with a trust that the government will take care of the issues like health and education policies, Security, international relations and tax benefit of the people. To make the voting process more effective the institutions like the 'Election Commission' came into existence in different parliamentary democracies. The institutions, along with setting up the process and legislation for conducting the elections, formed the voting districts, electoral process, and the balloting systems to help in the conduct of transparent, free, and fair elections. The concept of secret voting was introduced at the beginning of the voting system. Since the trust in democratic systems is increasing it is important to uphold that the trust in voting should not

decrease. In past, there were more examples that the voting process was not completely hygienic and faced the will of people was not observed to be effectively quantified several issues including transparency and fairness and translated in terms of the formation of the governments. Those examples are in countries like India, Bangladesh, Nigeria, Pakistan, and Brazil. Since all these countries are among the emerging democracies, in the next decades they will likely emerge as full democracies and the vote and the voting process will earn more respect and trust over time. There are some multifold mistrust and disadvantages are not limited to the following national problems as Political instability, Compromised writ, Compromised governance, Disorder in the state institution, Chain of command in state affairs, Economic instability and Mistrust in electoral process.

II. LITERATURE SURVEY

The Author of the paper analysed that in the past, digital vote casting systems have now not seen huge adoption due to facts privateness worries. [2]Previously proposed e-balloting structures employ a principal database to save records, resulting within the servers used to keep those databases being a unmarried point of failure. These systems have additionally been observed to be vulnerable to DoS assaults, leading to issues over their reliability. Blockchains were used to build relaxed and scalable allotted systems which have shown several blessings over centralized systems. They have visible makes use of in sectors starting from finance and healthcare to meals and energy. In this paper, we gift Vote Chain, a blockchain based vote casting gadget to assist carry transparency and protection to polls. We document on our implementation of Vote Chain, as well as the consequences acquired in testing the gadget in a actual-international ballot which prove that any such gadget can be used in practice for large-scale elections[4]. Blockchain has been stated to be one of the technology for the destiny, and researchers have argued that this era is going to disrupt many industries in the coming years, and democratic elections are one of the key areas blockchain goes to convert. Several groups have all started experimenting on blockchain-enabled e-vote casting systems, together with Democratic Earth, Horizon State and Follow My Vote. This have a look at seeks to conceptualize a blockchain architecture for the storage of election consequences that offer accept as true with, transparency, and immutability the use of dispensed ledger generation (DLT)[3]. One of the principle troubles with elections in Ghana and other sub-Saharan African countries is the incorrect recording of votes from polling stations, constituencies and at the countrywide office. There are times in which votes recorded at the polling station adjustments on the constituencies either deliberately or by chance. The take a look at mentioned the primary properties of the blockchain, which includes disbursed ledger, consensus mechanisms and cryptographic hash feature, and how it may be used to address the modern-day challenges in vote recording at some point of elections. The take a look at evaluates current blockchain-enabled e-balloting systems and designs a blockchain-based totally vote recording machine that gives immutability, accept as true with, and transparency. The proposed layout addresses the issues of vote tempering because transactions delivered to the block are at ease with a cryptographic hash feature which makes tempering of the votes saved inside the blockchain almost not possible and make it immutable. Blockchain is certainly one of the upcoming technologies in computing. It gives a tamper-evidence distributed ledger which ensures integrity and authentication, as well as removes the need of a centralized relied on authority. These outcomes in a relaxed and relied on device determined by way of the public. Although the blockchain become first carried out to crypto currencies (which led to bit coin), the functions it offers are perfect for several different applications. In this paper, we expand a blockchain-primarily based solution for securely digitizing the balloting procedure. Election technique is a vital test of democracy and rigging the election may additionally have disastrous outcomes, through this solution, we goal to provide a platform for electorate to forged their vote securely online, from their domestic. The votes may be published within the blockchain, a good way to be observable with the aid of all people. This might bring about a tamper-proof ballot gadget which could be impossible to manipulate. The anonymity of citizens could be maintained. Project goal is to apply this within the Indian context and similarly display how our machine meets the requirement of a web balloting machine, and the way it resolves the troubles found in modern-day in addition to proposed structures for the equal. The revolution in the device of records has reached a exquisite extent and paves a way for a effective generation known as blockchain for storing information and acting transactional operations in a decentralized network. Blockchain was first evolved to function a public transaction ledger for the crypto currency named "Bitcoins". Later, one such software is the net vote casting scheme. A ballot is a tool this is used to cast the votes in an election. In poll primarily based voting, still there may be no gadget to avoid proxy casting and recasting. We do no longer have any era to view our casted votes. In the electronic vote casting gadget primarily based on Blockchain, addresses some of the restrictions in the existing systems and labels some of the problems of e-voting. The idea in blockchain enabled balloting scheme is to integrate Aadhar card and Mobile quantity of the people using which the OTP is generated after which the voter is allowed to

forged their vote. Ethereum is an open supply blockchain based era that uses each private blockchain and remix platform and it acts as a device in storing the facts. The user can forged their votes from everywhere (nearby booth) and the corresponding contestant are notified to the users primarily based on their constituency and candidate guarantees. If NOTA votes crossed above 50%, then all the candidates are disqualified and are approved to contest for the next election. If any of the citizen do now not ballot their vote, then a caution message will be dispatched to the respective man or woman. They need to offer a valid reason for no longer vote casting within duration of 6 months; if the cause is invalid then important movement could be taken by using the authorities. If a member of citizen desires to view his/her balloting reputation then they can view it by using entering their aadhar range and the block number that is dispatched to them through the cell app. In Implementation of system addresses many troubles are faced in vote casting scheme and is used to avoid proxy casting and recasting and is also used to achieve above 95% of the vote. Traditional elections fulfill neither residents nor political government in current years. They aren't fully comfy since it is simple to attack votes. It threatens also privacy and transparency of citizens. Additionally, it takes too much time to be counted the votes. This paper proposes a solution the use of Blockchain to take away all risks of conventional elections. Security and records integrity of votes is without a doubt supplied theoretically. Voter privacy is every other requirement that is ensured in the system. Lastly, ready time for results decreased appreciably in proposed Blockchain balloting machine.

III. PROPOSED SYSTEM

The framework proposed shows the effectiveness of the polling process, hashing algorithm utility, block creation and sealing, data accumulation, and result declaration by using the adjustable blockchain method.

It claims the security and data management challenges in blockchain and provides an improved manifestation of the electronic voting process. By casting votes as transactions, we can create a block chain which keeps track of the tallies of the votes. Everyone can agree on the final count because they can count the votes themselves and because of the block chain audit trail, they can verify that no votes were changed or removed, and no illegitimate votes were added.

A. Advantage of Proposed System

- Digital voting has enhanced security.
- It has increased efficiency and speed.
- It can use improved traceability.
- It completely eliminates the possibility of casting “Invalid Votes”.
- Results can be reported and published faster. Voters save time and cost by being able to vote independently from their location.

IV. SYSTEM DESIGN

This proposed system consists of Arduino Nano, Arduino UNO, Accelerometer, Piezoelectric late/Force Sensing Resistor, GSM Module used to alert caretaker when fall occurs.

A. Voter Registration

Voters those who are first time to vote should have an voter id with their details such as name, D.O.B, age (above 18), location which can be mentioned or tracked by GPS. If we already have a voter ID card, then our name ideally appear on the electoral roll (which shows the list of eligible candidate names). There is an entire site named National Voter's services Portal. In this Portal it has the details of the voters which have to be filled. EMB determines who is eligible to vote, counting the votes, conduct polling.

B. Candidate Registration

The criteria for registration a political party or candidate for election should have the identity proof such as Aadhaar and or proof of geographical presence to ensure that person in a citizen. The Political parties put forward the candidate for electron, after the acceptance of EMB (Election Management Body) nomination. The candidate is allowed to stand in the election only when there is majority of the support.

System Architecture

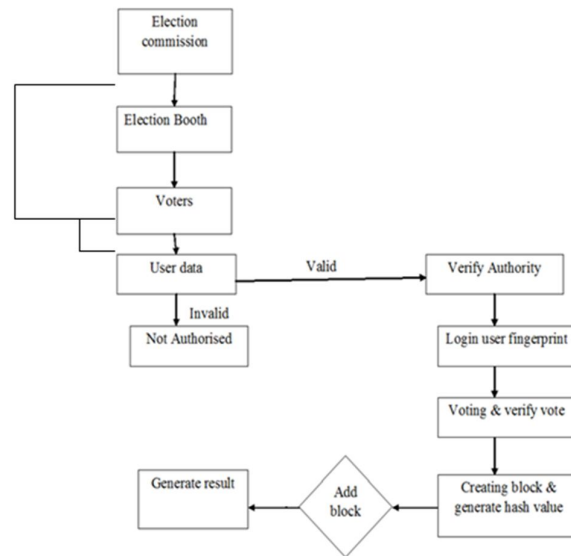


Figure 1. System Architecture for Voting Process

The screenshot shows the 'User Registration' page on the Election Commission of India website. The page has a green header with the logo and name of the Election Commission of India. Below the header is a navigation bar with links: Home, Register To Vote, Candidate Nomination, Election Result, Login, About Us, and Contact Us. The main content area is titled 'User Registration' and contains a form with the following fields: First Name, Last Name, Age, Gender (Male, Female, Other), Aadhar Number, Address, City, State (dropdown), Pin Code, Mobile Number, E-mail, User ID, and Create Password. On the right side, there is a sidebar with links: Instructions For Voter, Instructions For Candidate, Important Dates, and Electoral Roll. The browser window shows the URL 'localhost:8080/OnlineE_Voting/' and the time is 11:17 AM.

Figure 2. User Registration

C. Voters Login

Log in to the external website www.eci.gov.in that opens in a new window & click on online voter's registration. Sign up and get login username and password. Once the login is done, it directly takes the page to next information related to the signup details. Once the voter is logged in, then the fingerprint verification is verified.

D. Voting Process

Voting is the method by which electorate appoints its representative in its government. Voting is the method, in which electorate directly takes decision.

Voting process happens in the particular time from morning to evening in the date. Every citizen takes part in the election process by direct voting or by online voting methods. This method can be accessed even from out of station. Even though, the person accesses the application from out of station, they can be able to view only their candidate details and election related details in their location.

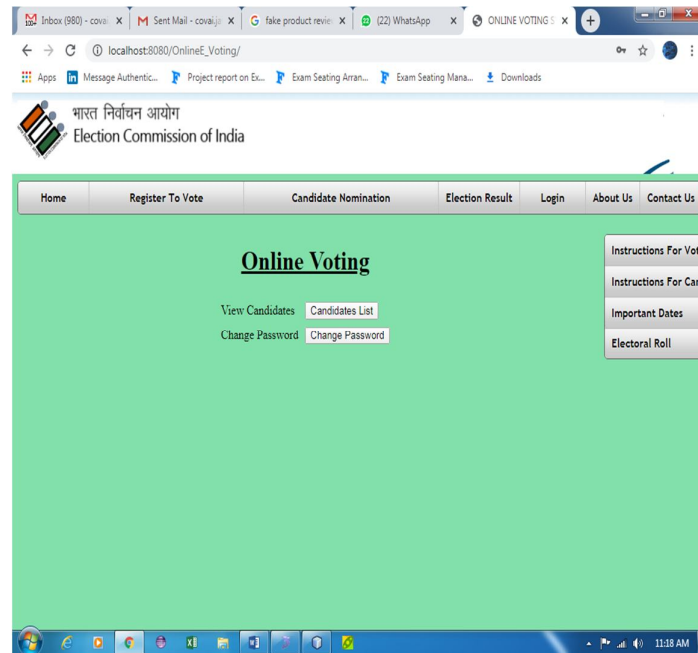


Figure 3. Voting Process

E. Result Viewer

Once the voters, chosen their candidate can vote and then click submit button. It shows the most chosen candidate in the base total votes counted. The total votes counted shows in the privacy manner, so that the particular voter can only view that from online only in that particular time. The online status keeps on updating from time-time. The voter can login and check the online status but cannot modify the applied vote.

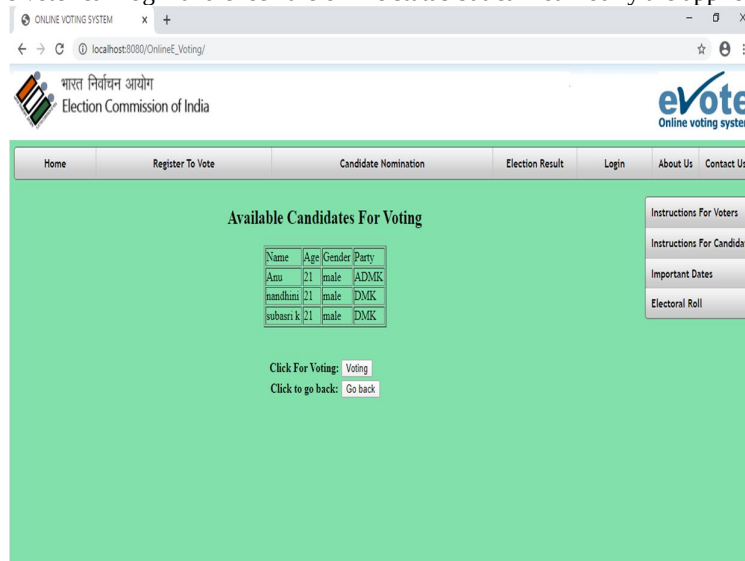


Figure 3. Voting Process Result Viewer

V. CONCLUSION

The project concludes that by using block chain we can manage the voting directory and also we can avoid failures of voting list and fraud detection. The block manages the hash values and dataset. This research has proposed a framework based on the adjustable block chain which could recognize the troubles in the polling process, selection of the proper hash set of rules, selection of adjustments in the block chain, process of vote casting information management and the security and authentication of the balloting system.

Block chain has plenty to offer the vote casting manner, but it nevertheless desires government and the leading bodies to embrace this new emerging Era.

FUTURE ENHANCEMENT

The electronic voting, however, has emerged as an alternative however nonetheless not being practiced at a massive scale. The digital vote casting is expected to have an exquisite future yet the past is not that glorious. In a few countries e-voting isn't always an option while few are in a procedure to put off the security, variability, and anonymity worries. There are troubles that require immensely deep attention by means of the legislatures, technologist, civil society, and the human beings. This research has proposed a framework based totally on the adjustable blockchain which could recognize the troubles in the polling process, selection of the proper hash set of rules, selection of adjustments in the blockchain, process of vote casting information management, and the security and authentication of the balloting system. The strength of blockchain has been used adjustably the dynamics of the electronic vote casting procedure.

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