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E-Voting System using Blockchain Technology for Distributed Environment

Rahul Rakhe¹, Rahul Kale¹, Pritish Bisht¹, Prof. K.S.Balbudhe²

B.E. Student, Dept. of IT, PVG's COET, Pune, India¹

Asst. Professor, Dept. of IT, PVG's COET, Pune, India²

ABSTRACT: Electronic voting (also known as e-voting) system refers to voting using electronic means and to take care of the votes given by the user and counting the votes accurately. An e-voting system must be secure, as it should not allow duplicated votes and be fully transparent, while protecting the privacy of the attendees. The disadvantages of traditional voting system are that there is no reliability of voting. No assurance that people gave the votes are not changed before they are counted on the system. There is no transparency between the voter and the system. So, to overcome all these issues we are proposing to use block chain technology as a medium in the voting system. The objective of such a scheme would be to provide a decentralized architecture to run and support a voting scheme that is open, fair, and independently verifiable. In this, we propose a potential new e-voting protocol that utilizes the block chain as a transparent ballot box. Therefore, there would be more transparency between the user and the system. The advantages that we get while using the e-voting system would be to reduce election expenses including material, logistics and salary cost. Peoples opinion would be more public and more accessible by politicians and managers. If the voter is out of station, he can vote remotely. So, it strengthens the overall attendance. E-voting can be very helpful because everyone can easily access the election and uses his/her votes and declares his/her choice. People can share private hyperlinks to any created poll (as long as they know the link) and people who have the link can vote and one browser can only use one vote. E-voting is being studied extensively, and many implementations are tested and even used for a while.

KEYWORDS: Blockchain, Electronic Voting System, e-voting

I. INTRODUCTION

Technology has positive impacts on many aspects of our social life. Designing a 24 hour globally connected architecture enables ease of access to a variety of resources and services. Furthermore, technology like the Internet has been a fertile ground for innovation and creativity. One such disruptive innovation is blockchain, a keystone of cryptocurrencies. The blockchain technology is presented as a game changer for many of the existing and emerging technologies/services. With its immutability property and decentralized architecture, it is taking center stage in many services as an equalization factor to the current parity between consumers and large corporations/governments. One potential application of the blockchain is in e-voting schemes. The objective of such a scheme would be to provide a decentralized architecture to run and support a voting scheme that is open, fair, and independently verifiable. In this work, we propose a potential new e-voting protocol that utilizes the blockchain as a transparent ballotbox.

We propose an e-voting scheme based on blockchain technology that meets the fundamental e-voting properties whilst, at the same time, provides a degree of decentralization and places as much control of the process in the hands of the voters as was deemed possible. We integrate the blockchain paradigm into e-voting procedure and come up with a feasible and general e-voting protocol. We Implement a system which provides a secure and flexible voting mechanism, satisfies almost all of the main requirements for an e-voting system and weakens the power of the election organizer.

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E-voting is more preferable because e-voting is available for everyone who has a computer, or a mobile phone, every single administrative decision can be made by people and members; or at least peoples opinion will be more public and more accessible by politicians and managers. This will eventually lead humanity to the true direct democracy. Its important for us since elections can easily be corrupted or manipulated especially in small towns, and even in bigger cities located in corruptcountries.

Plus, large-scale traditional elections are very expensive in the long term, especially if there are hundreds of geographically distributed vote centres and millions of voters. Also, the voters (mainly for members of organizations) might be on vacation, on a business trip or far away for any other reason, which will make impossible for that particular voter to attend the election and may lower the overall attendance. E-voting will be able solve these problems, if implemented carefully. This paper explores the potential of the block chain technology and its usefulness in the e-voting scheme, which is then implemented.

II. RELATED WORK

System presented in the issues and effectiveness of blockchain technology on digital voting tells us thatblock chain is a technology that enables moving digital coins or assets from one individual to other individual. Blockchain concept can be understand with the concept of linked list in Data Structure, because its next key address are stored in previous key and they are linked with each other. It was first conceptualized in 2008 which implemented in the successive year as a core component of the digital currency bitcoin, which works as a public ledger of all transactions. Digital voting through block chain technology has some issues and effectiveness but their concern is to focused that how much system make this technique more effective. Here, their main focus is that how system can implement this technique i n their daily life. Our country India is deeply interested for future use and lots of efforts are being done to overcome the security issues as early as possible[1].

System presented in the Electronic voting machine based on Blockchain technology and Aadhar verification states that a nation with less voting percentage will struggle to develop as choosing a right leader for the nation is very essential. Their proposed system designed to provide a secure data and a trustworthy election amongst the people ofthe democracy. Since Aadhar card is the most needed foraperson identity hence deploying an election process using it is highly recommendable. Blockchain will be publicly verifiable and distributed in a way that noone willbe ableto corrupt it. Their proposed system is mainly designed for our country based on Aadhar verification where the details of the persons who are above 18years are extracted from Aadharcard database since it had become mandatory in the present scenario. To ensure more security, finger print of voter is used as the main authentication resource. The system will allow t h e voter to vote through his finger print. As soon as they cast their vote, blockchain technology comes into existence which is integrated inside EVM. By adopting Blockchain in the distribution of databases can reduce one of the cheating sources of database manipulation[2].

For e-voting to become more open, transparent, and independently auditable, a potential solution would be thebase for it i.e block chain technology and its usefulness in the e-voting scheme ,which is then implemented [3]. Electronic voting systems attempt to be as easy to use and secure as ideal traditional elections and attempt to eliminate the human errors described. This is hard to achieve, because electronic voting systems need a strong encryption to guarantee security, integrity and anonymity of the vote. This must be ensured and still result in a user-friendly application, which is often hard to achieve. But to assume that traditional elections are completely secure and correct is also questionable, as system already so, this is a good opportunity to think about reinventing elections with the help of computers and cryptography [4].

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System presented in the secure end-to-end verifiable e- voting system using zero knowledge based blockchain that present a cryptographic technique for an authentication, end to end verifiable and secret ballot election. Voters should receive assurance that their vote is cast as intended, recorded as cast and tallied as recorded. The election system as a whole should ensure that voter coercion is unlikely, even when voters are willing to be influenced. System have modified the DRE-ip system so that if any recorded ballot is tempered by an adversary before the tallying phase, it will be detected during the tallying phase. In addition, system have described a method using zero knowledge based public blockchain to store these ballots so that it remains tamper proof. To the best of our knowledge, it is the first end-to end verifiable Direct-recording electronic(DRE) based e-voting system using blockchain. Their proposed system assumes that the bulletin board is insecure and an adversary as read and write access to the bulletin board. System have also added a secure biometric with government provided identity card-based authentication mechanism for voter authentication. System is able to encrypt ballot in such a way that the election tally can be publiclyverifiedwithoutdecryptingcastballotsmaintainingend-to-end verifiability and without requiring these cure bullet inboard[5].

III. PROPOSED METHIOD

We propose a system that highlights the implementation of e-voting using blockchain and from a practical point of view in both development/deployment and usage contexts. We are building an electronic voting system that satisfies the legal requirements of legislators has been a challenge for a long time. Distributed ledger technologies are an exciting technological advancement in the information technology world. Blockchain technologies offer an infinite range of applications benefiting from sharing economies. Here weaim to evaluate the application of blockchain as service to implement distributed electronic votingsystems.

In this we propose a potential new e-voting protocol that utilizes the blockchain as a transparent ballot box. The protocol has been designed to provide the fundamental e- voting properties as well as offer a degree of decentralization and allow the voter to give their vote in a secure manner (within the permissible voting period) using electronic means.

This system highlights the implementation of e-voting using blockchain in distributed environment. The system consist two different phases like admin and user, initially user creates own profile with some inputs e.g. name, address, AadharNo., PAN No. and other mandatory KYC details. Once users registration has done, admin validate those users according to the desired policy. Valid user can do the voting to desire time, and concurrently system generates the each block in blockchain. During the execution system use SHA-256for hash generation, mining algorithm for achieved the valid hashpolicy and consensus algorithm for validation all P2P nodes. This work aims to assess the request of blockchain as service to implement distributed electronic voting systems.

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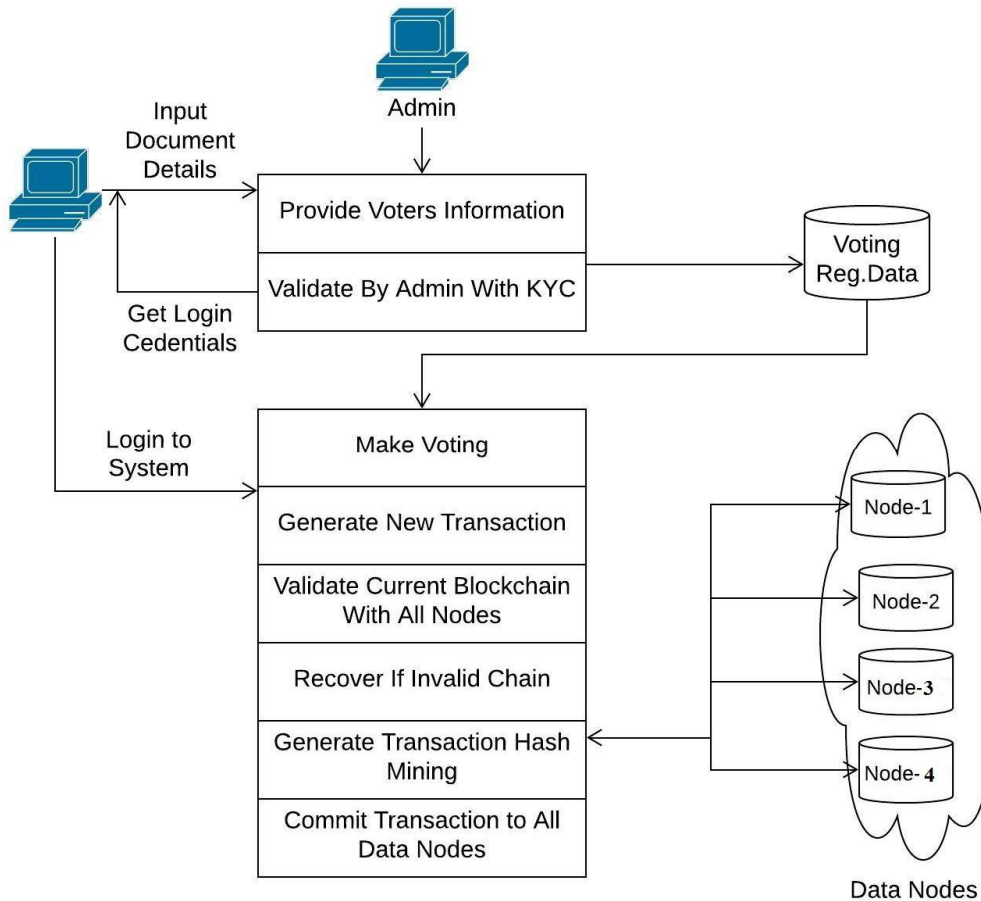


Fig. 1. Proposed System Architecture

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IV. IMPLEMENTATION AND DISCUSSION

In our study, we have used Blockchain chain technology i.e. a digital ledger technology that can securely maintain continuously growing lists of data records and transactions, has the power to potentially transform health care, according to industry experts. By simplifying and expediting the way the voting industry processes data in such areas

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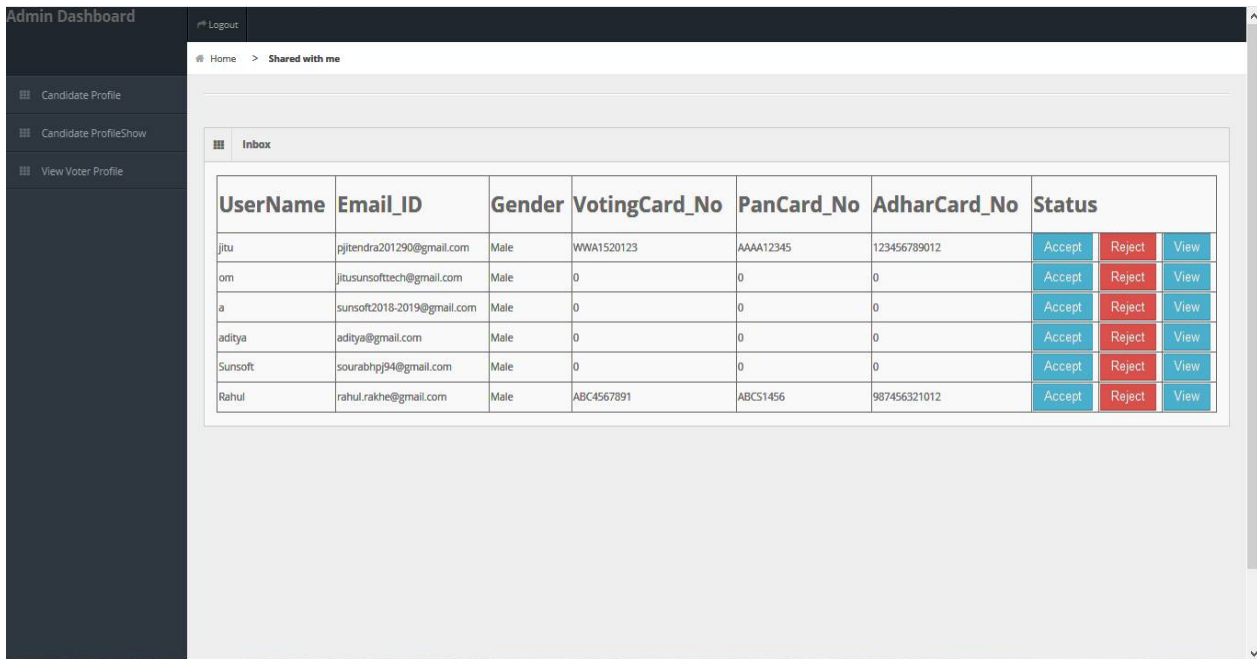
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as revenue e-voting data interoperability and supply chain validation. blockchain has the power to dramatically reduce back-office data input and maintenance costs and improve data accuracy and security.

Firstly, we create a multiple distributed ledger and e-voting transnational data and stored all transaction data into multiple data nodes. Each node will hold the specific block for each transaction. Same block has replaced for all the nodes, and generates a valid block chain. Now the System will retrieve data from all data nodes and commit the transaction, it should be any kind of DDL, DML as well as DCL transactional query. If any block chain invalid during the validation of data servers, then system will automatically recover whole blockchain using majority of servers. We will address and eliminate the runtime server attacks and recover it using own blockchain. System will provide the each transactional validation, for all servers.



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a	sunsoft2018-2019@gmail.com	Male	0	0	0	Accept Reject View
aditya	aditya@gmail.com	Male	0	0	0	Accept Reject View
Sunsoft	sourabhp94@gmail.com	Male	0	0	0	Accept Reject View
Rahul	rahul_rakhe@gmail.com	Male	ABC4567891	ABCS1456	987456321012	Accept Reject View

Fig. 2. Admin

In the admin module, we use the hash generation algorithm and the hash will be generated for the given string. Before executing any transaction, we use peer to peer verification to validate the data. If any chain is invalid then it will recover or update the current server blockchain. Mining algorithm is used for checking the hash generated for the query till the valid hash is generated.

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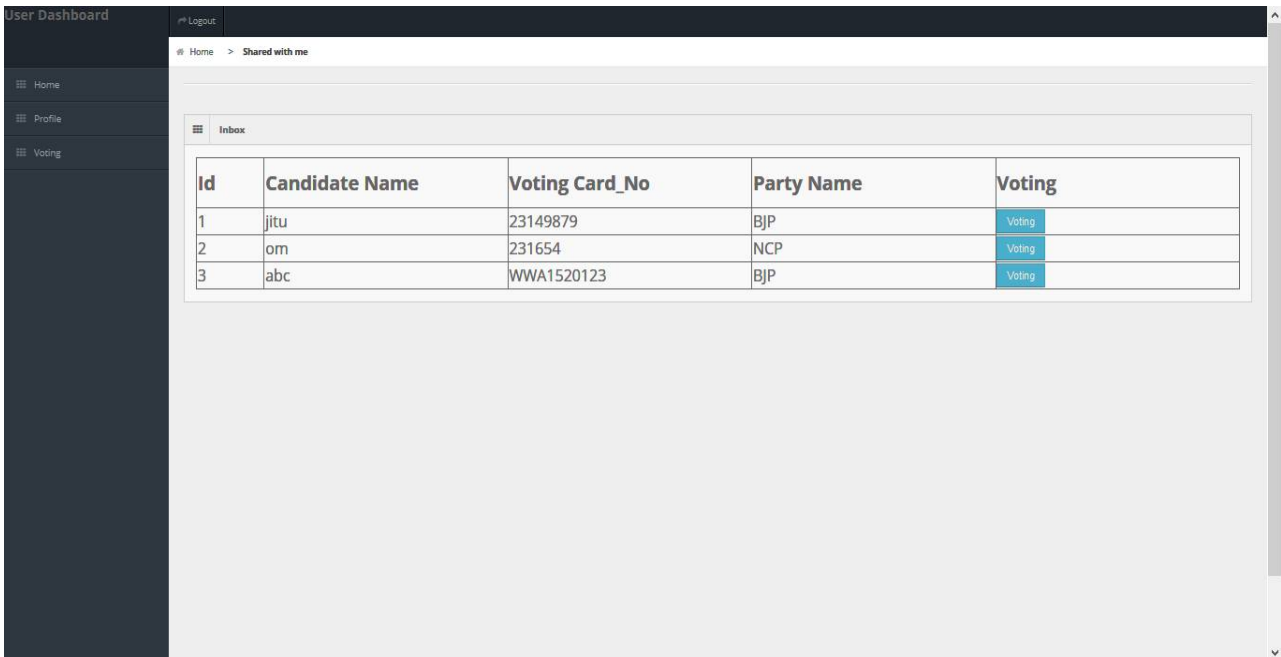


Fig. 3. Voting

The voting system will only allow the authorized user to vote. Here the voter can see the candidates and vote for their party. After allowing access through admin, user can see all these candidates and can get an option to vote.

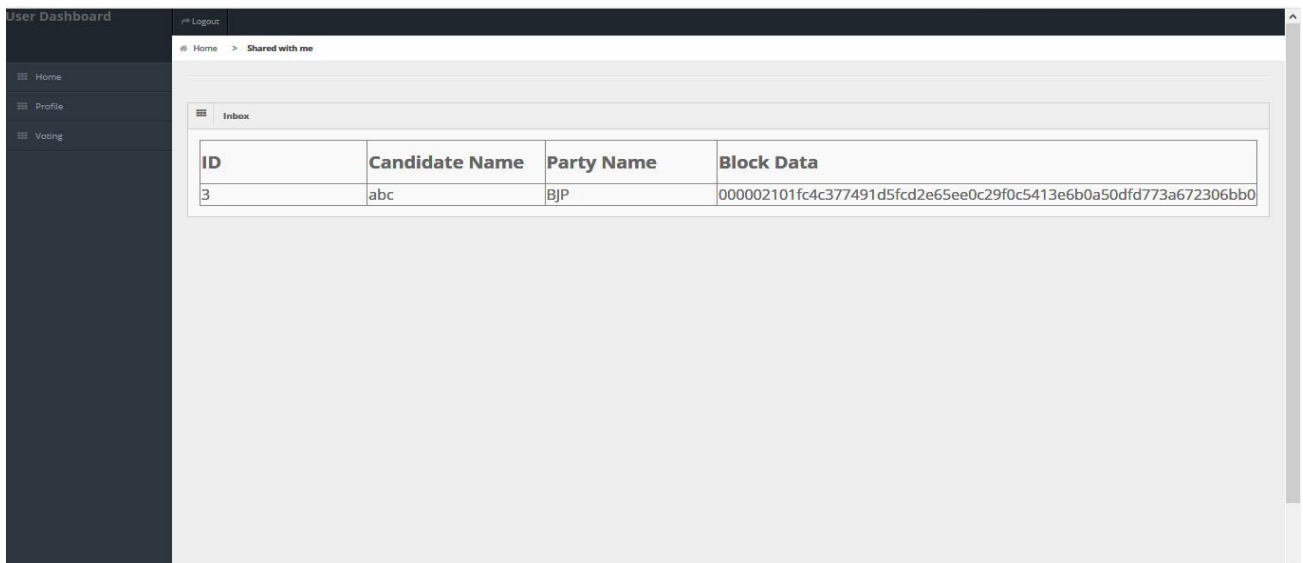


Fig. 4.Hash Generation

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In the block Generation and blockchain validation phase, the data is processed in multiple servers so that the transactions are processed in sequencing P2P distributed network. This illuminates the quality of service and time limits.

In the Consensus Algorithm validation and block chain recovery phase, The Consensus algorithm is used by the network which will store the data to the block that is added to blockchain and all nodes in the network admit the respective block and extend the chain base on the block. the consensus model helps us to preserve the integrity of data recorded on the blockchain. it is reported that various consensus mechanisms and issues could result when the consensus mechanism fails including blockchain forks, consensus failures, dominance issues, validating nodes and deficient performance of the blockchain network.

In the results generation phase, firstly E-voting will be done successfully and secondly if attacker attacks the system, then the system will automatically recover the blocks using blockchain technology.

V. CONCLUSION

There are many research directions in applying Blockchain technology to the voting industry due to the complexity of this domain and the need for more robust and effective information technology systems. An interoperable architecture would undoubtedly play a significant role throughout many voting use cases that face similar data sharing and communication challenges. From the more technical aspect, much research is needed to pinpoint the most practical design process in creating an interoperable ecosystem using the Blockchain technology while balancing critical security and confidentiality concerns in E-voting.

Whether to create a decentralized application leveraging an existing Blockchain, additional research on secure and efficient software practice for applying the Blockchain technology in voting is also needed to educate software engineers and domain experts on the potential and also limitations of this new technology. Likewise, validation and testing approaches to gauge the efficacy of Blockchain-based voting architectures compared to existing systems are also important (e.g., via performance metrics related to time and cost of computations or assessment metrics related to its feasibility). In some cases, a new Blockchain network may be more suitable than the existing Blockchains, therefore, another direction may be investigating extensions of an existing Blockchain or creating a voting Blockchain that exclusively provides e-voting services.

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