



## Online Voting System Using Secure Blockchain

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### ABSTRACT-

Building a protected electronic democratic system that offers the fairness and security of current voting scheme, while giving the straightforwardness and adaptability presented by electronic frameworks has been quite difficult for quite a while. The significant angle that must be considered is security in online processing system. BlockChain technology helps in keeping up with the protection from digital assaults in this application. In this work-in-progress paper, we evaluate an application of blockchain as a service to implement distributed electronic voting systems. This system provides distributed architecture of storing the data and this distributed architecture system stores the data among different servers. The paper proposes a clever electronic democratic framework dependent on blockchain that tends to a portion of the limits in existing system. Online Voting System will enhance the integrity, optimize the voting process, produce steady voting outcomes and strengthen the transparency of the voting system and improves the security and diminishes the expense of hosting a nationwide election.

Keywords: BlockChain Technology, Electronic Voting System, Distributed architecture.

## I. INTRODUCTION

Election security is a subject of natural security in every democracy. For the past ten years, the computer security industry has focused on the possible outcomes of electronic democratic systems, with the goal of reducing the cost of holding a public election while also fulfilling and expanding the security states of a political campaign. The democratic structure has been based on pen and paper since the outset of equally selecting applicants. To reduce fraud and make the voting process traceable and transparent, a new election system must replace the traditional pen and paper layout. The security community has deemed electronic democracy machines to be imperfect and fundamentally dependent on actual security concerns. Anyone who has physical access to such a machine can attack it, so influencing all votes cast on that machine.

To resolve EVM limitations, Blockchain technology is an irreplaceable existence. Nature of blockchain technology like an incontrovertible ledger, immutable, and distributed.

Key features of blockchain technologies are:-

- Eliminate the central database. P2P Network that each node has the same blockchain (data) but distributed that resulting in no single point of failure.
- When a new data or so-called block creating, the previous block will be referenced by the new block that constructed an immutable chain which protects data from tampering.
- Control over half of the nodes (51%) in the network which made the system extremely secured (Greatest wins the game.). It is impossible to launch DDoS to multiple nodes in the network simultaneously.

## II. BACKGROUND

Technologies used in this Project:-

- **Python**-It is used as the backend language in the project. Python is a high-level, interpreted, and general-purpose dynamic programming language that focuses on code readability. It has fewer steps when compared to Java and C. Python ranks among the most popular and fastest-growing languages in the world. Python is a powerful, flexible, and easy-to-use language. In addition, the community is very active there. It is used in many organizations as it supports multiple programming paradigms. It also performs automatic memory management.

- **Flask** - Flask is a web framework, it's a Python module that lets you develop web applications easily. It's has a small and easy-to-extend core: it's a micro framework that doesn't include an Object Relational Manager (ORM) or such features. Flask is often referred to as a micro framework. It is designed to keep the core of the application simple and scalable. Flask is based on the Jinja2 template engine. Jinja2 is a popular template engine for Python. A web template system combines a template with a specific data source to render a dynamic web page.
- **PostgreSQL**-PostgreSQL is a powerful, open source object-relational database system that uses and extends the SQL language combined with many Features that safely store and scale the most complicated datawork- loads. PostgreSQL comes with many features aimed to help developers build applications, administrators to protect data integrity and build fault-tolerant environments, and help you manage your data no matter how big or small the dataset. In addition to being free and open source, PostgreSQL is highly extensible.

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### III. EXISTING SYSTEM

#### A. How it Actually works

- **Paper-based Voting**-The voting system currently being used by the association is a paper based system, in which the voter simply picks up ballots sheets from electoral officials, tick off who they would like to vote for, and then cast their votes by merely handing over the ballot sheet back to electoral official.  
The electoral officials gather all the votes being cast into a ballot box. At the end of the elections, he electoral officials converge and count the votes cast for each candidate and determine the winner of each election category.
- **Direct Electronic Voting System**- EVM could be defined into three types which are dials, touchscreens, and buttons. After all, they possess one thing in common that stored the vote into CPU memory. The idea is to combine the voting and counting process which literally means record the vote when it was cast by the voter. The voter cast vote press any one of the buttons that represent the candidate on the EVM.

#### B. Disadvantage of Existing System

- Casting votes using paper ballot is a time consuming task.
- Standing in long queues.
- No way to audit this system unless you manually re-count the votes.
- The cost of expenditure on the paper ballot is way higher.
- Hackers can hack the machine and can tamper the vote counts easily.
- Loss of entire data due to some damages cause.
- Fake display units can be installed which can generate fake votes from the backend.

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### IV. PROPOSED SYSTEM

#### A. DESCRIPTION

Current voting systems like ballot box voting or electronic voting suffer from various security threats such as DoS attacks, polling booth capturing, vote alteration and manipulation, malware attacks, etc. and also require huge amounts of paperwork, human resources, and time. This creates a sense of distrust among existing systems.

Therefore the solution to the problem is to implement a blockchain technology. Using blockchain, voting process can be made more secure, transparent, immutable, and reliable. BlockChain is a 'chain' of blocks where each block contains an aggregated set of data. Data once inserted in blockchain we cannot update or delete and cannot be manipulated. It is having a decentralized architecture where it stores the data among different servers.

#### B. WORKING OF PROPOSED SYSTEM

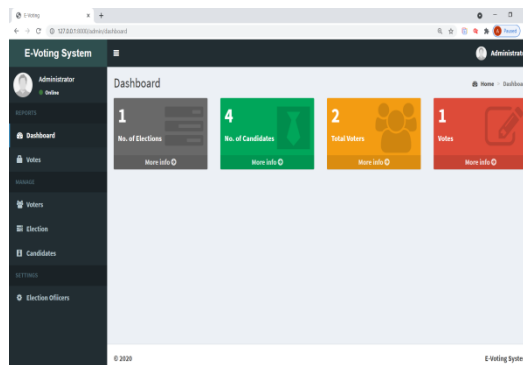
Here the voter will do his/her registration using aadhar id. If voter is eligible for voting process then only system accept registration of voter. Eligible voter can login with his/her aadhar card verification based on the biometrics. When voter enter in system he gets list of all candidates. Voter chooses candidate for voting and give candidate the vote. That Vote is a block which is added in blockchain and broadcast to every system in network. Every voter follow this same process and every block is added in blockchain and every block contains previous blocks hash value. So every block is connected with each other by hash value of previous block. As blockchain is decentralized then blockchain is created on every computer system in network. So hacking of blockchain and tampered with data is not possible. When whole election process is over, all votes calculated and result get declared. Since current voting systems don't suffice to security needs of modern generation, there is a need to build a system that leverages security, convenience, and trust involved in voting process. Hence voting systems make use of Blockchain technology to add an extra layer of security and encourage people to vote from anytime, anywhere

without any hassle and makes voting process more cost-effective and time-saving.

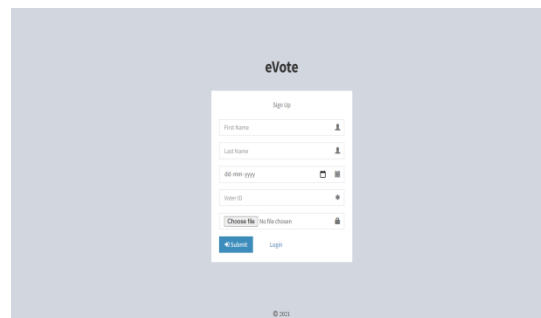
### C. ADVANTAGES

- You can vote anytime/anywhere (During Pandemics like COVID-19 where it's impossible to hold elections physically).
- Secure-Everything that occurs on the blockchain is encrypted and it's possible to prove that data has not been altered. Also, it is decentralized. So it is too secure and immutable.
- Transparent-Without transparency, people can become discouraged about the legitimacy of their votes and can lead to questions about tampering and falsified results. Transparency makes for a trustworthy election which then leads to more positive outcomes from the votes.
- As it is distributed system, data is stored on multiple machines in networks. So problem of data loss is avoided

## V. RESULTS AND DISCUSSIONS



**Fig1: Election Commission Home Page**



**Fig2. Voter Registration**

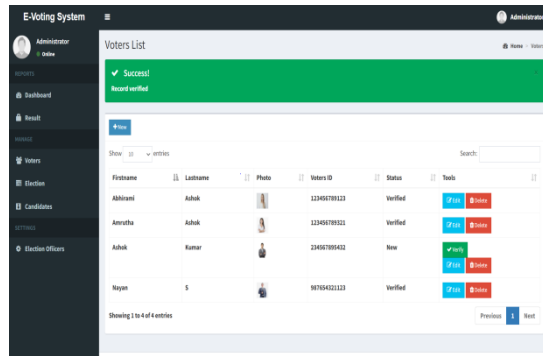


Fig3:- Voter Verifying

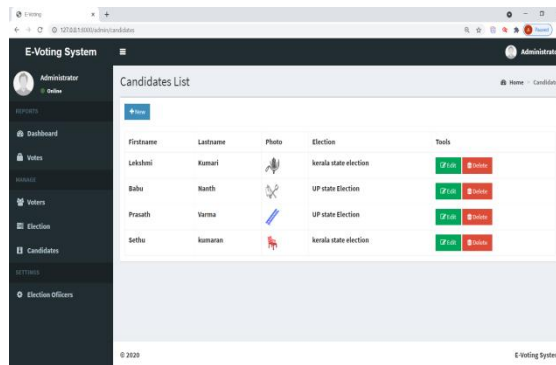


Fig 4. Candidate Details

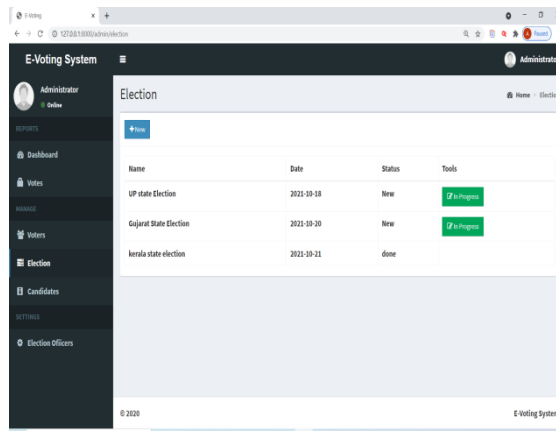


Fig 5. Election Detail

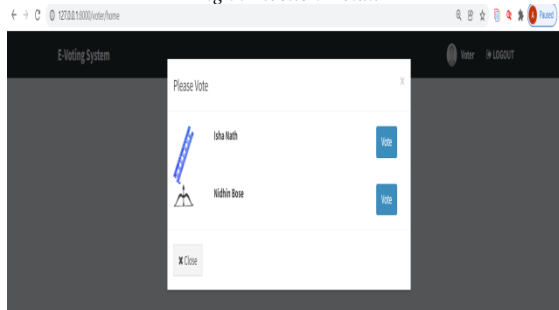


Fig 6. Voter Casting Vote



Election Results				
Lastname	Firstname	Photo	Election	Votes
Aadha	Aadha		Kerala Election	2
Aadha	Kumar S		Kerala Election	0

Fig 7. Election Result

## VI. CONCLUSION

Blockchain Technology is acquiring prominence step by step. The straightforwardness of the blockchain empowers really inspecting and comprehension of elections. Using blockchain in casting a ballot framework will assist with accomplishing secure and cost-efficient election while ensuring voters privacy. This paper investigates the capability of the blockchain technology and its convenience in the e-voting scheme. The blockchain will be publicly verifiable and distributed in a way that no one will be able to corrupt it.

## REFERENCES

- [1]. Mrs. Harsha V. Patil, Mrs. Kanchan G. Rathi and Mrs. Malati V. Tribhuwan, "A Study on Decentralized E-Voting System Using Blockchain Technology", International Research Journal of Engineering and Technology (IRJET) Volume: 05 Issue: 11 | Nov 2018.
- [2] Ong Kang Yi, Debashish Das, "BLOCKCHAIN TECHNOLOGY FOR ELECTRONIC VOTING", Journal of Critical Reviews (JCR) Vol 7: Issue 3, 2020.
- [3] Niveditha G, Nihal R, Sadhana D and Chowdamma N "ONLINE VOTING SYSTEM", KUVEMPUNIVERSITY, 2019-2020.
- [4] Friðrik Þ. Hjálmarsson, Gunnlaugur K. Hreiðarsson, "Blockchain-Based E-Voting System".
- [5] Md. Razu Ahmed, FM. Javed Mehendi Shamrat, Md. Asraf Ali, Md. Rajib Mia, Mst. Arifa Khatun, "THE FUTURE OF ELECTRONIC VOTING SYSTEM USING BLOCK CHAIN", Vol 9: Issue 02, 2020.