



Blockchain based Public Voting System

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Abstract— This paper E-voting system with blockchain works to create a safe and open elections environment in which users can cast their votes only once and display the total votes cast in real time without editing them after the election is complete. Working blockchains will ensure that the votes are maintained and that the systems are not rigged by any third party, the secure electronic voting system uses blockchain, which is decentralized, peer-to-peer transaction ledger. Using the technique of Blockchain, casted votes can be registered and reported in order to avoid several forms of voting fraud. In terms of online voting Blockchain will solve several issues. Blockchain's online voting application has no problem with Internet connectivity protection, so any hacker with terminal access would be unable to impact other nodes. Voters may actively cast their vote via this method without disclosing their identity or political views. You cannot control, record errors, manipulate or create fake IDs using Blockchain technique. Any vote casted will be taken as a single transaction and the results will then be announced. These votes will be counted.

Keywords—Blockchain, Ethereum, Decentralized, Digitalizing,

1. INTRODUCTION

There was extensive research on electronic voting systems that allow voters to vote on mobile telephones, computers or any other electronic device at their own convenience. Never threats to the safety of these systems may have contributed to the integrity of the voting process, however, have not incorporated any of those technologies to a greater scale. We discuss electronic voting systems in this paper using blockchain, a safe and robust system that ensures voting anonymity, transparency and robust performance.

1.1 Blockchain

Blockchain may be a technology that's rapidly gaining momentum in era of

industry 4.0. With high security and transparency provisions, it's being widely utilized in voting systems. By design, a blockchain is immune to modification of the info . it's an open, distributed ledger which will record transactions between two parties efficiently and during a verifiable and permanent way. By storing data across its peer-to-peer network, the blockchain eliminates variety of risks that accompany data being held centrally. The decentralized blockchain may use distributed networking.

2. LITERATURE REVIEW

A. Electoral: an E-voting system supported ethereum:

Nguyen: "To vote, an ET-base e-voting system," Vietnam National University of data Technology, HCMC University in Vietnam, reviews requirements then proposes Votereum: an electronic electoral system that uses blockchain technology Linh Vo-chao-thuy, Khoi Cao-minh, Chuong Dang-Le-bao, and Tuan A. Nguyen 2019 The system is supported by an Ethereum platform which manages the whole system, with one server handling all requests concerning the blockchain.

B. Voting online: Use of Blockchain by the voting system:

"Online voting: electoral system with B-chain," 2019, article gives a brief review on several methods used during current votes. Vaibhav Anasune, Pradeep Choudhari, Madhura Kelapure, and Pranali Shirke Prasad Halgaonkar. The paper helps create a system that addresses the challenges that lie ahead and eliminates disadvantages in these past architectures.

C. EthereumBlockchain-based decentralised polling platform:

Eli F. Kfoury, Ali Kassem and Hamza Harb, 2018 David Khoury, 'The Department of Computing Sciences American University of Science and Technology' proposes a replacement

approach for a decentralised, trustless voting platform supported blockchain technology to unravel the trust problems. "Decentralized voting platform supported Ethereum Blockchain." The system's principal features include ensuring data integrity and transparency, and forcing every poll with a secure privacy of a vote per mobile number. For this, the Blockchain runtime environment is that the Ethereum Virtual Machine (EVM).

D. E-Voting System Design Survey on Blockchain: Bhavan G, G "E-Voting System Design Survey on Blockchain",2018, By introducing blockchain on e-voting system distribution, one among the cheating data base manipulation sources are often reduced. we'll use AES algorithm to encrypt data from the fingerprint sensor. This investigation discusses the recording of voting results from every location of elections using blockchain algorithm.

E-voting system supported blockchain: The paper evaluates the potential of distributed ledger technologies through the outline of a case study, namely the choice process, and therefore the implementation of a Blockchain-based application that improves security and lowers cost. The paper is predicated on the analysis by Hjálmarsson, Gunnlaughur K. Hreiðarsson "Blockchain-based E-Voting System".

3. Existing System:

Current voting systems like ballot box voting and electronic voting are affected and require large quantities of documentation, human resources and time to be used by different security threats like DDoS attacks, poll booth capturing, vote shift and handling, malware assaults, etc. Some of the inconveniences are:

- Long Queues during elections.
- Security Breaches like data leaks, vote tampering.

- Difficult for differently-abled voters to reach the polling booth.

3.1 Limitations of Existing system:

Recent major technical challenges related to e-voting systems are, however, not limited to the security of digital identity management. Any potential citizen should be registered in the electoral system before the elections.

Their data should be in a digitally processed format. In addition, their identity data should be unbroken non-public in any information that involves them. The old E-voting system may face the following problems:

- **Voting in anonymous form:**After voting through the system, each vote can be anonymous or cannot contain a choice per candidate, including the system administrators.
- **Individualized voting procedures:** An open debate continues how a vote will be represented in net applications or databases. Whereas a transparent text message is that the worst plan is to offer obscurity and integrity with a hazardous token. Meanwhile, the vote should not be reputable, but the token resolution should not be binding.
- **Ballot casting verification by the voter:**The elector should be prepared to see and verify his/her own vote when he/she has cast a vote. This is often vital to be realised in such a way as to prevent, or at least to note, any potential malicious activity. This live counter, with the exception of the provision, suggests that the sense of non-repudiation can certainly boost the voters' sense of trust. These issues area unit partially self-addressed in some recent applications. However, it suggests that e-voting is currently in use in many countries, together with Brazil, the U.K., Japan and the Republic of Estonia.The Republic of

Estonia should be assessed in a different way than the others, since they provide a full e-voting resolution that is, it is said, equivalent to an old paper-based election.

- **High cost of initial installation:** Although online selector systems can be maintained and maintained at a much lower cost than elections, initial implementation could be expensive for companies in particular.
- **Increased security issues:** cyber attacks cause the general public polls to be threatened. If an associate degree of hacking try succeeds during an election, no one would settle for responsibility. In general, during the elections, DDoS attacks have been documented. Software mechanisms that promise the following should be implemented in order to mitigate these threats:

1. Evidence deletion prevention.
2. Privacy transparency

- **Timing is very important for voting;** technical capacity and infrastructures should be reliable and run as efficiently as possible to allow remote voting to be synchronised. Delays or inefficiencies in relation to remote voting are very important for voting programmes.

4. Objectives

Thus, the voting system envisaged hereby must meet the following requirements:

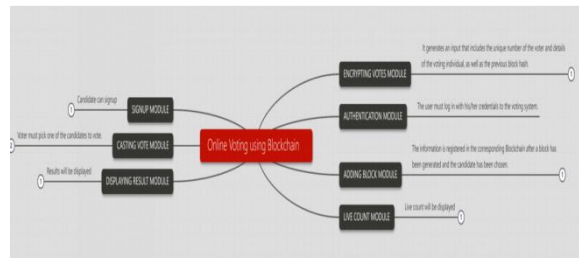
- Open and transparent electoral systems must be verifiable.
- The system of elections shall ensure recording of the vote cast by the elector.
- Voting must be authorised only for eligible voters.

- The electoral process must not be manipulated and controlled by a unauthorised organisation.

5. Proposed System

We have sought to create a system for our architectural design that does not replace fully the actual voting system, but integrate into the current system we use today. We have decided to do this because most people are aware of the existing system and creating confidence and disinterest can lead to the introduction of a new system.

5.1 System Architecture



Module Description

Authentication Module:-

- The user must log in with his/her credentials to the voting system.
- The system will validate all entered information and the user will be allowed to cast a vote in the event that a legitimate voter agrees.

Casting Vote Module:-

- Voter must pick one of the candidates to vote. A friendly user interface will be used to cast the votes.

Encrypting Votes Module:-

- Following successful casting, the device generates an input that includes the unique number of the voter and details of the voting individual, as well as the previous block hash. This way, both input and output are uniquely guaranteed.

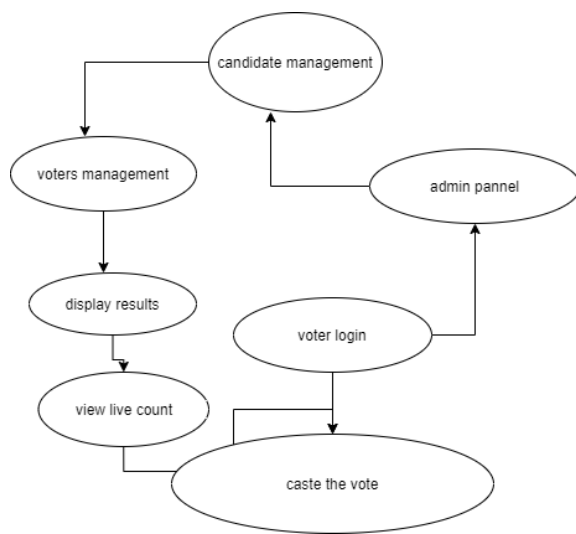
Adding Block Module:-

- The information is registered in the corresponding Blockchain after a block has been generated and the candidate has been chosen. The previously cast votes are connected to each block.

Displaying result Module:-

- After the election period is over results will then be made available to all the voters on their dashboard by the admin.

UML Diagram



In the first place, the user must register on the website. The user can then go to the voting page where he/she enters the OTP they received via e-mail. Once the user enters the OTP, the user will have access to the vote. After the user casts a vote, they will be confirmed by a prompt stating that they have voted successfully. Finally, the user can log out after the vote.

5.2 Software Details

Operating system	Windows 10
Programming language	Solidity,HTML,Css ,Bootstrap,javascript,visualstudio code
Database	Node js

5.3

5.4 Hardware Details

Processor	1.60 GHz Intel
HDD	1TB
RAM	4GB

5.5 Requirement Analysis

Details of implementation are provided here. The entire system consists of a registration system and a voting system in two sub-systems.

System for Registration

Using Html/Css, the javascript front end and NodeJs back-end a voting registration system is developed that contains personal user information already stored for eg: This can be regarded as an Aadhar database. When the user enters the webpage validating the voting correction, he or she takes a picture and then.. If the user is a valid user, a hash code /OTP that is used to log into the voting machine is delivered.

The Voting System

EVM can be considered a substitute for the voting system. It is a decentralised website in Bootstrap or Html with a front end and a blockchain in the rear end. The intelligent contract is in solid language. In smart contracts, the candidate's name with the candidate's symbol. The actual logic of the whole voting system is an intelligent contract.

Each blockchain change is referred to as a transaction. The way the outside world interacts with the network of Ethereum is transaction. When we want to change or update the state stored in the Ethereum network, transaction shall be used. A transaction fee or service charge is required for each transaction. A native currency circulates within a network of Ethereum: ether. Ether is also used mainly as a service charge or transaction fee.

6. Outputs:

Election Symbol	Party	Candidate Name	Vote
	Bharatiya Janata Party	Manugan	VOTE
	Indian National Congress	Marikandan	VOTE
	DMK	MK.stalin	VOTE
	ADMK	EPS	VOTE

7. Conclusion

The transparency of the block-chain allows for additional au-direction and election comprehension. These square attributes measure a number of the needs of the legal system. These characteristics are the result of redistributed net work and may lead to additional democratic processes for elections, in particular direct electoral systems. In order for e-voting to become additionally open, clear and severally audiable, a possible answer would be based on blockchain technology. This paper explores the potential of blockchain technology and its quality in the field of e-voting. The blockchain will be publicly verifiable and distributed in such a way that nobody will be able to get corrupted. The idea of adapting digital selection systems to make the general public electoral method cheaper, faster and easier could be a compelling one in a trendy society. The creation of a low-cost and fast electoral method normalises it in the eyes of the voters, removes an explicit power barrier between the elector and therefore the functionary and puts an explicit amount of pressure on the functionary. In addition, it opens the door to a more direct kind of democracy, allowing voters to make their own individual bills and proposals more accurate.

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8.Scope

- Connecting the app to the government's voting scheme information
- Improving the system's security.
- Improving the application's Graphical User Interface (GUI).
- It is possible to have local languages, which would be incredibly useful.
- Rural residents, as well as the uneducated, have a part to play.
- individuals
- A voter's prior social work experience and credentials may be applied to make them a better option.
- Also, a recommendation system for voters is being added.

- The general public is encouraged to make recommendations to the current winner.
- A complaint mechanism should be included, allowing the public to voice their concerns.
- people who want to make a complaint about a nominee.