BLOCKVOTE-A BLOCK CHAIN BASED VOTING SYSTEM

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ABSTRACT

Voting is pivotal to choosing a government in a democracy and should be open, free and accessible to all. Many countries use ballots or EVMs for the election process but these are not completely tamper proof and are prone to faults and wrong doings, however online voting systems are relatively safe and they are not completely tamper proof and can be hackable. Block chain finds its application in such cases because block chain is decentralized system and the blocks of data are related and connected, any change in this connection can be detected and corrected and the bank of votes can be kept safe and the accurate result can be declared.

In this project, the concept of developing an electronic voting system using blockchain technology is implemented. The two-level architecture provides a secure voting process without redundancy of existing (not based on blockchain) systems. The blockchain-based voting project has two modules to make the whole project integrated and work along. One will be the Election Commission who will be responsible for creating elections, adding registered parties and candidates contesting for the election added under the smart contracts. The other end will be the voter's module where each individual can cast a vote for their respective Assembly Constituency and the vote will be registered on the blockchain to make it tamper proof.

KEYWORDS: Blockchain, Ethereum, Ganache, Metamask.

INTRODUCTION

Modern democracies are built upon traditional ballot or electronic voting (evoting). In these recent years, devices which is known as EVMs are hugely criticized due to irregular reports of the election results. There have been many questions regarding the design and internal architecture of these devices and how it might be susceptible to attacks. This [1] paper has analyzed different techniques of tampering the EVMs. Online-voting is pushed as a potential solution to attract the young citizens and the non- resident of the country. For a robust online election scheme, a number of functional and security requirements are to be met such as transparency, accuracy, auditability, data privacy, etc.

We have worked the following ideas by having the two different set of modules: election commission and the voter(s). Election Commission creates elections and adds registered candidates along with the parties for contesting the election. Using an election's REST API hosted on Ethereum's Blockchain, the details are shown at the front-end of the voter for casting the vote. Then, while polling the vote is stored on our blockchain framework of which the Election Commission fetches the vote count. The limitation which we have faced due to not using the traditional way of smart contracts is that the blockchain framework which we have coded cannot run on the main net as it needs to be hosted and a separate web3 provider have to be used for interacting with it and not having a public API of voter ID creates a drawback of not having authentication of a voter.

The most important factor of this application is to integrate the blockchain framework with both the modules for seamless voting.

II. EXISTING METHODS

In India, before 2004 there was a paper-based voting system. This is called as ballot Paper system. Voters had to go to polling booth and cast their vote by marking on seal in front of the symbol of a candidate for which they wanted to cast their votes on ballot paper. Results were announced by counting the votes. The maximum vote gainer was declared as winner. India has population more than 120 crores the ballot paper voting is not much reliable, time consuming and very difficult to count the vote and there are also problems like replacement of ballot paper boxes with duplicate, damage of ballot paper, marking stamp seal for more than one candidate hence there is a strong need to overcome these problems. In order to overcome these problems Electronic Voting Machines Were introduced. Electronic Voting Machine (EVM's) mainly consists of two components:

1. ***Control Unit***: It stores and assembles votes, used by poll workers.
2. ***Ballot Unit***: It is placed in the election booth and is used the voters.

III. PROPOSED METHOD

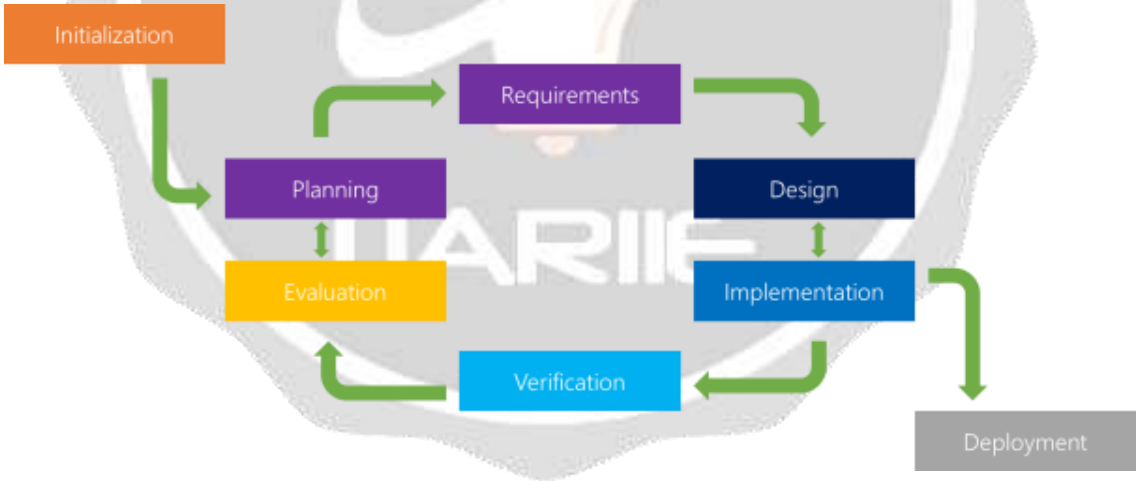
Several studies have been done on using computer technologies to improve elections. These studies tell about the risks of adopting electronic voting system, because of the software challenges, insider threats, network vulnerabilities, and the challenges of auditing.

We've proposed to design the existing online voting system which is integrated with the Blockchain technology. The proposed system has the following advantages as compared to the existing system:

- Users' can vote from anywhere in the world until he possess a citizenship of the country.
- The voting is stored in the Blockchain which makes it tamper proof.

As there's no standing in queue for casting vote it will save a lot of time and reduce the workload.

IV. METHODLOGY



VI. SYSTEM DESIGN

DESIGN GOALS: Design goals are important properties of the system to be optimized, and which may affect the overall design of the system. There is a fine line between system design and requirements. Requirements include specific values that must be met in order for the product to be acceptable to the client, whereas design goals are properties that the designers strive to make "as good as possible", without specific criteria for acceptability.

MODULARIZATION DETAILS: The project has been divided into many modules in which for every functionality we have designated modules. Any software comprises of many systems which contains several sub-systems and those sub-systems further contains their sub-systems. So, designing a complete system in one

go comprising of each and every required functionality is a hectic work and the process can have many errors because of its vast size.

Effective modular design can be achieved if the partitioned modules are separately solvable, modifiable as well as compliable. Following are the project modules:

I. **Election Commission:** In this module, an entity named Election Commission will be responsible to setup the smart contract and register candidates, parties and start off an election.

II. **Election Test:** This is the module to test our smart contract where we use Mocha Framework to perform unit test on our application.

III. **Voter Module:** In this module, voters who have been provided with the personal ETH wallet will import onto the voting portal using the Metamask extension and cast their vote

IMPLEMENTATIONS:

The tiers given below alludes to different level or layers where activities occur.

Client: Client is any user or program that wants to perform an operation over the system. Clients interact with the system through a presentation layer.

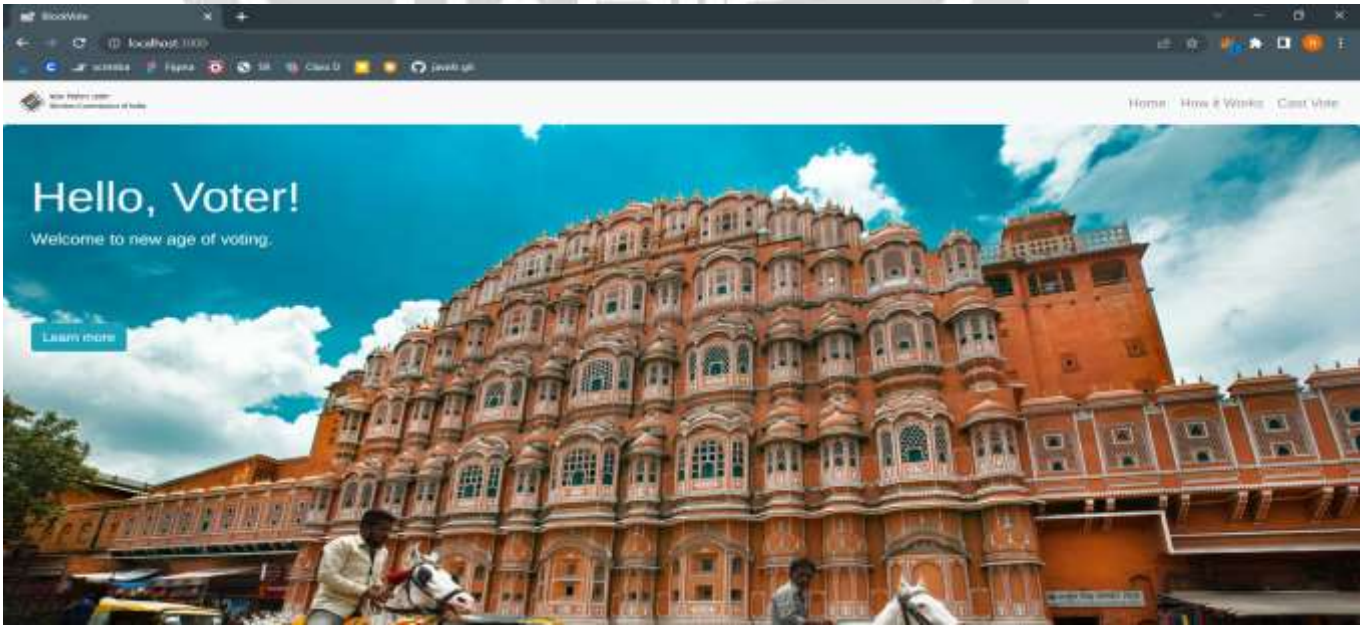
Presentation Layer: This layer is responsible for the presentation of data at the client side, i.e., it provides an interface for the end-user into the application to cast the votes.

Resource manager: The resource manager deals with the organization (storage, indexing and retrieval) of the data necessary to support the application logic. This resource manager here is the Local Blockchain server maintained by Ganache.

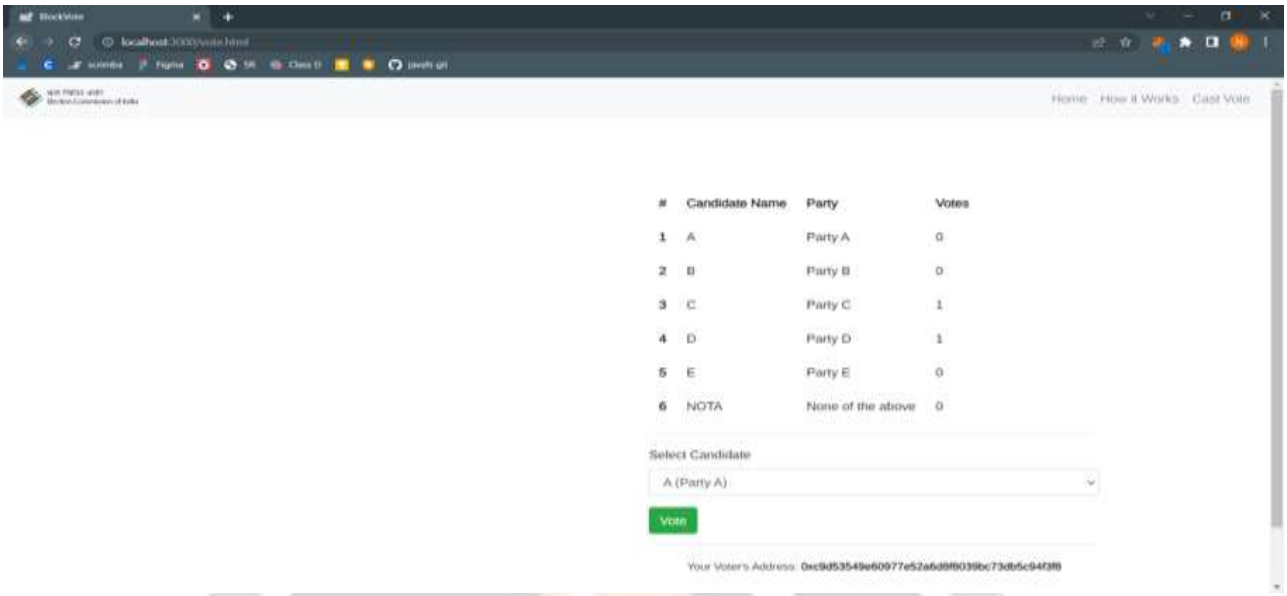
Application logic: The application logic figures out what the system actually does. It takes care implementing the business rules and establishing the business processes. Blockchain voting system is designed and implemented according to the three tier architecture.

VII.OUTPUTS

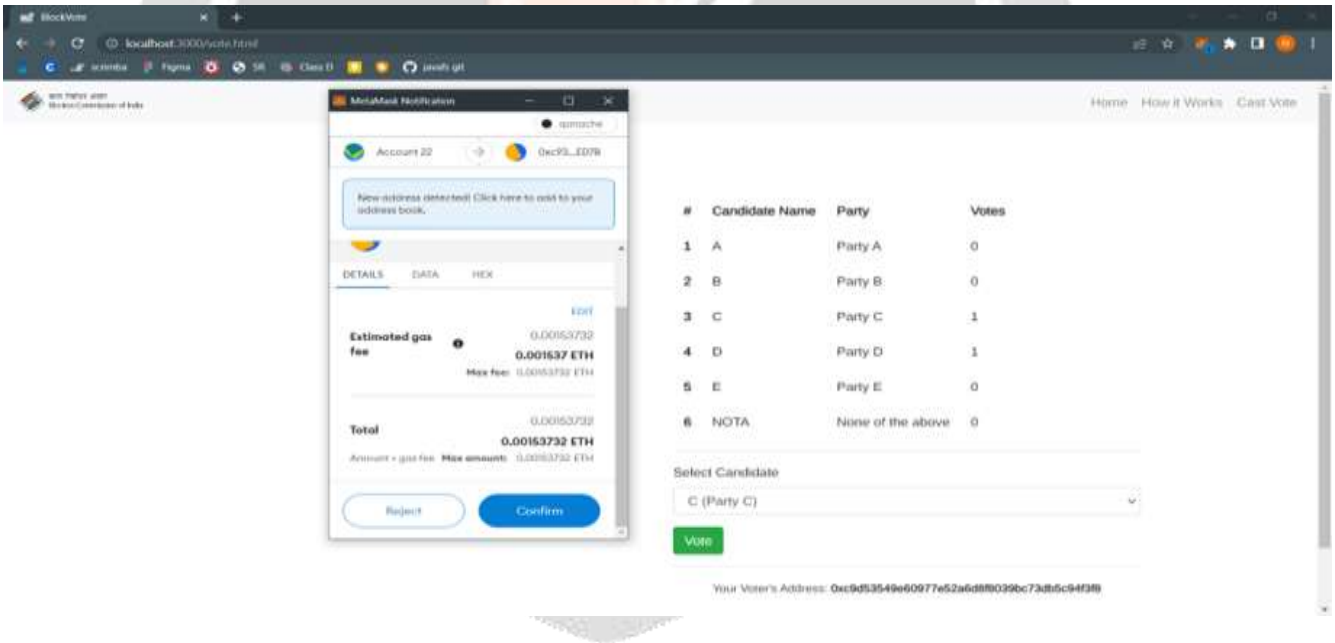
USER INTERFACE DESIGN:



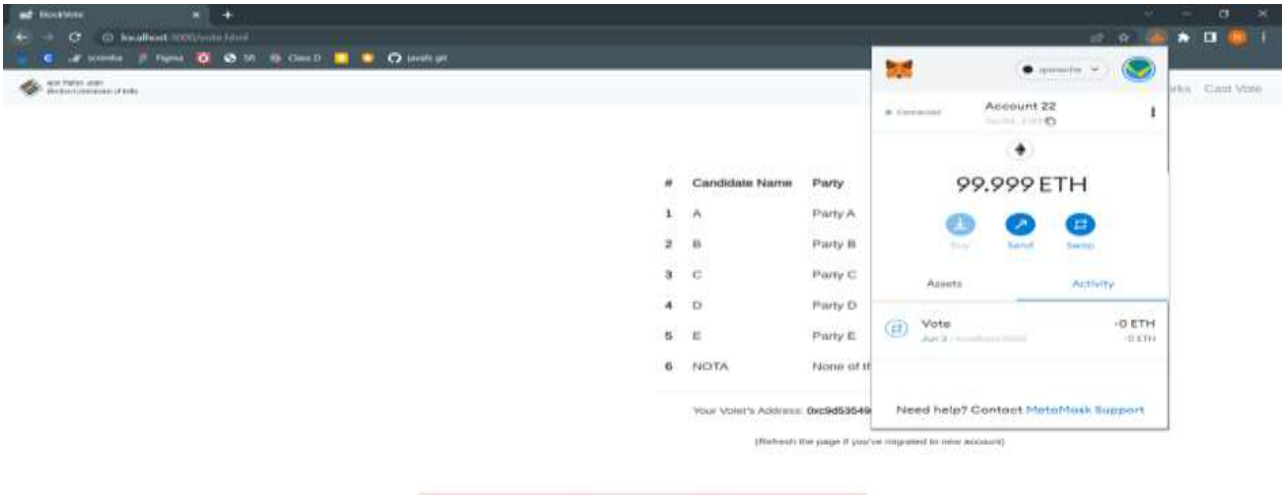
Home Page



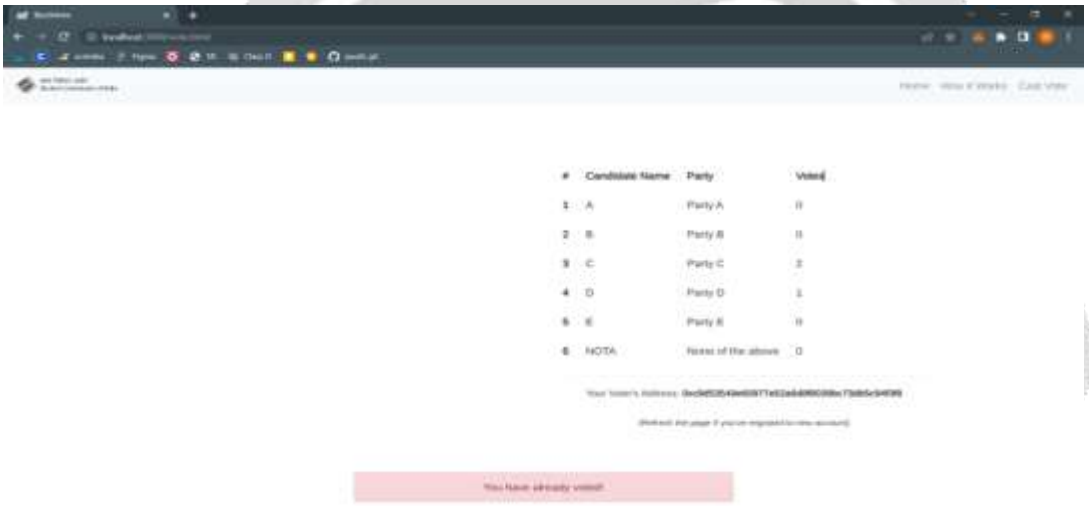
Casting a Vote



Confirming the transaction to cast vote



Transaction confirmed by miners



Vote casted successfully

VIII Conclusion

Democracies depend on trusted elections and citizens should trust the election system for a strong democracy.However traditional paper-based elections do not provide trustworthiness.The idea of adapting digital voting systems to make the public electoral process cheaper, faster, easier and most importantly increases the trust of voter.This project has been developed to a blockchain-based electronic voting system that utilizes smart contracts to enable secure and cost-efficient election while guaranteeing voters privacy.

This project has been developed to a blockchain-based electronic voting system that utilizes smart contracts to enable secure and cost-efficient election while guaranteeing voters privacy. It outlines the systems architecture, the design, and a security analysis of the system.

IX References

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