iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 10 **Issue:** VI **Month of publication:** June 2022

DOI: https://doi.org/10.22214/ijraset.2022.43852

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 10 Issue VI June 2022- Available at www.ijraset.com

Blockchain Based E-Voting System

Abhishek Sharma[1], Satyam[2], Ravi Sarva[3], Rajan Kumar Jha[4], Prof. Dr. Rekha Sugandhi[5], Prof. Palash Sontakke[6]
MIT ADT University, Loni, Pune, Maharashtra

Abstract: Voting is the fundamental right for every nation. An Electronic Voting (E-Voting) system is a voting system in which the election process is notated, saved, stored, and processed digitally, which makes the voting management task better than the traditional paper-based method. Blockchain is offering new opportunities to develop new types of digital services. While research on the topic is still emerging, it has mostly focused on the technical and legal issues instead of taking advantage of this novel concept and creating advanced digital services. Blockchain-enabled e voting (BEV) could reduce voter fraud and increase voter access. Eligible voters cast a ballot anonymously using a computer or smartphone. BEV uses an encrypted key and tamper-proof personal IDs. Electronic credibility services have become an integral part of the information space. With the reliable implementation of basic services as an electronic signature and electronic authentication, it is possible to build more complex systems that rely on them, particularly the electronic voting system. In this project, the concept of developing an electronic voting system using blockchain technology is implemented.

I. INTRODUCTION

Modern democracies are built upon traditional ballot or electronic voting (e-voting). 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 paper has analyzed different techniques of tampering the EVMs. Online-voting is pushed as a potential solution to attract the young citizens and the nonresident of the country. For 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 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 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 we have faced due to not using the traditional Browser is used to rendered the candidate Names and it is the main UI of the project to cast a vote
The most important factor of this application is to integrate the blockchain framework with both the modules for seamless voting.

II. SYSTEM OVERVIEW

Several studies have been done on using computer technologies to improve elections. These studies talk 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 for example The voting is stored in the Blockchain which makes it tamper proof.

III. SOFTWARE REQUIRED

A. Browser

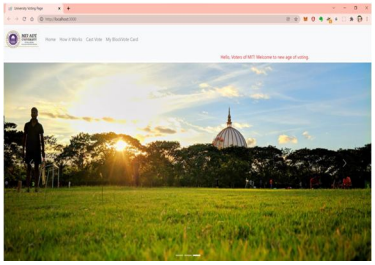


Fig.1 Browser

©IJRASET: All Rights are Reserved

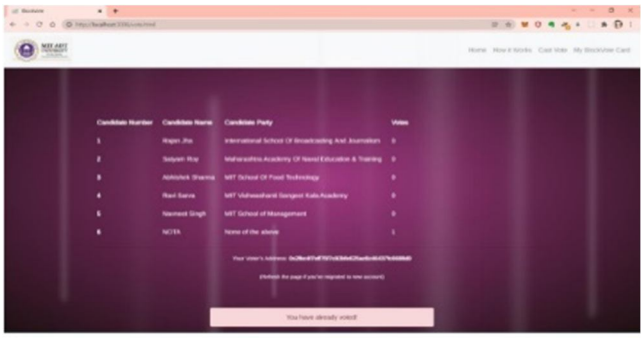


Fig.1.1 Showing Candidate Name

List of another software required is mentioned below in Table 1.

Ganache Ethereum	Blockchain Server
Meta Mask	Ethereum Wallet
Truffle	Development framework for ETH
Node	JavaScript Runtime
Visual Studio Code	Integrated development environment
Remix	Solidity's IDE
Window	Operating System

Table 1: Specifications of Software METAMASK

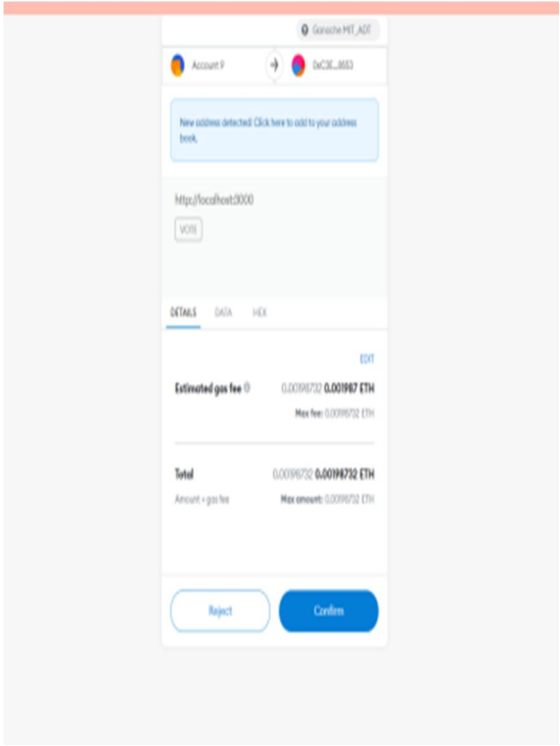


Fig 2:

MetaMask is a software cryptocurrency wallet used to interact with the Ethereum Blockchain. It allows users to access their Ethereum wallet through a browser Extension or mobile app, which can then be used to interact with decentralized application MetaMask is developed by consensyn software. Inc, a blockchain software company focusing on Ethereum based tools and infrastructure. MetaMask allows users to store and manage account, broadcast transactions, send and receive Ethereum based cryptocurrencies and tokens

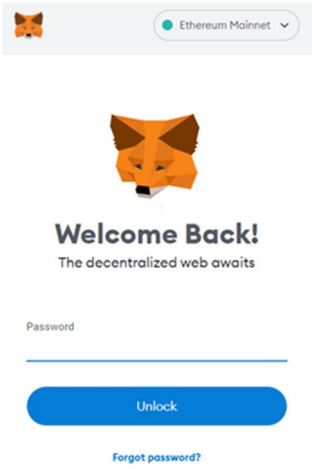


Fig Metamask Mainnet Interface

IV. GANACHE LOCAL BLOCKCHAIN SERVER

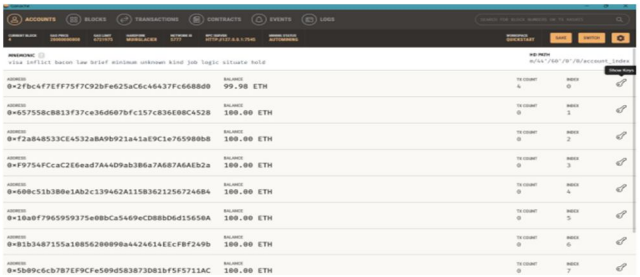


Fig: Ganache Server with 10 Free accounts

Table 2:

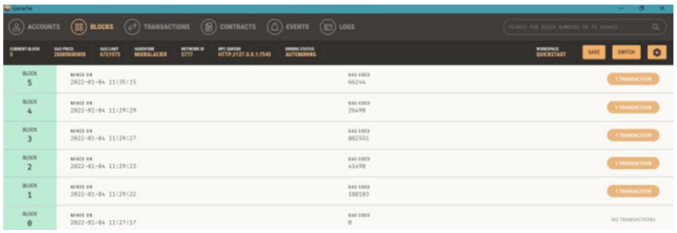
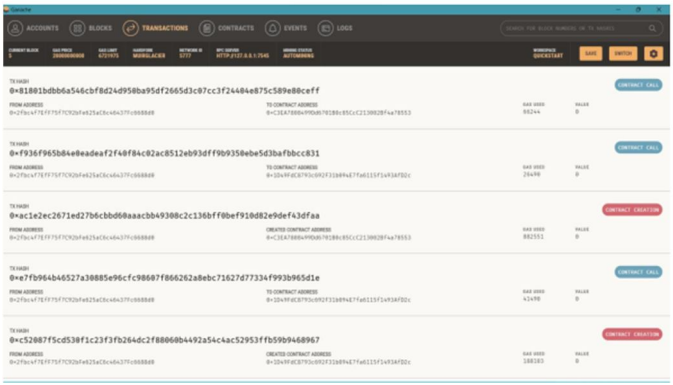


Fig: Blocks created after casting a vote in a form of transaction.

Ganache is a personal blockchain for rapid Ethereum and Corda distributed application development. You can use Ganache across the entire development cycle; enabling you to develop, deploy, and test your dApps in a safe and deterministic environment. Ganache comes in two flavors: a UI and CLI. Ganache UI is a desktop application supporting both Ethereum and Corda technology. The command-line tool, ganache-cli (formerly known as the TestRPC), is available for Ethereum development. Prefer using the command-line? This documentation will focus only on the UI flavor of Ganache.



Above image shows the transaction details happened in the form of vote casted by user as it is a write operation to smart contract.

V. TRUFFLE

Truffle is a framework for building, testing, and deploying applications on the Ethereum network that was founded by Tim Coulter. The Truffle Framework consists of three primary development frameworks for Ethereum smart contract and decentralized application (dApp) development called Truffle, Ganache, and Drizzle.

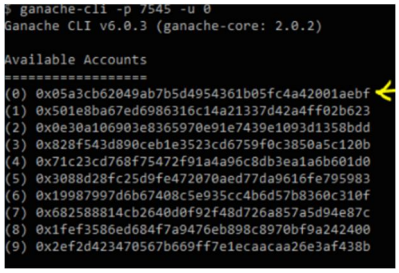


Fig. 10 Free account for testing

First, create a new folder, and type the next line:
truffle init

It will initialize an empty truffle project.
Then copy the Voting.sol file from the last folder, into the folder “contracts”.
Next, open the folder “migrations” and create a new file named “2_deploy_contracts.js”. Migrations are simply scripts that’ll help us deploy our contracts to a blockchain.
In the first part, we will use Ganache.

Fire a new command-line and type in the following command:
ganache-cli -p 7545

What it does is, it tells ganache-cli to start at the port 7545.
Ganache will generate test accounts for us, they have 100 ethers by default, and are unlocked so we can send ether from them freely.
The first account for example is the one used by smart contract compilation.
Compile will compile our Solidity code to bytecode (the code that the Ethereum Virtual Machine (EVM) understands), in our case, Ganache emulates the EVM.
Migrate will deploy the code to the blockchain, in our case, the blockchain could be found in the network “development” we set earlier in the “truffle-config.js” file.

©IJRASET: All Rights are Reserved



Fig. Deployed Network

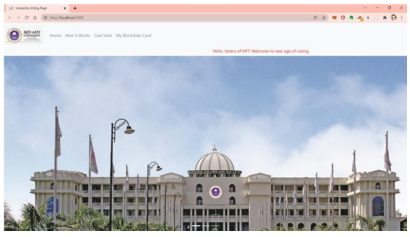
VI. FUTURE SCOPE

This document describes the modeling and the requirement analysis of the system.

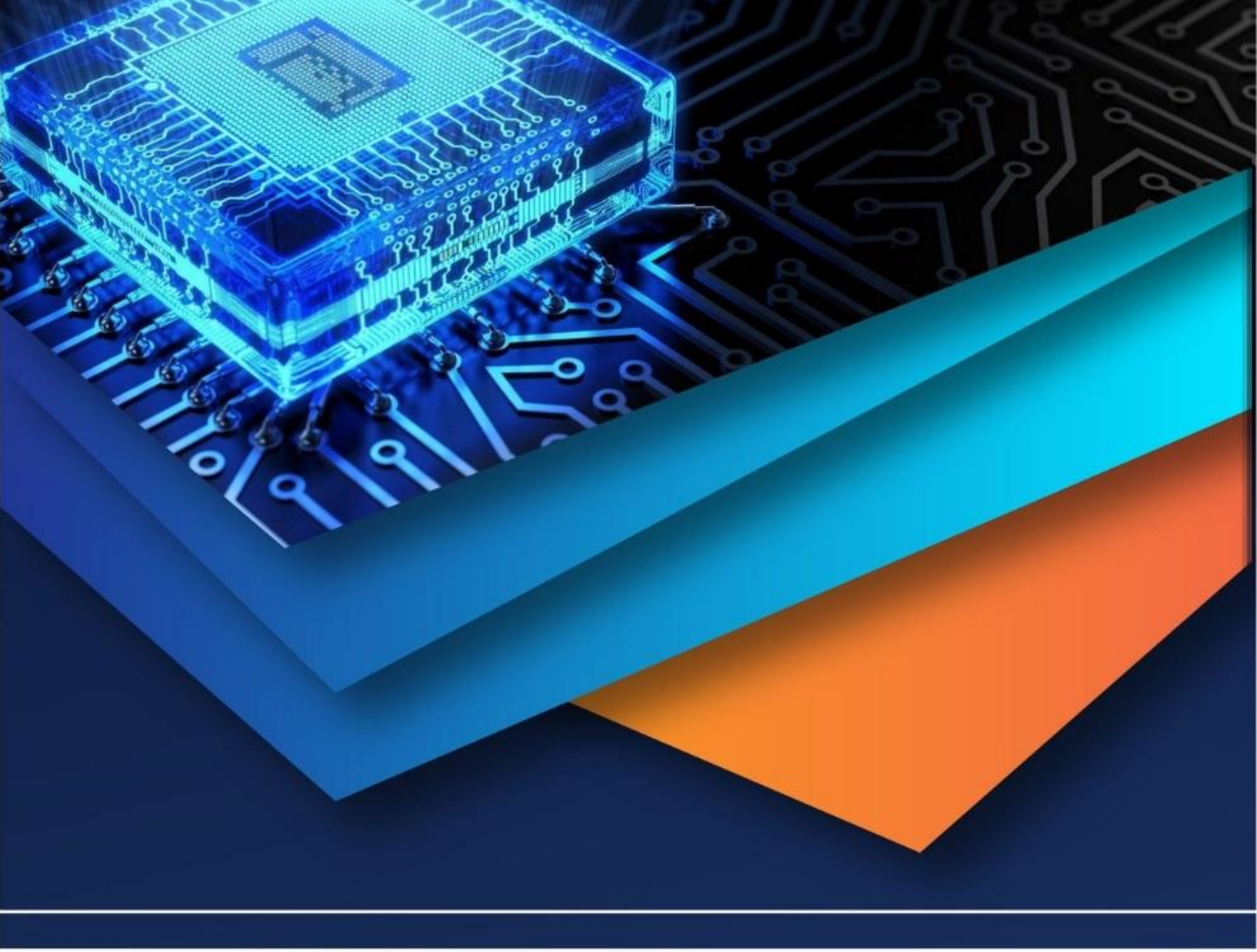
The main aim of the system is to provide a set of protocols that allow voters to cast votes while the election commission is responsible for creating elections and adding candidates. This project is for the creation of an online election system using Blockchain technology.
We can make it better and efficient system using Hyperledger Fabric.

VII. CONCLUSION/RESULT

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 and easier, is a compelling one in modern society. Making the electoral process cheap and quick, normalizes it in the eyes of the voters, removes a certain power barrier between the voter and the elected official and puts a certain amount of pressure on the elected official.
It also opens the door for a more direct form of democracy, allowing voters to express their will on individual bills and propositions. 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. In the next build of this application, it has been proposed to create separate client designs for various roles such as one for election commission and one for candidates registered to a certain party with the existing voting client design.
Also, the current versions lack authentication as we don't have access to current Aadhar's or Voter SDK to integrate in our application. Also, it is planned that in the next build notification prompt will be given on the day of voting to all the voters to cast their vote so that the voter turnout is maximum for that election.


Fig .UI Of Project (Voters Main Page)

The above figure is the actual view of our project. With the help of this project a person can cast a vote by navigating into casting vote page and can download the voter Unique Id card afterwards.



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089 (24*7 Support on Whatsapp)