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# **Assignment 1**

## **Product Description**

The “Online Job Portal and recruitment system” is a package to be used by agencies to improve the efficiency of the business. The “Online Job Portal and recruitment system” to be developed benefits the members greatly. The system provides a jobs catalog and information to members and helps them decide on the jobs to apply for. The admin can keep the jobs catalog updated all the time so that the members (Job seekers and the agencies) get the updated information all the time. The main users are users: Admin, Members who are the Job seekers, and the agencies.

## **Software Interfaces**

- **Front End:** HTML ,CSS, JavaScript, Bootstrap,React JS
- **Database Server:** MongoDB
- **Back End:** Node Js , Express JS

## **Product Functions**

This “Online Job Portal and recruitment system” provides online real-time information about the jobs available in the agencies and the user information. The member should be provided with the updated information about the jobs catalog provisions for the members to apply for the job they want if all the other required rules hold good. The member is given a provision to check his account information.

- Any time in the given validity period.

- The members are provided with the jobs available roster and allowed to apply for jobs, which they want.
- The admin can get the information about the members who have advertised jobs

## **Functional Requirements**

It is the primary requirement that is fulfilled by our job portal. It's allowing the users, and employers to use our portal at the level of ease. The purpose of our portal is to provide the full information that is required of the user. Here is the following requirement that is fulfilled by our system.

### **Users**

- **User Login**

This feature is used by the user/admin to login into the system. A user/admin must log in with his username and password to the system after registration. If they are invalid, the user is not allowed to enter the system.

- Username and password will be provided after user registration is confirmed.
- Passwords should be hidden from others while typing it in the field.
- **Register New User**

A new user will have to register in the system by providing essential details in order to apply for the job. The admin must accept a new user.

- The system must be able to verify and validate the information.
- The system must encrypt the password of the user to provide security.
- **Search Jobs**

The user can search for the desired jobs. He can view different jobs. After confirming the login in the search user can select it and apply by providing the necessary details.

- **Upload Resume**

The job seekers can upload their resumes and provide the necessary details if they are interested in jobs.

## **Admin**

- **Manage Users and Employers**
- The administrator can add users, delete users, and view users.
- **Manage jobs**
- The administrator can add jobs, delete jobs, hide jobs, and view jobs.
- **Manage details**
- The system must identify the login of the admin.
- Admin account should be secured so that only the owner of the portal can access that account

## **Non-Functional Requirements**

- **Efficiency Requirement**

When an “Online Job Portal and recruitment system” is implemented job seekers and employers can view and upload job vacancies respectively from their homes easily without any difficulty.

- **Usability Requirement**

The “Online Job Portal and recruitment system” is designed for a user-friendly environment and ease of use.

- **Reliability Requirement**

The system should provide a reliable environment for both employers and job seekers. All jobs should be reaching the admin without any errors and should be shown to the viewers.

- **Implementation Requirement**

Implementation of the system using HTML, CSS, JavaScript, React JS and Bootstrap in the front end with Javascript, and Node , Express JS as the back end and it will be used for database connectivity. And the database part is developed by MongoDB. Responsive web designing is used for making the portal compatible for any type of screen.

- **Delivery Requirement**

The whole system is expected to be delivered in four months of time with weekly evaluation by the project guide.

- **Database Security**

An unauthorized person cannot access the panel and database, and do not read and write the information.

- **Availability**

This “Online Job Portal and recruitment system” will be available online 24/7 a week.

Mega Project Report

ON

## **“Online Voting System Using Blockchain”**

*Submitted to*  
**Government College of Engineering, Nagpur**

*in partial fulfilment of the requirement for the degree of*  
**BACHELOR OF ENGINEERING**  
*in*  
**Computer Science & Engineering**

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**2020-2021**

## CERTIFICATE OF APPROVAL

Certified that the project report entitled “**Online Voting System Using Blockchain**” has been partially completed by **Amruta Dodke, Jueli Ikhar, Kunal Madne, Pranshi Deodia, Radha Ingale, Vijaya Dongre, Yash Chauhan** under the guidance of **Prof. Chandrayani Rokde** and it is submitted to Department of Computer Science & Engineering.

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**2020-2021**

## **ABSTRACT**

In any democratic country, Voting is a fundamental right of any citizen that enables them to choose the leaders of tomorrow. It gives individuals in a community the facility to voice their opinion. It helps them to realize the importance of citizenship. Online voting systems are software platforms used to securely conduct votes and elections. As a digital platform, they eliminate the need to cast your votes using paper or having to gather in person. They also protect the integrity of your vote by preventing voters from being able to vote multiple times.

Electronic voting or e-voting has fundamental benefits over paper based systems such as increased efficiency and reduced errors. The electronic voting system tends to maximize user participation, by allowing them to vote from anywhere and from any device that has an internet connection. The blockchain is an emerging, decentralized, and distributed technology with strong cryptographic foundations that promises to improve different aspects of many industries. Expanding e-voting into blockchain technology could be the solution to alleviate the present concerns in e-voting. Here we propose a blockchain-based voting system that will limit the voting fraud and make the voting process simple, secure and efficient.

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## **CHAPTER-1**

### **INTRODUCTION**

India is a democratic country and has a democratic country. As now all Indian citizen become a part of the growing digital India with a digital ID that is Aadhaar card. Voting schemes have evolved from counting hands in early days to systems that include paper, punch card and electronic voting machine.

#### **EXISTING SYSTEM**

The Existing System of Election is running manually. The Voter has to Visit to Booths to Vote a Candidate so there is wastage of Time. Due to this many people don't go out to cast their vote which is one of the most important and Worrying factor. In democracy Each and every vote is important. This Traditional system can be replaced by a new online system which will limit the voting frauds and make the voting as well as counting more efficient and transparent.

#### **Proposed System:**

The current voting system requires some improvement in it because of the issues mentioned above. This can be achieved by replacing the existing system by the new system which will limit the voting frauds and make the voting as well as counting more efficient.

- Online Election System would have user registration, user login and admin login.
- This Online Voting System will manage the Voter's information by which voter can login and use his voting rights.
- At the time of registration voter will be asked for this: Full name, age, Aadhaar card no, mobile no. email id and after being verified will be given the access.
- At the time of requesting vote, voter will be asked to enter his Aadhaar id. Then voter will be authenticated, and he can give vote from one of the candidate from the list .Voters can vote for a Candidate only once per Election.

- The software system allows the user to login in to their profiles and upload all their details including their previous milestone onto the system. The admin can check each Candidate details.
- The software system also allows Voters to view a list of Candidates in their area. The admin has overall rights over the system and can moderate and delete any details not pertaining to Election Rules.

## **BLOCKCHAIN**

Blockchain can help to implement a system that is immutable, transparent, and efficient and cannot be hacked into. The inability to change or delete information from blocks makes the blockchain the most effective technology for voting systems. Blockchain technology is supported by a distributed network consisting of variety of interconnected nodes. Each of these nodes have their own copy of the distributed ledger (information) that contains the total history of all transactions the network has processed. There is no centralized system that controls the network. If the majority of the nodes agree, then they accept a transaction. This network permits users to stay anonymous. A basic analysis of the blockchain technology (including sensible contracts) suggests that it is an appropriate basis for e-voting and furthermore, it might have the potential to form e-voting a lot of acceptable and reliable.

Blockchain technology makes e-voting cheaper, easier, and much more secure to implement. It is a considerably new paradigm that can help to form decentralized systems, which assure the data integrity, availability, and fault tolerance. This technology aims to revolutionize the systems. The blockchain systems are formed as decentralized networked systems of computers, which are used for validating and recording the pure online transactions. They also constitute ledgers, where digital data is tied to each other, called the blockchain. The records on the blockchain are essentially immutable.

### **Benefits of E-voting system over the current system:**

#### **1. Increasing the level of participation**

The Internet voting system tends to **maximize user participation**, by allowing them to **vote from anywhere** and **from any device** that has an internet connection.

## 2. Security

By considering the importance of the e-voting system is implemented using “Blockchain”.

## 3. Efficiency

The **reduction** in organizational and implementation **costs** significantly increases the efficiency of election management compared to traditional paper voting, for example.

## 4. Precision

The electronic vote eliminates errors in manual count, which brings with it an **accurate and quick publication of results**, with receipt of vote for each vote cast.

### **Proposed Plan of Work:**

For our proposed plan of work we are considering two modules that are to be completed in three phases. Two modules are as follows:

1. Front-end for the application
2. Back-end using Solidity to implement Blockchain.

Each of these module will be considered as one phase and the remaining one phase will cover the connection and testing of these modules.

- Phase 1: In this phase we will cover the front-end module, in which we will build the interactive user-interface for the admin as well as the user. In parallel the research work related to the implementation of Blockchain in decentralized application will be done.

- Phase 2: In this phase we will cover the back-end module, we will implement the Blockchain using Ethereum framework and convert the system into a decentralized application.

- Phase 3: The connection of two different module along with the testing of the platform will be completed in this phase.

## **CHAPTER -2**

### **LITERATURE SURVEY**

Currently increasing digital technology helped many people lives. In contrast to the electoral system, there are many conventional uses of paper in its implementation. The aspect of security and transparency is a threat from still widespread election with the conventional system .Block chain technology is one of solutions, because it embraces a decentralized system and the entire database are owned by many users.

There is no doubt that the revolutionary concept of the blockchain, which is the underlying technology behind the famous crypto currency Bit coin and its successors, is triggering the start of a new era in the Internet and the online services. In this work, we have implemented and tested a sample e-voting application as a smart contract for the Ethereum network using the Ethereum wallets and the Solidity language.

Block chain was first introduced by Satoshi Nakamoto (a pseudonym), who proposed a peer to-peer payment system that allows cash transactions through the Internet without relying on trust or the need for a financial institution. Block chain is secure by design, and an example of a system with a high byzantine failure tolerance.

E-voting is a potential solution to the lack of interest in voting amongst the young tech savvy population. For e-voting to become more open, transparent, and independently auditable, a potential solution would be base it on block chain technology. Block chain technology has a lot of promise; however, in its current state it might not reach its full potential.

Electronic voting has been used in varying forms since 1970s with fundamental benefits over paper based systems such as increased efficiency and reduced errors. With the extraordinary growth in the use of block chain technologies, a number of initiatives have been made to explore the feasibility of using block chain to aid an effective solution to e-voting. It presented one such effort which leverages benefits of block chain such as cryptographic foundations and transparency to achieve an effective solution to e-voting. The proposed approach has been implemented with Multichain and in-depth evaluation of approach highlights its effectiveness with respect to achieving fundamental requirements for an e-voting scheme.

Recent major technical challenges relating to e-voting systems embrace, however not restricted to secure digital identity management. Any potential citizen ought to be registered to the electoral system before the elections. Their data ought to be in a very

digitally processable format. Besides, their identity data ought to be unbroken personal in any involving information. Ancient E-voting system could face following problems:

- Anonymous vote-casting.
- Individualized ballot processes.
- Ballot casting verifiability by (and only by) the voter.
- High initial setup costs.
- Increasing security problems.
- Lack of transparency and trust.
- Voting delays or inefficiencies related to remote/absentee voting

To mitigate these threats, software mechanisms which promise the following should be deployed:

1. Prevention of evidence deletion.
2. Transparency with privacy.

Using a Blockchain, the most important requirements are satisfied:

- Authentication: Only registered voters will be allowed to vote.
- Anonymity: The system prevents any interaction between the votes casted by the voters and their identities.
- Accuracy: Votes once cast are permanently recorded and cannot be modified or changed under any circumstances.
- Verifiability: The system will be verifiable such that the number of votes is accounted for

As technology advances, many countries have now opted for electronic voting systems. Any voting system must follow principles of transparency and impartiality in order to achieve fairness; the electronic voting process must also be protected against cyber-attacks or denial-of-service attacks (DDOS) because such attacks may affect the processing time in voting procedures and even hinder the fairness in voting. This study establishes a network security mechanism for voting systems based on blockchain technology. The blockchain mechanism employs a distributed architecture that can prevent system shutdown resulting from malicious cyber-attacks; additionally, any user in the blockchain can authenticate data integrity, which satisfies requirements of transparency and impartiality in voting systems.

## **CHAPTER-3**

### **WORK DONE**

#### **Proposed Plan of Work:**

For our proposed plan of work we are considering two modules that are to be completed in three phases. Two modules are as follows:

1. Front-end for the application
2. Back-end using Solidity to implement Blockchain.

Each of these module will be considered as one phase and the remaining one phase will cover the connection and testing of these modules.

- Phase 1: In this phase we will cover the front-end module, in which we will build the interactive user-interface for the admin as well as the user. In parallel the research work related to the implementation of Blockchain in decentralized application will be done.
- Phase 2: In this phase we will cover the back-end module, we will implement the Blockchain using Ethereum framework and convert the system into a decentralized application.
- Phase 3: The connection of two different module along with the testing of the platform will be completed in this phase.

#### **Division of Phase One:**

- We have considered 2 main modules which are as follows:
  - A. Admin- The admin module is divided into 5 components-
    1. Dashboard-It will contain various charts to display information such as number of parties, number of voters etc.
    2. Add Candidate - In this feature of admin, he can add candidates who are standing in the election. After candidate is added it will be displayed on the user side.

3. Create Election- This feature of admin will allow him to create election.  
A user can cast his vote only after the election is created by admin. A user can cast vote between the start date and end date.
4. Election Details- In this section admin can update election details such as start date, end date etc.
5. Candidate Details- In candidate details all the candidates added by admin will be displayed. Admin can update the candidate details if incase a wrong entry is done.

**B. User- The user module is divided into 4 components**

1. Dashboard- The user dashboard contains information about parties and their candidates. A user can see all the information about candidate.
2. Voter Register- In this section first user will have to register himself only then he will be able to cast his vote.
3. Voting Area- After user is registered, then only he will be directed to this page and then he can cast his vote.
4. Results- In this component the user will be able to see the results of the election.

### Phase One Flow Diagram

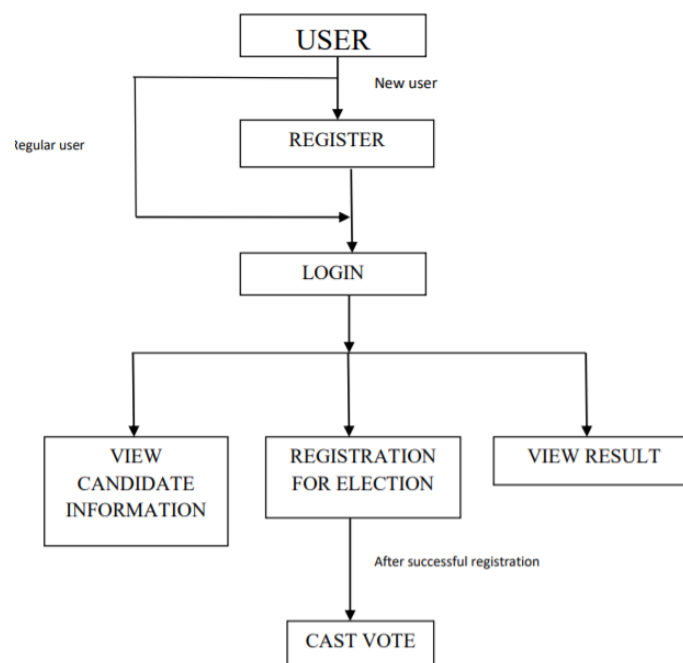


Fig.3.1 User flow diagram



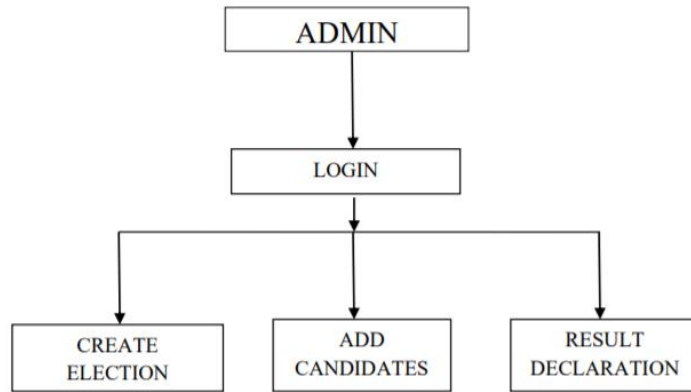


Fig.3.1 Admin flow diagram

## Research Methodology of Phase Two

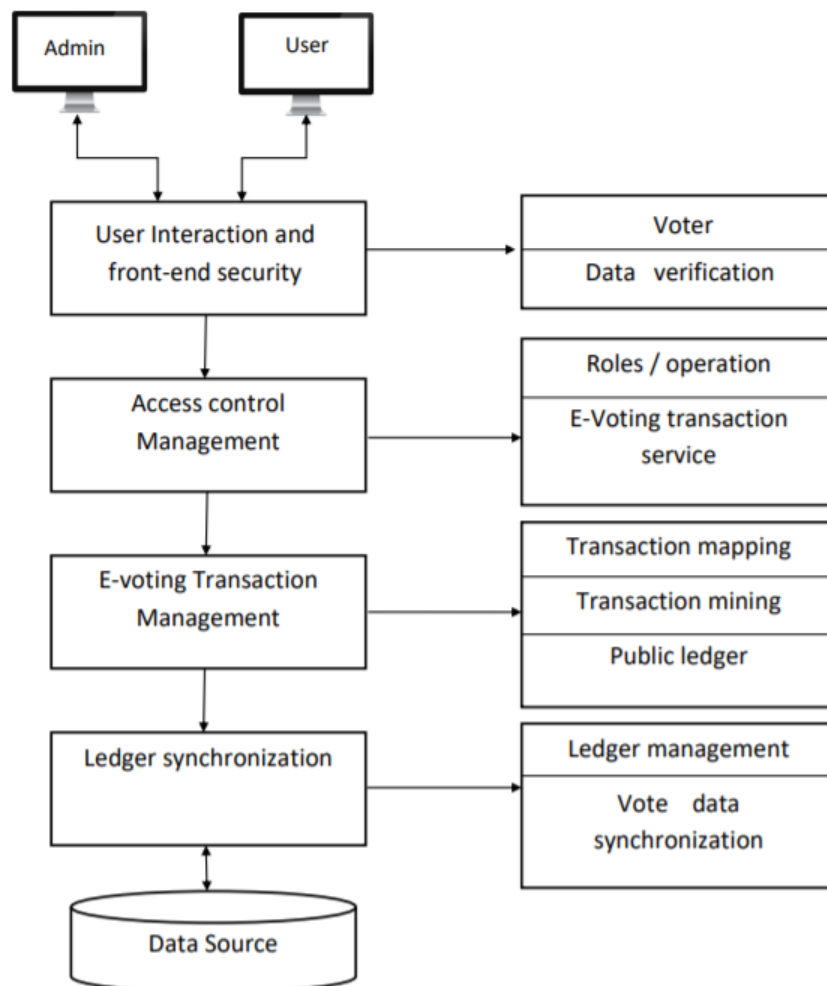


Fig.3.3 Research methodology

## **CHAPTER-4**

### **DATA ANALYSIS AND RESULT**

The existing system for voting in India is the EVM (Electronic Voting Machine) based system. Prior to this system there were paper ballots and manual counting. The paper ballots method was widely criticized because of fraudulent voting and booth capturing, where party loyalists captured booths and stuffed them with pre-filled fake ballots.

Replacing the existing system with a new election system is critical to limit fraud and having the voting process traceable and verifiable. As we can see the internet has brought a revolution in each and every domain possible, by trying to shift the existing system towards the online platform to make the proceedings fast and user convenient.

We know that the existing system is reliable but that does not mean that we should not take a step ahead towards the betterment of the existing system. Online voting system using blockchain can be that step.

A blockchain is a distributed, immutable, incontrovertible, public ledger. This new technology works through four main features:

- The ledger exists in many different locations: No single point of failure in the maintenance of the distributed ledger.
- There is distributed control over who can append new transactions to the ledger.
- Any proposed “new block” to the ledger must reference the previous version of the ledger, creating an immutable chain from where the blockchain gets its name, and thus preventing tampering with the integrity of previous entries.

We have tried to build a user interface of the decentralized application that will make the voting process more convenient. The UI portion can be assumed as 30% of the total work that is to be completed. The major portion in this system is related to the blockchain technology which will be responsible for the reliable voting process.

## UI of Website

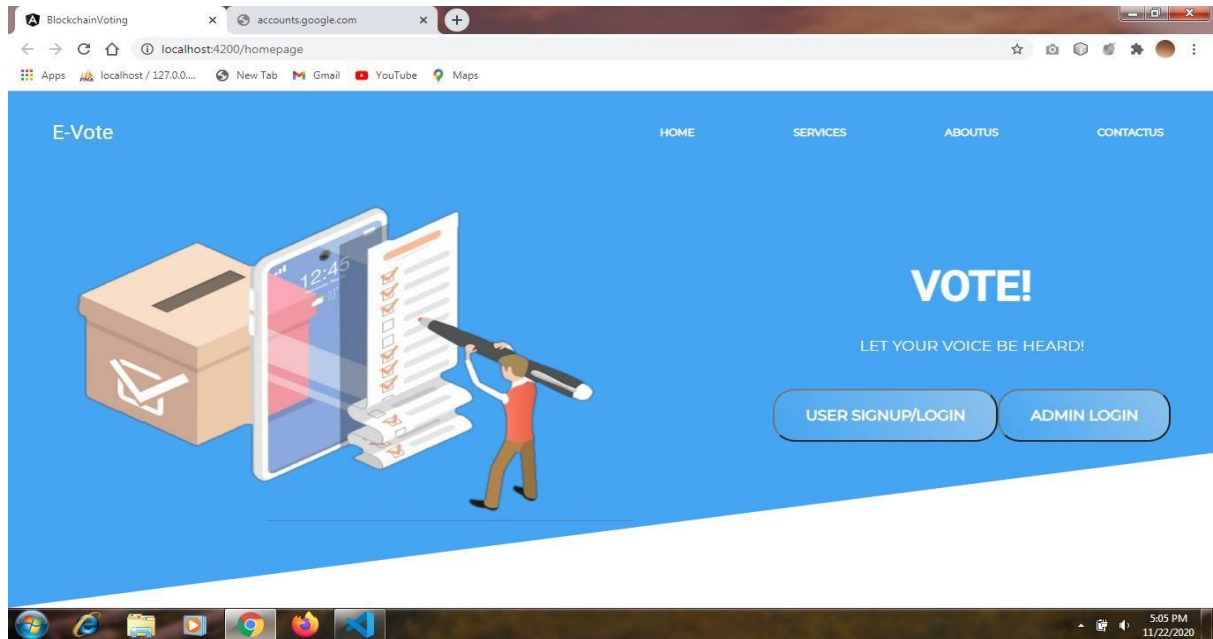


Fig.4.1 Homepage

- The homepage consists of 2 options –
  1. First option is for admin login
  2. Second option is for user signup/login

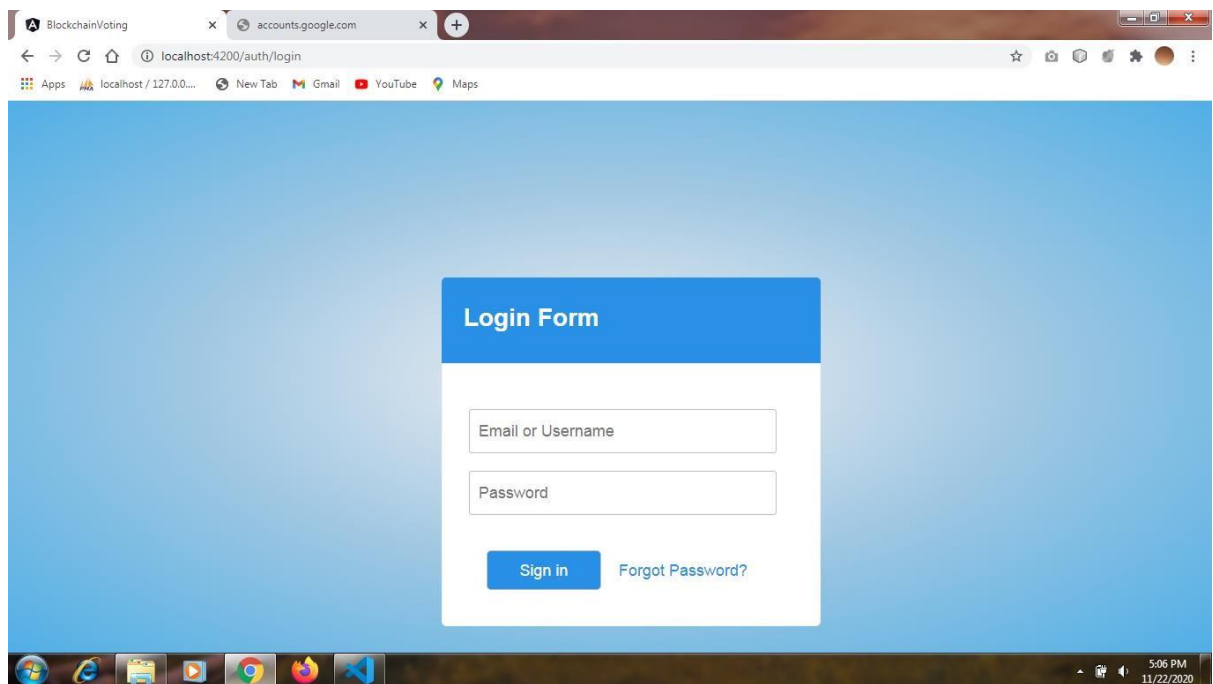


Fig.4.2 Admin Login

- This is the login page for admin.

After admin is logged in he is directed to the dashboard

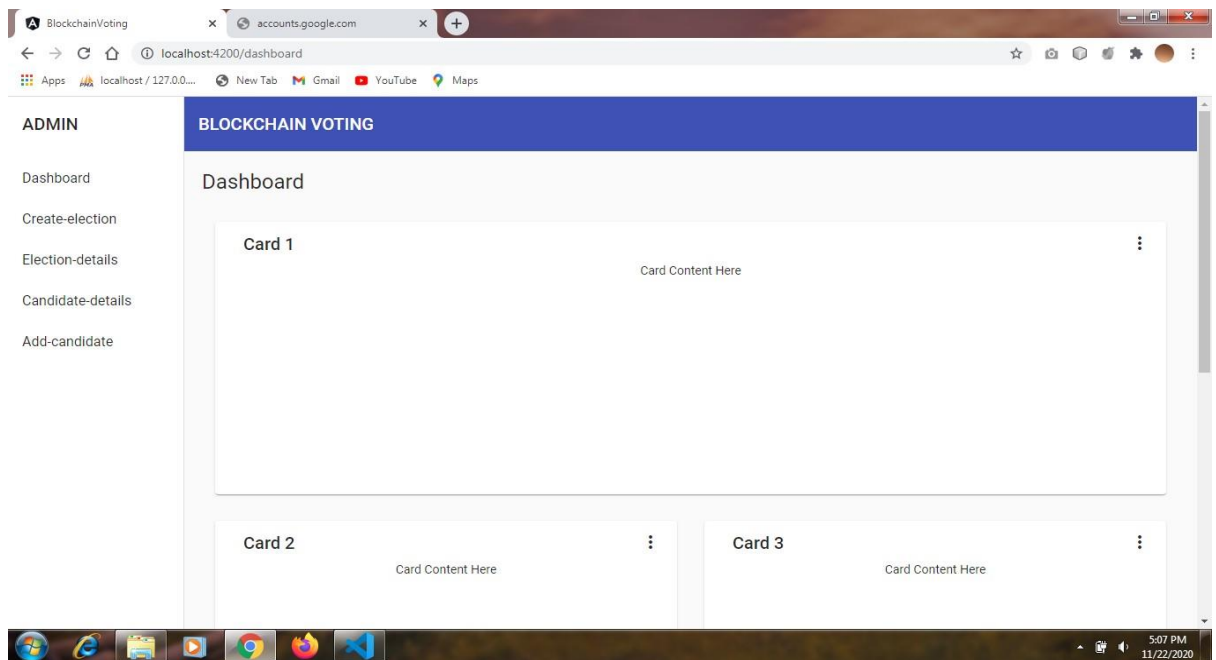


Fig.4.3 Admin Dashboard

- The dashboard will contain various charts to display information such as number of parties, number of voters etc.

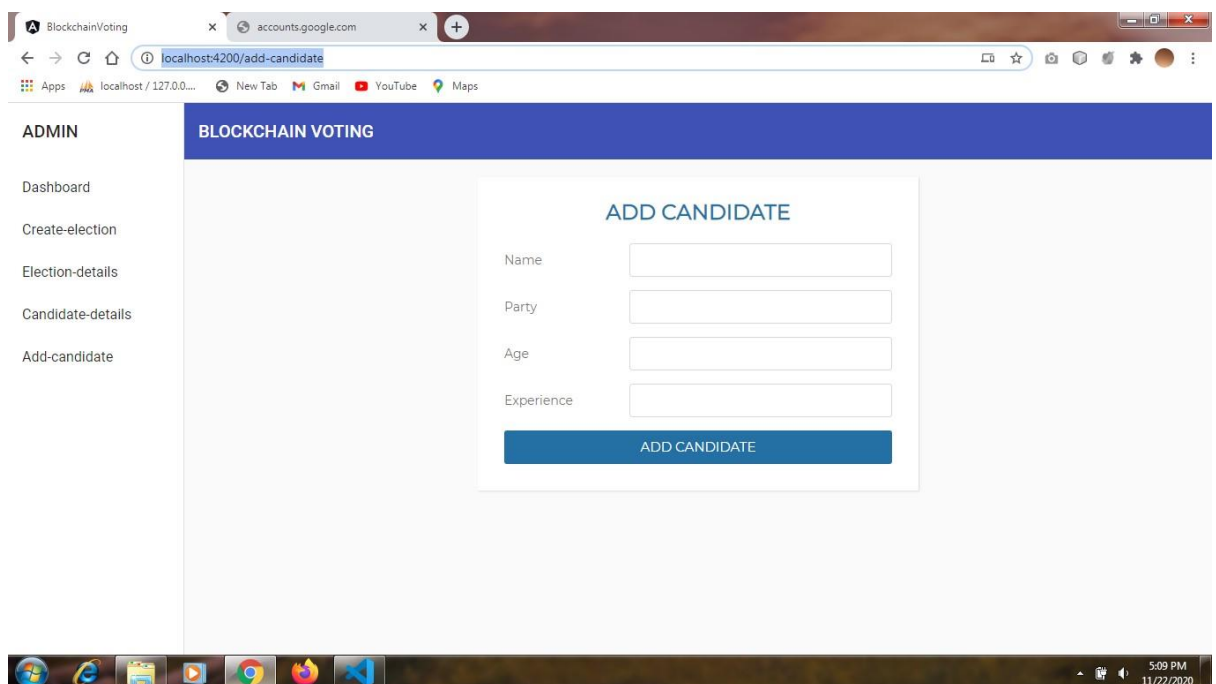


Fig.4.4 Add Candidate Page

- In this feature of admin, he can add candidates who are standing in the election.
- After candidate is added it will be displayed on the user side.

The screenshot shows a web browser window with the address bar displaying 'localhost:4200/create-election'. The page has a blue header with the text 'BLOCKCHAIN VOTING'. On the left, there is a sidebar with the word 'ADMIN' and a list of links: 'Dashboard', 'Create-election', 'Election-details', 'Candidate-details', and 'Add-candidate'. The main content area features a form titled 'CREATE ELECTION' with the following fields: 'Type', 'Organiser', 'Start Date', 'End Date', 'Start Time', and 'End Time'. Each field is represented by a white rectangular input box. Below these fields is a blue button labeled 'Create'. The browser's taskbar at the bottom shows various application icons and the system clock indicating 5:07 PM on 11/22/2020.

Fig.4.5 Create Election Page

- This feature of admin will allow him to create election.
- A user can cast his vote only after the election is created by admin.
- A user can cast vote between the start date and end date.

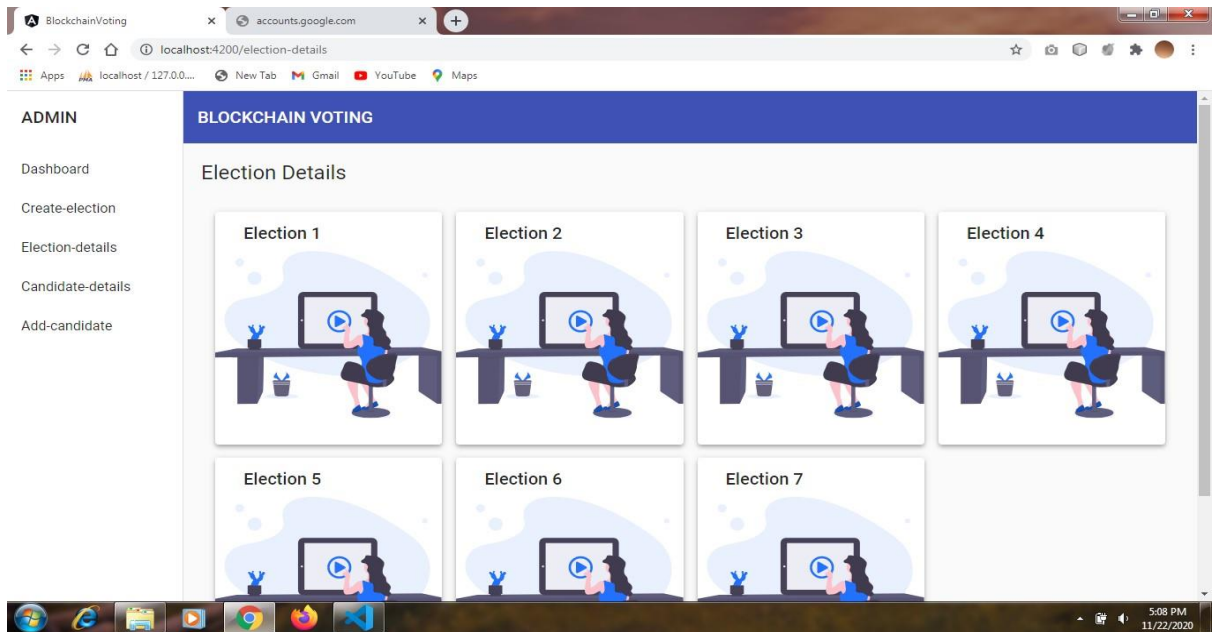


Fig.4.6 Candidate Details

In candidate details all the candidates added by admin will be displayed. Admin can update the candidate details if incase a wrong entry is done.

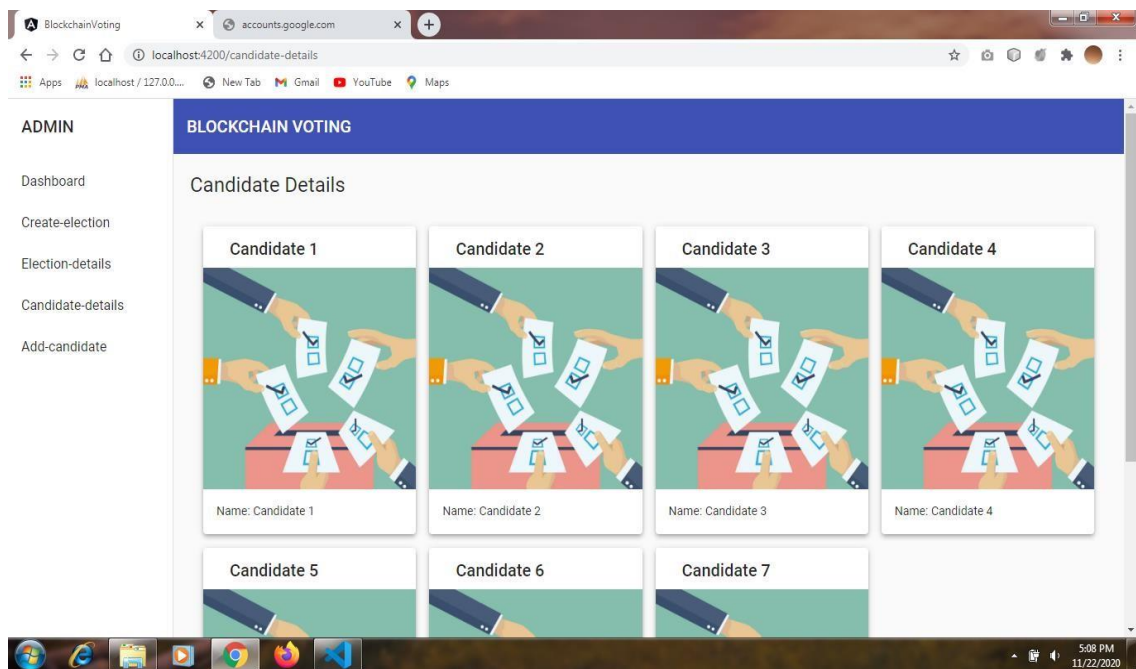


Fig.4.7 Election details

- In this section admin can update election details such as start date, end date etc.

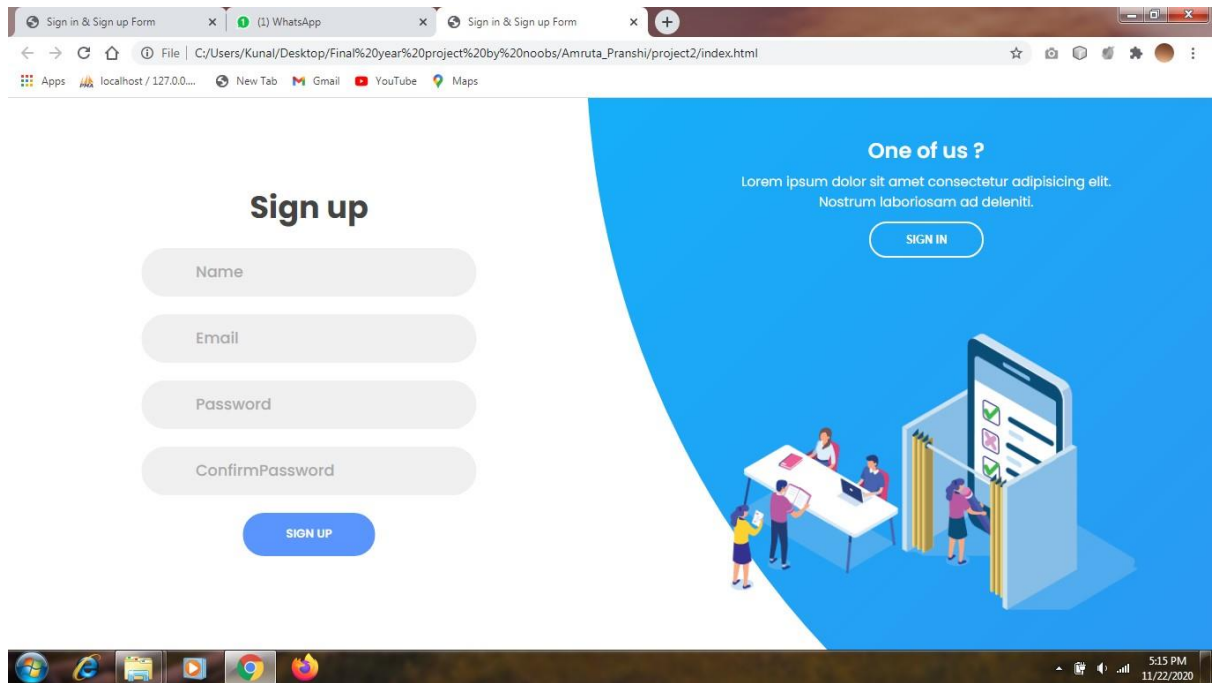


Fig.4.8 User Sign up

- User will have to sign up before login.
- This is the signup page for the user.

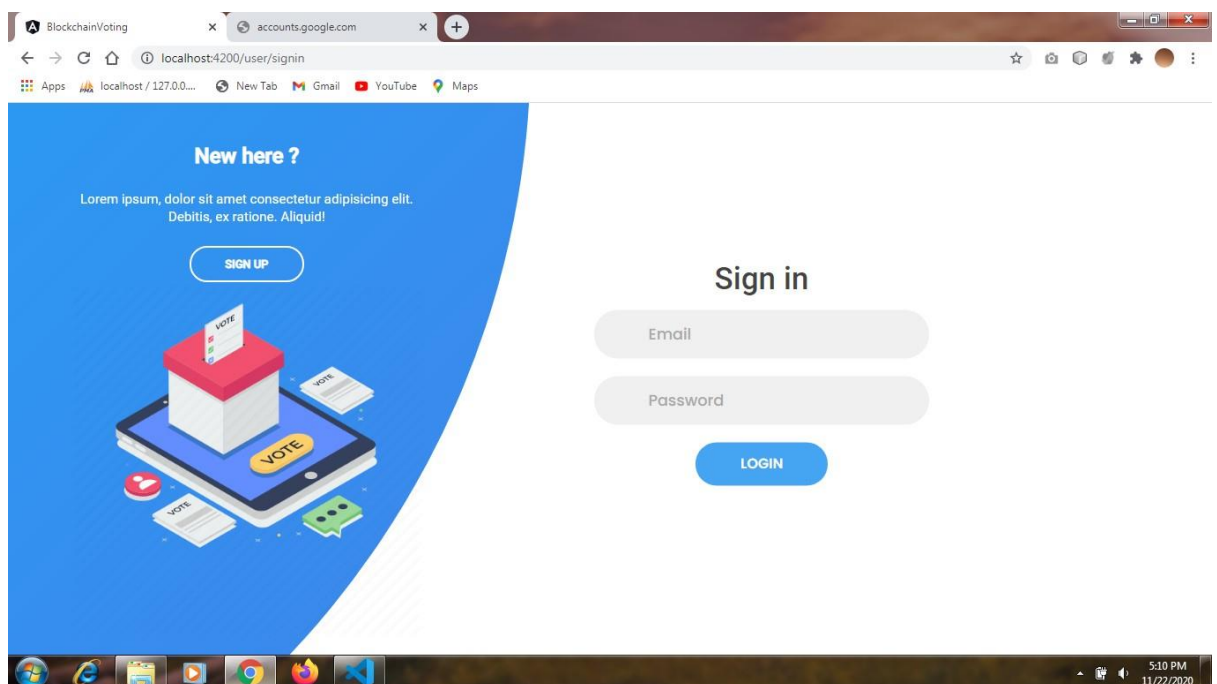


Fig.4.9 User Sign in

- If user chooses user sign in option on homepage he will be directed to this page.
- After login he will be directed to user dashboard.



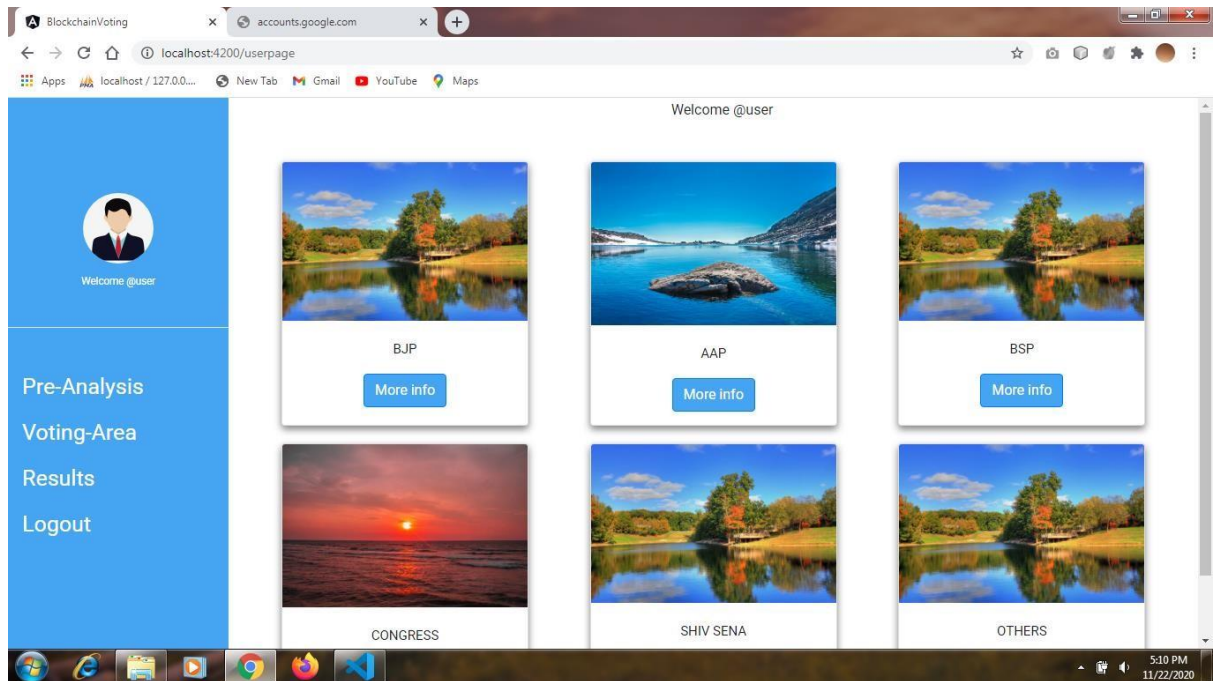


Fig.4.10 User Dashboard

- The user dashboard contains information about parties and their candidates.
- A user can see all the information about candidate.

Fig.4.11 Voter Registration form

In this section first user will have to register himself only then he will be able to cast his vote.



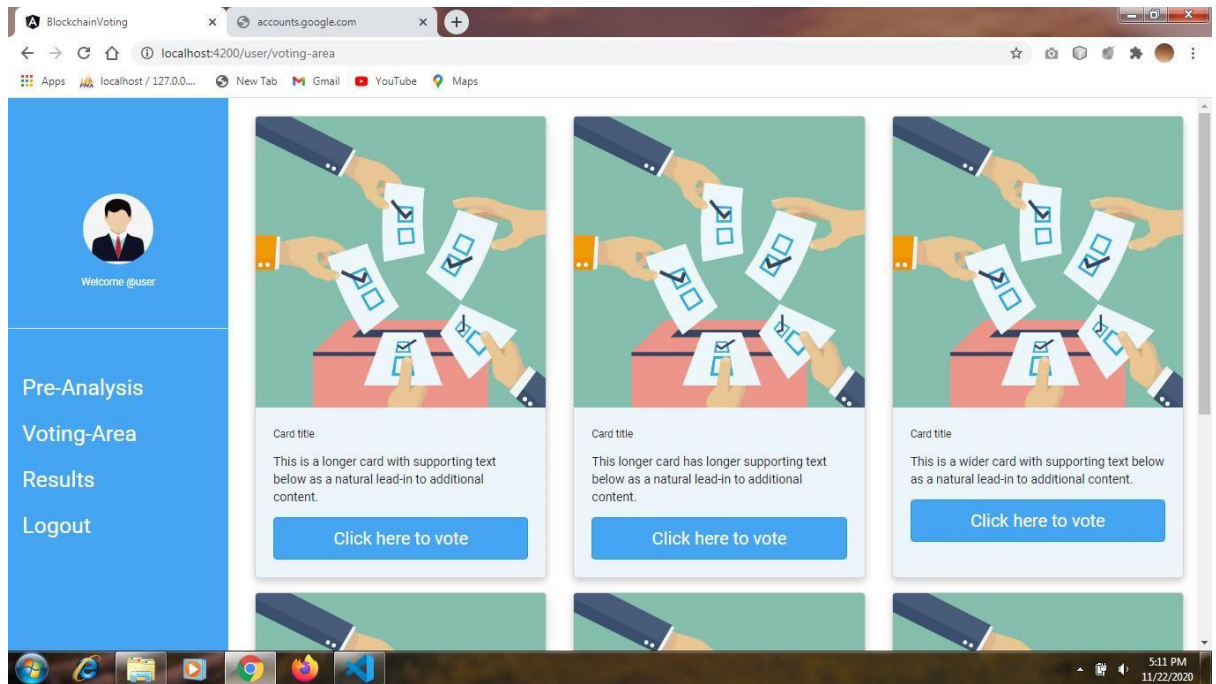


Fig.4.12 Vote Casting Page

After user is registered, then only he will be directed to this page and then he can cast his vote.

## **CHAPTER-5**

### **SUMMARY AND CONCLUSION**

In this project, we introduced a blockchain-based electronic voting system that utilizes smart contracts to enable secure and cost-efficient election while guaranteeing voters privacy. Blockchain technology offers a new possibility to overcome the limitations and adoption barriers of electronic voting systems which ensures the election security and integrity and lays the ground for transparency. Using an Ethereum private blockchain, it is possible to send hundreds of transactions per second onto the blockchain, utilizing every aspect of the smart contract to ease the load on the blockchain. To achieve this we have divided this overall work into three modules.

1. The front-end module
2. The back-end module
3. Connection of two different module along with the testing.

Until now we have completed our first module, in which we created the interactive user-interface for the admin as well as the user. We have also done some research work related to the implementation of Blockchain in decentralized application.

And In the future to make the voting process more secure and to correctly identify the person who is voting we can use ML and AI concepts. Using these concepts we can verify whether the person voting is the same as the person who has registered during the registration process.

## CHAPTER-6

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