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Blockchain Based Online Voting System

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Abstract: Election is a very important part of the modern democracy. But most of the people around the world do not trust the current flawed electoral system. There are many issues in current voting system such as vote manipulation, central database hacking, EVM hacking and many more. So in this paper we are trying to solve the above mentioned issues by proposing e-voting model which give fundamental benefit over current voting system. Blockchain technology is used to implement the proposed model which promises the security, transparency and cryptography. There are many blockchain framework which give blockchain as service, and some are explained in the paper. The paper presents the details of proposed system and how it is implemented using ethereum blockchain.

Index Terms **- E-Voting, Blockchain, Decentralized system, Ethereum, Election.**

I. INTRODUCTION

Democratic government is considered to be the best government among all other government. Because it provide a complete authority to its citizens to select their government. This candidate or party selection process is carried out through a process called Election. Therefore Election plays a vital role in any democracy. In this process every citizen of that particular country vote for his/her favorite candidate. The party which secure the highest vote is considered to be the winner and they form a government for next term. Hence election is a crucial part of any democracy.

As Election is a crucial part of any democracy its safety and security is also a matter of national safety. Currently almost all countries in the world follow the E-Voting mechanism that uses EVM's to vote. E-voting system was introduced to overcome the drawbacks of paper based voting system such as manual vote counting by election staff, heavy cost of election process and also slower result publishing. Even after all these advantages of E-voting system, it faces many challenges such as security, transparency, reliability and many more.

The main concern about current voting system is that it uses complex software for conducting election, because of which election fraud become more possible. Such as software can be hacked by introducing malicious code into the system, high initial setup cost, anonymity of voter, delayed voting and result, people may not trust the system as behind process can not be seen by them like how counting occurs, whether his/her vote is considered, whether the vote has gone to intended person only and so on. Then the biggest problem with this method is centralized data storage where all the sensitive data is stored in a single centralized system. If this one system is hacked then everything is gone.

So to overcome all these problems a blockchain technology can be used which help us to solve the above mentioned problems with its decentralized behavior and ability of transparency. Blockchain is a system which records the information in such way that makes it impossible to change or cheat the system. It is a digital ledger of transaction that are duplicated and distributed over complete blockchain network of computer system.

II. LITERATURE SURVEY

Building a secure electronic legal system that provides the fairness and privacy of current voting schemes, while providing the transparency and adaptability offered by electronic systems has been a challenge for a protracted time. Here author researched many real time applications based on blockchain and author explained in This paper evaluates an application of blockchain as a service to implement distributed electronic voting systems. The paper proposes a completely unique electronic legal voting system supported blockchain that addresses a number of the restrictions in existing systems and evaluates a number of the favored blockchain frame works for the aim of constructing a blockchain-based e-voting system. Patidar and S. Jain have proposed a paper "Decentralized E-Voting Portal Using Blockchain," which defines some blockchain frameworks for e-voting. The proposed solution is suitable for small-scale elections like inside corporate houses, board rooms, etc. The implementation uses a smart contract from Ethereum. The truffle framework is employed during this paper for the event, testing and deploying of smart contracts. Ganache is employed as an Ethereum client for testing. Here Meta-mask is employed as a browser wallet.

III. SYSTEM DESIGN

A detailed description of the Blockchain Based online voting system is based on software design. Software design describes a detailed description of modules the Blockchain Based online voting system mainly contains the modules like admin,voter.

The activity Diagram of the proposed system is as follows,

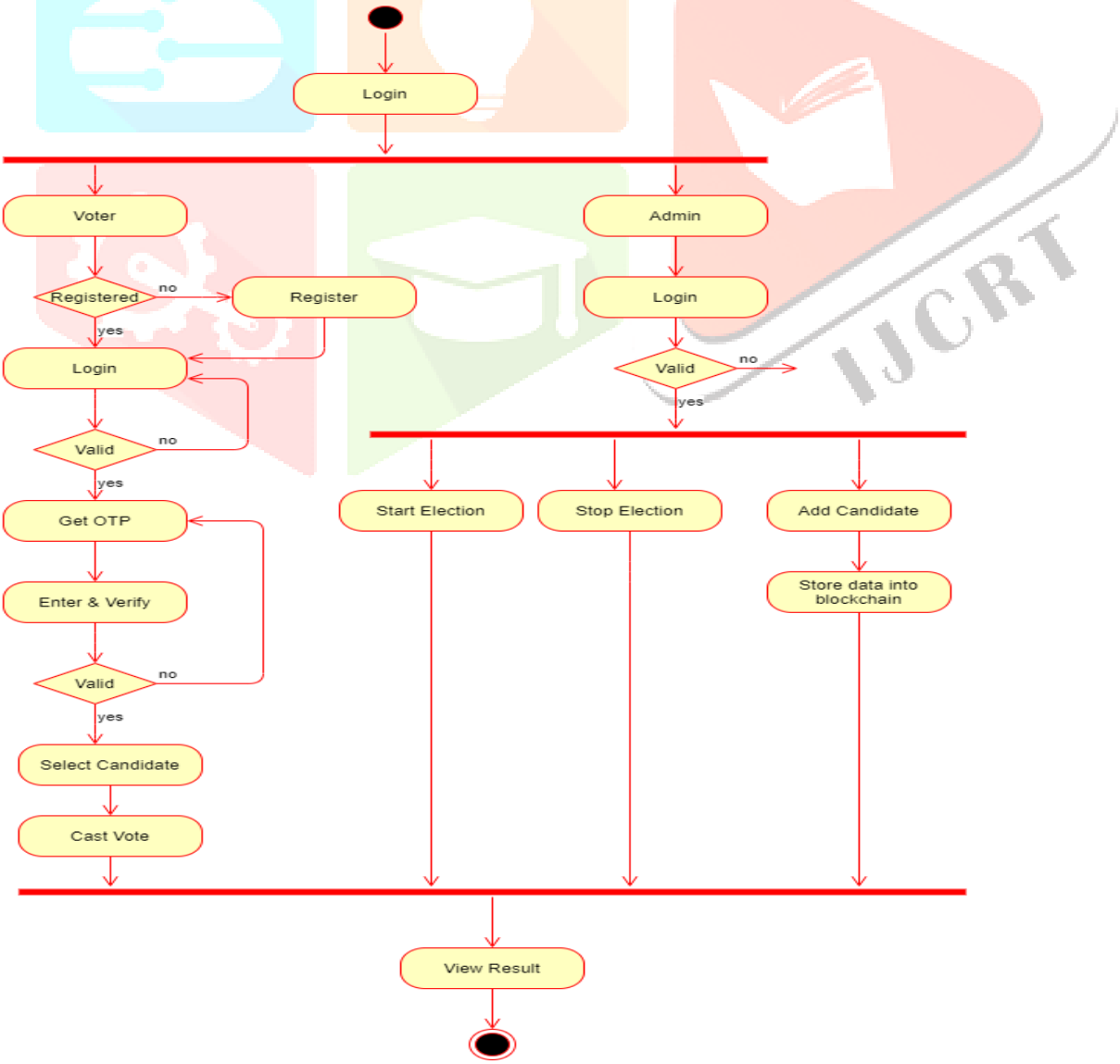

Fig 1 Activity Diagram of Blockchain based online voting system.

The above activity diagram represents a flow of activities performed by both Voter and Admin. A Application starts with home page where the user can either login as Admin or Voter. Admin can login to Application with his username and password then he can to either of 3 activities such as Start Election, Stop Election or Add Candidate. And Voter has to register to the system before logging in. Then the Voter can login with his Adhar Number and password, then the OTP authentication is done. After this he can choose a candidate of his choice and vote for him. After all this both the Admin and Voter can view the result and exit.

IV. PROPOSED SYSTEM

Election is a very important part of the modern democracy. But most of the people around the world do not trust the current flawed electoral system. There are many issues in current voting system such as vote manipulation, central database hacking, EVM hacking and many more. So in this application we are trying to solve the above mentioned issues by proposing e-voting model which give fundamental benefit over current voting system. Blockchain technology is used to implement the proposed model which promises the security, transparency and cryptography. There are many blockchain framework which give blockchain as service. The paper presents the details of proposed system and how it is implemented using ethereum blockchain.

3.1Proposed system and following modules

Voter can login to the application with his registered data like adhar number and password, if valid user then he will redirected to authentication page, where voter request system for an OTP, once he verifies OTP authentication then he will be redirected to voting page. There he could choose the candidate of his choice to vote. The validation is done for multiple vote hence if the voter has voted already then he will not be allowed to vote. After the election is over then he could see the result in his page about who has won the election.

Admin:

Admin need not to register to the system. But he shold login to the system with his username and password. Admin is the one who manages whole functionality of the application. He will decide when to start election and when to end election. Admin add the candidates for election. After the election is over he can see the result and display the same to voter page.

IV. RESULTS AND DISCUSSION

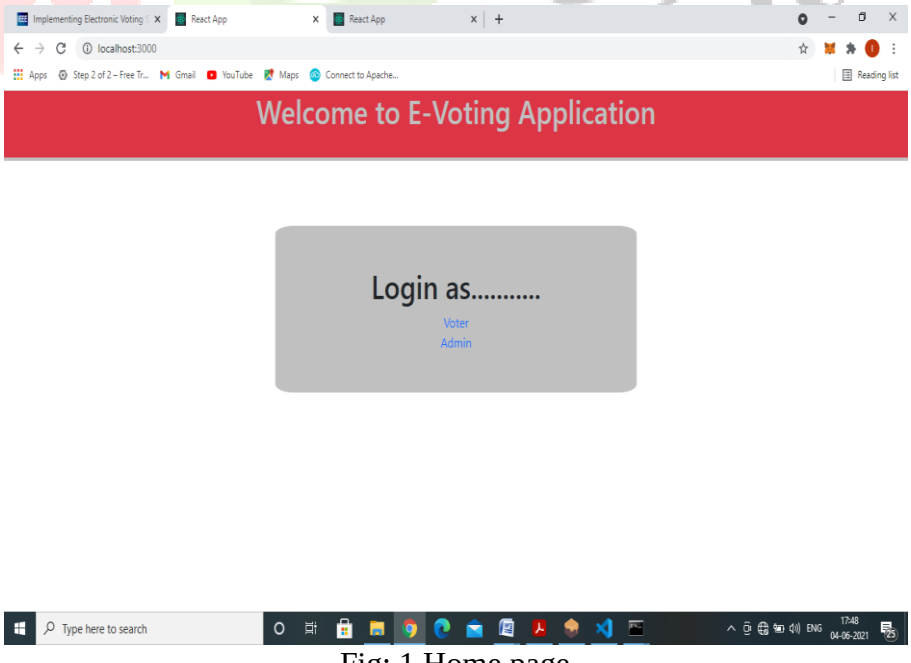

Fig: 1 Home page

Fig 1 shows the User Interface of the proposed Voting System. Through which users can easily access the services of the voting system.

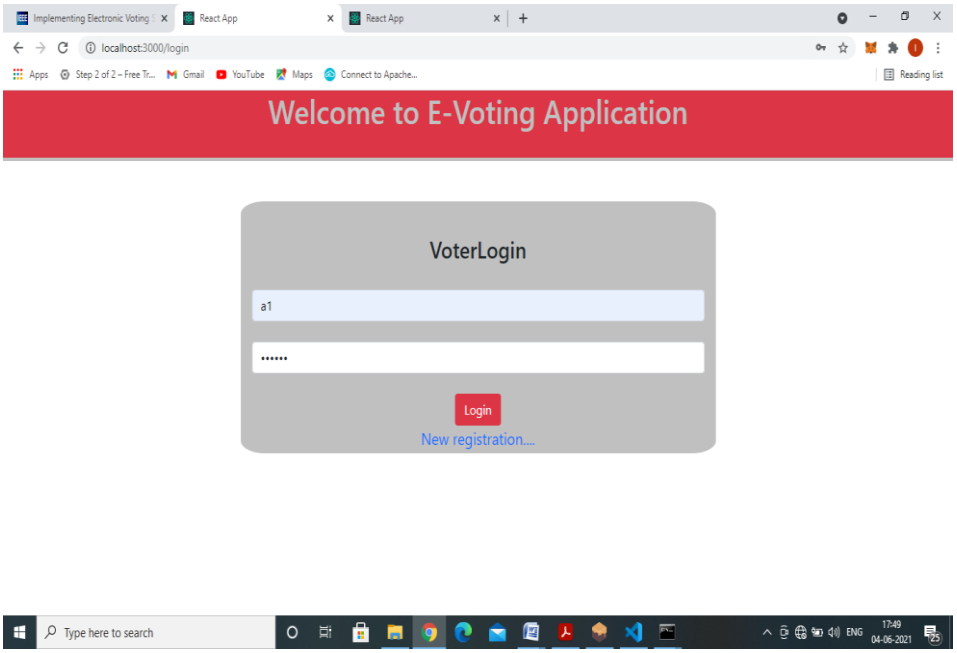

Fig 2 : Voter Login

The Fig 2 is a login page for Voters where he can use his registered adhar number and password to enter into E-Voting system.

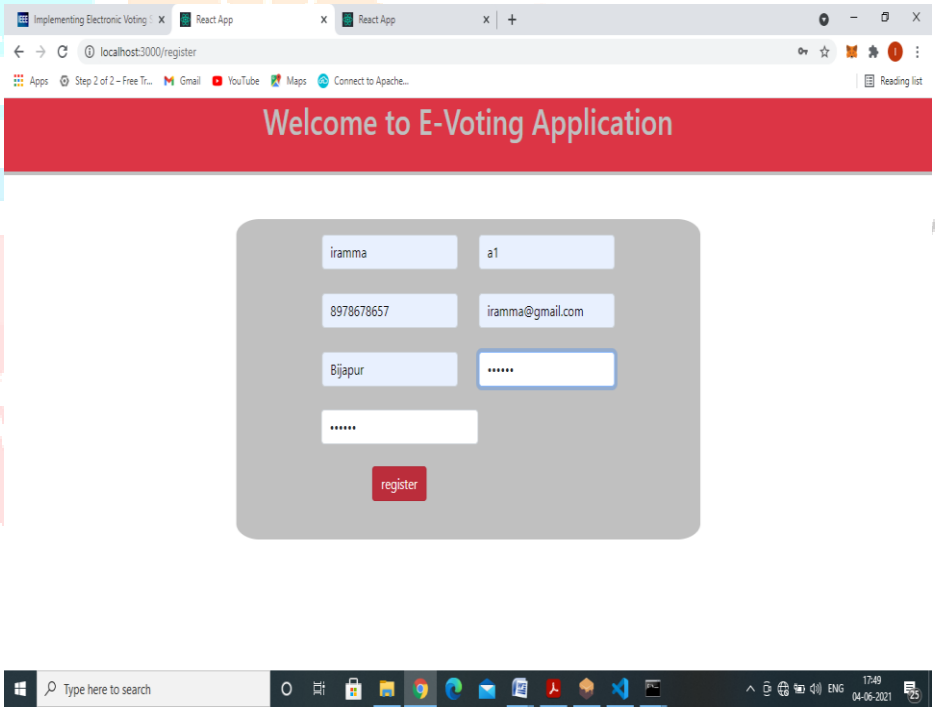

Fig 3: Voter registration page

The Fig 3 is a registration page for Voter where Voter need to register himself with valid data and submit it to blockchain.

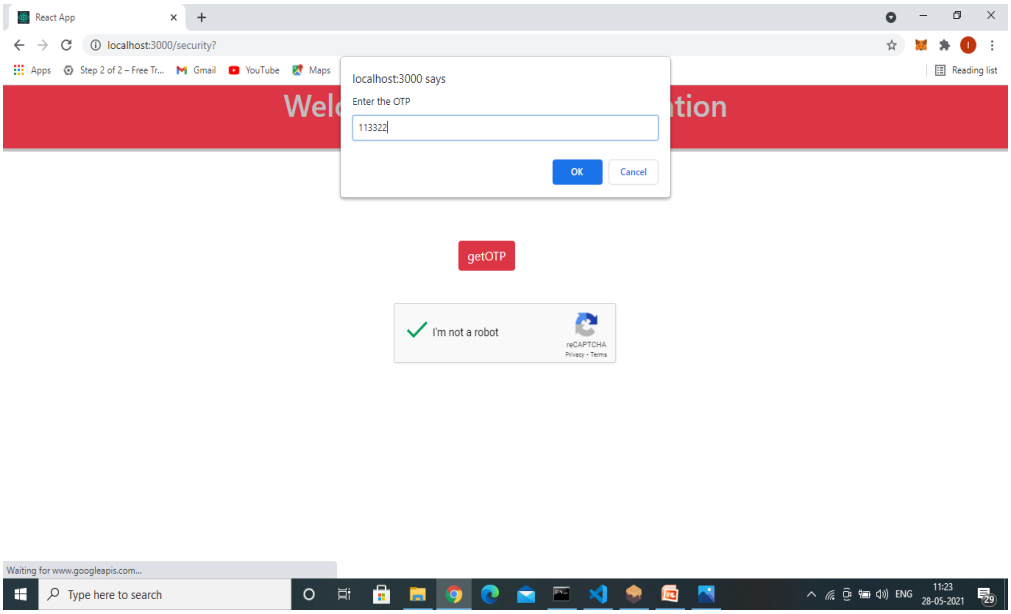

Fig 4 : Voter authentication

The fig 4 is the authentication page for voter. When voter login to the system he need to authenticate himself with an OTP sent to his registered mobile number.

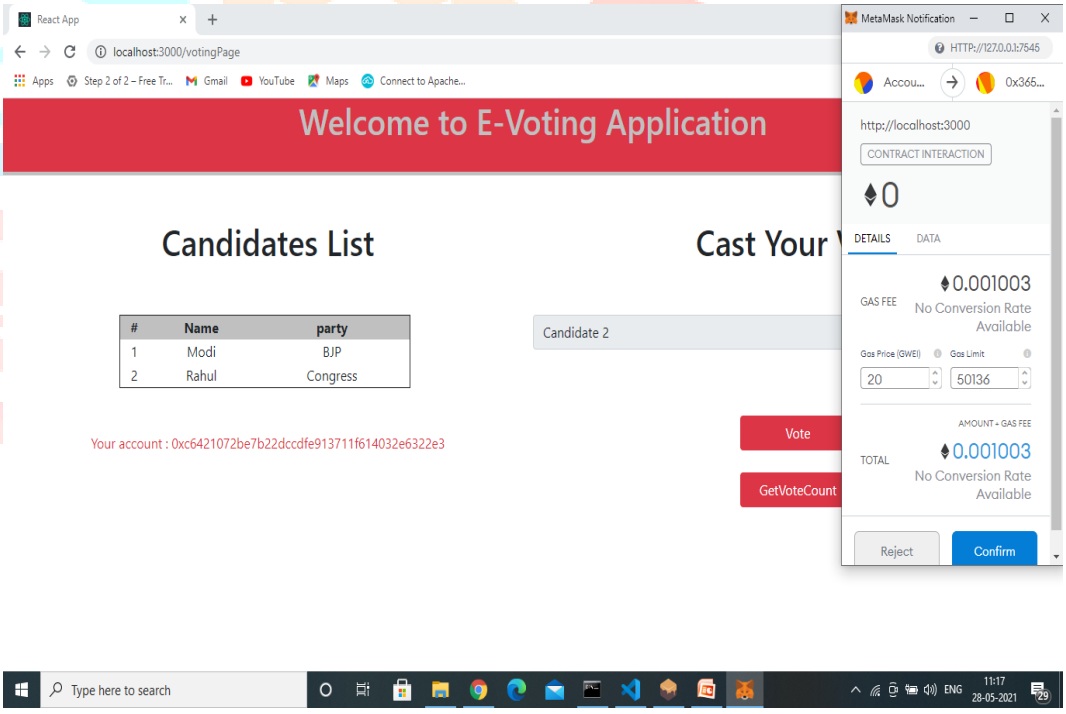

Fig 5: Voting page after election starts

The fig 5 is the voting page for voter which the voter will be getting after the election is started by the Admin. This page will be having a list of candidates participating in election and option for voting.

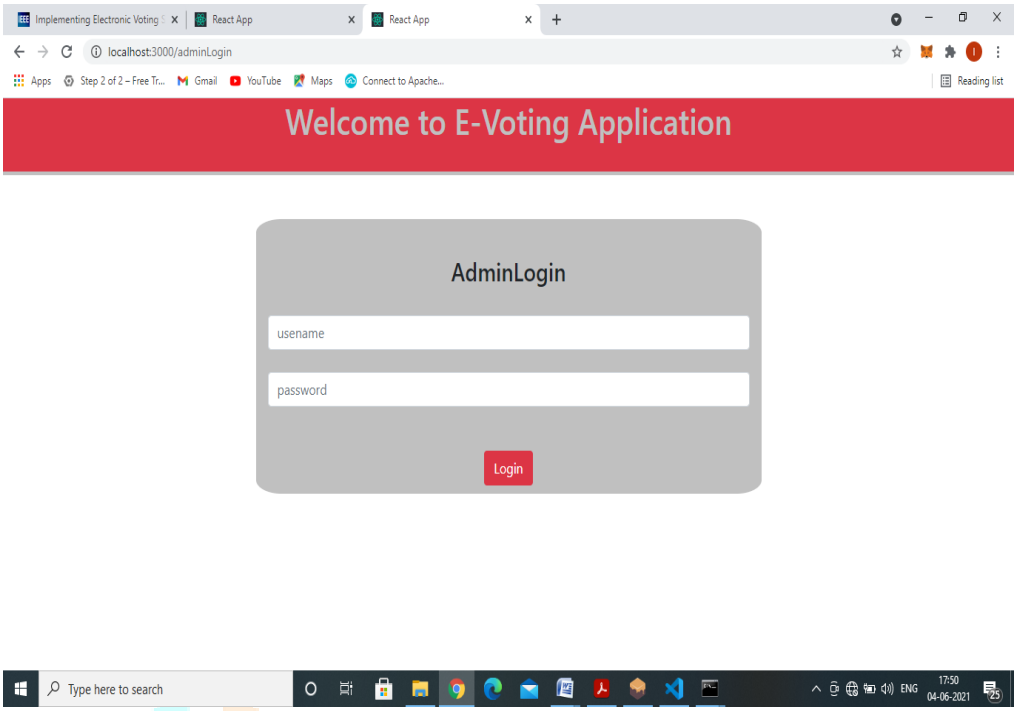

Fig 6: Admin login page

The fig 6 is the login page for Admin. Where Admin will be having his own username and password so he need not to register to the system.

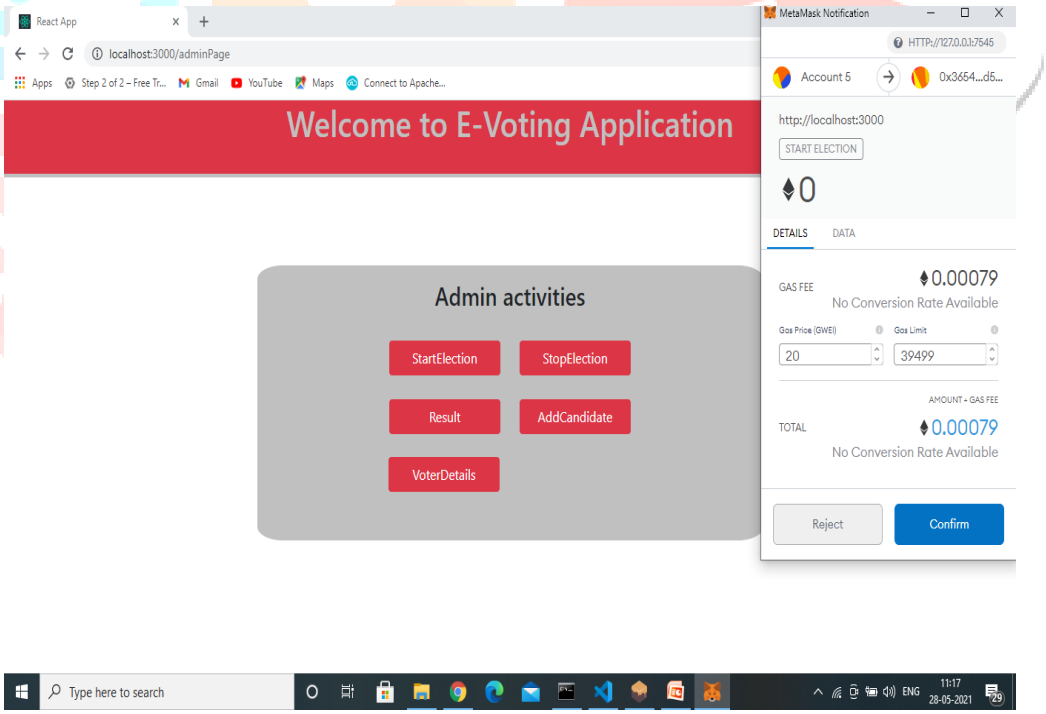

Fig 7: Admin page

The fig 7 is the main page of admin, where there several activities that the admin can perform such as start of election, stop of election, add candidate, and View election result.

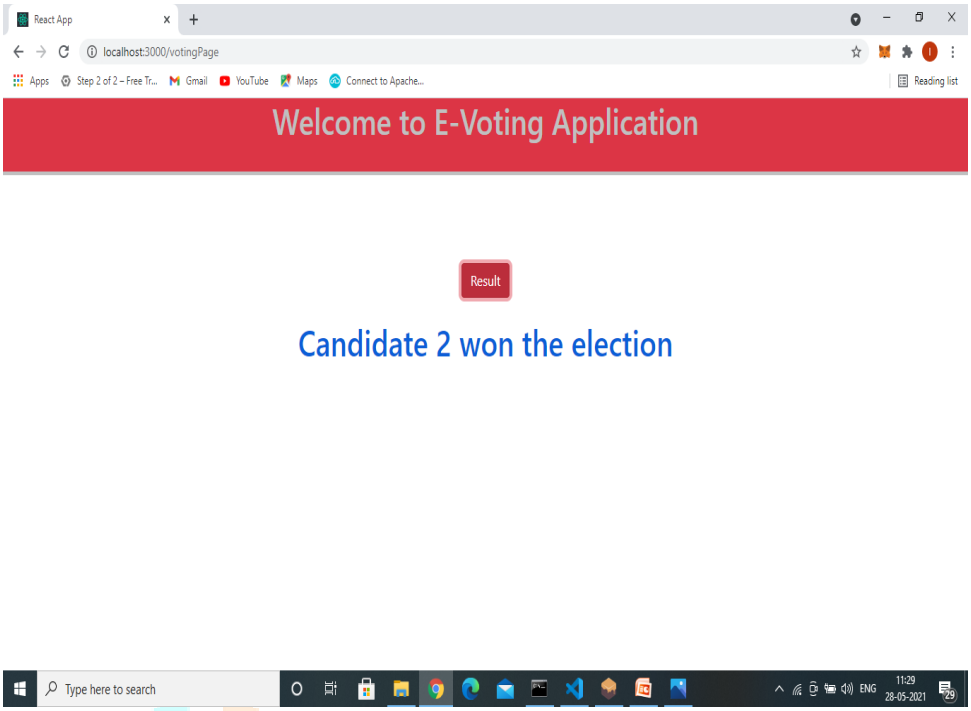

Fig 8 election result page

The fig 8 is shows the final result of the election got over. Here in the above screenshot it shows candidate 2 has one the election.

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