ELECTRONIC VOTING SYSTEM

A PROJECT REPORT

Submitted by

NATHIYA T (622620104017)

MANIMARAN M (622620104013)

BALAJI M (622620104003)

SOWBAKYAN S (622620104027)

TEAM ID: NM2023TMID11494

In partial fulfillment for the award of the degree

Of

BACHELOR OF ENGINEERING

in

COMPUTER SCIENCE AND ENGINEERING

SHREENIVASA ENGINEERING COLLEGE, DHARMAPURI

TABLE OF CONTENT

1. INTRODUCTION

1.1 PROJECT OVERVIEW:

With blockchain technology steadily striving towards becoming the new system for decentralized payment schemes, amongst other implementations, it is easy to imagine why this technology can be considered an ethical liberator with regards to different application domains. Blockchain, although a relatively new concept, has gained enough popularity for applications to emerge, such simplified methods for identification and authentication, the widely known decentralized payment scheme, Bitcoin, and domain systems which reside outside the control of the government or non-governmental organizations (NGOs) and many (Swan, 2015). The number of blockchain systems is steadily increasing, however the electronic voting domain is very slow to adapt to changes in technology with a relatively low number of systems devised so far, which introduce a fresh look on the electronic voting scene, based on our observation of the state of the art.

1.2 PURPOSE:

Electronic voting technology intends to speed the counting of ballots, reduce the cost of paying staff to count votes manually and can provide improved accessibility for disabled voters. Also in the long term, expenses are expected to decrease.[6] Results can be reported and published faster.[7] Voters save time and cost by being able to vote independently from their location. This may increase overall voter turnout. The citizen groups benefiting most from electronic elections are the ones living abroad, citizens living in rural areas far away from polling stations and the disabled with mobility impairments.

2. LITERATURE SURVEY

2.1 Existing problem:

Online voting in elections might seem like a logical step forward considering the many other daily activities, like banking and shopping, that we complete online. However, voting online does present unique challenges that usually don't apply to other internet-based processes. These challenges are related to a variety of factors, including the security required for online voting, legal requirements and frameworks, public opinion, and investment.

Elections always require a high level of security in order to protect voter privacy and the integrity of final results. Meeting the security needs of elections means that online voting technology must overcome barriers that don't apply to other online-based processes.

2.2 References

[1] ACCURATE: A Center for Correct, Usable, Reliable, Auditable, and Transparent Elections. http://accurate-voting.org/.

[2] The American Statistical Association, by-laws, article III.2. http://www. amstat.org/about/bylaws.cfm.

[3] Chapter 2, rule 13: election of president - opening address. http://www. europarl.europa.eu/.

[4] Comment on the article published in the Guardian. http://vvk. ee/valimiste-korraldamine/vvk-uudised/vabariigivalimiskomisjoni-vastulause-the-guardianis-ilmunudartiklile/.

[5] Communities in America currently using proportional voting. The FairVote website archives. http://archive.fairvote.org/?page=2101.

2.3 Problem Statement Definition:

" The basic methodology as applied to online voting system would involve giving voter realistic voting task to accomplish using a variety of ballot designs. A regroups methodology is used to sample variable aspects of the system, such as vectors and ballots. The sample is constructed so as to provide a statistical basis for generalization from the sample to the populations they represents voting task performance is measured using variables such as accuracy time and workload.

In online voting mechanism each voter receives a unique ballot code. The ballot code has an arbitrary length and is generated randomly to help prevent manipulation. Online voting system mails virtual ballot papers, including the ballot code, to the voters before election. The voters can then uses their email clients to return their votes to the voting server."

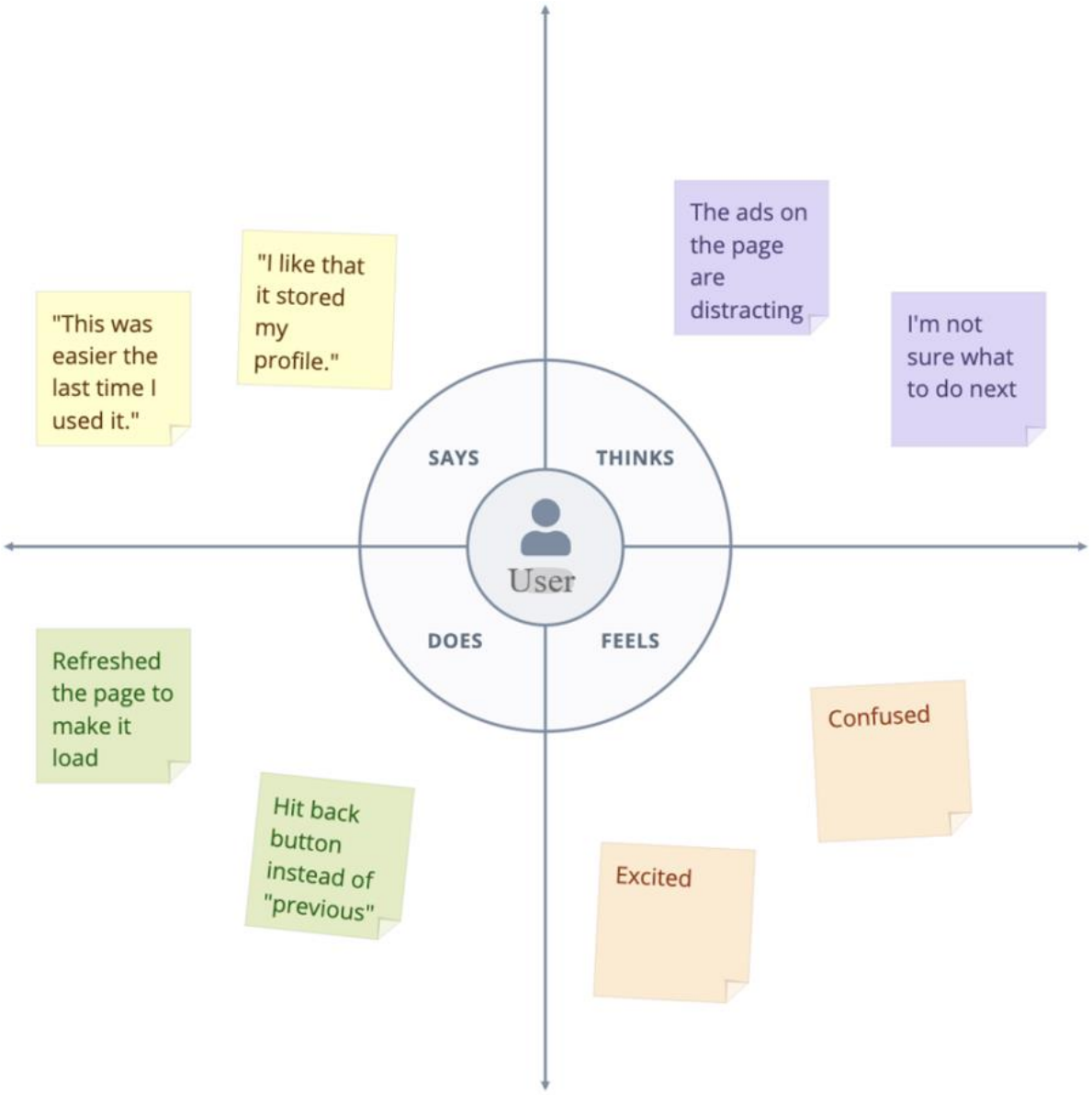
With blockchain technology steadily striving towards becoming the new system for decentralized payment schemes, amongst other implementations, it is easy to imagine why this technology can be considered an ethical liberator with regards to different application domains. Blockchain, although a relatively new concept, has gained enough popularity for applications to emerge, such simplified methods for identification and authentication, the widely known decentralized payment scheme, Bitcoin, and domain systems which reside outside the control of the government or non-governmental organizations (NGOs) and many (Swan, 2015.

This problem statement succinctly outlines the current challenges in the voting and clearly articulates the goals and objectives of your project. It provides a solid foundation for development and implementation of your electronic voting system.

.

3. IDEATION & PROPOSED SOLUTION:

3.1 Empathy Map Canvas:



3.2 Ideation & Brainstorming

2 Brainstorm

Write down any ideas that come to mind that address your problem statement.

10 minutes

TIP

You can select a sticky note and hit the pencil [switch] to start drawing!

NITHOSH KUMAR N

VETRIAZHAGAN

BARNIKA B

Person 5

Person 6

Person 7

Person 8

3 Group ideas

Take turns sharing your ideas while clustering similar or related notes as you go. Once all sticky notes have been grouped, give each cluster a sentence-like label. If a cluster is bigger than six sticky notes, try and see if you and break it up into smaller sub-groups.

20 minutes

TIP

Add customizable tags to sticky notes to make it easier to find, browse, organize, and categorize important ideas as themes within your mural.

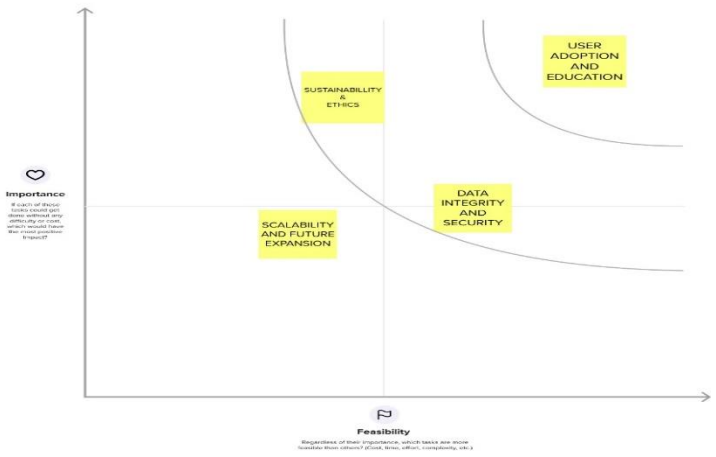
4 Prioritize

Your team should all be on the same page about what's important moving forward. Place your ideas on this grid to determine which ideas are important and which are feasible.

20 minutes

TIP

Participants can use their cursors to point at where sticky notes should go on the grid. Ask participants to confirm the spot by using the laser pointer holding the **M key** on the keyboard.



After you collaborate

You can export the mural as an image or pdf to share with members of your company who might find it helpful.

Quick add-ons

Share the mural
Share a view link to the mural with stakeholders to keep them in the loop about the outcomes of the session.

Export the mural
Export a copy of the mural as a PNG or PDF to attach to emails, include in slides, or save in your drive.

Keep moving forward

Strategy blueprint
Define the components of a new idea or strategy.
Open the template →

Customer experience journey map
Understand customer needs, motivations, and obstacles for an experience.
Open the template →

Strengths, weaknesses, opportunities & threats
Identify strengths, weaknesses, opportunities, and threats (SWOT) to develop a plan.
Open the template →

Share template feedback

4. REQUIREMENT ANALYSIS:

4.1 Functional requirement:

1. Mobility: The voter should not be restricted to cast his ballot at a single poll-site at his home precinct.

• Realistic: He shall be able to vote from any poll-site within the nation. • Unrealistic/Expensive: He shall be able to vote from any county-controlled kiosk (situated at public places such as banks, shopping malls, etc.) within the nation. (Unrealistic because of logistical and cost issues).

• Infeasible: He shall be able to vote from virtually anywhere using an Internet connection. (Infeasible both for technical security issues as well as social science issues).

2. Convenience: The system shall allow the voters to cast their votes quickly, in one session, and should not require many special skills or intimidate the voter (to ensure Equality of Access to Voters).

3. User-Interface: The system shall provide an easy-to-use user-interface. Also, it shall not disadvantage any candidate while displaying the choices (e.g., by requiring the user to scroll down to see the last few choices).

4. Transparency: Voters should be able to possess a general knowledge and understanding of the voting process.

5. Flexibility: The system shall be flexible in that it allows a variety of ballot question formats including open-ended questions (e.g. Write-in candidates and survey questions).

6. Support for Disabled Voters: The system shall cater to the needs of physically challenged voters (e.g. blind voters).

7. Accuracy: The system shall record and count all the votes and shall do so correctly.

8. Eligibility: Only authorized voters, who are registered, should be able to vote.

9. Uniqueness: No voter should be able to vote more than once.

10. Auditability: It should be possible to verify that all votes have been correctly accounted for in the final election tally, and there should be reliable and demonstrably authentic election records, in terms of physical, permanent audit trail (which should not reveal the user's identity in any manner).

11. Voter Confirmation: The voter shall be able to confirm clearly how his vote is being cast, and shall be given a chance to modify his vote before he commits it.

12. To issue Receipt or not? • The system may issue a receipt to the voter if and only if it can be ensured that vote-coercion and vote-selling are prevented, so that he may verify his vote at any time and also contend, if necessary.

13. No Over-voting: The voter shall be prevented from choosing more than one candidate / answer.

14. Under-voting: The voter may receive a warning of not voting, but the system must not prevent undervoting.

15. Provisional Ballots: The voter shall be able to vote with a provisional (electronic) ballot if he has some registration problems, which could be counted if verified by the authorities later.

16. Documentation and Assurance: The design, implementation, and testing procedures must be well documented so that the voter-confidence in the election process is ensured.

17. Cost-effectiveness: Election systems should be affordable and efficient.

4.2. Non-Functional Requirements:

Functional suitability

Performance efficiency

Compatibility

Usability

Reliability

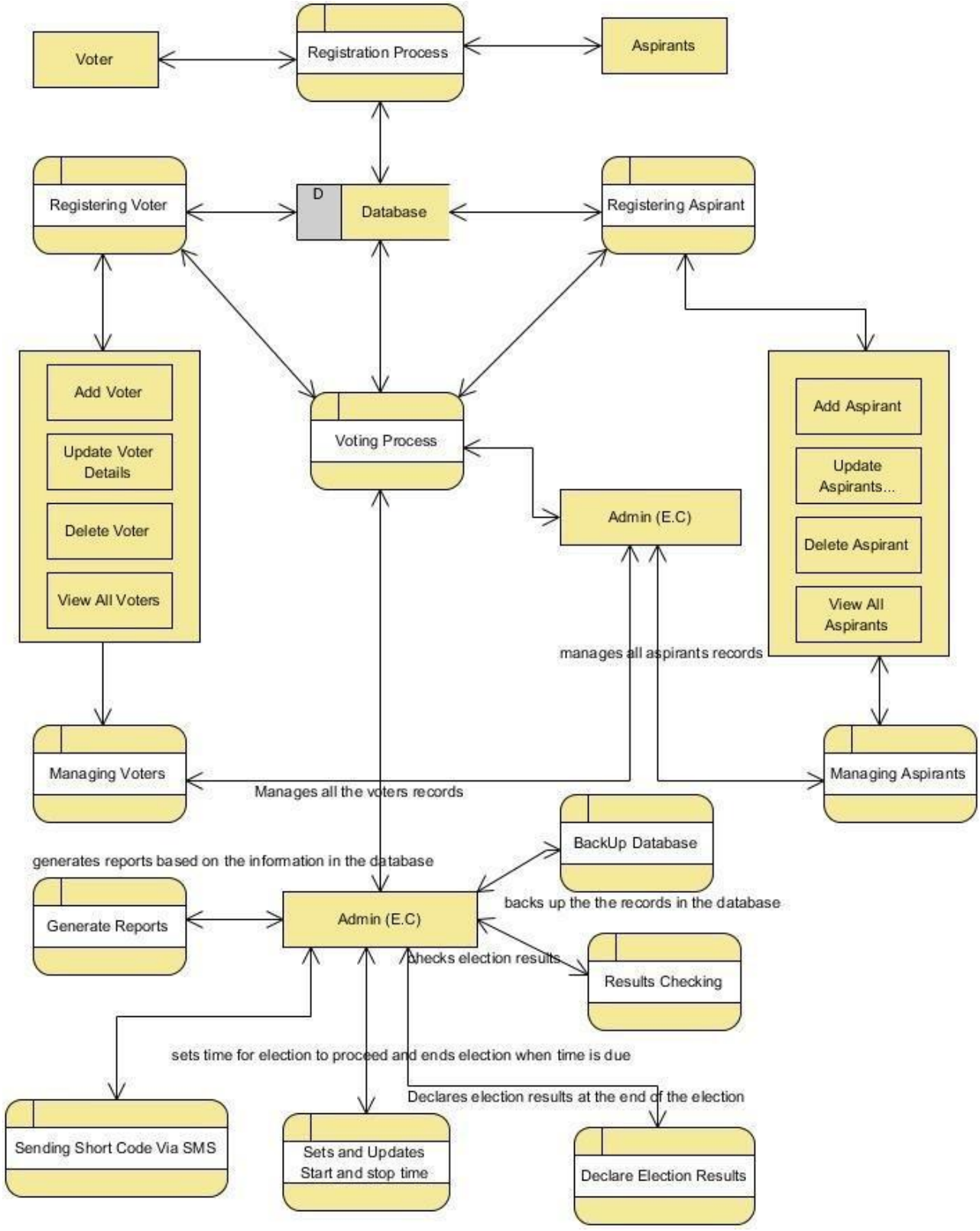
Security

Maintainability

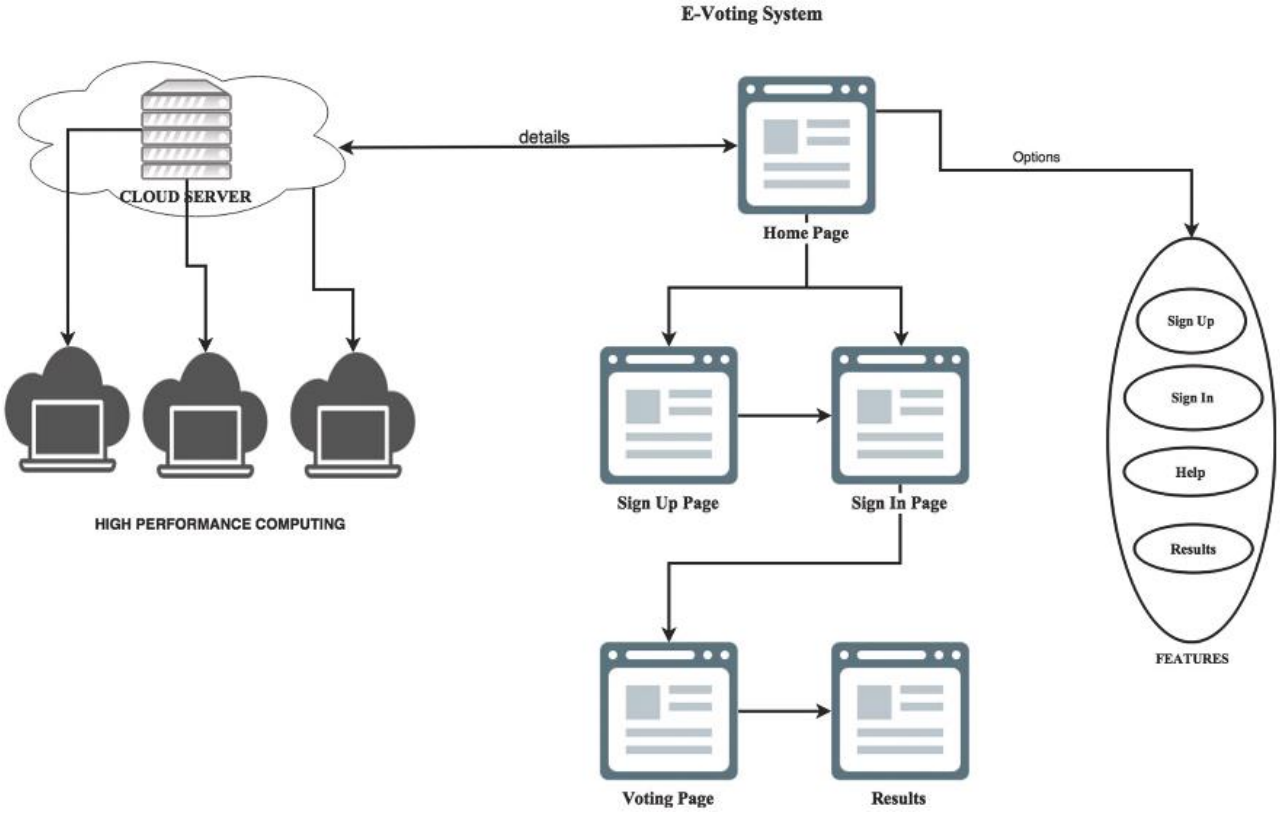
Portability

5. PROJECT DESIGN:

5.1 Data Flow Diagrams & User Stories:

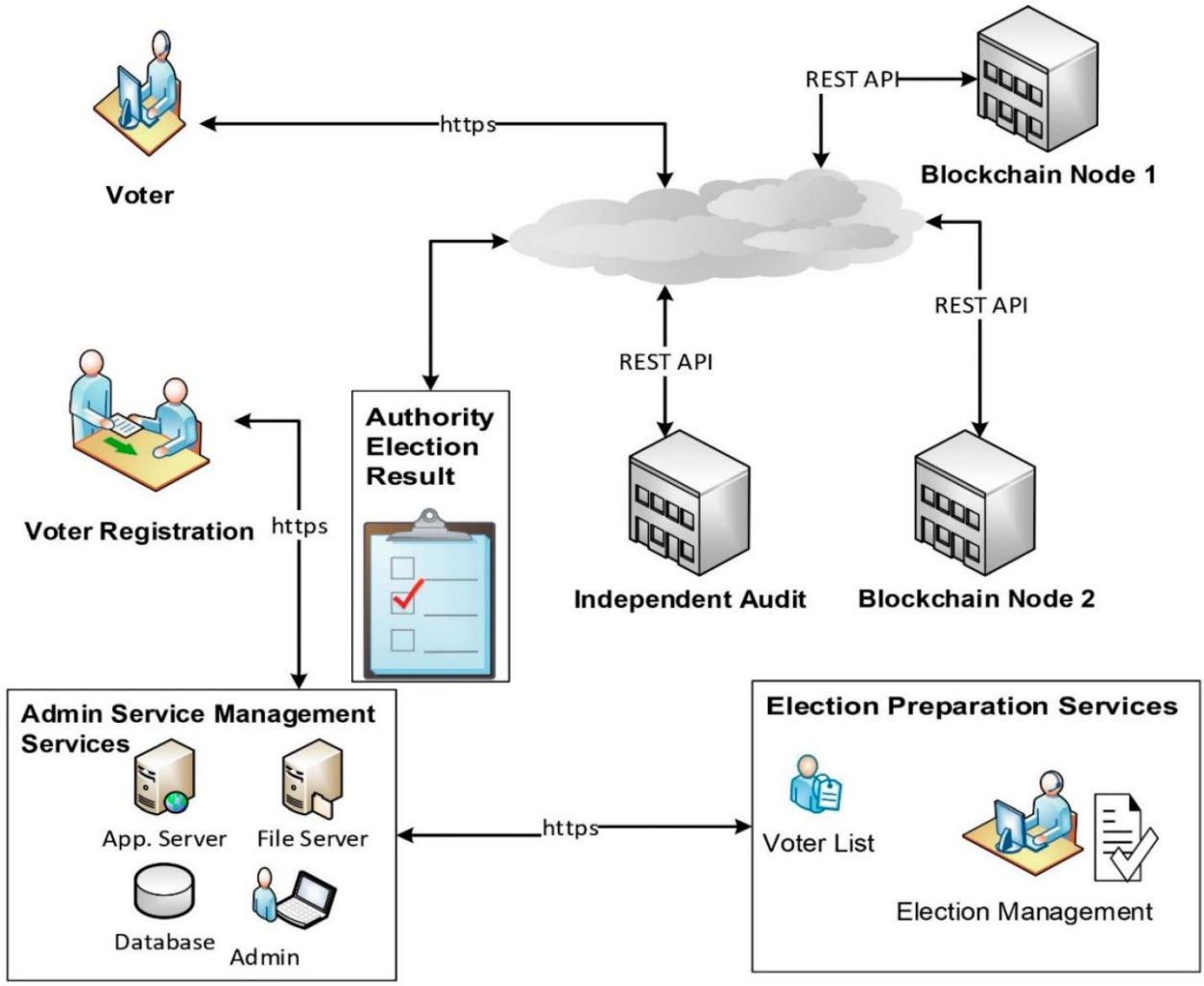


5.2 Solution Architecture:



6. PROJECT PLANNING:

6.1 Technical Architecture:



7. CODING & SOLUTIONING:

7.1 Feature 1:

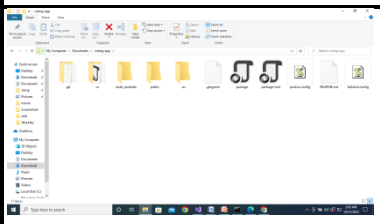
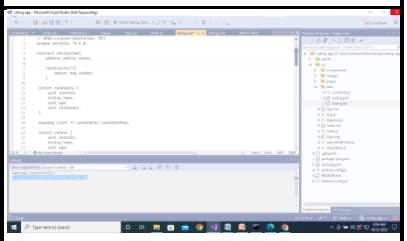
Your chosen online voting provider should offer nominations services, which streamlines the process of selecting candidates before the election. Members can easily nominate someone through online petitions or simple forms that only require an email address. The service should include application assistance, the ability to upload pertinent information, and opportunities for review. Better yet, some software can alert nominees if they're missing information or don't meet eligibility criteria. The review process should allow the deciding bodies to add notes and check the status of every application in real time.

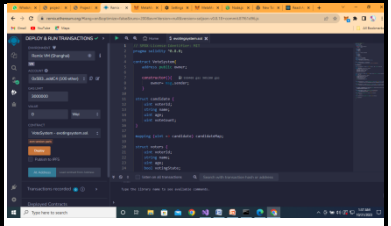
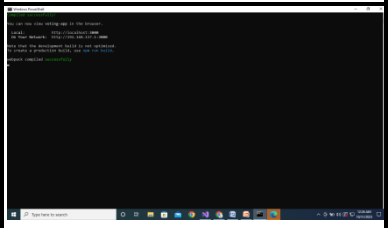
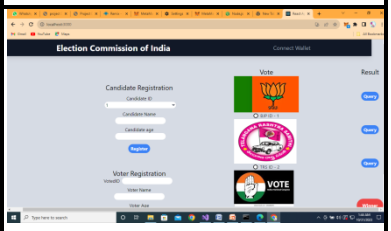
7.2 Feature 2:

It's crucial your online voting service provides a seamless election experience, so members of your organization shouldn't have to lift a finger, except to participate in the vote. The company you partner with should set up and manage the election from the nominations stage to the final tabulation and analysis process. The service should also provide 24/7 technical support to the organization and individual voters should they have trouble accessing the ballots. You should also ensure voters have the ability to access their ballots at any time, anywhere on the day of the election.

8. PERFORMANCE TESTING:

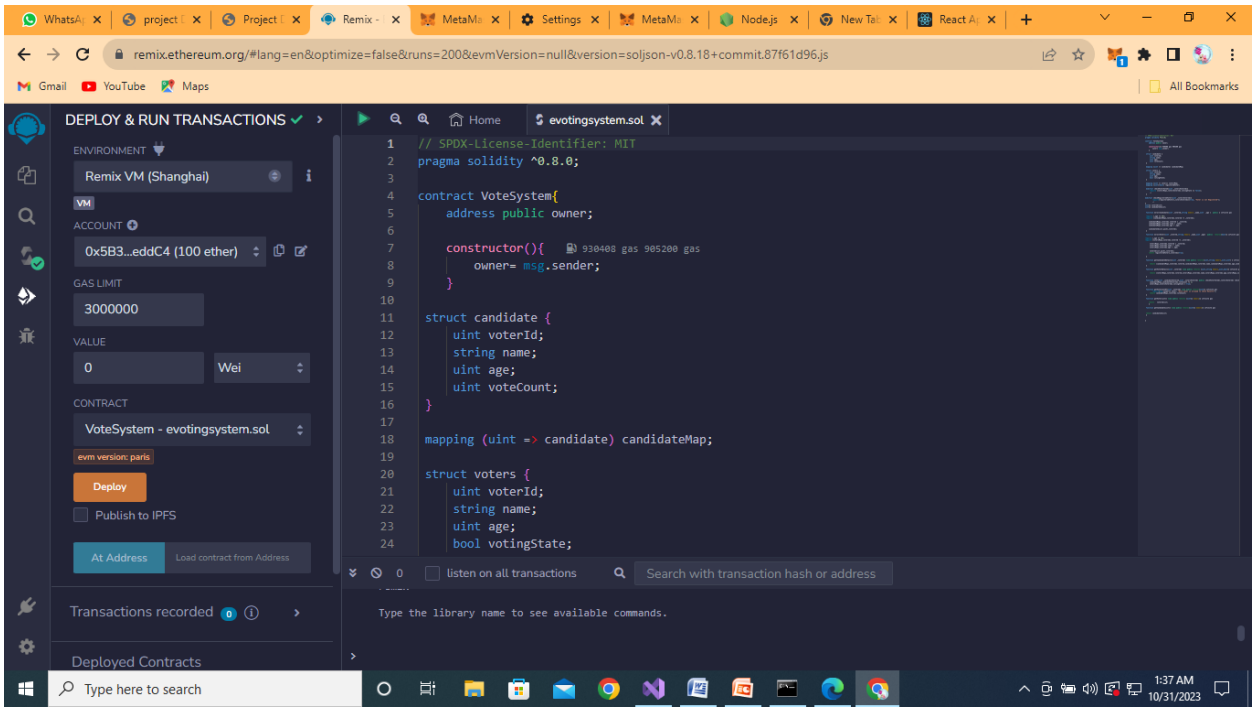
8.1 Performace Metrics:

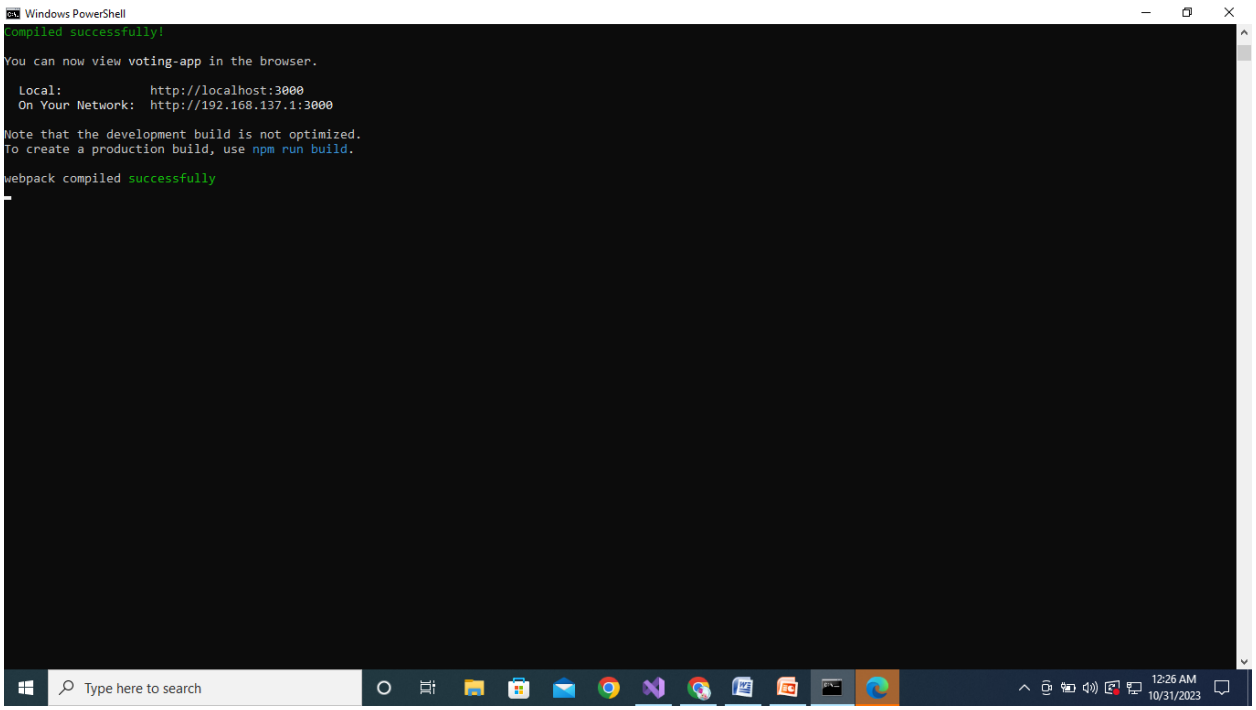
S.No.	Parameter	Values	Screenshot
1.	Informationgathering	SetupallthePrerequisite:	
2.	Extractthezipfiles	Opentovscode	

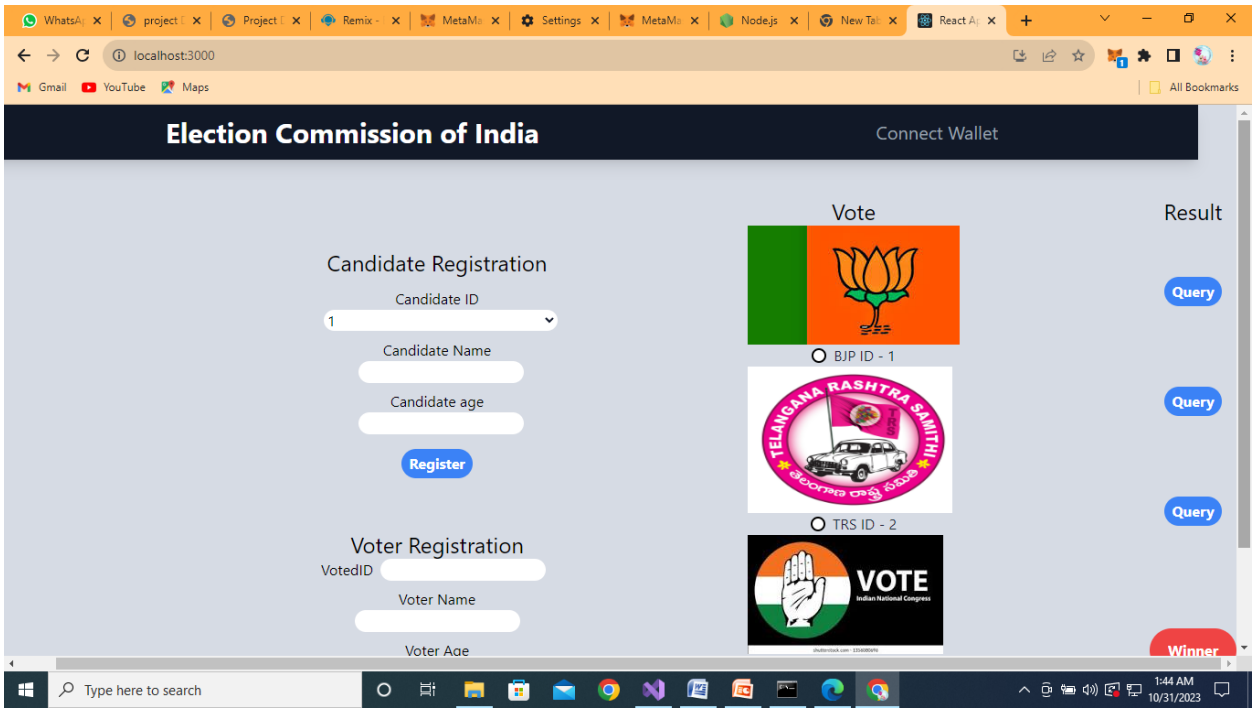
3.	Remix Ide platformexpl orting	Deploythesmartcontractcode Deployandrunthetransaction.By selecting the environment - injecttheMetaMask.	
4	Openfileexplorer	Opentheextractedfileandclickon thefolder. Opensrc,andsearchforutiles. Open cmd enter commands1.npminstal l.npm install 2. npm bootstrap 3. npmstart	
5	{LOCALHOSTIPADDRESS	copytheaddressandopenittochromesoyoucanseethe frontendofyourproject.	

9. RESULTS:

9.1 OUTPUT SCREENSHOTS:






Election Commission of India
Connect Wallet
Candidate Registration
Candidate ID
1
Candidate Name
Candidate age
Register
Voter Registration
VotedID
Voter Name
Voter Age
Vote
Result
BJP ID - 1
TRS ID - 2
Query
Query
Query
Winner
VOTE
Indian National Congress
Type here to search
1:44 AM
10/31/2023

10. ADVANTAGE & DISADVANTAGE:

10.1 ADVANTAGE:

Increased Efficiency

One of the most significant advantages of online voting systems is incredible efficiency. With traditional paper-based voting, there are a lot of steps involved, from printing ballots to counting votes by hand. You can avoid all of that with online voting.With an online system, you can send out electronic ballots to all of your voters in just a few clicks. And once the voting period is over, the system will automatically tally the results, so you don't have to do it yourself, saving your organization a lot of time and money.

Improved Accuracy

Another advantage of online voting systems is that they tend to be more accurate than traditional paper-based systems. On the other hand, there's always the potential for human error with paper ballots, whether it's miscounting votes or mixing up ballots.But with an online voting system, the votes are tallied automatically, so there's no chance for human error, giving you peace of mind knowing that your results are accurate.

Greater Turnout And Voter Engagement

Another advantage of online voting is that it can increase voter turnout because it's more convenient for voters to cast their ballots online than to have to go to a physical polling place.In addition, online elections can also improve voter engagement. It can be easy for voters to feel disconnected from the process of traditional voting. But with online voting, they can see the results in real-time, making them feel more engaged in the process.

10.2 DISADVANTAGE:

The Security Of Online Voting Systems

One of the most significant disadvantages of online voting systems is that they're not as secure as traditional paper-based systems because there's always the potential for hackers to tamper with the results.To improve election security, you should look for a system that uses encryption to protect the data. The system must get tested by independent security experts.For example, we secure our online voting system using 256-bit encryption—the same level of security that major banks offer. Plus, we don't share user and voter data, which means your elections stay private and confidential.

Lack Of Transparency

Another disadvantage of online voting is that it can lack transparency. With traditional paper-based voting, voters can see people counting the ballots. But with online voting, the process is entirely electronic, making it harder to verify the results.It’s essential to look for an online voting system that offers transparency features. For example, some systems provide a live election results page where voters can see the results as they roll in.Our voting system also offers election audit, which means the votes cast using our system are auditable. We also provide independent verification, where an independent, third-party accountant ensures the election process is fair.

11. CONCLUSION:

Online Voting Systems have many advantages over the traditional voting system. Some of these advantages are less cost, faster generation results, easy accessibility, accuracy, and low risk of human and mechanical errors. It is very difficult to develop online voting system which can allow security and privacy on the high level. Future development focused to design a system which can be easy to use and will provide security and privacy of votes on acceptable level by proper authentication and processing section. It is easy to use and it is less time consuming. It is very easy to debug.

12. FUTURE SCOPE:

The challenge of developing electronic voting systems is not only security but also protecting the secrecy of the ballot, a bedrock principle of free and fair elections. Currently there is “no known technology that can guarantee the secrecy, security, and verifiability of a marked ballot transmitted over the Internet.

Online voting presents numerous vulnerabilities and is fundamentally insecure. There is potential for unobserved vote manipulation as well additional security vulnerabilities including potential denial of service attacks, malware intrusions, and privacy concerns. Online voting does not produce a paper trail for auditing.

13.APPENDIX

13.1 SOURCE CODE

```
// SPDX-License-Identifier: MIT
pragma solidity ^0.8.0;

contract VoteSystem{
   address public owner;

   constructor(){
      owner= msg.sender;
   }

 struct candidate {
    uint voterId;
    string name;
    uint age;
    uint voteCount;
 }

 mapping (uint => candidate) candidateMap;

 struct voters {
    uint voterId;
    string name;
    uint age;
    bool votingState;
 }

 mapping (uint => voters) votersMap;
 mapping (uint=>bool) registeredVoter;

 modifier checkVoterVoted(uint _votersVoterId){
    require (votersMap[_votersVoterId].votingState == false);
    _;
 }

modifier checkRegisteredVoter(uint _votersVoterId){
      require(registeredVoter[_votersVoterId]==true, "Voter is not Registered");
      _;
}
uint[] voterIdlist;
uint[] candidateIdList;
```

```
 function enrollCandidate(uint _voterId,string memory _name,uint  _age )  public {

 require (_age >= 25);
 require (candidateMap[_voterId].voterId != _voterId);

    candidateMap[_voterId].voterId = _voterId;
    candidateMap[_voterId].name = _name;
    candidateMap[_voterId].age = _age;

    candidateIdList.push(_voterId);
 }

 function enrollVoter(uint _voterId,string memory _name,uint _age)  public
returns(bool){

require (_age >= 18);
require (votersMap[_voterId].voterId != _voterId);

     votersMap[_voterId].voterId = _voterId;
     votersMap[_voterId].name = _name;
     votersMap[_voterId].age = _age;

     voterIdlist.push(_voterId);
    return registeredVoter[_voterId]=true;

 }

 function getCandidateDetails(uint _voterId) view public returns(uint,string
memory,uint,uint) {

     return
(candidateMap[_voterId].voterId,candidateMap[_voterId].name,candidateMap[_vo
terId].age,candidateMap[_voterId].voteCount);
 }

 function getVoterDetails(uint _voterId) view public returns (uint,string
memory,uint,bool){

     return
(votersMap[_voterId].voterId,votersMap[_voterId].name,votersMap[_voterId].age,
votersMap[_voterId].votingState);

 }
```

```
 function vote(uint _candidateVoterId,uint _votersVoterId) public
checkVoterVoted(_votersVoterId) checkRegisteredVoter(_votersVoterId) {
    candidateMap[_candidateVoterId].voteCount += 1;
    votersMap[_votersVoterId].votingState = true;
 }

 function getVotecountOf(uint _voterId) view public returns(uint){
       require(msg.sender== owner, "Only owner is allowed to Check Results");
    return candidateMap[_voterId].voteCount;
 }

 function getVoterList() view public returns (uint[] memory){

   return   voterIdlist;
   }

 function getCandidateList() view public returns(uint[] memory){


 return candidateIdList;
 }


}
```