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Online Voting System

Documentation

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Abstract

Our paper deals with an online voting system that facilitates users (voters), candidates and administrators (who will be in charge and will verify all the user and information) to participate in online voting. Our online voting system is highly secured, and it has a simple and interactive user interface. The proposed online portal is secured and has a unique security feature such as unique id generation that adds another layer of security (except login id and password) and gives the admin the ability to verify the user information and to decide whether he is eligible to vote or not. It also creates and manages voting and an election detail as all the users must login by user name and password and click on candidates to register to vote. Our system is also equipped with a chat bot that works as a support or guide to the voters, this helps the users in the voting process.

Acknowledgement

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Chapter One : Project Initiation

1.1 Shop management system:

The main objective behind this project is to develop a web oriented application which can provide an online shopping feature to the users. In other words, this project aimed at creating a virtual shop environment for users, in some handy form, which will be available to them through the internet. The objective of this project is to develop a general purpose e-commerce store where any product can be bought from the comfort of home through the internet. Customers can browse the catalog and select products of interest. Users can login into ecommerce websites.



Fig (1.1): Shop Management

1.2 Crime Detector:

In the 21st century where mobile and information technology have become an integral part of our lives. Smart cities have the combination of technology and human resources to improve the quality of life. This allows us to take steps towards implementing smart, safe cities, by using the personal mobile devices and social networks to make the people alert and aware of their surroundings. Hence we are developing an android application which provides an indication of the crime to the user through an android application. This application has functions like search crimes by locations, posting a crime incident (record crime) and crime places integrated on google map with different colors, SOS along with emergency numbers.



Fig (1.2): A Crime Detector

1.3 Online voting system:

Online voting system is an online voting technique. It is based on the other online services. In this system people who have citizenship and whose age is above 18 years of any sex can give his\her vote online without going to any polling booth. There is a database which is maintained by the election commission in which all the names of voters with complete information is stored.

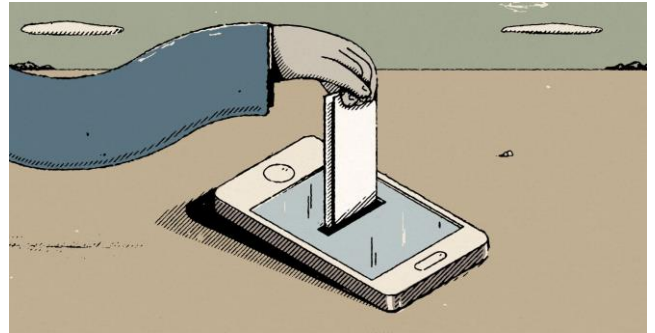


Fig (1.3): Some One cast vote through online

After consulting with our instructor we chose to work with ***Online Voting System***.

1.3.1 Reason to choose

Nowadays, there are tons of things we do online, from shopping to doing any kind of official arrangement. And you may think, why not voting online too? Whether you are part of a small, medium or large organization, you may have thought at some point about the reasons to choose online voting and how it could benefit your entity. Here I give you five reasons why online voting could be a good option for you:

- **Vote at anytime from anywhere:** Today's way of living doesn't leave much free time. We have little to no time to do anything or go anywhere. So don't you think that maybe giving the chance to the members of your organization to cast their vote in just a few minutes, without the need to go to a certain place, would be a good option? If your answer is "yes", then you should probably consider online voting. Unlike traditional voting, that makes voters go to a specific place at a specific time in order to vote, online voting allows them to cast their vote at any time of the day and from any place, just with the need of an Internet connection.
- **Boost participation:** As a result of the previous point, choosing online voting for your election will more likely boost the participation. You will give the chance to members that otherwise may not be able to vote.
- **Less physical infrastructure:** When running a voting online, you avoid the need for all the physical infrastructure usually required on a traditional voting. No need for paper, printing, physical urns or staff.
- **More rich ballots:** With the power of linking, image rendering and so on, online voting gives you the chance to add additional information to the ballots that would not be possible on the traditional ones.
- **Fast and easy votes tally:** Since the tally in online voting is run by machines, you can assure that it will not have human counting errors and that it will in most cases run faster than a count carried out by persons, so the results of your election will be available sooner.

1.3.2 Introduction

One basic feature of democracy that cuts across all divides of people is the act of election. Democracy thus encourages individual freedom according to the rule of law, so that people may behave and express themselves as they choose. This not only gives people a chance to choose their leaders, but also to freely express their views on issues. The Online Voting System is defined as a voting system, where voters can cast their vote over the Internet and send the vote to the concerned election authority or officer safely. Internet voting is intended as a service to the electorate, so that the voters might have more convenience to cast their vote. They can vote from anywhere in the world by any computer connected to the Internet. The implementation of this internet voting system requires various technical solutions to ensure accurate voter authentication, secrecy of the ballot and security

1.3.3 Objective

- Reviewing the existing voting process
- Coming up with automated voting system
- Implementing a automated Voting system
- Validating the system to ensure that only eligible voters are allowed

Chapter two :Requirement analysis

2.1 Requirement Analysis:

Requirements Analysis is the process of defining the expectations of the users for an application that is to be built or modified. We will now discuss about our project's requirement analysis:

Here we will have three phases:

- User Requirement,
- Technical Requirement
- Business Requirement

2.1.1 User Requirement:

- Users will know that our website is secured and their data will be saved in a secured way. No one can access the user's data without the user and the admin.
- Users can select the option anonymously and can vote anonymously.

2.1.2 Technical Requirement:

- Reduce server response time
- Database management system will be used to give the final result
- Choosing the right hosting option
- Enable browser caching

2.1.3 Business Requirement:

This website can be used in two versions, paid version and a free version. Features will be more efficient and data will be more secure in paid versions, also it will take less time to browse. It will also provide subscription based service.

2.2 Possible Complications

Here our main problem will be privacy concerns. We need to make people understand that their data cannot be accessed by anyone without an admin panel.

2.3 Feasibility Analysis:

Feasibility analysis is the process of confirming that a strategy, plan or design is possible and makes sense. It takes all of a project's relevant factors into account including economic, technical, legal, and scheduling considerations to ascertain the likelihood of completing the project successfully. It follows the opportunity recognition stage and comes before the development of a business plan. We need here three types of feasibilities to ensure economically acceptable project:

- Economic Feasibility
- Technical Feasibility
- Schedule Feasibility

2.3.1 Economic Feasibility:

The first purpose of this effort is to financially model the venture opportunity and achieve a break-even analysis. In other words, based upon the costs of goods sold, capital costs, and management and administration, how much revenue generated from units sold is required to break-even and over what period of time.

2.3.1.1 Simple Cash Flow Method:

	<u>Year 0</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Total</u>
<u>Total benefits</u>		20000	45000	65000
<u>Total cost</u>	40000	10000	10000	60000
<u>Net benefits</u>	(40000)	10000	35000	5000
<u>Cumulative Cash Flow</u>	(40000)	(30000)	5000	

$$\begin{aligned}\text{Return of Investment} &= (65000-60000)/60000 \\ &= 0.083\%\end{aligned}$$

$$\begin{aligned}\text{Break Even Point} &= 2 + ((35000-5000)/35000) \\ &= 2.85 \text{ Years}\end{aligned}$$

As the BEP is 2.85, so the project is economically feasible.

2.3.2 Technical Feasibility:

It tells us whether a project is worth the investment—in some cases, a project may not be doable. There can be many reasons for this, including requiring too many resources, which not only prevents those resources from performing other tasks but also may cost more than an organization would earn back by taking on a project that isn't profitable.

Some of problems that user may have with our website:

- It may take time to load if many people try to log in at the same time
- If any other company develop similar website with more features

2.3.3 Schedule Feasibility:

It's important for a project to be created within its limited time. So Schedule Feasibility helps you to understand whether the project can be completed within a proper time frame or not.



Fig (2.1): Schedule Feasibility

Chapter Three :Diagrams

3.1 Use Case Diagram:

In this use case diagram, we have two actors Voter and Admin. First the Voter has to restart. After completing the registration they have to login. If they have any problem in login they can go to the forget password process. If they successfully login they can see the candidates. And they can cast their vote then submit the vote and log out.

From the Admin first they have to login. . The Admin can go to the forget password process if they forget their login password. After completing the login they can see the Candidates and the list of the voters. They can add new candidates and also can delete the Candidate. They can generates reports. They can update votes and Candidates. They can edit the voter profile. They can filter the results.

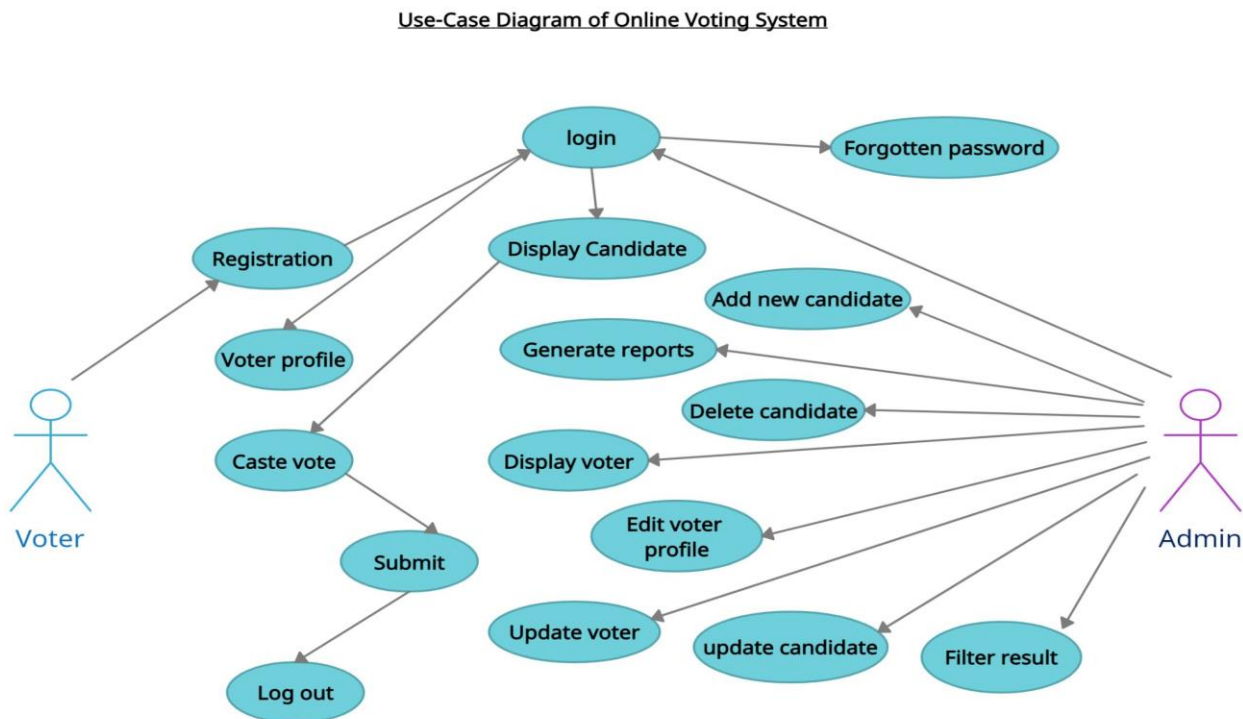


Fig (3.1): Use Case Diagram

3.2 Data Flow Diagram

This is a Level 0 Data Flow Diagram. DFD Level 0 is also called a Context Diagram. It's a basic overview of the whole system or process being analyzed or modeled. It's designed to be an at-a-glance view, showing the system as a single high-level process, with its relationship to external entities. Here Voter entity can access our system by login into our system and Admin entity checks, verifies and maintains the process.

That is a level-1 Data Flow Diagram for our system. We can see that there are three entities which are Voter, Candidate and Election Commissioner [E.C Admin].

The voter and Candidate. Firstly they have to go to the Registration Process. And all the data is stored in our system Database. Registering Voter has added voter, Update Voter information, Delete Voter and View All Voter. The Registering Candidate has also added Candidate, Update Candidate information, Delete Candidate and View All Candidate. Then the E.C Manage all the voter and Candidates List and store in the databases.

For the Vote Cast Process, the [E.C Admin] starts to work. He Backup all the data and generates the citizen and candidate's information. Then he declared the Voting date. On the day he turns on a voting url and asks all the citizens to cast their vote. The citizen login with proper access and cast the vote. After dateline time, automatically turn off the vote cast process. Then the EC Check the Result through the Result Checking process. After that he declared the Election

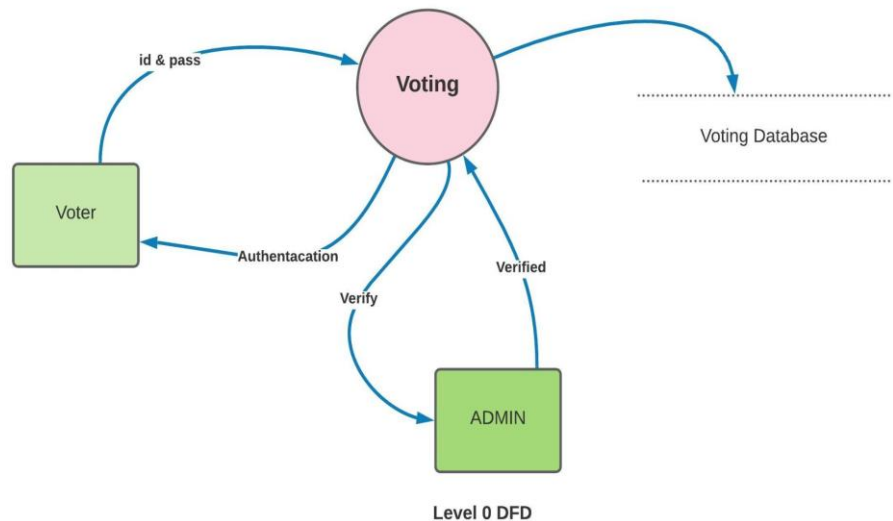


Fig (3.1): **Level 0** Data Flow Diagram (DFD)

Result. And backup all the necessary data as needed.

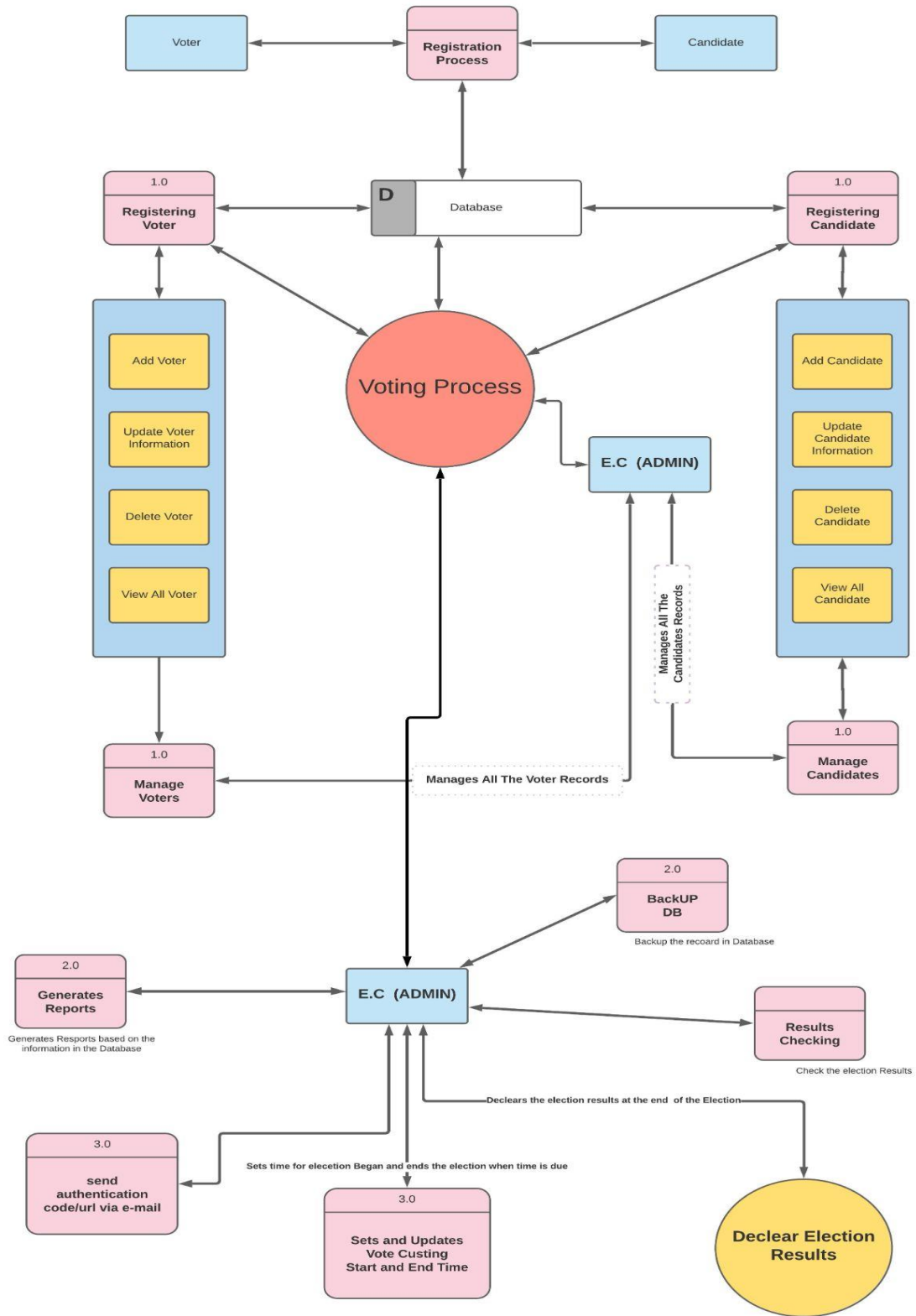


Fig (3.2): Level 1 Data Flow Diagram (DFD)

3.3 Entity Relationship Diagram (ERD):

From our Entity Relationship Diagram shows the relation among the data stored in the database. Here ER Diagram we can see that there are five entities which are Citizen, Candidates, Vote Form, Vote Count and Admin. Each entity has some attributes. Citizen entity has a total eight attributes and they are Voter ID, Citizen Name, Father Name, Mother Name, Date of birth, Address and Blood Group. Here Voter ID is the main primary key. Then Candidates entity has a total six attributes and they are Candidate id (primary key), Can Name, Can Gender, Can Age, Can Date of Birth and Area Code. Then we have a Vote Form entity which has two attributes and they are Voter ID and Candidate ID. Here Voter ID is the primary key. The Vote Count entity has a total four attributes and they are Can ID (Primary Key), Can Party, Area Code and Candidate Name. Finally, we have Admin entity has a total three attributes and they are Admin ID, Admin Name and Admin Password. Here Admin ID is the Primary key.

Here we can see a few relationships between entities as well. Admin can maintain All the Citizen and Candidates list. Citizens can check Candidate attributes and the citizen can vote for their choice. They enter in the Vote Forms With their ID. And the Vote Forms Have Vote Counts

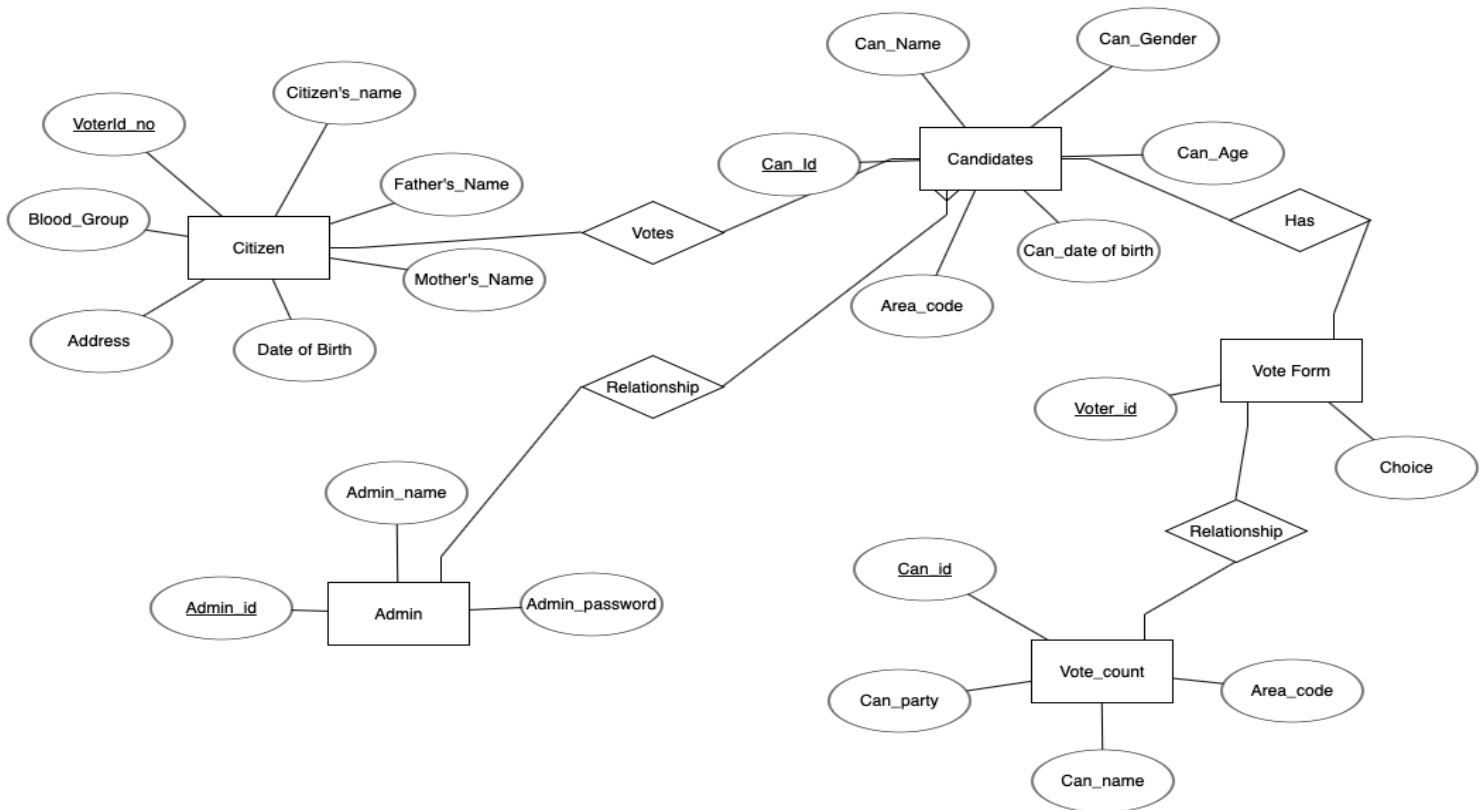


Fig (3.3): Entity Relationship Diagram (ERD)

3.4 Class Diagram:

Class diagram represents all the classes along with the attributes and methods. Class diagrams are useful to get a clear idea of implementation of a system. Here, this Class Diagram shows that there are seven classes in our system along with their attributes and methods. They are Citizen, Citizen Profile, Candidates, Admin, Vote Form, Vote Count And Results

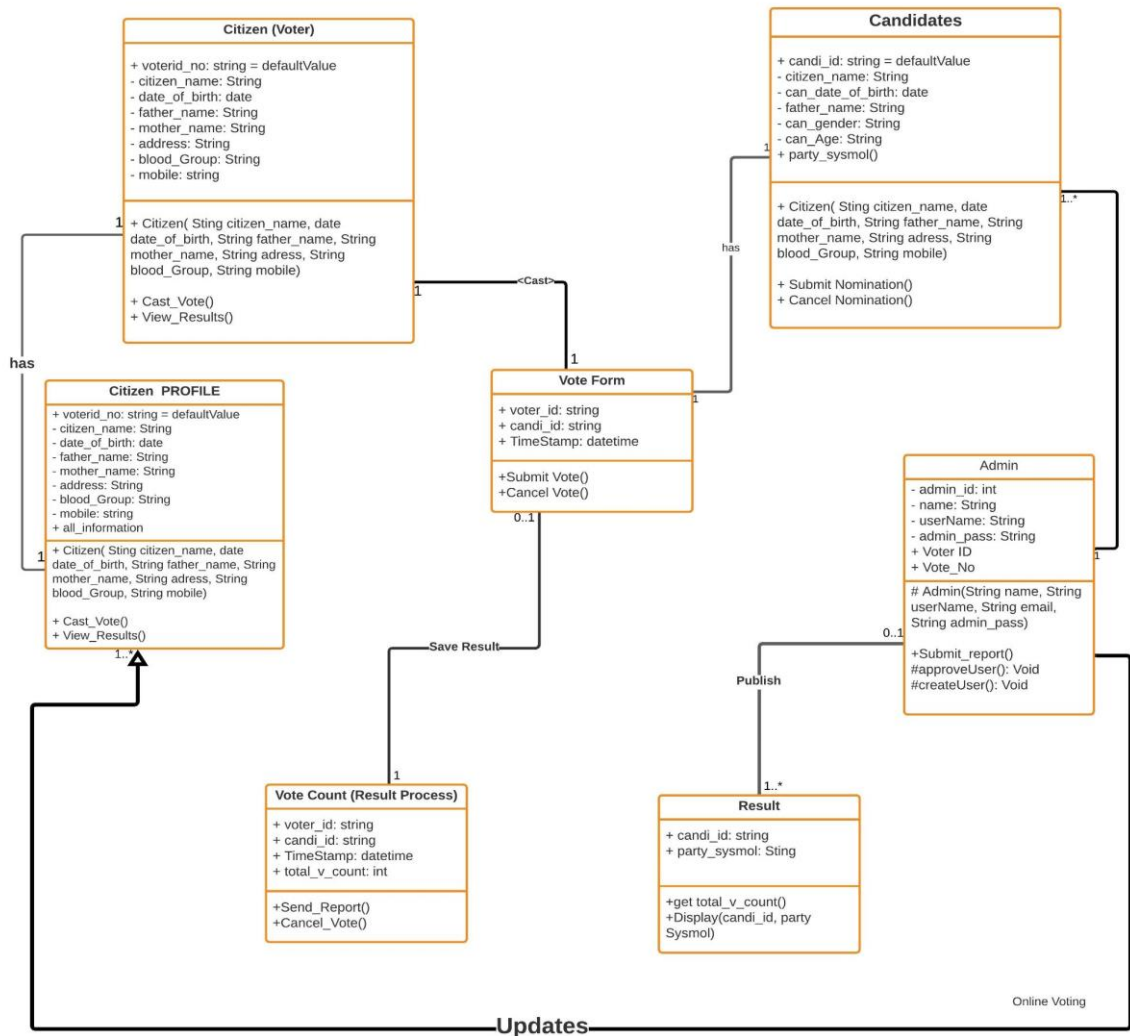


Fig (3.4): Class Diagram

Most importantly, we see that citizens can cast their vote through Vote Form. Admin can customize citizen/candidate, voting schedule date and so on. But he cannot change the result of the vote.

3.5 Sequence diagram:

A sequence diagram simply depicts interaction between objects in a sequential order i.e. the order in which these interactions take place. We can also use the terms event diagrams or event scenarios to refer to a sequence diagram. Sequence diagrams describe how and in what order the objects in a system function. Here this sequence diagram the process are:

Step 1: Company or Organization will start their project as they will pay for our system.

Step 2: Organization has an election commission that the system can access.

Step 3: Admin will manage the system and update it if needed.

Step 4: Voters will be registered to the system.

Step 5: Admin will register candidates.

Step 6: All data will be stored in the database and votes will be counted.

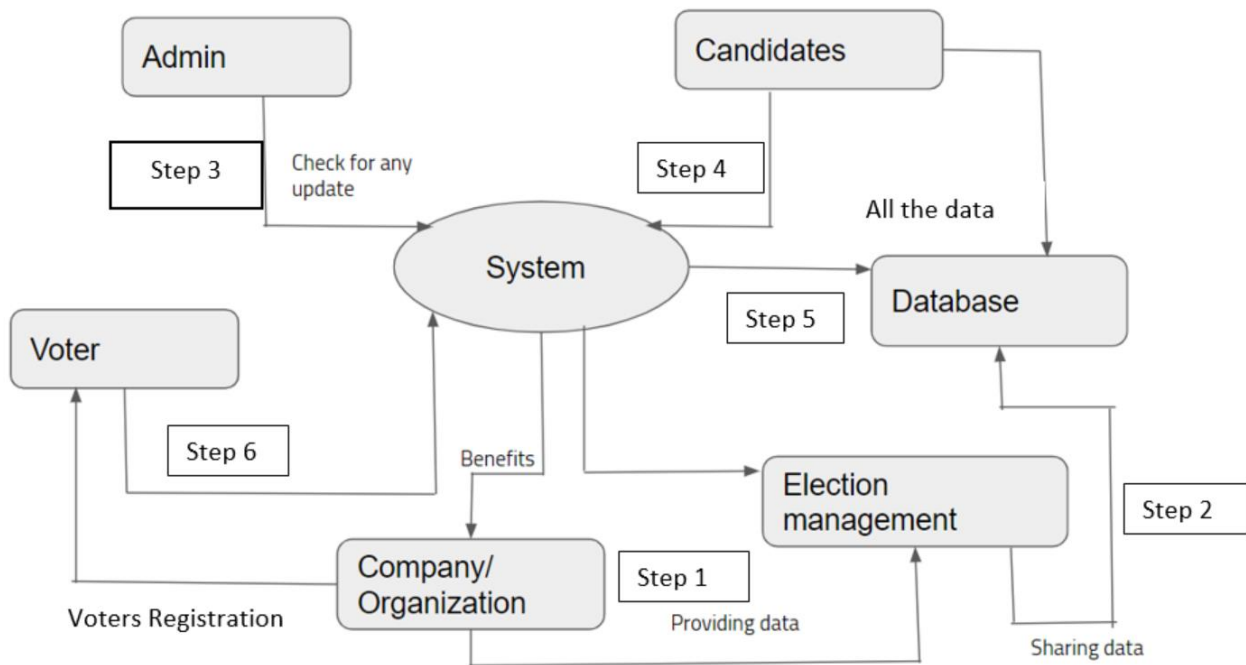


Fig (3.5): Sequence Diagram

Chapter Four :Complex Engineering Problems(CEP)

4.1 Critical Challenges

Maintaining it's security and making people understand that it is the trustworthy online voting system will be critical challenges for us now.

4.2 Conflicting Requirements

Making the user acknowledgment and agreement policy so that user get information about what data are being collected

4.3 Some components of Complex Engineering Problem

Knowledge Profile (K) [K –short name]	Attribute	P1 and some or all of P2 to P7:
K1 – natural sciences	Depth of knowledge required	P1: one or more of K3, K4, K5, K6 or K8
K2 –mathematics	Range of conflicting requirements	P2: wide-ranging or conflicting technical, engineering and other issues
K3 –engineering fundamentals	Depth of analysis required	P3: no obvious solution
K4 –specialist knowledge	Familiarity of issues	P4: Involve infrequently encountered issues
K5 –engineering design	Extent of applicable codes	P5: outside problems encompassed by standards and codes of practice
K6 –engineering practice	Extent of stake-holder involvement and conflicting requirements	P6: diverse groups of stakeholders with widely varying needs
K7 –comprehension	Interdependence	P7: many component parts or sub-problems
K8 –research literature		

Let's explore how a few P's could be addressed through this project

P1 (*Depth of knowledge required- one or more of K3, K4,, K6 or K8*): This project needs the study of related works having the same goal like our project (K8- *research literature*), designing the project e project with user interface and software experience, (K5- *engineering design*), fundamental to use among various choices to ensure sustainability (K3- *engineering fundamentals*, decide which Computer engineering fundamental to use among various choices to ensure sustainability (K4- *specialist knowledge*), Developing Website and App for the project (K6- *engineering practice*).

P4 (*Familiarity of issues- Involve infrequently encountered issues*): This project solves an engineering problem which is deeply associated with CSE engineering faculty and Government Authority.

P6 (*Extent of stake-holder involvement and conflicting requirements- diverse groups of stakeholders with widely varying needs*): Diverse group of stakeholders (usually all the citizens of Govt. of Bangladesh who) will be benefited by this project.

P7 (*Interdependence- many component parts or sub-problems*): Project involves two subsystems mainly:

1. Application model
2. Hardware model [for Casting vote]
3. Data analysis on the inputs and output (real time data [NID]) of this project

List of activities (A's)

Attribute	Some or all of the following:
Range of resources	A1: use of diverse resources (include people, money, equipment, materials, information and technologies)
Level of interaction	A2: resolution of significant problems arising from interactions between wide-ranging or conflicting technical, engineering or other issues
Innovation	A3: creative use of engineering principles and research based knowledge in novel ways
Consequences for society and the environment	A4: consequences in a range of contexts, characterized by difficulty of prediction and mitigation
Familiarity	A5: Can extend beyond previous experiences by applying principles-based approaches

Let's explore how a few A's could be addressed through this project

Attribute	Some or all of the following
Range of resources	A1 (<i>Range of resources</i>) : Project needs to engage diverse resources including people, equipment, materials, money, information and technology.
Level of interaction	A2 (<i>Level of interaction</i>) : A good level of interaction is needed among the students and the law and Computer engineering department's faculty members.
Consequences for society and the environment	A4 (<i>Consequences for the society and environment</i>) : An Unadulterated voting system will be the consequence of this project towards the society.
Familiarity	A5 (<i>Familiarity</i>) : Solving a voting related problem will be a new challenge for a government and student.

Chapter Five :Methodology

5.1 Project Methodology

Methodology in research is defined as the systematic method to resolve a research problem through data gathering using various techniques, providing an interpretation of data gathered and drawing conclusions about the research data. Essentially, a research methodology is the blueprint of a research or study. With observation, surveys, Interviews, focus groups, experiments. and secondary data Analysis we can define our project methodology

For our Project Online voting system we will be following **Waterfall Project Methodology**.

The waterfall model emphasizes that projects should follow a logical progression of steps throughout the software development life cycle (SDLC).

General Overview of “Waterfall Model”

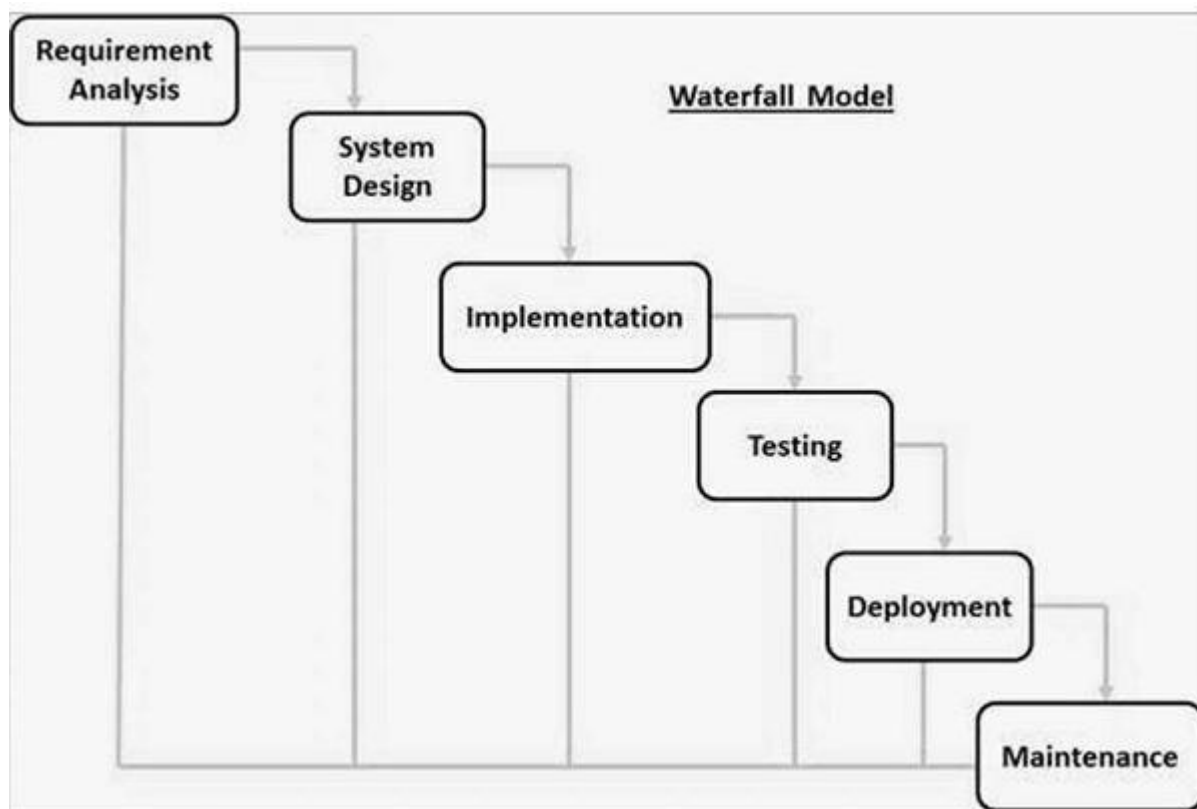


Fig (5.1): Waterfall Model

5.2 Conclusion

Online voting allows people in today's mobile and digitally advanced society to participate in the democratic process over the internet. The online voting system offers the highest levels of transparency, control, security and efficiency of election processes. Online votings provide voters with a comfortable and secure voting experience and allow election organizers to save resources in planning their next election.
