

E-VOTE

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Declaration

We declare that this work has not been previously submitted and approved for the award of a Diploma by this or any other University. To the best of our knowledge and belief, the proposal contains no material previously published or written by another person except where due reference is made in the proposal itself.

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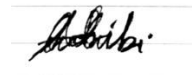
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Abstract

Voting in Kenya is a vital process for expressing democracy and choosing leaders. The current system has a lot of errors like inaccurate results due to human error thus resulting to violence and loss of lives. Human error also brought about by-elections which was a double expense. The system, E-vote proposes a faster, efficient and more transparent Electrical Voting System that will eradicate human error and reduce anxiousness due to its fast processing nature. The system will be a web-based application that can be used on mobiles and desktops. The Analysis and Design Approach in E-Vote is Object Oriented Analysis and Design (OOAD) and this is because it uses the Methodology of Incremental Iterative, focuses on objects and is suitable for large projects with changing requirements. The diagrams used to describe E-vote are Use case, Entity Relationship Diagram, Class Diagram, Database Schema and Wireframes. The system is a modified waterfall methodology which provides a structured approach to develop the system. The web-based application is developed using various programming tools like PHP, HTML and a Database Management System. The system tabulates the casts votes and produces results within a short period.

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List of Abbreviation

IT- Information Technology

IEBC- Independent Electoral Boundary Commission

ID- Identification

DRE- Direct Recording Electronic

HTML- Hyper Text Mark Up

JS- Java Script

CSS- Cascading Style Sheets

DBMS- Database management system

MySQL- Structured Query Language

SDLC- Structured development life cycle

OOAD- Object-Oriented Approach Design

CHAPTER ONE: INTRODUCTION

1.0 Introduction

1.1Background

An election is a process of voting to choose people for official positions. It is also referred to as an act of choosing or selecting candidates who will represent the people in the government of a country (Goulding, 2019). The Election is also said to be a contest between competing political parties or groups for government power. Some of the positions for which election is made include president, governors, senators and local government. The individual doing the voting is the electorate and the process of the election is the electoral system.

There are various importance's of elections including; Elections give the voter the choice to elect their own leaders. Democracy which means of the people, by the people, for the people is promoted by elections in that the citizens are given the right of choice. Gives the elected representative the legitimate right to rule, it is a fair and civilized way of placing people in the position of authority. Elections give the government more insight on public opinion to understand more about the mind of the people. It also helps to assess the performance of elected public officers (Baker, 2009).

Voting is a method for a group, such as a meeting or an electorate, in order to make a collective decision or express an opinion usually following discussions, debates or election campaigns. Democracies elect holders of high office by voting.

Voting is a basic process that keeps a nation's governmental system works. It enables citizens to choose their own government. It also allows people to choose their representatives in the government (Caarls, 2010). The purpose of every government is to develop and implement various policies for the benefit of its citizens.

It also enables the person with the right to question the government about issues and clarifications. Voting is the way to express the opinion of a citizen in a democratic nation. Voting is crucial to activating the democratic process.

You can have an election without a vote. Suppose, for example, that a seat became vacant. If only one candidate came forward, there would still technically be an election but, in the absence of rival candidates, there would be no vote. The lone candidate would be elected unopposed. Conversely, you can have a vote without an election. This is most common when having a referendum (Goulding, 2019).

Technology is playing a vital role in our lives today. According to Mirror, (Fox, 2019), Advancement in the technological sector has improved greatly mostly in the 21st century. Computers over the years have developed becoming smaller, more affordable and powerful. With this rapid advance of technology has been integrated into IT.

Elections are a reflection of a democratic practice according to the, (Uraia, 2010). In Kenya national elections take place every five years. It uses a ballot system to conduct Elections. The electoral system being manual, it resulted in the political violence in the year; 1997 and 2007. Violence, which was mainly triggered by the perception that the election had been rigged increased support towards lawlessness, reduced trust and social capitals among communities, (Roxana, 2007).

In 2017, distrust in the system caused a by-election thereby causing a tremendous decrease in the turn-out of voters. It was clear that Kenya needed a system they could trust and feel secure. Therefore need to develop E-VOTE. Our system assists in that results cannot be delayed and manipulated. This project is going to be concerned with accurate, efficient and transparent election results. Where there will be accountability for each vote.

1.2 Problem Statement

The current voting system in Kenya is Manual using ballot and ballot boxes. Voters, Candidates and the administrators of the IEBC get a hectic time during the election period. Due to the system being manual, votes are usually compromised at any point in the polling stations. Also, the risk of inaccurate results due to human error is inevitable. The whole voting process is time-consuming and slow for the voters who have to stand in line for a very long time and for the population at large who are kept anxiously waiting for the new batch of leaders. It requires a lot of manpower to be able to execute the whole voting process making it costly. There is a need for

a comprehensive electronic voting system that would help curb the problems faced by the current system.

1.3 Aim

This project is an Electronic Voting System that will help the voters to select their leaders of choice from a computer and accurately tally their results for each candidate and declare the winner. It shall also keep track of who has voted and those who have not. It also consumes less time compared to the current system. There will be a reduction in the number of personnel in the polling station.

1.4 Specific Objectives

The objectives of E-VOTE are;

- i. To understand challenges faced by voters, Candidates and Election officers(those who count the votes).
- ii. To review the voting system that has been in use.
- iii. To design and develop a web-based voting system.
- iv. To test and implement the developed solution.

1.5 Justification

The system assures the voter a faster and more efficient voting process due to reduced movement across the polling station. The results are accurate because the votes are automatically counted by the tabulation server.

1.6 Scope and Limitations

1.6.1 Scope

In each polling station, there are several computer devices depending on the number of registered voters in that area. There is mass education on how to use the system. The details entered by a voter are counter checked by the existing details on the database so as to enable the voter to vote.

1.6.2 Limitation

The system is limited for election purposes only. E-vote is specifically designed for use by one county, yet there are forty-seven counties, in the elections.

CHAPTER TWO: LITERATURE REVIEW

2.0 Introduction

This chapter explains the voting system in Kenya, the challenges brought about by the voting system, a new and improved voting system and similar systems that have been implemented.

2.1 Voting systems in Kenya

Elections in Kenya take place within the framework of multi-party democracy and a presidential system. The President, Senate and National Assembly are directly elected by voters, with elections organized IEBC (Uraia, 2010).

IEBC is an independent regulatory agency that was founded on 9th November 2011 by the Constitution of Kenya. The Commission is responsible for conducting and supervising elections to any elective body or office established by the Constitution, and any other elections as prescribed by an Act of Parliament. It was created in a provision of the 2010 constitution and the Independent Electoral and Boundaries Commission Act. It deals with the continuous registration of voters and revision of the voter's roll, the delimitation of constituencies and wards, the regulation of political parties process, the settlement of electoral disputes, the registration of candidates for elections, voter education, the facilitation of the observation, monitoring and evaluation of elections, the regulation of money spent by a candidate or party in respect of any election, the development of a code of conduct for candidates and parties, and the monitoring of compliance with legislation on the nomination of candidates by parties (Elisha Ongoya, 2012).

The current system being used starts with the voter standing in line followed by; Identification of the voter, verification of voter information from the computer, Issuing the voter with stamped ballot papers, marking of the ballot papers by the voter, casting of the votes into the ballot box, marking of the left small finger with indelible ink and finally the voter leaves the polling Centre (Elisha Ongoya, 2012).

2.2 Challenges of voting system

The current voting system in Kenya is faced with a lot of challenges including;

- i. This system brought about the disagreement in 1997 and 2007 which led to violence which was mainly triggered by the perception that the election had been rigged. This caused reduced trust in the system by voters (Roxana, 2007).
- ii. The Voters face various challenges one of them being that the system is slow causing the voters to queue for a long period of time .
- iii. The election officers being human are prone to error so it is hard to be convinced that the counting of votes is accurate.
- iv. The candidates and voters are put in a state of anxiousness due to the period that they have to wait for the results to be released.

2.3 Related works

There are various countries that have come up with different voting systems. For example;

2.3.1 USA DRE Voting system

The DRE is a web-based system in the United States of America for elections. The system is used by voters, administrator and election personnel. In the United States of America DRE's is the most common voting system. A DRE voting machine records votes by means of a ballot display provided with mechanical or electro-optical components that can be activated by the voter (typically buttons or a touch screen); that processes data by means of a computer program; and that records voting data and ballot images in memory components. After the election, it produces a tabulation of the voting data stored in a removable memory component and as a printed copy. The system may also provide a means for transmitting individual ballots or vote totals to a central location for consolidating and reporting results from precincts at the central location.

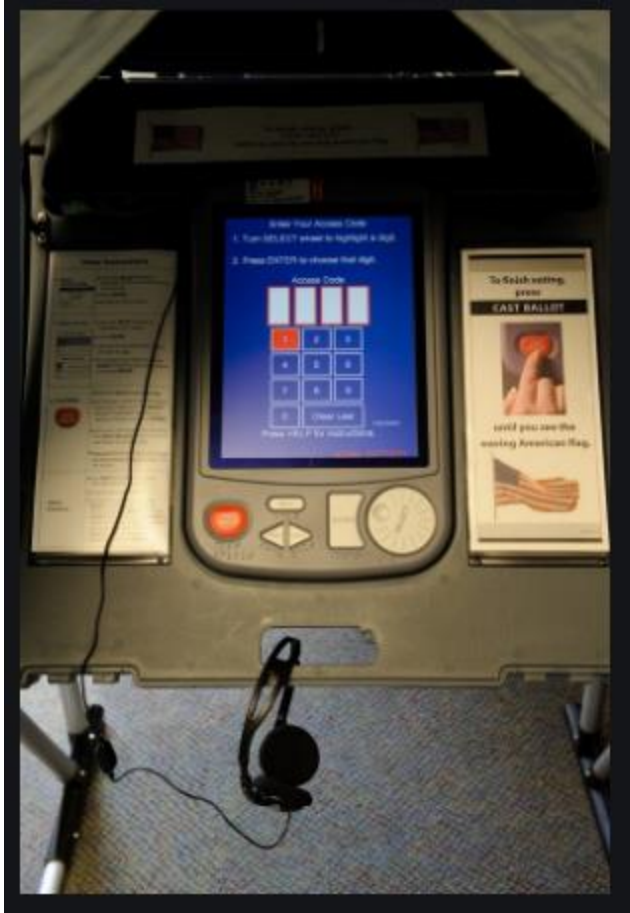


Figure 2.1 DRE'S Voting System

2.3.2 Estonia Internet Voting

The system is internet-based. The users of the system include voters and the administrator. Estonia is the only country which uses the Internet voting system. It is a system that allows voters to cast their ballots from any internet-connected computer anywhere in the world. During a designated pre-voting period, the voter logs onto the system using an ID-card or Mobile-ID, and casts a ballot. The voter's identity is removed from the ballot before it reaches the National Electoral Commission for counting, thereby ensuring anonymity. Internet voting is available during an early voting period (sixth day to the fourth day prior to Election Day). Voters can change their electronic votes an unlimited number of times, with the final vote being tabulated. It is also possible for anyone who votes using the Internet to vote at a polling station during the early voting period, invalidating their Internet vote. It is not possible to change or annul the

electronic vote on Election Day. A comparison of the cost-efficiency of the different voting channels offered in the Estonian Municipal Elections concluded that the Internet Voting is the most cost-efficient voting channel offered by the Estonian Electoral System(Trechsel, 2011).



Figure 2.2 Estonian Voting System

2.3.2 Brazil Biometric Voting System

Brazil is an example of a country with a thriving electronic voting system. In 2000, it became the first country to have elections completely by an electronic voting system and has since remained at the forefront of the electronic voting movement. In Brazil, the research and development of electronic voting systems is funded by the Brazilian Supreme Electoral Court (TSE), which is also currently testing ways to improve the system, such as by using digital screens and printing systems (Paulosao, 2007). These improvements likely have been a significant source of voter satisfaction and will continue to emphasize the government's commitment to a fair and effective system in the future. Although no election is ever without some controversy, Brazil has also maintained a relatively trouble-free experience with its electronic voting approach and serves as a good model for other similar countries looking to fully integrate these systems (Martin, 2007).



Figure 2.3 Brazil Biometric Voting System

2.4 Gaps

In Brazil Biometric Voting System it does accommodate the handicapped thus leading to the votes not being fair due to lack of a specific minority. In Estonia Internet Voting, voters can change their electronic votes an unlimited number of times, with the final vote being tabulated. It is also possible for anyone who voted using the Internet to vote at a polling station during the early voting period, invalidating their Internet vote.

2.5 Proposed System

Online Election System has a Candidate registration, document verification, Voters Card ID, National ID and pass for candidate and Voters. There is an Admin Login which is handled by the Election Commission. Voter Login which is handled by the system after the user has keyed in their information, Using which they can vote for a Candidate only once per Election. The project is beneficial for Election Commission, Voters as the can get to know the candidate background and choose wisely, and even for Candidate. The software system allows the Admin to login into the profiles of the candidates and uploads all their details including their previous milestone onto

the system. The admin can check each Candidate details and verify the documents. The software system 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. Only the IEBC Commissioner has access to the results of the Presidential elections.

The new System is advantageous in that it is a Faster and easier way of conducting Elections compared to the current system. Voters can view information like the political parties of each Candidate. Admin is to key in the information of the Candidates, which is provided by the Candidates running in the election, into the system. The role of the Admin is to verify the documents and details of the Candidate. The Results can be viewed immediately after voters compared to the ballot system which takes a long period of time.

2.6 Conceptual Framework

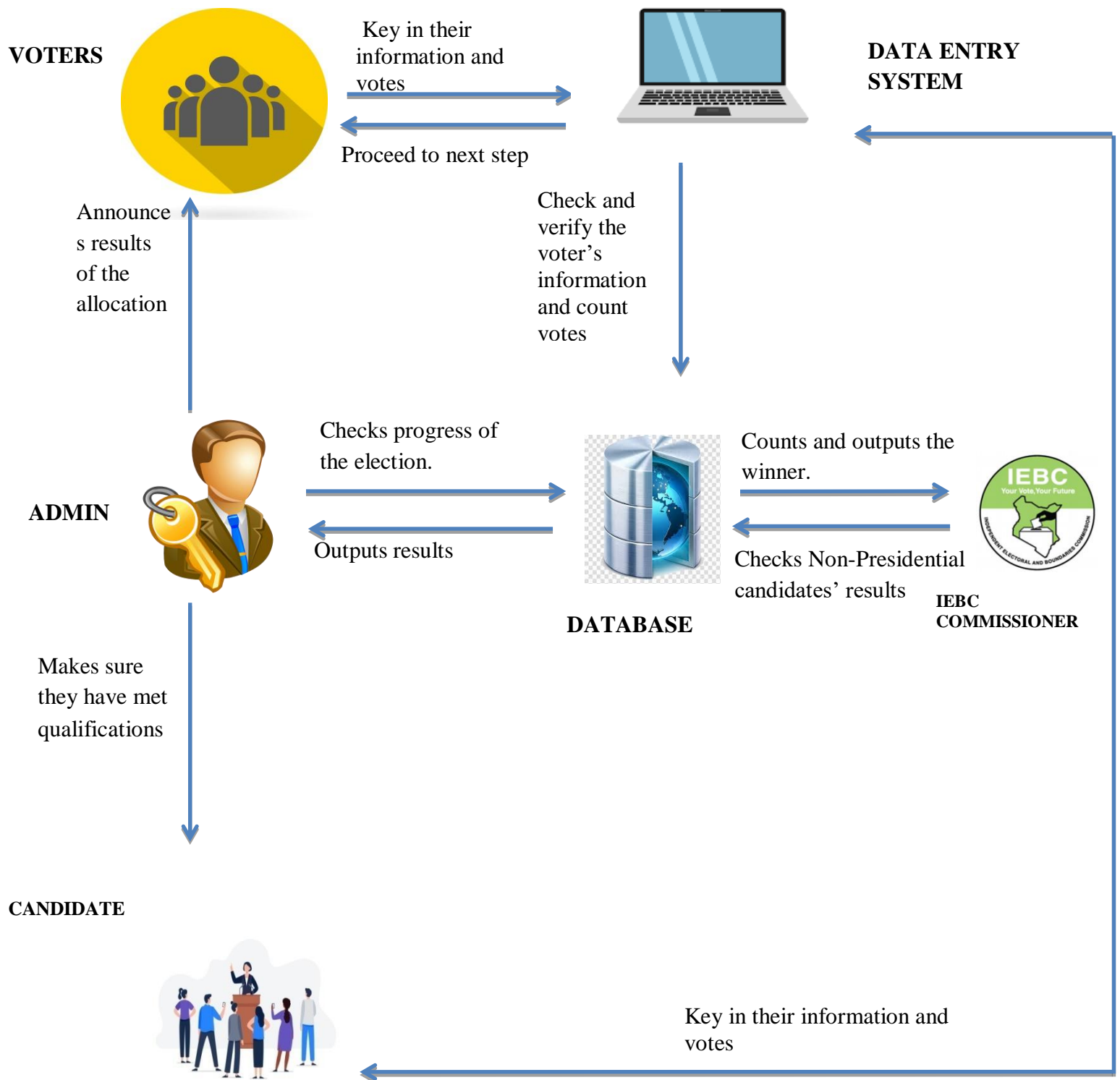


Figure 2.4 Conceptual Framework

CHAPTER THREE: RESEARCH METHODOLOGY

3.0 Introduction

This chapter highlights the methodology used to develop the E-Vote system. The requirements of the system such as functional and non-functional requirements have also been explained to understand the development of the system.

3.1 Approach to System Designed

The Analysis and Design Approach in E-Vote is OOAD and this is because it uses the Methodology of Incremental Iterative, focuses on objects and is suitable for large projects with changing requirements. It is advantageous in that it simplifies system development, enhances Code re-usability and improves the quality of the system.

3.2 System Development Methodology

The E-Vote has been developed using a modified waterfall methodology. The modified waterfall methodology provides a structured approach to develop application projects. Waterfall model is an SDLC approach that assumes the various phases of a project can be completed sequentially—one phase leads into the next phase. It also ensures that the development process is efficiently managed. Due to its structured technique, the developers put equal emphasis on all modules to come up with a project that is of high quality to the consumers. Waterfall model is used when the requirements are very well known, a new version of an existing product is being created and technology being used is understood. This is a similar case to E-vote. The advantage of the Waterfall Model is that it is easy to understand and implement, it provides structure to inexperienced stuff and it reinforces good habits like define before design.

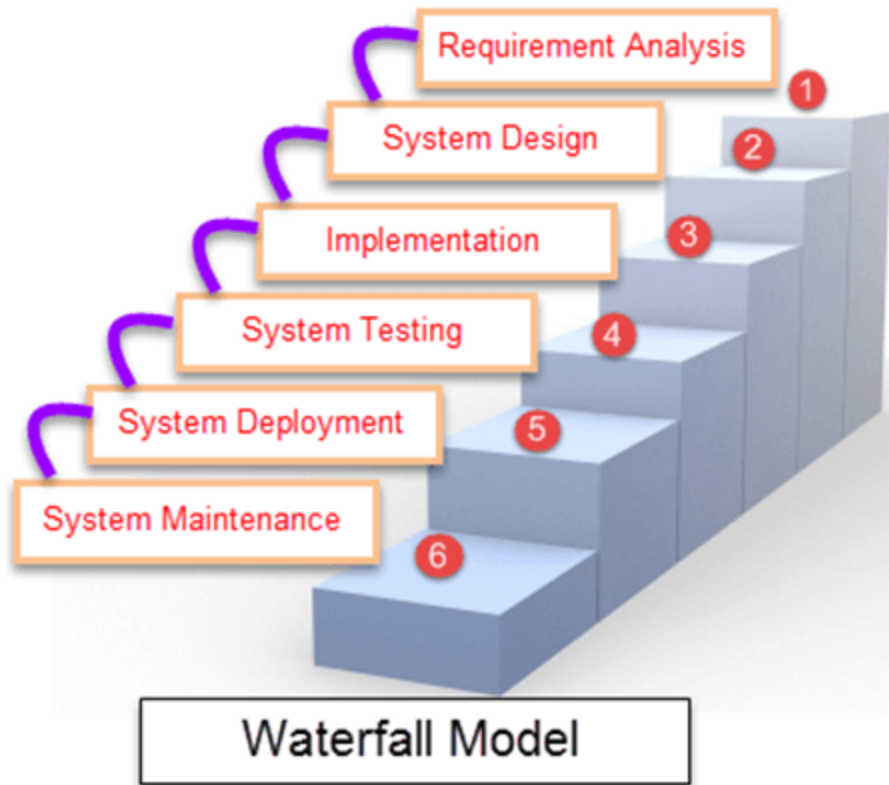


Figure 3.1 Waterfall Model

3.2.1 Requirements Analysis

It is the process of determining user expectations for a new or modified product. These features, called requirements, must be quantifiable, relevant and detailed.

3.2.1.1 Functional Requirements

A functional requirement defines a system or its component. It describes the functions software must perform. Functional requirements help you to capture the intended behavior of the system. They include;

- i. The Voters shall login.
- ii. The Administrator should be able to add candidates to the E-Vote.
- iii. The Voters shall cast in their votes.
- iv. The Administrator and IEBC should have access to the database.
- v. E-Vote should save the casted votes.
- vi. E-Vote should tally the cast votes.

- vii. E-Vote should post results on the website.

3.2.1.2 Non-Functional Requirements

While functional requirements define what the system does or must not do, non-functional requirements specify how the system should do it. Non-functional requirements do not affect the basic functionality of the system. They include;

- i. Ease of use
- ii. Scalability
- iii. Security

3.2.2 System Design

It is the process of defining elements of a system like modules, architecture, components and their interfaces and data for a system based on the specified requirements.

- i. Use Case Diagrams

It is used to gather the requirements of a system and get an outside view of a system. It identifies the external and internal factors influencing the system. It also shows the interaction between the requirements and actors.

- ii. Class Diagrams

It is the main building block of object-oriented modeling. It is used for general conceptual modeling of the structure of the application, and for detailed modeling translating the models into programming code.

- iii. Database Schema

It indicates how the entities that make up the database relate to one another, including tables, views, stored procedures, and more. A database schema is created to help programmers whose software will interact with the database.

- iv. Sequence diagram

It is used to model the logic behind a sophisticated function, operation or procedure. It is also used to show details of UML use case diagrams. It is also used to understand the detailed functionality of current or future systems. It visualizes how tasks move between objects or components in a system.

3.2.3 Implementation

It is a realization of a technical specification or algorithm as a program, software component, or other computer systems through computer programming and deployment. The proposed System and its Database, uses the following coding techniques; HTML, CSS, PHP and JS.

3.2.3.1 Tools and Techniques to be developed

These are the tools and methods that were used to develop the system. They include the programming and mark-up languages used in preparing the system into a functional web-based application.

3.2.3.1.1 HTML

HTML is a markup language that provides a means to create structured documents and is widely used to write web pages. It is also used to embed images and other interactive forms onto the web application.

3.2.3.1.2 CSS

CSS is a simple mechanism for adding style for example; fonts, colors, spacing to Web documents. Describes how HTML elements are to be displayed on the screen, paper, or in other media. CSS saves a lot of work. It controls the layout of multiple web pages all at once. (w3schools, 1998)

3.2.3.1.3 PHP

This is a server-side scripting language used for web development. PHP code is embedded onto HTML code. It is used to connect the application to a database.

3.2.3.1.4 JS

JS is a text-based programming language used both on the client-side and server-side that allows you to make web pages interactive. JS gives web pages of interactive elements that engage a user.

3.2.3.1.5 MySQL

MySQL is an open-source relational database management system. This has been used to create a database which is connected to the system.

3.2.4 System Testing

System Testing is a level of software testing where complete and integrated software is tested. The purpose of this test is to evaluate the system's compliance with the specified requirements. In this system, Black box testing is used to examine the functionalities not known to the tester while White box testing will be used to test internal structures and workings of the system known to the tester.

3.2.5 System Deployment

In this phase, the system will be released to the market after ascertaining that it is working correctly after the testing phase.

3.2.6 System Maintenance

This is the phase where the system is updated, improved or changed.

3.3 Deliverables

This defines what the system is expected to offer the users

3.3.1 Voter Module

The Voters vote with a system that is faster, more efficient and trustworthy.

3.3.2 Candidate Module

For Candidates, they are able to vote with a system that is trustworthy and the results are released within a shorter period of time reducing anxiousness in the Candidate.

3.3.3 Administrator Module

For Administrators, the system gives them humble time since they do not have to manually login the voters and count the votes.

3.3.4 IEBC Commission

IEBC commission gets an easier time since there are reduced personnel working in each polling station and also tracking and monitoring of the system is easier. It is also easier to add, delete and update candidates' information.

CHAPTER FOUR: SYSTEM ANALYSIS AND DESIGN

4.1 Introduction

This chapter covers the analysis and design of the web based electronic voting system (E-vote). It explains the system's analysis through diagrams like use case diagram, entity relationship diagram and much more. The design phase is thoroughly explained through wireframes and database schema. It also includes a detailed description of the functionalities.

4.2 Analysis of Requirements

4.2.1 Functional Requirements

Function	Log_in
Description	This functionality enables the user of the system to be able to access the system with ease.
Input	Password, User name (Voter ID or Admin name)
Source	User defined
Output	Successful logging into the system
Destination	VotingProcess_Functionality
Action	Pressing the Login button
Precondition	A successful login for the user
Post-condition	The user can proceed to the next step in the system

Table 4.2.1.1 Log_In Functionality

Function	Vote_Counting
Description	This functionality enables the counting of votes and finally declares the winner.
Input	Candidate name, Candidate position

Source	Candidate_Report
Output	Successful counting of votes
Destination	Admin_Report, IEBC_Functionality
Action	Press Vote button
Precondition	Successful counting of votes.
Post-condition	Successful announcement of results

Table 4.2.1.2 Vote_Counting Functionality

Function	VotingProcess_Functionality
Description	This functionality enables the voter to proceed to vote for their candidate of choice.
Input	Username, Password
Source	Candidate_Report
Output	Viewing of all the candidates vying for a certain post
Destination	ReviewVote_Functionality
Action	Pressing the Vote button
Precondition	A successful casting of votes
Post-condition	Completion of voting process by voter

Table 4.2.1.3 VotingProcess_Functionality

Function	Candidate_Report
Description	This functionality enables the user of the system to be able to see the candidates they are voting for and their information.
Input	Null
Source	Admin_Report
Output	Viewing of the candidates information
Destination	Admin_Report
Action	Clicking the View Votes button

Precondition	Successful viewing of candidates information
Post-condition	Voter can see the candidate's details and vote thereafter

Table 4.2.1.4 Candidate_Report

Function	Admin_Report
Description	This functionality enables the Admin of the system to be able to access various areas of the system like the Results Panel for Senators and Governors. It also enables them to update candidate's information
Input	Name , Password
Source	Results_Panel, Candidate_Review,VotingProcess_Functionality
Output	Successful monitoring of the system
Destination	IEBC_Functionality
Action	Clicking the Admin Rights button
Precondition	Successful update of candidate information
Post-condition	Admin can easily view the results process

Table 4.2.1.5 Admin_Report

Function	IEBC_Functionality
Description	This functionality enables the IEBC Commissioner to view all the candidates' results including those for the Presidents candidates. They can also modify candidates information and manage the political party panel
Input	Name , Password
Source	Results_Panel,Candidate_Review,VotingProcess_Functionality, Admin_Report
Output	Successful monitoring of the system
Destination	Admin_Report
Action	Clicking the IEBC Rights button
Precondition	Successful update of candidate information and political party
Post-condition	Admin can easily view the results process

Table 4.2.1.6 IEBC Functionality

Function	Log_out
Description	This functionality enables the user to leave the system with ease
Input	Null
Source	Null
Output	Successful leaving the site
Destination	Null
Action	Pressing the Logout button
Precondition	Successful log out
Post-condition	Successful log out

Table 4.2.1.6 Log_out Functionality

4.2.2 Non Functional Requirements

i. Ease of use

The proposed system is very easy to learn. It is also very efficient since users can reach their goals quickly. These goals include voting, counting vote and much more. Whenever the user makes a mistake they can easily correct it. It is very easy to use it and the user can be able to use it again after a certain period of time.

ii. Scalability

Scalability assesses the highest or lowest workloads under which the system will still meet the performance requirements. The system will not be affected by the turn up of the voters. It will continue working normally.

iii. Security

The proposed system will ask the users (Voters, Administrators and IEBC Commissioner) for their logins and passwords so as to make it more secure. The system will only allow authenticated users to access it.

4.3 System Analysis

In this phase, the analyst gathered all the system requirements and environmental considerations. The requirements were then analyzed in order to come up with an overview of the system

architecture and functionality. The analyst also identified the overall direction that the project took through the creation of the project strategy documents.

4.3.1 Use Case Diagram

A use case diagram is a representation of a user's interaction with the system that shows the relationship between the user and the different use cases in which the user is involved. A use case is a methodology used in system analysis to identify, clarify and organize system requirements. The use case is made up of a set of possible sequences of interactions between systems and users in a particular environment and related to a particular goal. In this system, we have the following actors; IEBC commissioner, Voter, Admin and Candidate who interact and relate differently with the system.



Figure 4.1 Use Case Diagram

4.3.2 Entity Relationship Diagram

An Entity Relationship Diagram (ERD) is a snapshot of data structures. An Entity Relationship Diagram shows entities (tables) in a database and relationships between tables within that database. Attributes are the data we want to collect for an entity. Relationships describe the relations between the entities.

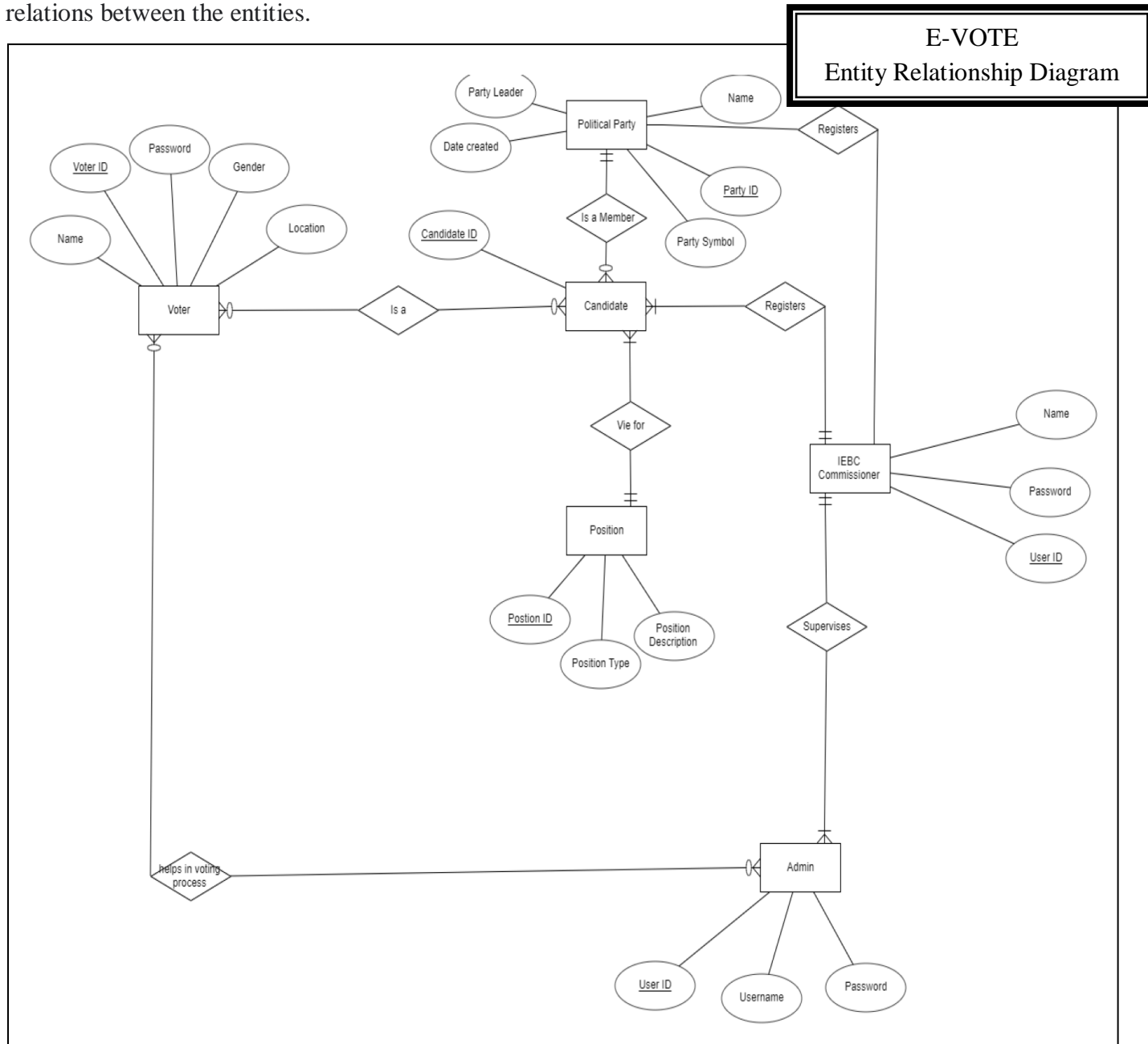


Figure 4.2 Entity Relationship Diagram

4.3.3 Sequence Diagram

Sequence diagrams; model the interactions between objects in a single use case. They illustrate how the different parts of a system interact with each other to carry out a function, and the order in which the interactions occur when a particular use case is executed. Once a user logs into the system they are able to perform a number of activities for example, a voter can vote, an IEBC Commissioner can upload candidates' information and check results.

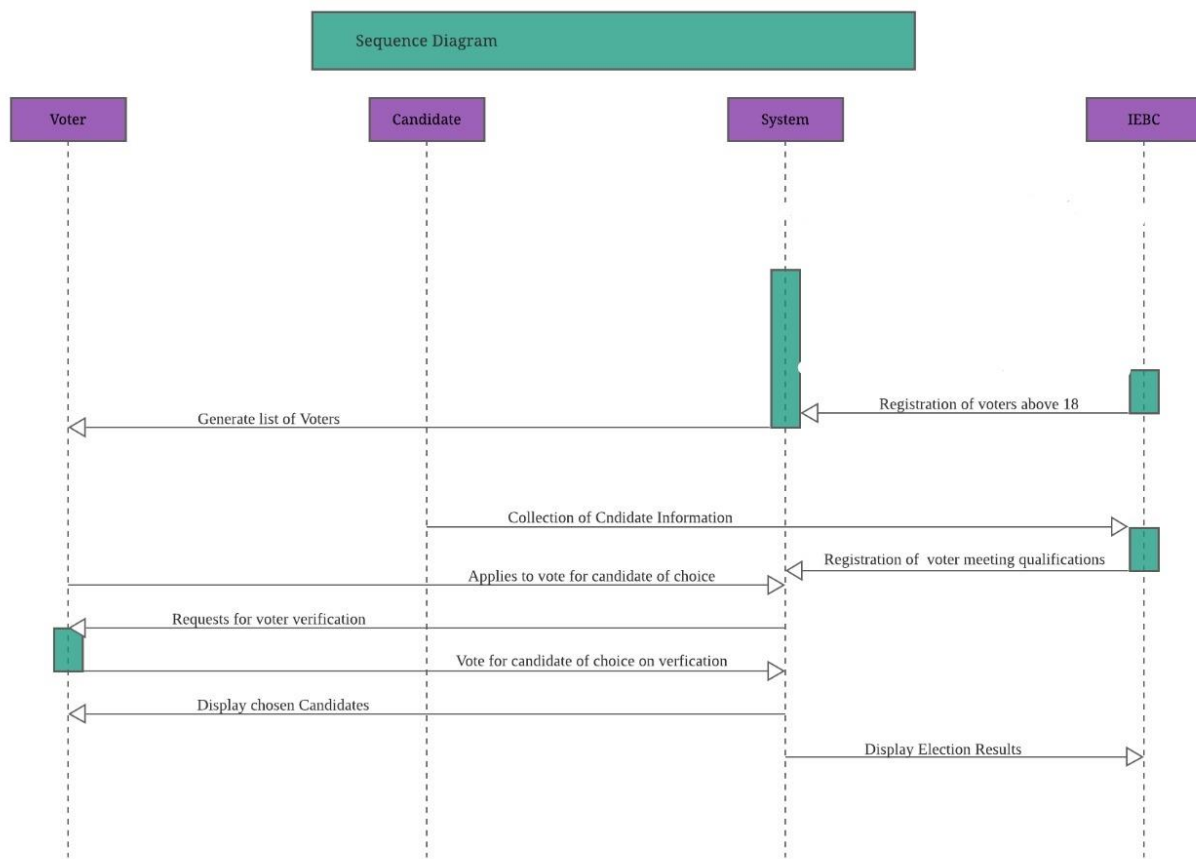


Figure 4.3 Sequence Diagram

4.3.4 Class Diagram

The **class diagram** is the main building block of object-oriented modeling. It is used for general conceptual modeling of the structure of the application, and for detailed modeling translating the models into programming code. Class diagrams can also be used for data modeling.

E-VOTE Class Diagram

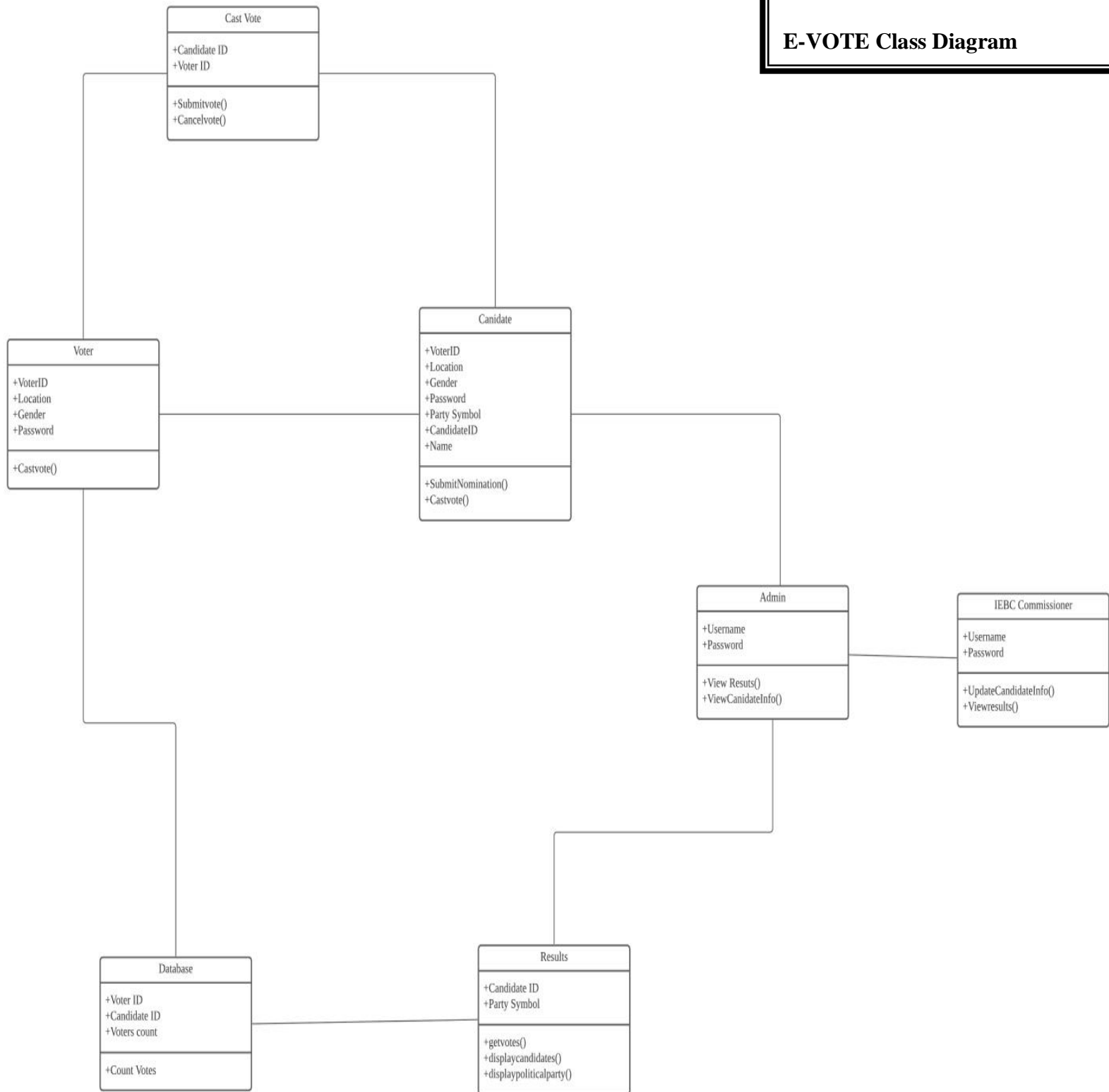


Figure 4.4 Class Diagram

4.4 System Design

In this phase, the system requirements and logical description of the entities, relationships, and attributes of the data that were documented during the Requirements Analysis phase were further refined and allocated into system and database design specifications that were organized in a way suitable for implementation within the constraints of a physical environment (e.g. computer, database, facilities).

4.4.1 Database Schema

This Figure shows the structure of a database schema described in a formal language supported by the DBMS. The structure represents the logical view of the entire database. It defines how the data is organized and how the relations among them are associated.

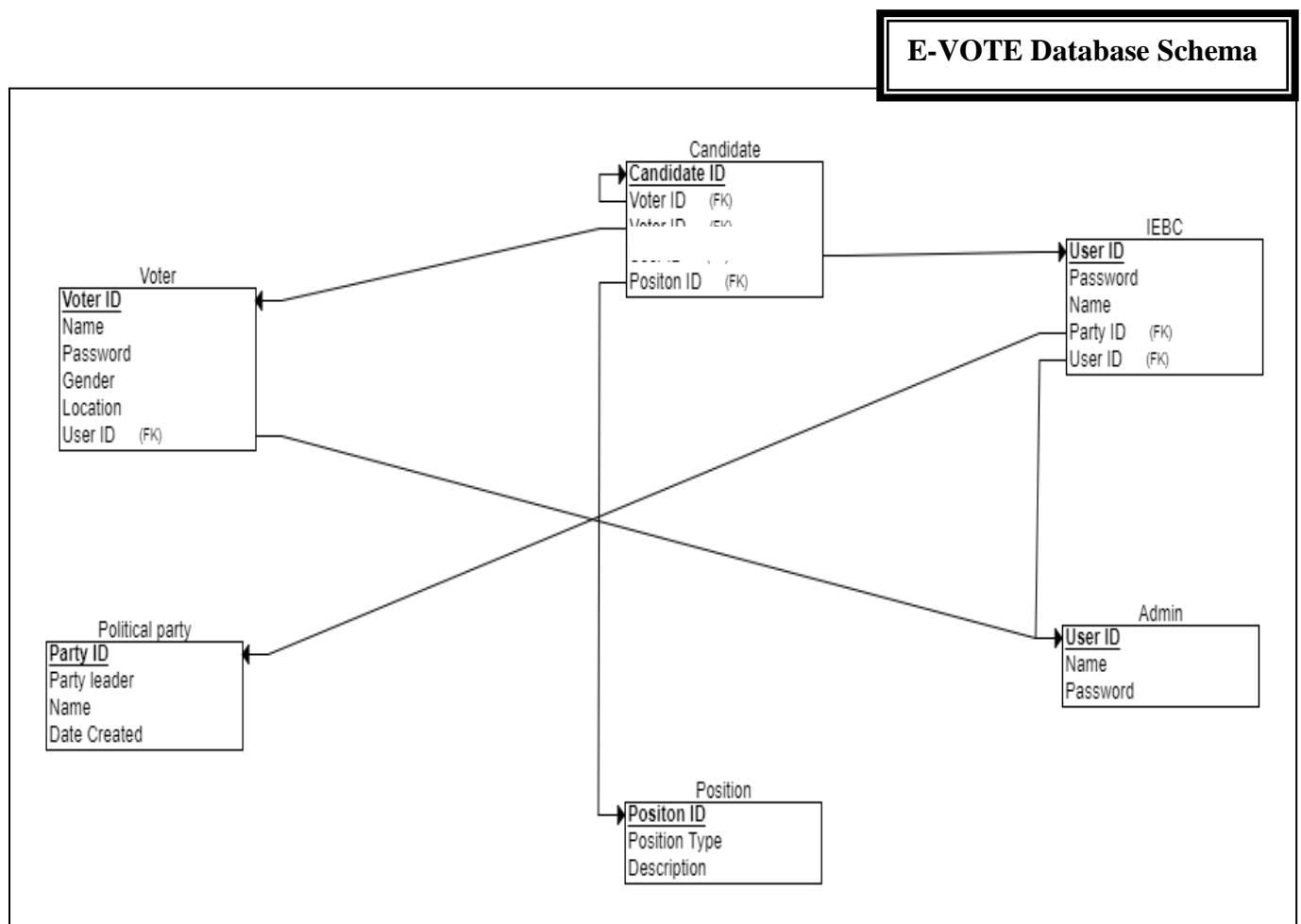


Figure 4.5 Database Schema

4.4.2 Wireframes

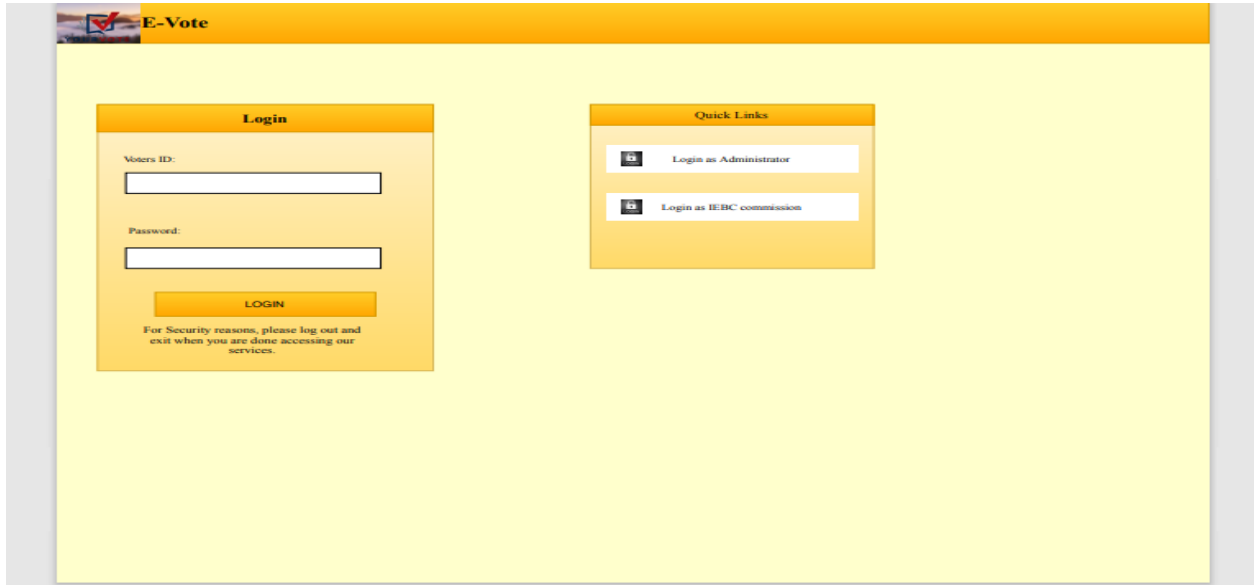
A wireframe is a schematic, a blueprint, useful to help you and your programmers and designers think and communicate about the structure of the software or website you're building.



4.4.2.1 Welcome Page

This is a Welcome Page of E-vote System. Once entering E-vote system, this is what they see on their screen.

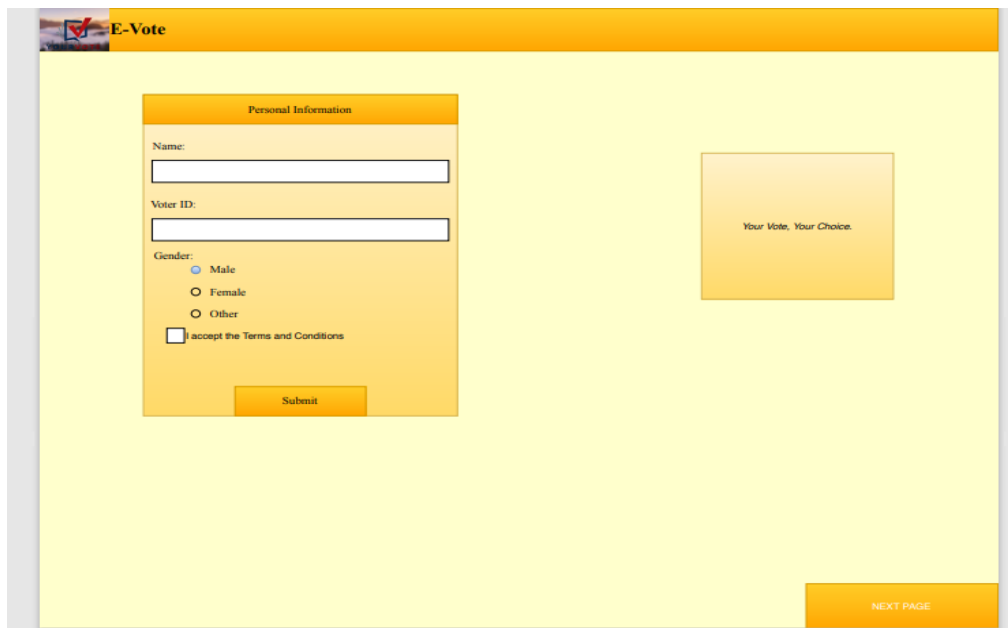
Figure 4.4.2.2 Login



The screenshot shows the E-Vote Login page. At the top, there is a header with the E-Vote logo and the text "E-Vote". Below the header, the page is divided into two main sections. On the left, there is a "Login" box with a yellow background. It contains a "Voters ID:" label followed by a text input field, a "Password:" label followed by a text input field, and a "LOGIN" button. Below the button, there is a security notice: "For Security reasons, please log out and exit when you are done accessing our services." On the right, there is a "Quick Links" box with a yellow background. It contains two links: "Login as Administrator" and "Login as IEBC commission", each preceded by a small icon.

This is where you vote login into the system to enable the voter to vote.

Figure 4.4.2.3 Input Info



The screenshot shows the E-Vote Input Info page. At the top, there is a header with the E-Vote logo and the text "E-Vote". Below the header, the page is divided into two main sections. On the left, there is a "Personal Information" box with a yellow background. It contains a "Name:" label followed by a text input field, a "Voter ID:" label followed by a text input field, and a "Gender:" label followed by three radio buttons: "Male", "Female", and "Other". Below the radio buttons, there is a checkbox labeled "I accept the Terms and Conditions". At the bottom of the box is a "Submit" button. On the right, there is a box with a yellow background containing the text "Your Vote, Your Choice." At the bottom right of the page, there is a "NEXT PAGE" button.

Figure 4.4.2.4 Voted for

E-Vote

YOUR VOTES

Here are the people you voted for;

Senator
Kung'u Karumba Flamingo Party

Governor
Wangari Maathai Mahawa Party

President
Achieng Oneko Orange Party

[Go Back](#) [Confirm](#)

Figure 4.4.2.5 Admin Login

E-Vote

Login

Voters ID:

Password:

LOGIN

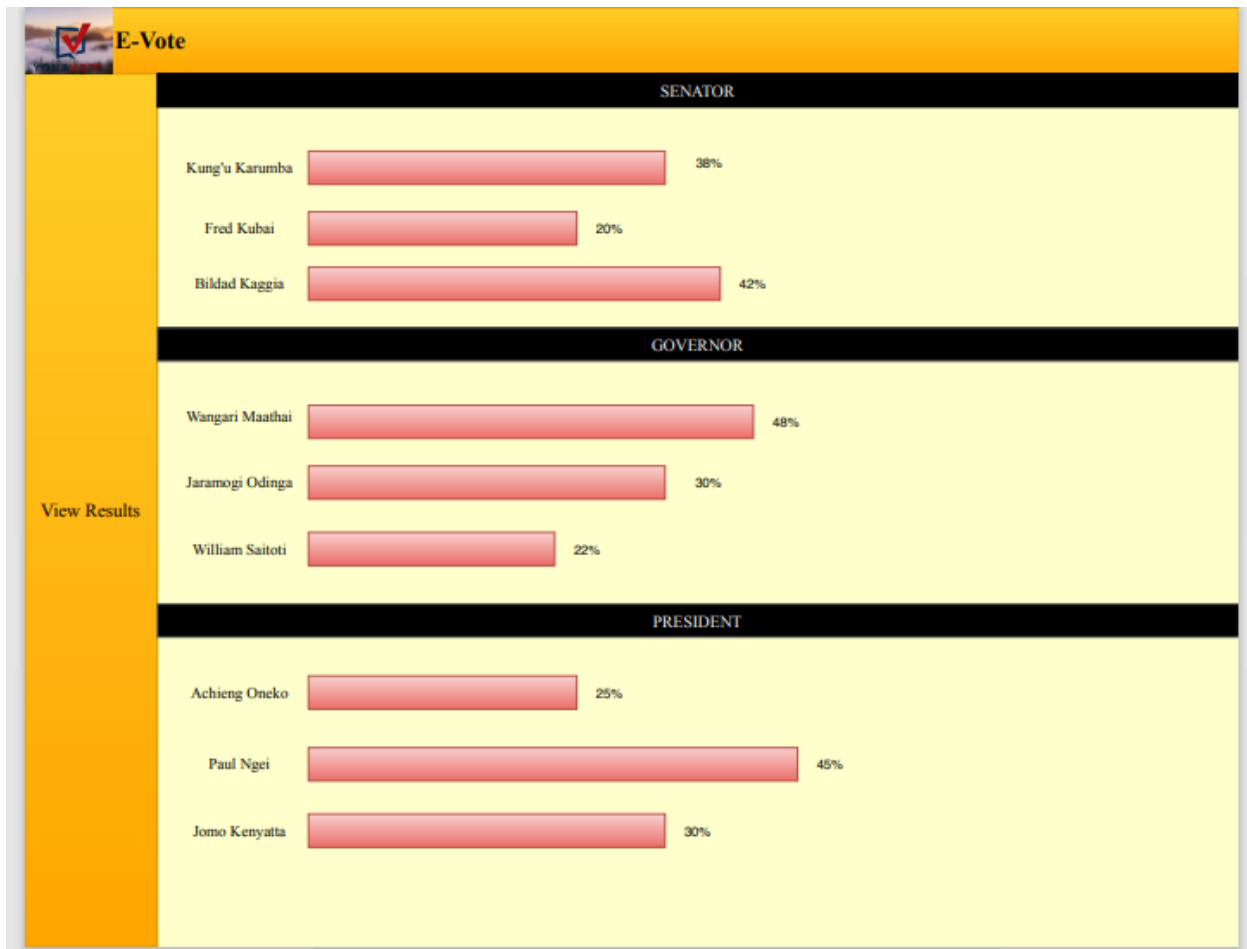
For Security reasons, please log out and exit when you are done accessing our services.

Quick Links

[Login as Voter](#)

[Login in as Admin](#)

Figure 4.4.2.6 Results page



CHAPTER FIVE: IMPLEMENTATION AND TESTING

5.1 Introduction

This is where the testing of implementations of technology specifications. This process serves the dual purpose of verifying that the specification is implementable in practice, and that implementations conform to the specification.

5.2 Description of Implementation Environment.

5.2.1 Hardware Specs

RAM- 2GB

5.2.2 Software specs

OS- Operating system/platforms features

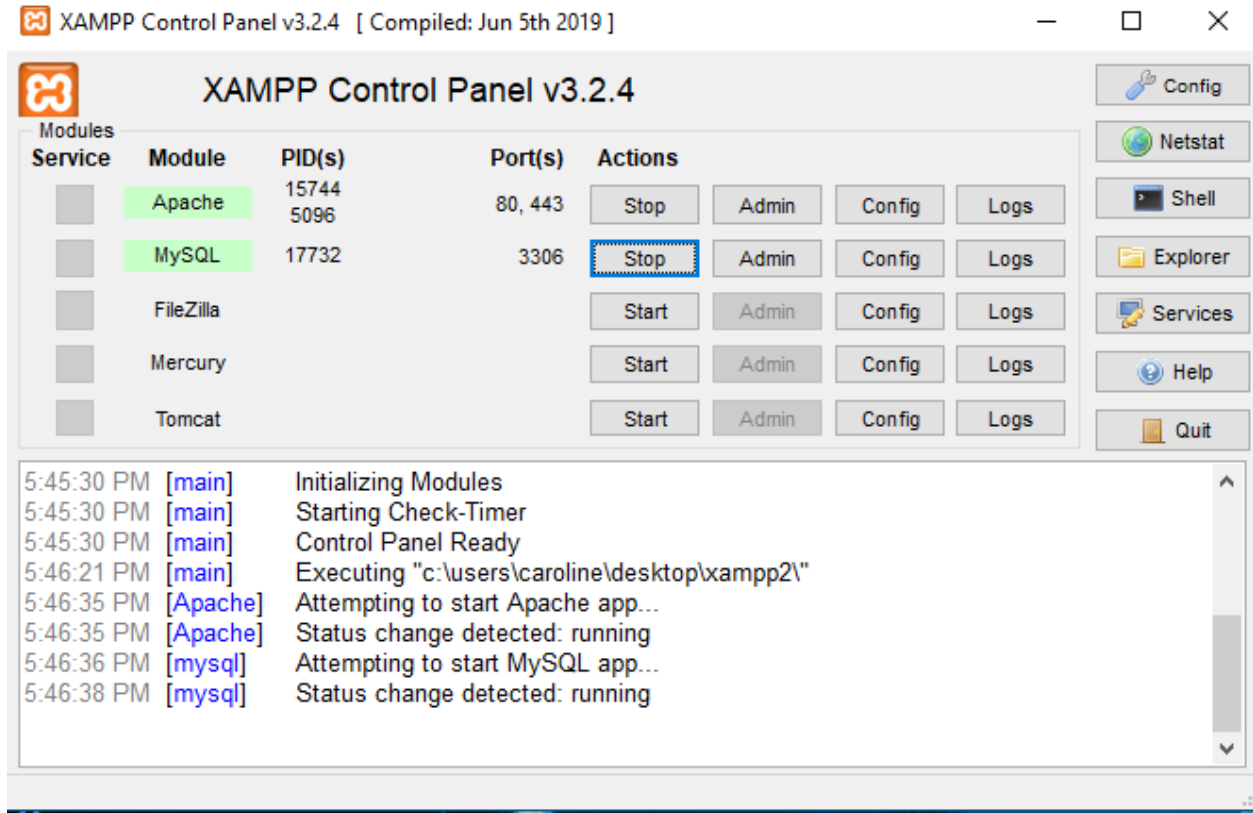
IDE: Visual Studio (version 15.9.8).

- i. Download the Visual Studio Code installer for Windows.
- ii. Once it is downloaded, run the installer (VS Code User Setup-{15.9.8}.exe). This will only take a minute.
- iii. By default is installed by user; C:\users\{ClariceG}\AppData\Local\Programs\Microsoft VS Code.

What version android version (15.9.8)

XAMPP: 8.0.0; PHP 8.0.0; apache (8.0.0; 80,443);

PHP MyAdmin for MySQL (3306) DBMS 3.2.4



5.2.2.1 How to Install Xampp

5.1 Description of Testing

The Module/unit	Expected Tested Result	Actual Test Result
Login Form	A user is supposed to Login as a registered voter and approved by the system database.	Users can login and vote for candidate of choice.
Vote.	After a Voter has logged in they vote for their candidate of choice and vote is taken to the database.	The Voter can vote for candidate of choice and view results of the candidates after voting. Figure5.3.3
Password	Cannot access the Voting section inputting password in the form.	The voter cannot access the voting section without a password.

Table 5.3.1 Description Of Testing

This is the home page of E-Vote where instructions of how to vote are given. Also we have a navigation bar where the voter can view at the political parties and login to vote for candidate of choice.

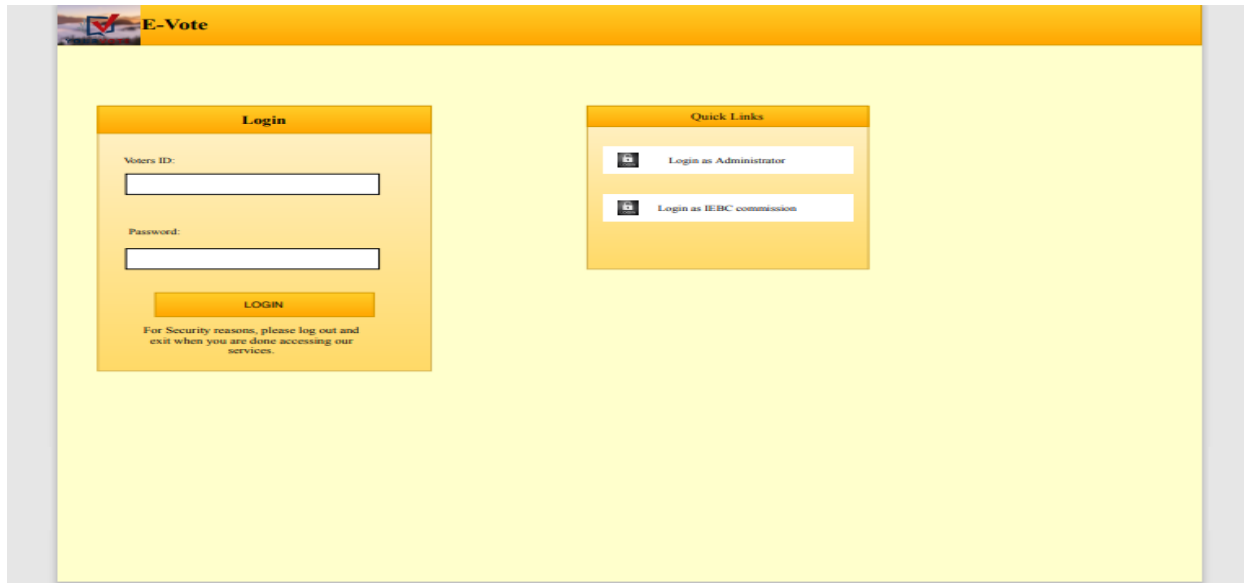


Figure5.3.2 Log In Page

This is the login page where the user is supposed to login and if they input wrong credentials they are denied access to the voting page, if they input correct credentials found in the database and vote for candidate of choice.

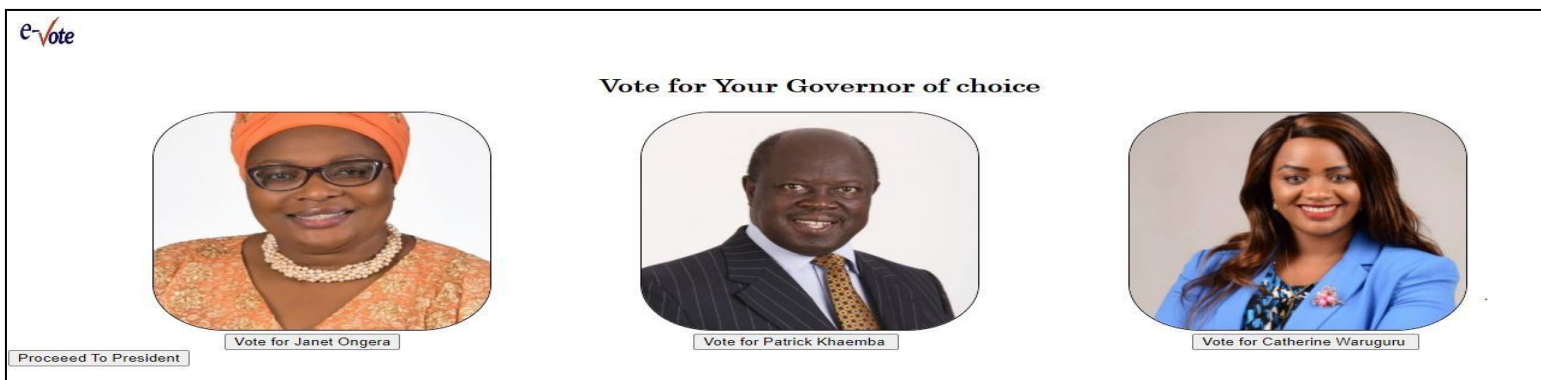


Figure 5.3.3 Voting Process

This is where the voter is supposed to select candidate of choice and proceed to the next page. The voter does not have access to the previous pages once you have completed voting so the user cannot update, change or delete their vote.

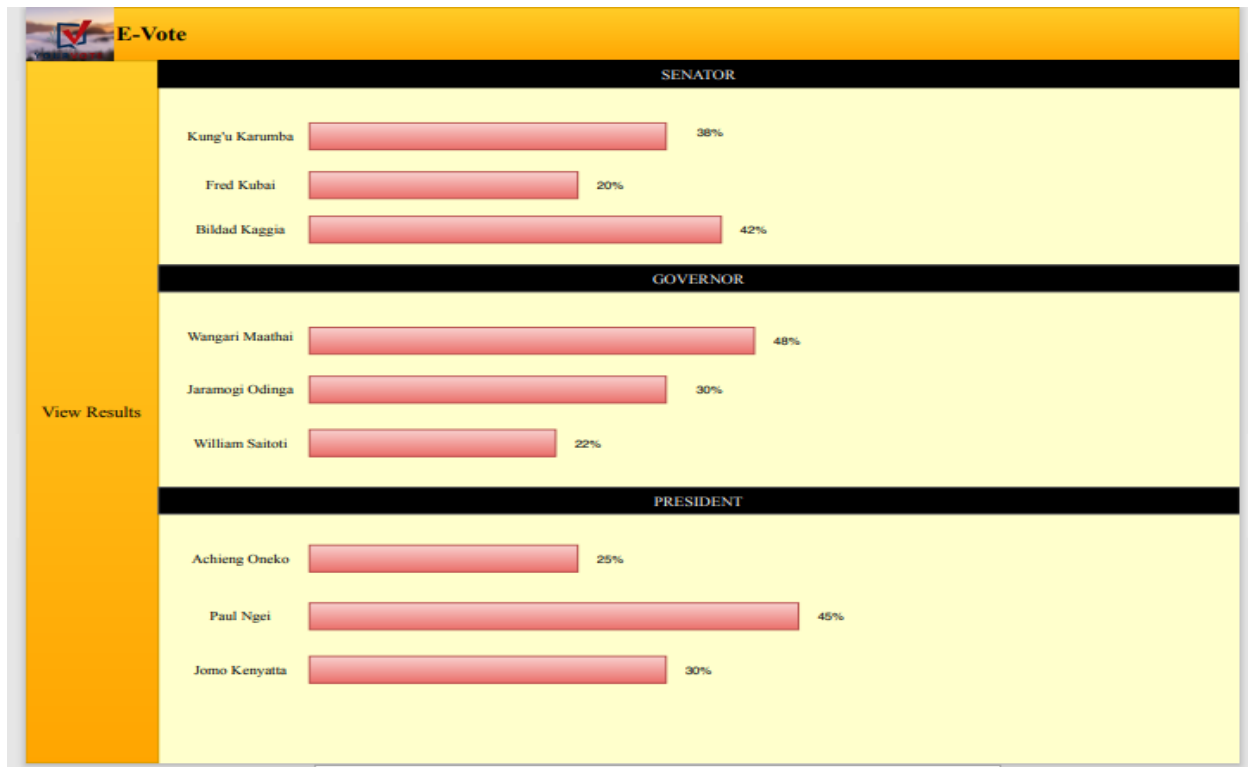


Figure5.3.5 Results

This shows the results after the voter has voted and they have been tallied. The results are not visible to a voter who has not voted.

5.1 Test Data and Results (functional and Non-functional Requirements)

The testing of the various functionalities of the system is tested and the results documented.

Test Id	Test Item	Description	Priority/Criticality	Results
001	Login	The user is supposed to input their credentials to gain access to the voting page. If username and password correct, login successfully else deny access. Sample data (User: Adrianna Bitutu Password: Blomq13hzd)	Very Critical process	Success
002	Vote	After logging in the user is granted access. Enables the user to vote for candidate of choice.	Very Critical process	Pass
003	Vote Counting	The system is to perform Counting of votes and shows percentage the percentage for each candidate.	Very Critical Process	Pass
004	Admin Report	They input their credentials to access the results page. Ability to view results of the various seats up for election.		Pass
005	Candidate Report	This page is supposed to enable the user to view the candidate information like the various political parties.		Pass
006	Logout	The user is supposed to leave the site after voting because this is a voting system once you vote you can second guess your vote making the decision you made the final one.	Very Critical Process	Pass

Table 5.4.1

5.2 Non-Functional Requirements.

Test Id	Test Item	Description	Priority	Results
---------	-----------	-------------	----------	---------

001	Security	The Usernames and Passwords are encrypted in the database and if user inputs invalid credentials they are denied access.	Very crucial	Success
002	Ease of Use	The User Interface design is focused on the anticipation of what the users might need to do bring together concepts from interaction design, visual design, and information Architecture.		Pass
003	Scalability	The voters can vote multiple at a time and the system will still process all the voters' votes simultaneously.	Very Crucial	Pass

Table 5.5.1

CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS.

6.1 Conclusion

The system where the voter has logged in and when they input invalid credentials they are denied access also if they are not found in the database they are also denied access to the voting page. After they have logged in they are taken to the voting page and allowed to choose for candidate of choice where after the Voting for the Senator they are automatically taken to the rest of the pages and after they voting for the president they finish voting and cannot access the previous pages due to it being a voting system it is not logical for a user to be able to update or delete their vote meaning the vote is final once you have voted.

Implementing the Admin and IEBC page where they are the only ones with access to the results so to make it easier we enabled the voter to be able to view their results after voting for the candidate of the specific position so as to confirm that their vote has been tallied.

6.2 Recommendations

A voter can vote for an unlimited number of times and that is not something you want with you voting system so to make the voter able to vote only once we need to put restrictions on the database that once a voter has voted they are removed/ deleted from the database disabling them from voting multiple number of times because their credentials are not valid for voting.

Appendix A

Gantt chart

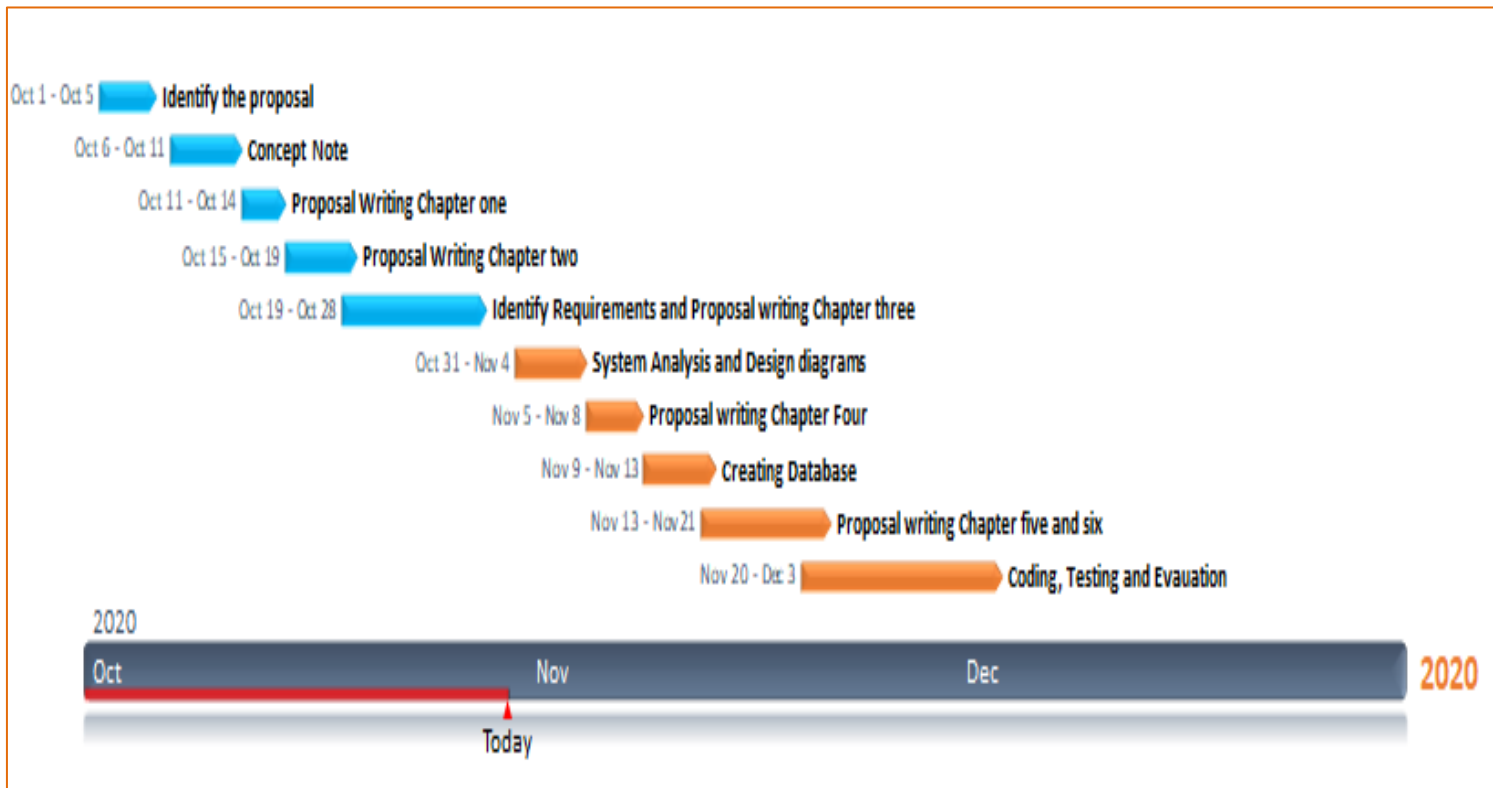


Figure 4.6 Gantt Chart

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