Acknowledgement

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Abstract

The intension of this project is developing automated voting system for Ethiopia, particularly for debere birhan city. The current mechanism for handling the vote management system of the country is limited on manual work. This has limitation on controlling the work securely, for declaring the result on time, and has high consumption on resources. Many countries have used different technologies to support their voting activity and have got successful results. Electronic voting is the most known technology for voting from the existed alternatives. This project proposes a web based electronic voting. The experience of other countries is used as an input for the system .The requirements for the system are collected from historical records and policies of the Ethiopian election. The system architecture, the security risks, and the implementation details of the system are also included in the document.

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CHAPTER ONE

1. Introduction

1.1 Background

Election or voting is a formal process by which Voters make their political choice on public office or candidates for public office. It makes a fundamental contribution to democratic governance. The Constitution of the Federal Democratic Republic of Ethiopia, in its article 56, declares a Political Party or a Coalition of Political Parties that has the greatest number of seats in the House of People's Representatives shall form the executive and lead it. Also in the Amended Electoral Law of Ethiopia, Proclamation clearly puts that a Candidate who received more votes than other Candidates within a Constituency shall be declared the winner.

Therefore the Constitution and the amended Electoral law emphasize that the country follows the majority system, under which the candidate who receives more votes than any competitors within a constituency is declared the winner.

Elections allow the populace to choose their representatives and express their preferences for how they will be governed. Naturally, the integrity of the election process is fundamental to the integrity of democracy itself. The election system must be sufficiently robust to withstand a variety of fraudulent behaviors and must be sufficiently transparent and comprehensible that voters and candidates can accept the results of an election.

In the present the election system in Ethiopia is using paper ballot and there are 45 000 polling stations in the country which makes the voting process more time consuming and needs man power to execute the voting process. This existing election system in Ethiopia has many problems during the election process and the outcome of actual results and it is not a kind of election system they can trust. Whereas the government officials claimed it was fair and free election system. The integrity of the election process is fundamental to the integrity of democracy itself.

Therefore, the purpose of this study is to develop a web-based voting system in which is which votes can be casted electronically and also used for counting results instead of traditional manual schemes.

1.2. Statement of the problem

In Ethiopia, elections take place every five years to elect members of HOR. The electoral procedure involves many processes. The processes are voter Registration, Voter Register Exhibition, Voting, Vote Counting, Collation and Publication of Results.

A number of problems associated with each phase of the electoral process are discussed below:-

- **Invalid votes:** A vote is considered to be invalid if the thumbprint or the mark has not been placed at the right spot. (The Board has published that an average of ---% of invalid votes are recorded during every election.)
- **Long voting process:** The manual voting exercise involves a number of steps that result in long queues. This is because each voter takes a considerable amount of time to vote.
- **Delays in result publication:** It has been gathered that it takes the NEBE about more than --months to eventually publish election result.
- **High cost of election organizing:** The procurement of materials that ensure the validity of the voters' registration, as well as the complete success of the electoral process makes election costs very high. Indelible ink, ballot boxes and papers as well as other logistics, despite being expensive, are indispensable in a manual voting system.

Therefore, this project is an effort in solving the problems associated with each phase of the electoral process. The Efforts may be geared towards the minimization, if possible the total elimination of the problems associated with the manual election system.

1.3. Objective of the project

1.3.1 General objective

The main objective of the project is producing aweb based voting system that can supplement the current paper based voting system of Ethiopia.

1.3.2 Specific objective

- Identifying the problem
- Selecting the appropriate development tools for the system
- Designing friendly user interface
- Designing database to the system that can hold all the information
- Implementing standard security algorithms that can keep the confidentiality of the data.
- Testing the system
- Integrating the whole system

1.4. Scope and limitation of the project

1.4.1 Scope of the project

The scope of this project is developing web based voting system for Ethiopia . There are different kinds of electronic voting system in the world, but this project targets to do web based voting system. The system contains modules that can handle voters' and candidates' registration system, including vote counting module. The project will cover the following activities:-

- ✓ Cast vote online.
- ✓ Registering voter and candidate to database.
- ✓ Create account to the system users.
- ✓ Generate report from the database.
- ✓ Manipulate (or edit) profile and change password.
- ✓ View profile from the database.
- ✓ Show vote result online.
- ✓ Limit access level of the voter.
- ✓ Encrypt user data

1.4.2 Limitation of the project

Limitation of the project defines what the newly proposed system is not going to perform and not cover.

- Our system cannot help any **blind voter** those wants to vote their representatives by sound synthesizer.
- Our system cannot help any **illiterate voter**.

1.5 Feasibility Study of the new System

Feasibility study is essential to evaluate the cost and benefits of the new system. On the basis of the feasibility study decision is taken on whether to proceed or to cancel the project**.**

Need of the feasibility study:

- It determines the potential of the existing system.
- It used to determine/finds out the problem of the existing system.
- To determine all goals of the new system.
- It finds all possible solutions of the problems of the existing system.

1.5.1 Operational Feasibility

The system to be developed will provide accurate, active, secured service and decreases labor of workers and also it is not limited to particular groups or body. And also it is plat form independent i.e. it run's in all operating system.

1.5.2 Technical Feasibility

The system to be developed by using technologically system development techniques such as asp.net, Java script,css and MYSQL database server without any problems and the group members have enough capability to develop the project. So the system will be technically feasible.

1.5.3 Economic Feasibility

The system to be developed is economically feasible and the benefit is outweighing the cost. Since this project already computerizes the existing system, by now the reduction of cost for materials used in manual operation becomes beneficiary to the organization.

Generally the system that we developed, online voting system brought a number of tangible and intangible benefits.

1.5.3.1 Tangible benefits:

1. Cost Reduction.
2. Error Reduction.
3 Increase Speed of activity.

1.5.3.2 Intangible benefits:

1. Reduce Resource Consumption.
2. Increase security.

1.5.4 Political feasibility

The system to be developed is not conflict with any government directives, because it gives services for the people effectively and efficiently, all the stakeholders also agreed before the system developed. So the citizen is profitable and the system will be politically feasible.

1.6. Significance of the project

The main purpose of online voting system includes:

- Improve voting service to the voters through fast, timely and convenient voting.
- Reduction of the cost incurred by the election board during voting process in paying the very many clerks employed for the sake of the success of the manual system.
- This system require less number of staff during the election
- The system is a lot easier to independently moderate the elections and subsequently reinforce its transparency and fairness.
- Online voting systems require being very precise or cost cutting to produce an effective election management system.

1.7. Methodology and software used

1.7.1. Fact finding techniques

- **Interview**

The additional data would be gathered through the technique of interview, through this technique we get different information's from the current workers of the organization and from peoples who have been participating on voting before.

- **Document(literature review)**

We will collect information from different references, projects and web sites.

- By **discussing** and **analyzing** the problems with project team and some teachers.

1.7.2. System analysis techniques

We use some system analysis technique for our project development. Some of them are:

- Use case diagram
- Sequence diagram
- Activity diagram
- Class diagram
- Database diagram

1.7.3. Tools to be used in this project

1.7.3.1 Software requirement

This project team will use the HTML as a front end and the SQL Server as a back and or database tool to develop the new computer based system. In addition to these programing and database tools we will use additional software to different tasks. These are:

- Visio software
- Microsoft word 2013
- Rational Rose
- Edrew max
- Microsoft PowerPoint 2013
- Xampp Server
- mySql database server
- Visio 2013
- Notepad++

1.7.3.2 Hardware requirement

- Any Desktop Computer
- Flash disk 2GB - 8GB
- Compactable CD-ROM 700MB
- Laptop

1.8Time Scheduling

no	Task	Start	End	Duration	Nov. 2007 Two Weeks	Dec 2007 Three weeks	Jan 2007 Four weeks	Feb 2007 2 weeks	Mar 2007 2 weeks	Apr 2007 2 weeks	May2007 5 weeks	Jun 2007 7 weeks
1	Information gathering	15/03/07	30/03/07	15d								
2	Project information and planning	30/03/07	09/04/07	10d								
3	Requirement elicitation	10/04/07	30/04/07	20d								
4	Project Analysis	1/05/07	10/06/07	40d								
5	project design	7/06/07	16/07/07	37d								
6	Project Implementation	17/08/07	10/10/07	43d								

Table 9Time scheduling

1.9Cost Scheduling

No.	Tems	Quantity	Total price(birr)
1	Computer and laptop	1(for development and deployment purpose)	free
2	Printing		300
3	Ms visual studio		free
4	Visio		free
5	Ms office		free
6	paper	1 desta	100
7	Mysql database server		free
8	Xamp server		free
9	Notepad++		free
10	Edrow max		free
Total			400

Table 10Cost scheduling

1.10 Team organization

Tasks	Responsible person	Deliverables
PROJECT INITIATION AND PLANNING		
Explanation of the existing system	Araya	Existing system documentation
Major functions of existing system	Araya and Nurhusen	
PROJECT ANALYSIS		
Use case modeling	Biruktayit and Nurhusen	Use case diagram and description
Sequence diagramming	Habtamu	Sequence diagram
Activity diagramming	Tamrat	Activity diagram
Functional & non Functional Requirement	Araya and Tamrat	User Requirement documentation
PROJECT DESIGN		
State chart modeling	Asmamaw	State chart diagram
Design class diagramming	Asmamaw and Habtamu	Class diagram
Collaboration diagramming	Biruktayit, Tamrat and Araya	Collaboration diagram
Component diagramming	Asmamaw	Component diagram
User interface diagramming	Biruktayit, Asmamaw and HAbtamu	User interface flow diagram
PROJECT IMPLEMENTATION		
Coding	All group members	Project code
Testing	All group members	Checked the code and tested the system

Table 11 Team organization

CHAPTER TWO

2. The current System

2.1 Description of the current system

The Current system is the manual system that needs intensive human labor, resource, consume time, less security. First of all in these manual systems voters have requested to register.

Voters Need to Know during Registration:-

1. An elector shall be registered in person.
2. Any person shall be registered once and at one polling station only.
3. Registration shall be held only at the polling station, registration out of polling station is forbidden

Voters' vote the candidates by going to voting station that is centralized. To vote, each voter gets the candidates symbol and name that present on the vote paper and makes **"X"** marks on only one candidates. On the other hand illiterate electors shall vote by pressing one of their **fingerprints** in the square corresponding to the candidate for whom they want to vote. Counting the voice of each voter and reporting the winner also need much time, perhaps if the counting error is occurred that manual system cannot report. Resources are extravagances when papers are duplicated for the candidates to introduce themselves. Fraud (fake) occurring during election time was protected by law.

2.2 Practices to be preserved from the existing system

Even if the existing system has a lot of problems, there are a number of activities that need to be preserved. Those are:-

- ✓ Existing **data storage** system is partially automated for use, Since the NEBE used manually and partially automated data storage system. This stored data has a vital role in the case power lose and when the automated system got the affected by the virus.
- ✓ **Registration: -** shall be made up on presentation of an identity card or passport.

- ✓ **Distribution of tasks**:-Here everyone has its duty to do and come over the problem of overloading the work to some part of the workgroup.

2.3 Players in the existing system

There are different players in the existing system:-

1. **Voters:-**

- They should vote their candidates.
- View the result.

2. Election offices:-

- Register the candidates.
- Coordinates and manages the workers and co-workers.
- Count the votes.
- Report the result.

3. **Workers and co-workers**:-

- Register the voters.

. 4 **.Candidates**:-

- Candidates registered by Election offices.

5. **Spectators:-**

- They should see what is going on in the election.

In our proposed system

☞ Players in the new system

- ✓ System Admin
- ✓ Election Officer
- ✓ Election Registrar
- ✓ Voter
- ✓ Candidate

2.3.1 Business Rule of the current system

BR1: To vote at Federal level:-

- You must be above 18 years old.
- You must be an Ethiopian.
- Has not served a term of imprisonment is eligible to vote.
- You must reside within the constituencies for at least 6 months.

BR2: The voter must be come to the office on the registration day.

BR3: The Election Offices can register the candidates and tell when the Election date is begin.

BR4: The Workers can register the voters and tell, when the Election date is begin.

BR5: The voter must came in the given schedule.

BR6: The voter can select one candidates and putting an "X" mark across the symbol of the candidate on a voting paper box.

BR7: The Election Officer can coordinate the workers and the co-workers in the time of Election.

BR8: The NEBE can announce the result in mass media such as: - TV, Radio, Magazines, Internet etc...

2.4 Business rule of the new system

BR1: To participate in vote at Federal level:-

- You must be above 18 years old.
- You must be an Ethiopian.
- Has not served a term of imprisonment is eligible to vote.
- You must reside within the constituencies for at least 6 months.

BR2: The voter must be come to the office on the registration day.

BR3: The Election Offices can register the candidates and tell when the Election date is begin.

BR4: The Election Registrar can register the voters and tell when the Election date is begin.

BR5: The voter must vote in the given time schedule online.

BR6: The election page must be activated on the Election Day and deactivated when the election schedule time ends.

BR7: The voter can select one candidate and select the check box across the symbol of the candidate.

BR8: The System show the result online as soon as the voting starts

BR9: The system user must use their ID as their username and password to cast a vote and do other activities.

2.5 Classes Responsibilities and collaboration (CRC) Modeling

Classes' responsibilities and collaborator (CRC) is technique used for identifying classes' responsibilities and their attributes and methods. They also help in identifying the classes. Class's responsibilities and collaborators is based on the ideas that an object either can accomplish a certain responsibilities itself or it may require the assistance of other objects. To fulfill its responsibility identifying an object's responsibilities and collaborators attributes and methods can be identifies.

The classes, Responsibilities, and Collaborators process consists of three steps:

1. Identify responsibilities(and identify classes)
2. Assign responsibilities
3. Identify collaborators

2.5.1Classes and their Responsibilities

No.	Class Name	Responsibilities
1.	System Admin	Manipulate database and create account for the system users.
2.	voter	Castes his/her vote and views candidate profile
3.	Election Registrar	Register voter, view profile and view result.
4.	Election officer	Generate result, view profile of the selected user, register candidate
5.	View profile	Displays the required profile information
6.	View result	Displays the election result
7.	Voter register	Registers the voters
8.	Candidate register	Registers the participant candidates
9.	Profile manipulation	Updates the selected profile in the database
10.	General manipulation	Update and add new feature to the system
11.	Generate result	Count the vote and generate the result
12.	Login	Check the validity of the system user
13.	Check Eligibility to cast vote	Validate the reliability of system
14.	Create Account	Creates account for the system user

Table 12 Classes and their Responsibilities

2.6. Alternative solution

Even if the current system has a lot of the problems, that limits or hinders the functionality, performances, efficiency, competence, security, speeds of the organization. To make, the organization more organized.

- ✓ Automating the whole process to reduce time and budget consumption, to reduce error.
- ✓ Documents also secured.
- ✓ The NEBE also report within short period of time.

Despite the fact that the above suggested solution is alternative solution to the existing system, they are costly & time taking to solve the problem completely. So, having this in mind, our team suggested that, the NEBE to use the proposed an automated internet based system with minimum cost and time to easy to use.

2. 7 Proposed Systems

2.7.1 Overview of the proposed system

The main aim of this project is to automate the current manual system and it will solve the problems that are in the manual system. This system saves resources by doing all things used in election system; and counts the result for each candidate correctly and report with exact value electronically. The new system does not pass over without reporting the occurred errors during the counting result. Also in security side our system is secured because, it needs User name and Password. Before the Election Day the system will be used for viewing candidates' profiles. Our system will be in election mode, for the purpose of vote casting only on the Election Day. When aiming this system we consider the following significance aspects:

- ➢ Reduce the time and task required to perform the operation within the election area.
- ➢ It will change the manual processing to computerize system.
- ➢ It will provide speed, efficient, Flexibility, reliability, and security for the system users.
- ➢ For voters, better satisfaction of the speed provided by the system casting their vote.
- ➢ And it improved the moral (motivation) of the users to use the new technology.

2.7.2 Functional requirements

Functional requirements describe the interactions between the system and its environment independent of its implementation. The environment includes the user and any other external system with which the system interacts.

The following points list down the functional requirements of our system:-

- **Register Election Officer:**

The person who takes care of conducting the elections by declaring the election details should be declared the result.

- **Register Candidates:**

Before the vote casting process begins, the election offices needs to register the candidates.

- **Check authorization to cast a vote:**

Our system will check whether the voter is authorized to cast a vote or not by interacting with database.

- **Cast Vote:**
- When the voter keys the correct Username and Password to the system, the system will extract the eligible candidates on that polling station, then, the voters casts the vote by keeping the rules.

- **Generate report:**

At the end of the election, the System will generate the reports based on the polling stations code.

- **Counting:**

This system will count the votes automatically so the counting process will be faster and that will help to publish the result faster.

- **Authentication**:

Election offices have their own credentials stored in the database. The system will check the keyed values against the values stored in the database.

2.7.3 Nonfunctional requirements

Non-functional requirements (also known as **quality requirements**), which impose constraints on the design or implementation (such as performance requirements, security, or reliability).

- **Usability Requirements:-**

It is expected that the user should be able to vote easily online. User should complete voting in a few minutes. Provide an online help and a quick guide for users.

- **Reliability Requirements:-**

The system should be reliable. Security is a major concern for an online voting system. Process used in this system should be secure enough to be able to meet the requirements mentioned for online voting. It requires database connections and network connections. Changes can be done in the databases to store the votes. All changes needs to be confirmed and if the transfer is complete the confirmation should be displayed. The changes should be monitored.

- **Performance Requirements:-**

There might be many users accessing to the web server simultaneously. As an online voting tool performance shouldn't be affected much and response time for submitted page should be less than a minute.

- **Security Requirements**:-

The system should provide basic security features like password authentication. All the passwords generated and communicated to the users should be stored in the server only in an encrypted form for login management to prevent misuse.

- **Safety Requirements:**

  In order to prevent data loss in case of system failure, the result of votes that were polled till then have to be saved in the database, for the system to resume the counting process on reboot. The Election officer should set up his system time appropriately for the election process to start at the correct time. The system should be capable of gracefully recovering from earlier crashes and continuing the voting process

- **Modeling the Functions of the system (Use Case Modeling)**

The main activities that are performed in this part will be:

- ✓ Identifying if there is any additional actors and use cases,
- ✓ Constructing a use case model, and
- ✓ Documenting the use case course of events.

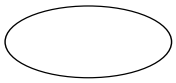
2.8. Use case diagram

Use Case represents interaction between a user (human or machine) and the system.

Use case components:

- **Actor:** is a person, or external system that plays a role in one or more interaction with the system. And represented with:

- **Use case**: describes a sequence of actions that provides something of measurable value to an actor and is drawn as a horizontal ellipse.



- **System boundary**: indicates the scope of the system project. Anything within the box represent functionalities in side in scope.

2.8.1 System models and the artifacts

2.8.1.1 Use case diagram

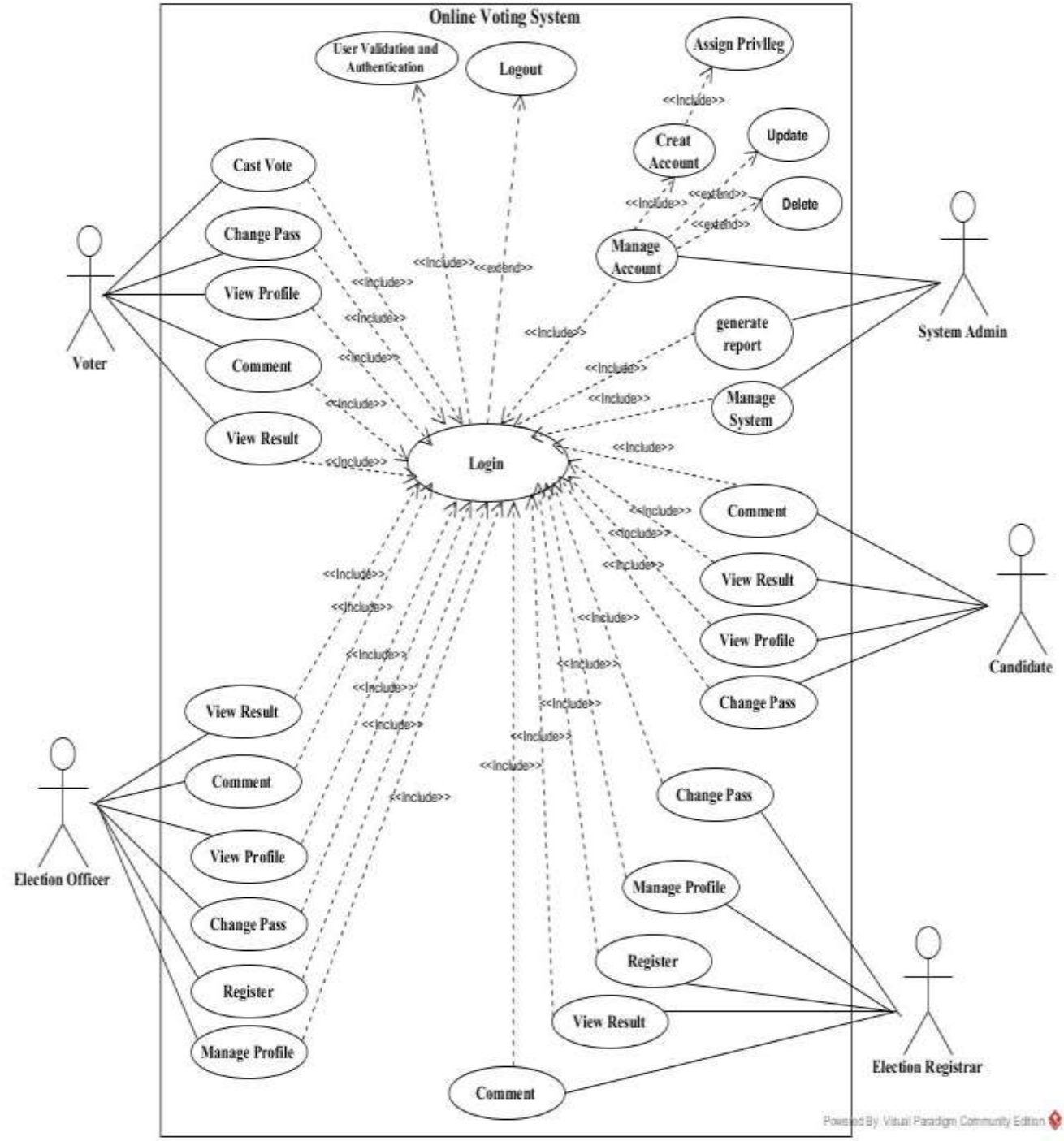


Figure 0-1 Main use case diagram

2.8.1.2**Actor Description**

- ✓ **System Admin**: perform login, create account, generate report and control the system.
- ✓ **Election officer**: perform login, register Election Registrar and approve(register) Candidate and manipulate the profile of the election registrar and candidate when there is a change.
- ✓ **Election Registrar:** perform login, register voter and manipulate the profile of the voter when there is a change.
- ✓ **Voter:** perform login and cast vote.
- ✓ **Candidate:** perform login and advertise information.

2.8.1.3Use Case Description

1. Use case name: **Login**

Use case id: UI-1

Description: used to authenticate the user

Actors: Administrator, voter, candidate, Election Officer.

Precondition: The actors should activate the system.

Basic course of action:

1. the actor instantiate login page
2. Login page will be activate
3. actor enter user name and password and clicks login button
4. system checks the validity of the provided information
5. if the user ID and password are valid, the actors will be logged on to the system
6. Confirmation message will be. displayed
7. Workers home form displayed.

Post condition: the actor should log on successfully.

Alternative course of action:

1. actor enter user name and password and clicks login button
2. system checks the validity of the provided information
3. If the user ID and password are invalid.
4. The system displays "error message".
5. The system asked to re-enter user name and password.

2. Use case name: **Cast Vote**

Use case id: UI-2

Actor: Voter

Description: This use case is initiated by the voter. This use case will enable the voter to cast one vote at a time. It provides the capability to the system to process the voter's ballot.

Pre-condition: The voter must have valid user id.

Basic course of Action:-

- This use case begins when the voters select cast vote from main page.
- The system shall display the well come page.
- The voter will insert his/her id number and encrypted code.
- The system shall check the id number and encrypted code with the existing id number and encrypted code.
- The system will open.

Post-condition: The voter can vote one candidate.

3. Use case name**: View Result**

Use case id: UI-3

Actor: Voter, Election Officer, candidate system Admin and Election Registrar.

Description: This use case is initiated by the voters, candidate, Election Officer, system Admin and Election Registrar. It provides the capability to the system to perform the counting of ballots polled for each candidate and announces the election results.

Pre-condition: Ballot information should be secured before the counting.

Basic course of Action:-

The Use Case begins when the voter, Election Registrar, Election Officer sends request to view the result.

Post-condition: Must report the result to the voters, Election Registrar, Election Officer.

4. Use case name**: Register**

Use case id: UC-4

Actor: Election officer, Election Registrar

Description: this use case is initiated by the Election officer and Election Registrar. It provides to register voter and candidate.

Pre-condition: The Election officer and Election Registrar must log on the system.

Basic course of Action:-

1. The Election officer must activate the system.
2. The Election officer fills user name and password on the login page.
3. The system shall check the user name and password with the existing user name and password.
4. The system will open the Election officer page or the Election Registrar page.
5. The Election officer or Election Registrar will be registering the voter/candidate.
6. The Election officer/ Election Registrar click the save button.

Post-condition: The Election officer/ Election Registrar register the candidate or voter respectively.

5. Use case name**: Create Account**

Use case id: UC-5

Actor: System Administrator

Description: this use case is initiated by the System Administrator. It provides to Create Account.

Pre-condition: The System Administrator must log on the system.

Basic course of Action:-

1. The administrator selects Create account from account menu.
2. Create new account user interface displayed.
3. The administrator insert account name, password.
4. Click of create account button.
5. New account created message displayed to the administrator.

Post-condition: System Administrator Creates Account.

6. Use case name**: Generate Report**

Use case id: UI-6

Actor: System Admin

Description: this use case is initiated by the Election Officer. It provides to generate result.

Pre-condition: The Election Officer must log on the system.

Basic course of Action:-

1. The System admin must activate the system.
2. The System Admin select report form from Report menu
3. Report from menu interface displayed.
4. The System can generate the report from the page.

Post-condition: The System Admin generate result that the system can count the casting vote.

7. Use case name**: View Profile**

Use case id: UI-7

Actor: Voter, Election Registrar, Election Officer.

Description: This use case is initiated by the voters, Election Registrar, Election Officer. It provides the capability to the system to View each candidates.

Pre-condition: The Actors must activate the system.

Basic course of Action:-

The Use Case begins when the voter, Election Registrar, Election Officer sends request to view the Profile.

Post-condition: Must report the Profile to the voters, Election Registrar, Election Officer.

8. Use case name**: Profile Manipulation**

Use case id: UI-8

Actor: Election Registrar, Election Officer, System Admin

Description: This use case is initiated by Election Registrar, Election Officer, and System Admin. It provides the capability to the system to process the profiles of the voters and the candidates. The processing here includes creation, modification and deletion process.

Pre-condition: the Election Registrar, Election officer, and System Admin must log on to the system. And the election database must be the updated one, before this use case is started.

Basic course of action:-

- First the Election Officer ,Election Registrar, and System Admin must initiate the system by log on to the system
- And then those actors select the update form from the profile menu
- Then update page displayed
- The Election Officer, Election Registrar, and System Admin can update the profile that has to be updated.

9. **Use case name:** General Manipulation

Use case id: UI-9

Actor: System Admin

Description: This use case is initiated by System Admin; update and add new feature to the system.

Pre-condition: the system admin must logon to the system first.

Basic course of action:

- The system admin must activate the system first
- The Admin then go to main database system and manipulate the database.

10. Use case name**: System control**

Use case id: UI-10

Actor: System Admin

Description: This use case is initiated by System Admin. And the system Admin control the system by activating it.

Pre-condition: the system admin must logon to the system first.

Basic course of action:

- The system admin must activate the system first
- The Admin then go to main database system and activate the system from the database.

2.9 Dynamic Models

2.9.1 Sequence diagram

A **Sequence diagram** is an interaction diagram that shows how processes operate with one another and in what order. It is a construct of a Message Sequence Chart. A sequence diagram shows object interactions arranged in time sequence. It depicts the objects and classes involved in the scenario and the sequence of messages exchanged between the objects needed to carry out the functionality of the scenario. Sequence diagrams are typically associated with use case realizations in the Logical View of the system under development. Sequence diagrams are sometimes called event diagrams or event scenarios.

A sequence diagram shows, as parallel vertical lines (*lifelines*), different processes or objects that live simultaneously, and, as horizontal arrows, the messages exchanged between them, in the order in which they occur. This allows the specification of simple runtime scenarios in a graphical manner.

The main purpose of a sequence diagram is to define event sequences that result in some desired outcome. The focus is less on messages themselves and more on the order in which messages occur; nevertheless, most sequence diagrams will communicate what messages are sent between a system's objects as well as the order in which they occur.

Sequence diagram for login.

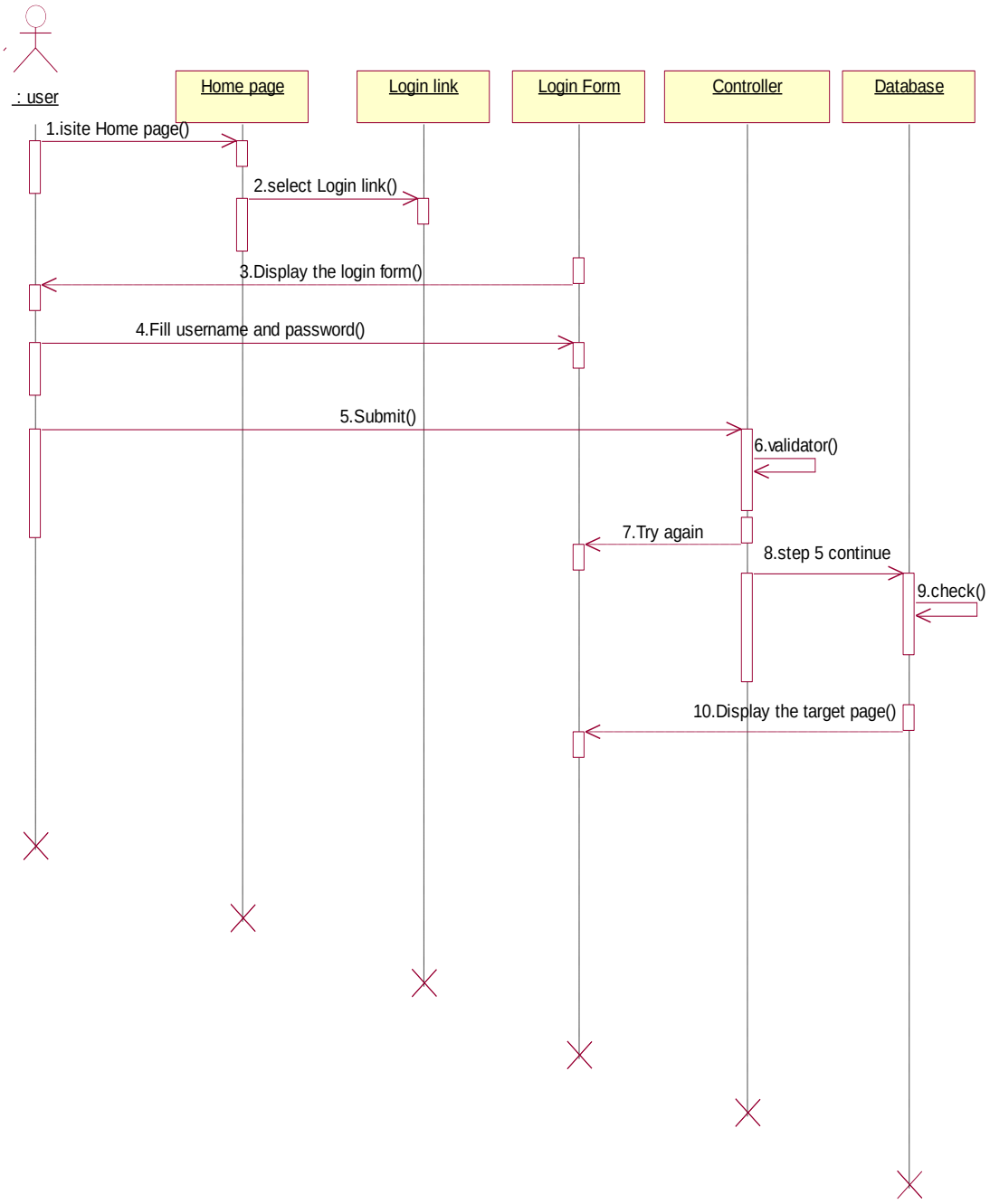


Figure 0-2 Sequence diagram for login.

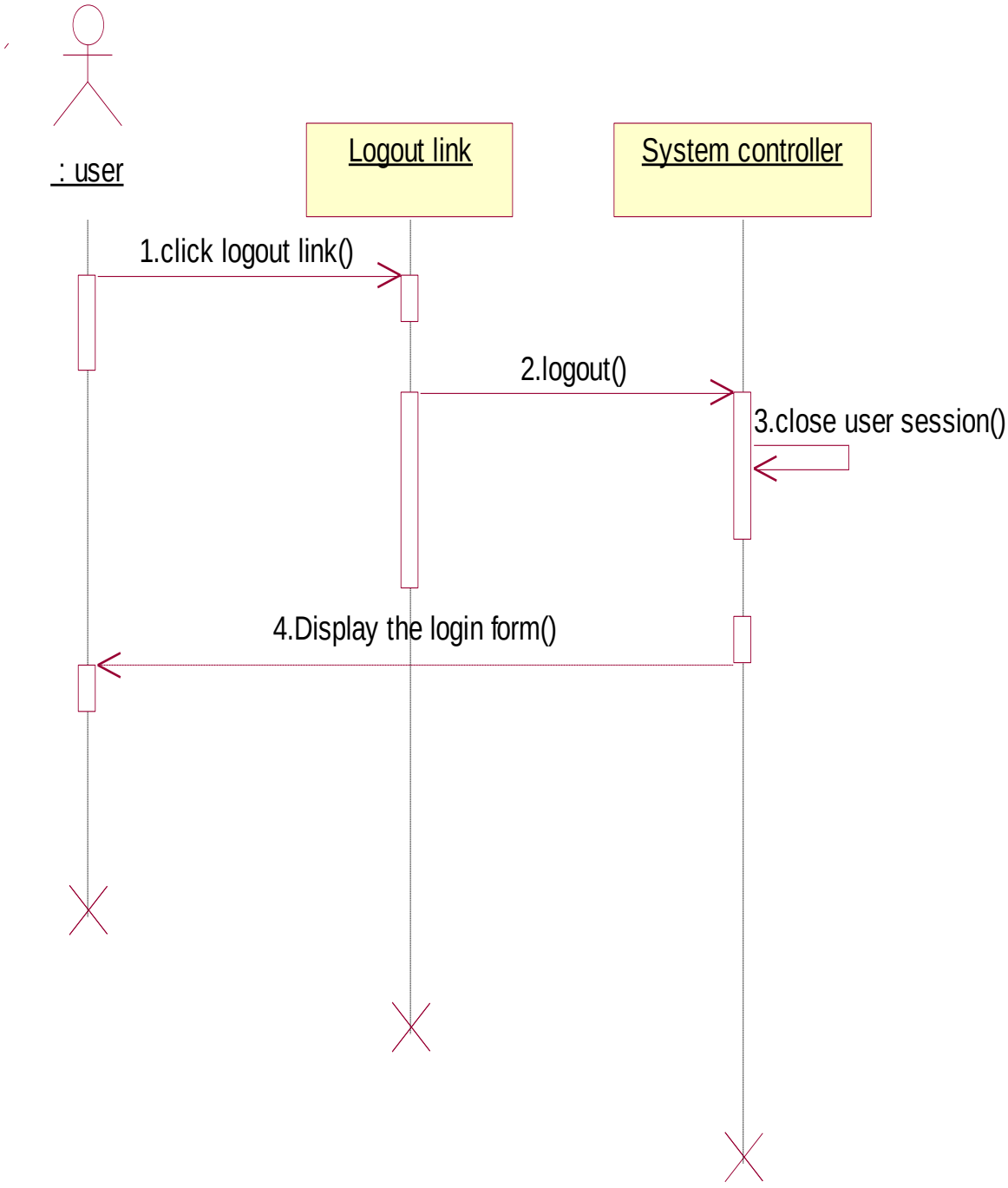


*Figure 0-3*Sequence diagram for logout.

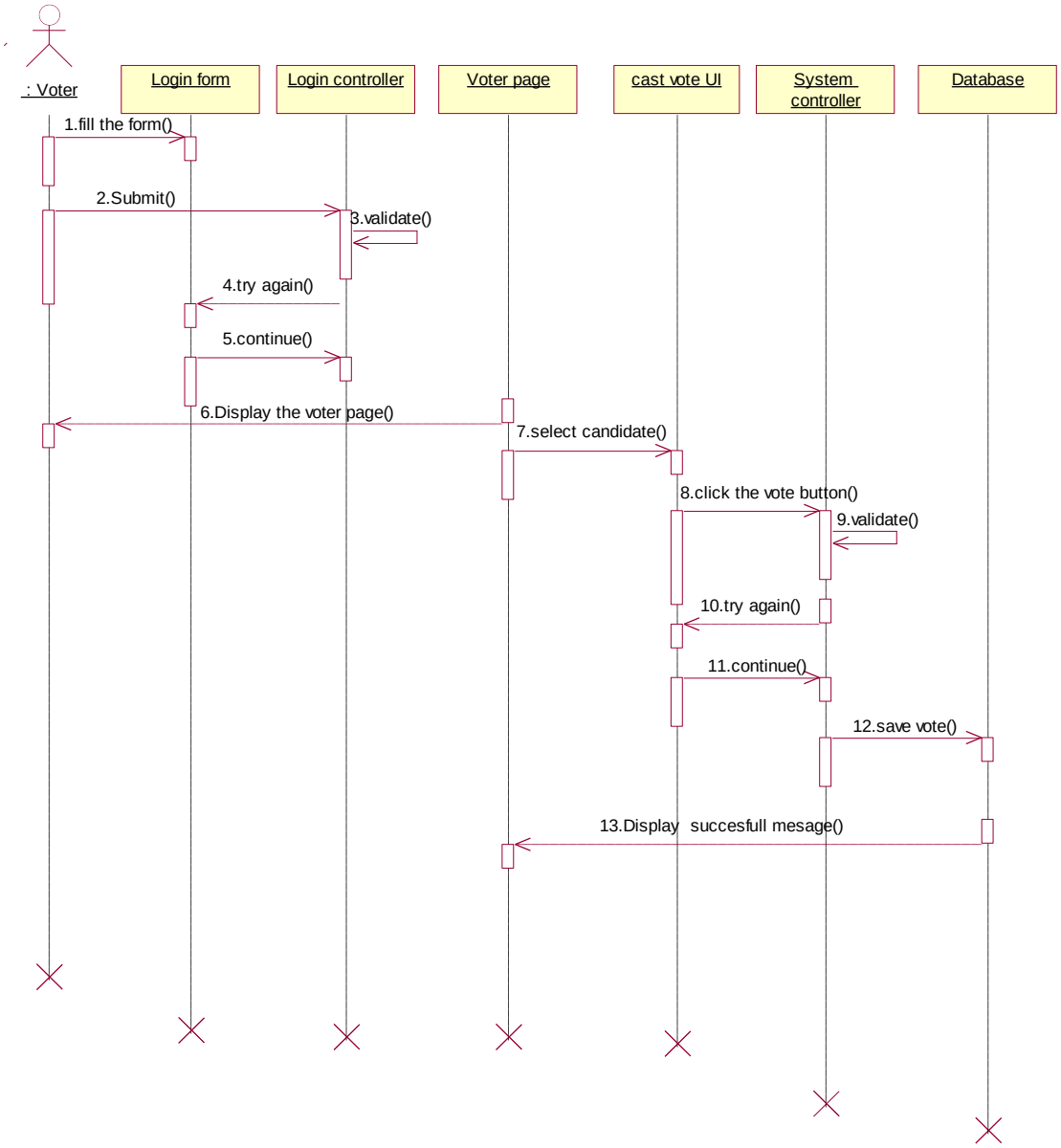


*Figure 0-4*Sequence Diagram for cast vote.

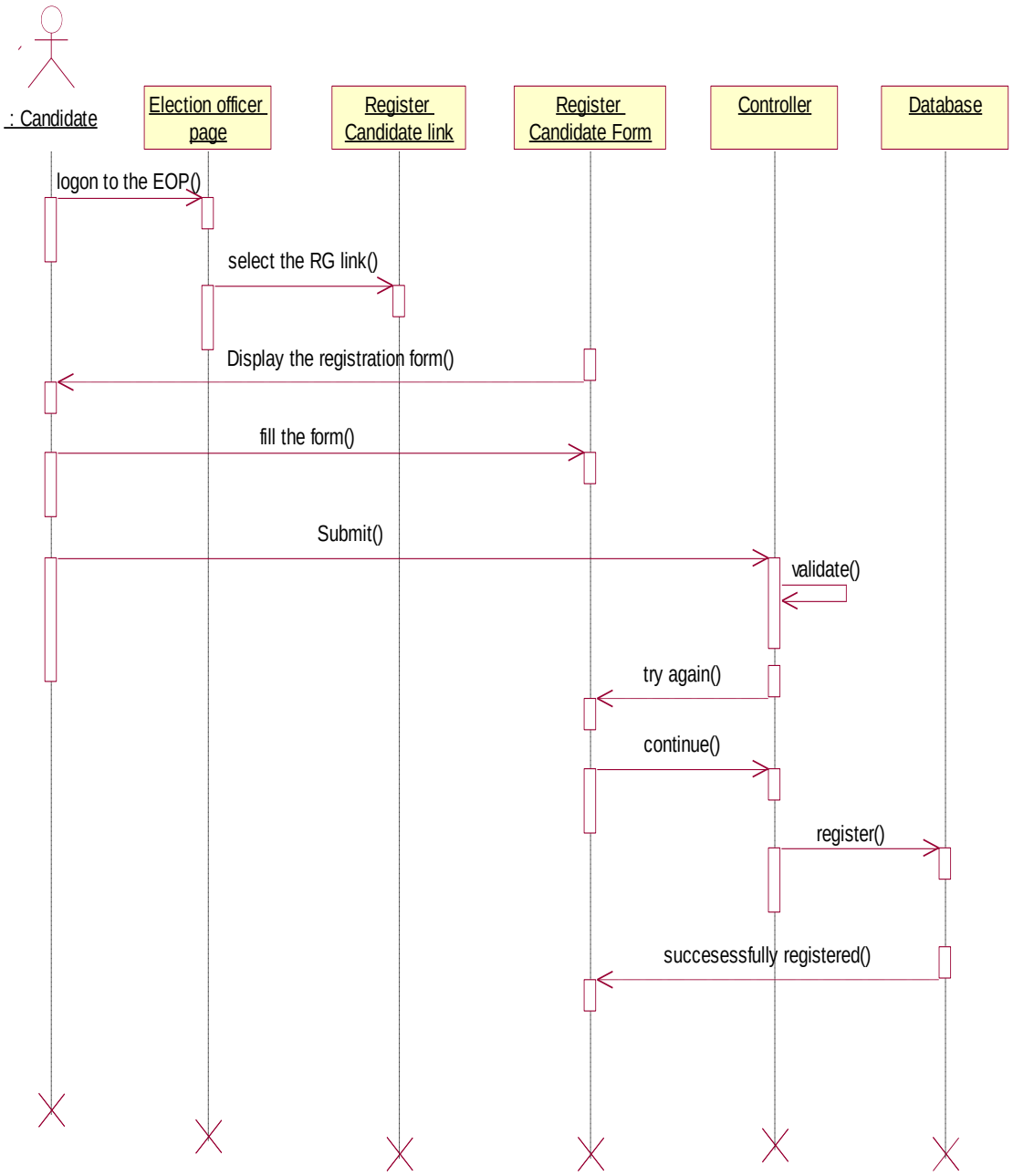


Figure 0-5 Sequence diagram for Register candidates.

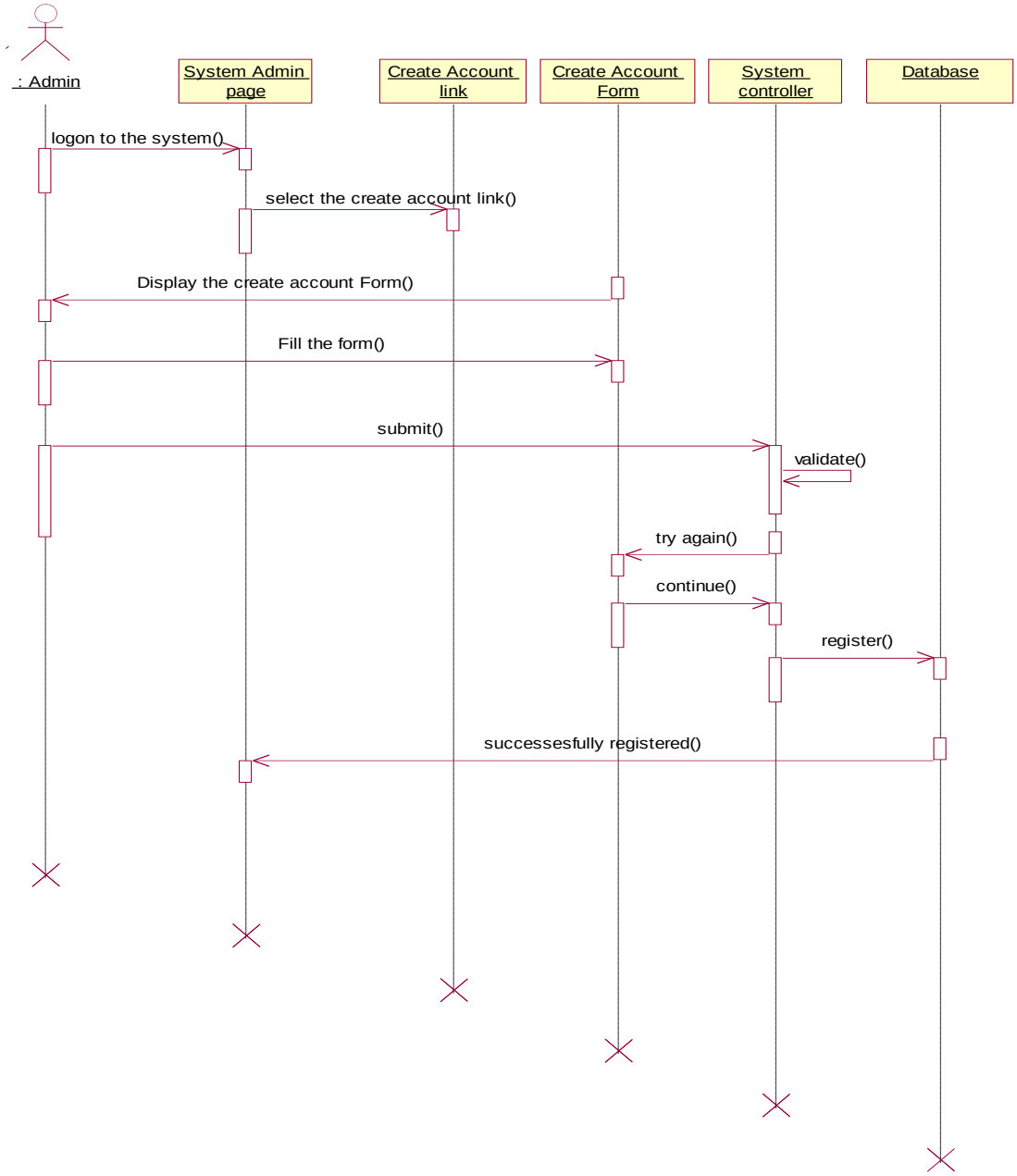


*Figure 0-6*Sequence diagram for Create Account.

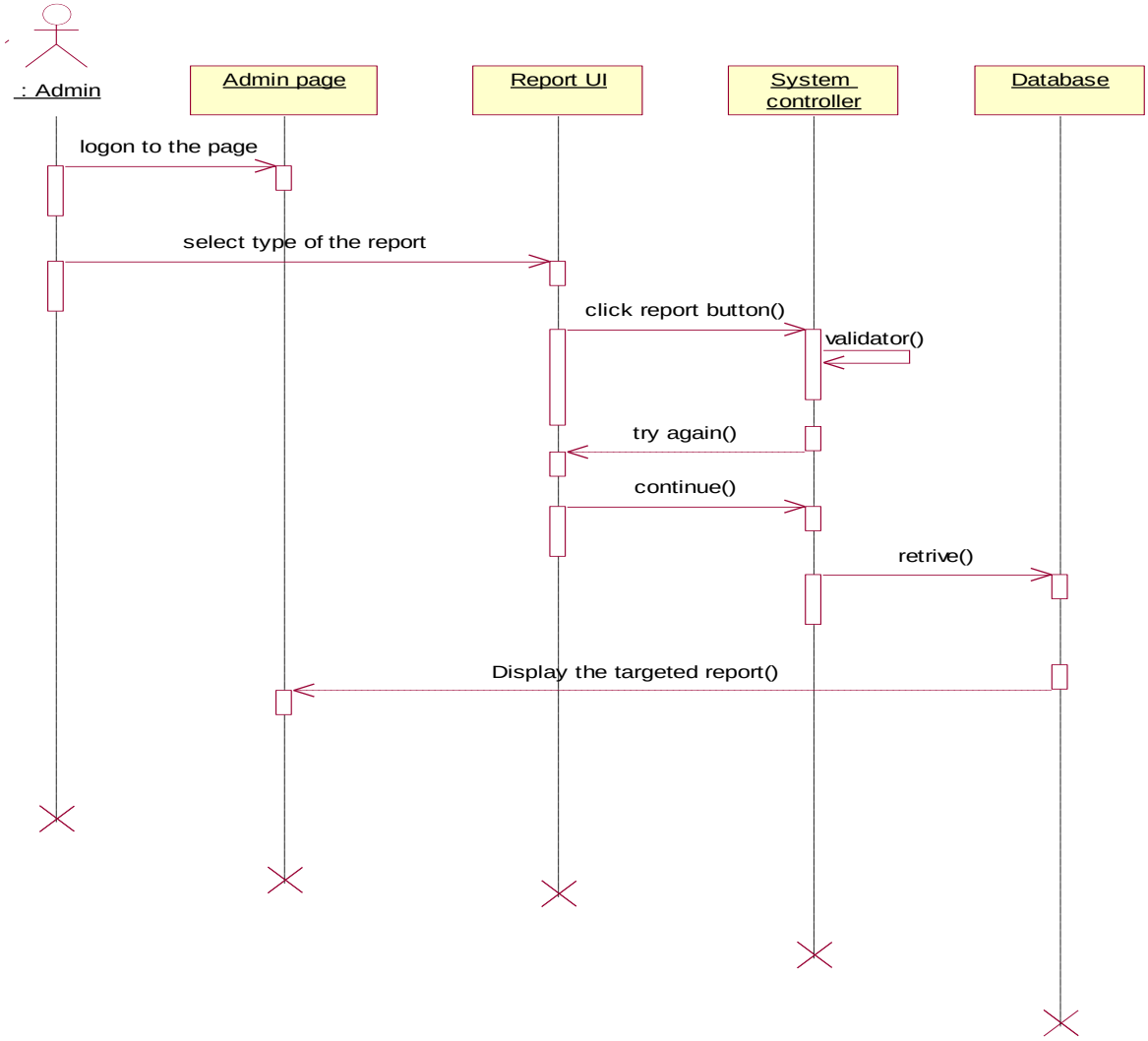


*Figure 0-7*Sequence diagram for generate report

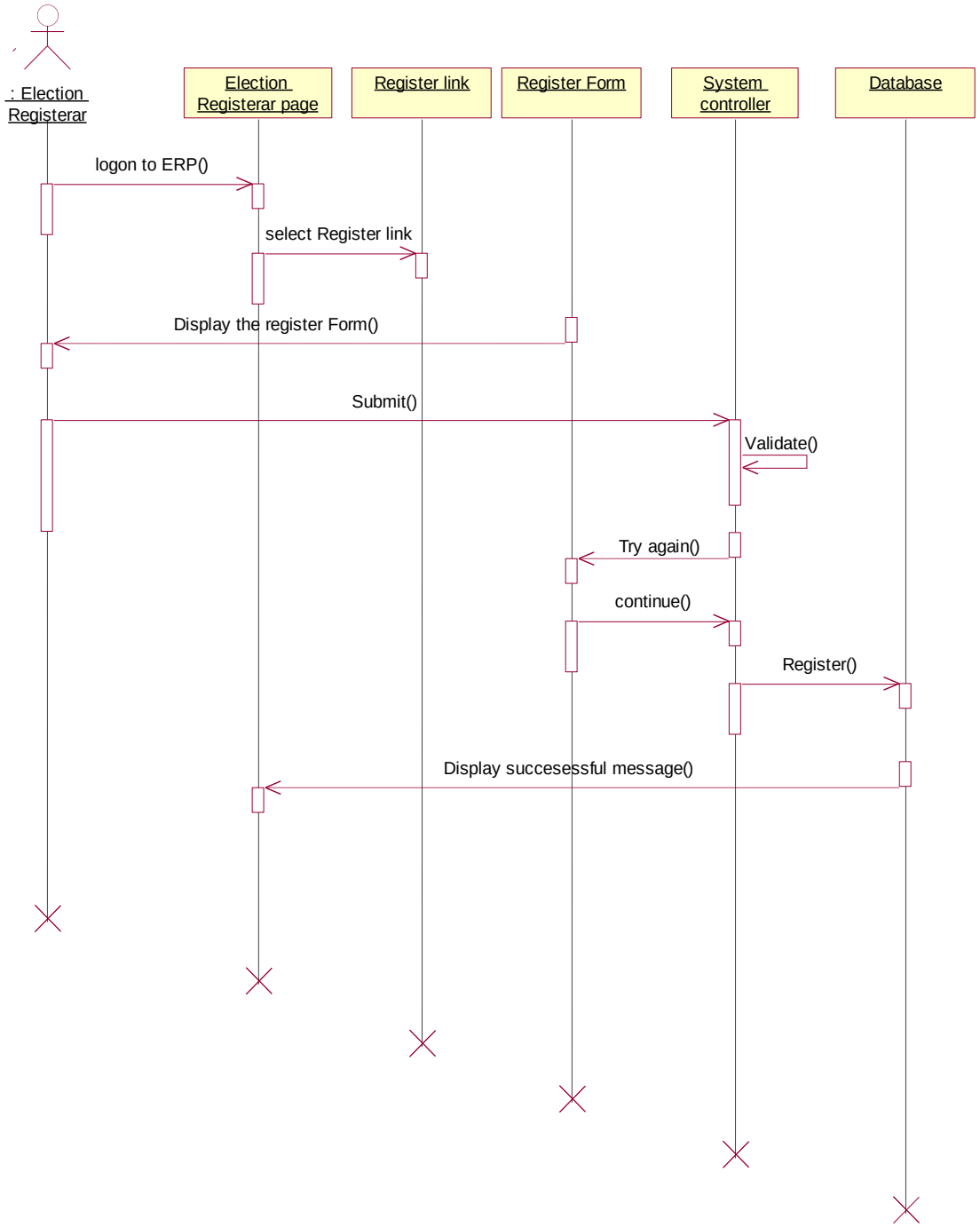


*Figure 0-8*sequence diagram for register voters.

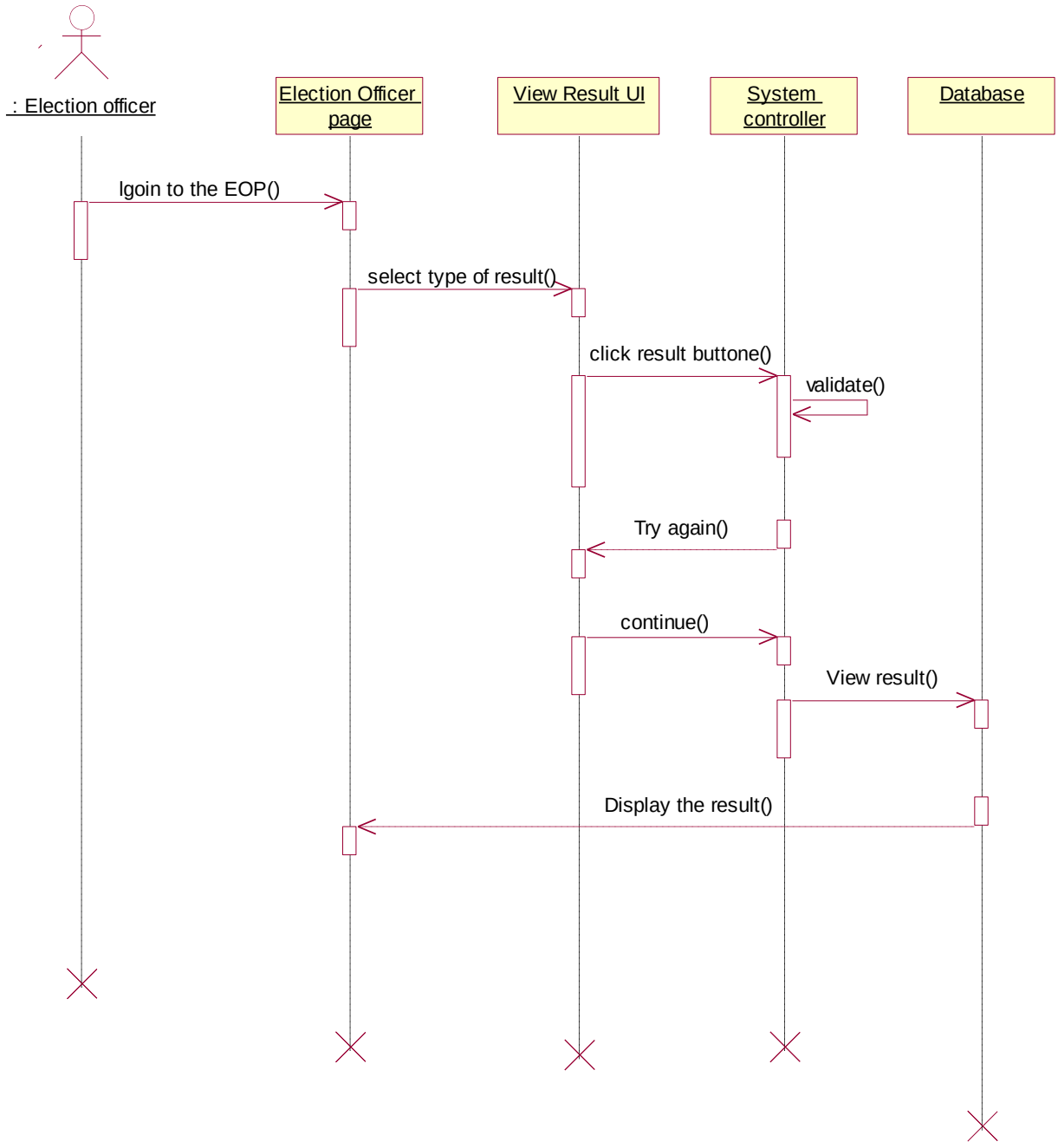


Figure 0-9 Sequence diagram for view result initiated by the Election officer.

2.9.2 Activity diagram

Activity diagram is another important diagram in UML to describe dynamic aspects of the system. Activity diagram is basically a flow chart to represent the flow form one activity to another activity. The activity can be described as an operation of the system. So the control flow is drawn from one operation to another. This flow can be sequential, branched or concurrent. Activity diagrams deals with all type of flow control by using different elements like fork, join etc. The purposes of activity diagram can be described as:

- Draw the activity flow of a system.
- Describe the sequence from one activity to another.
- Describe the parallel, branched and concurrent flow of the system.

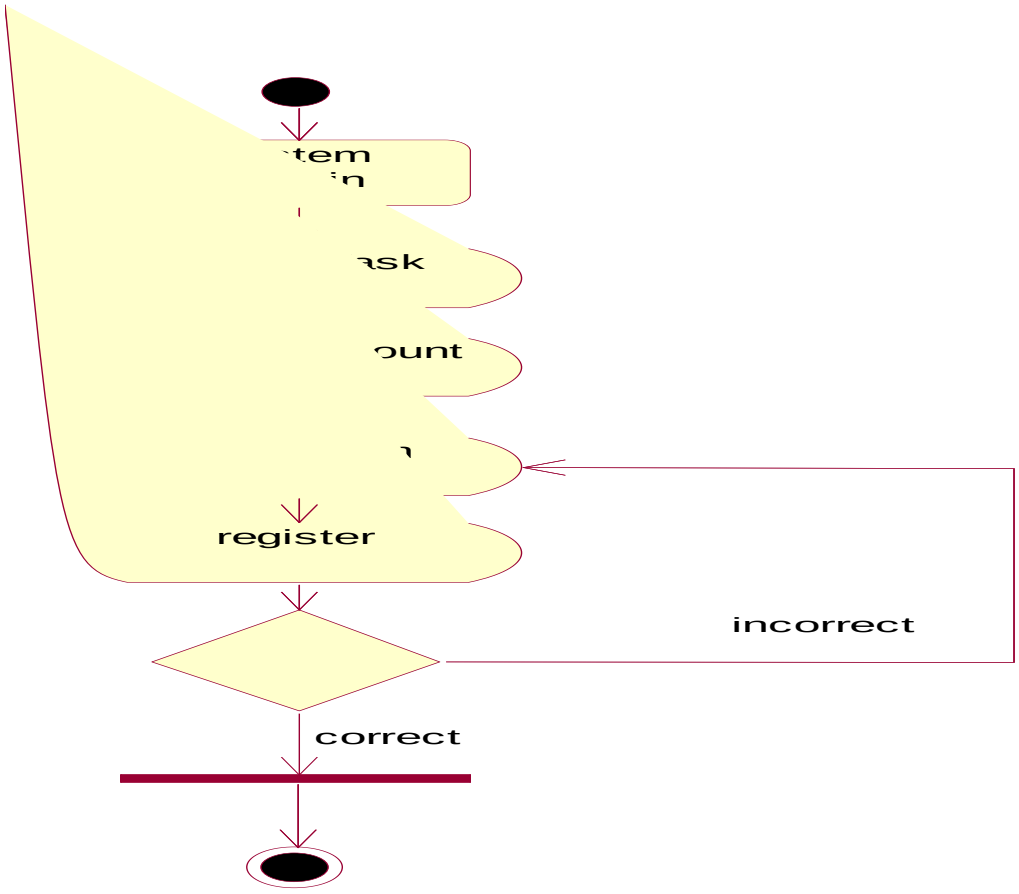


Figure 0-10 Activity diagram for tasks of System Administrator

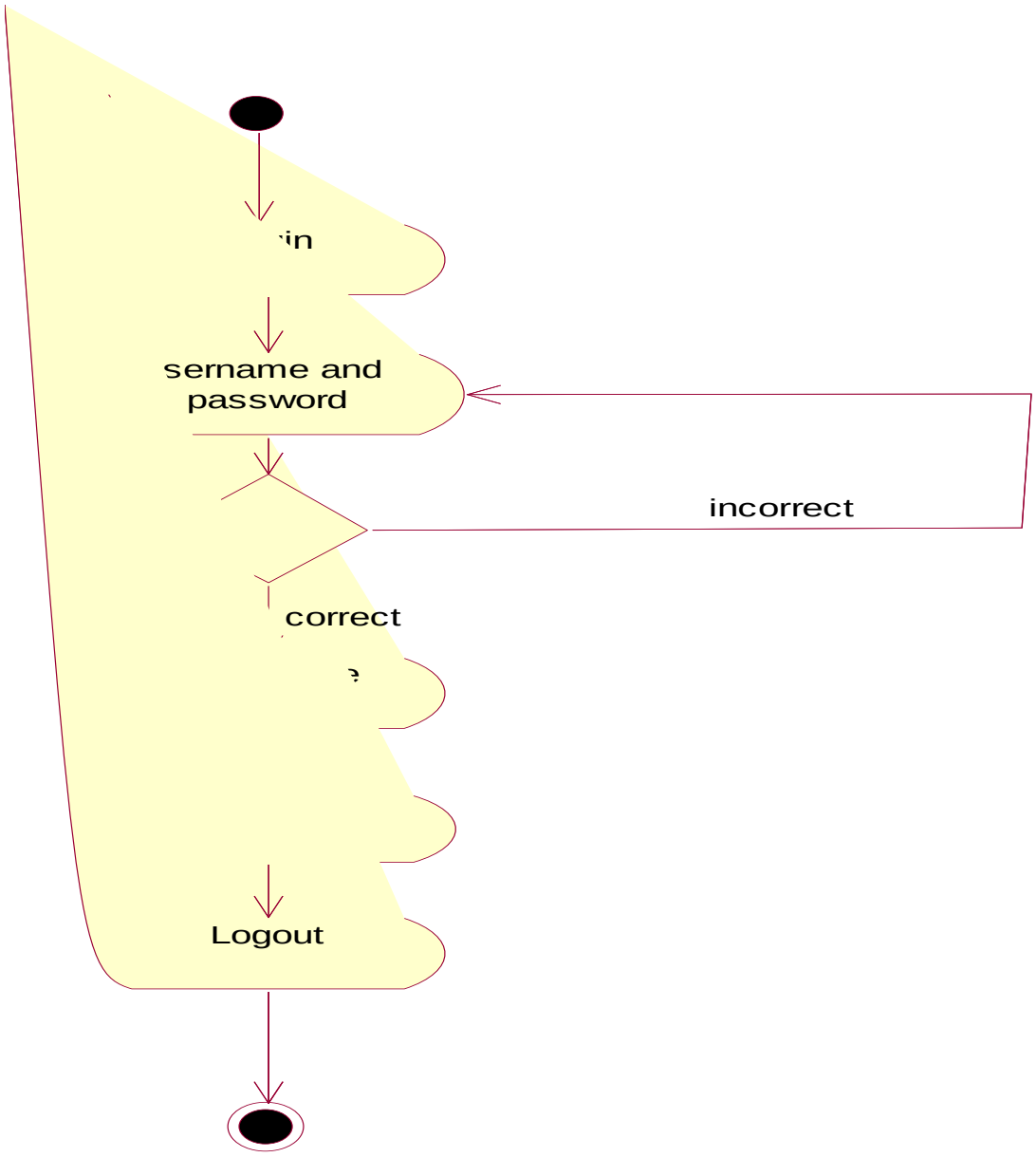


*Figure 0-11*Activity diagram for cast Vote.

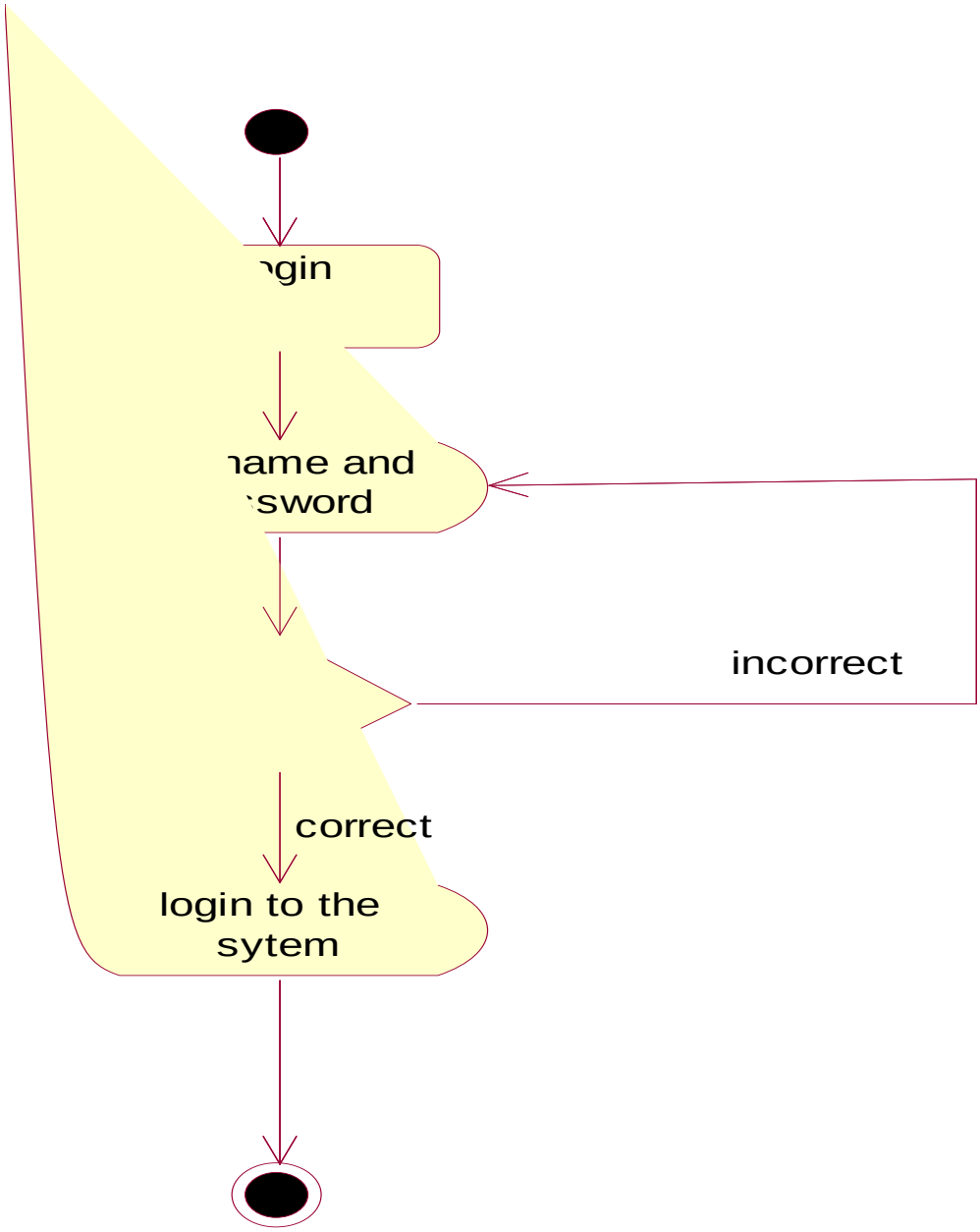


*Figure 0-12*Activity Diagram for Login.

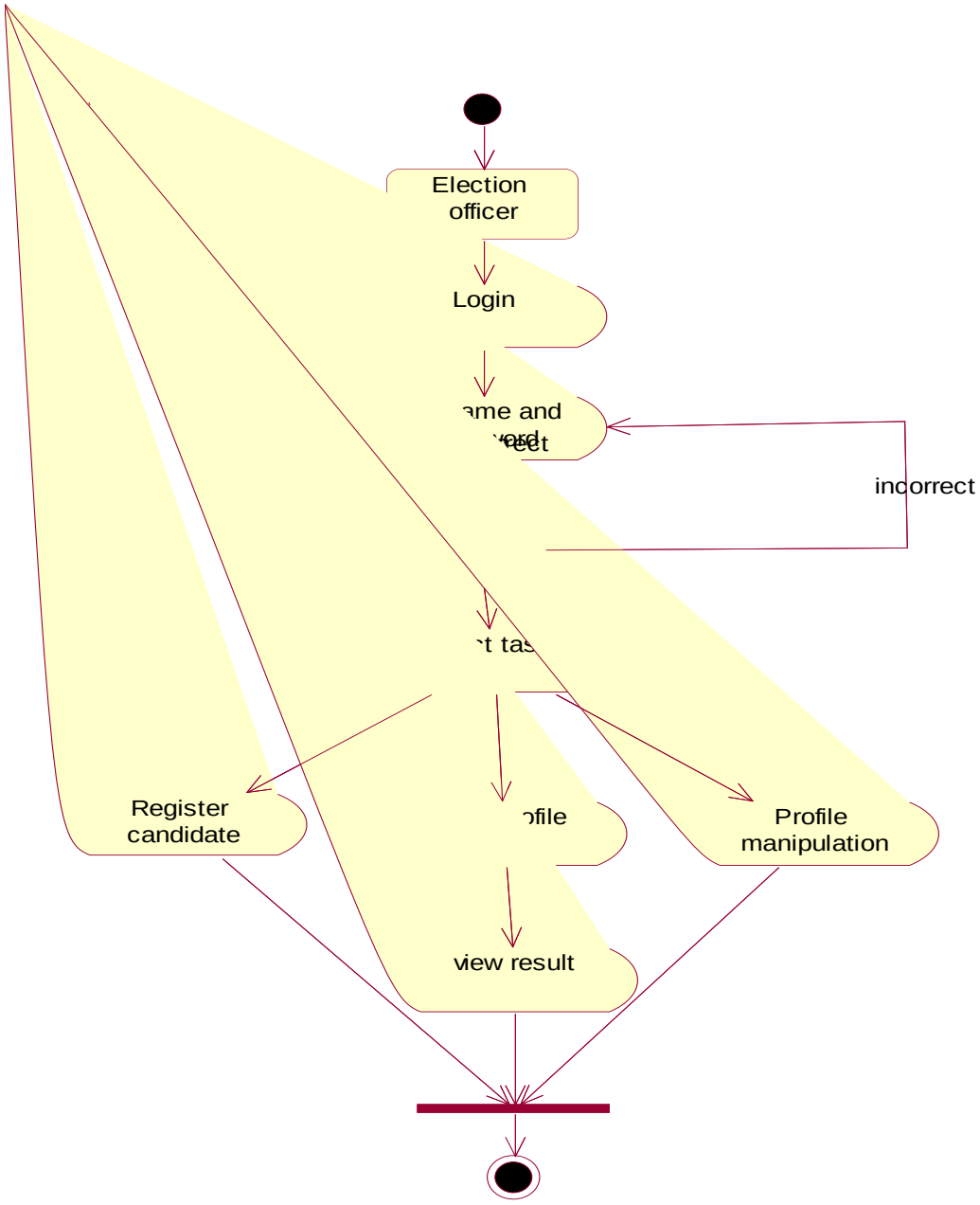


Figure 0-13activity diagram tasks for Election officer

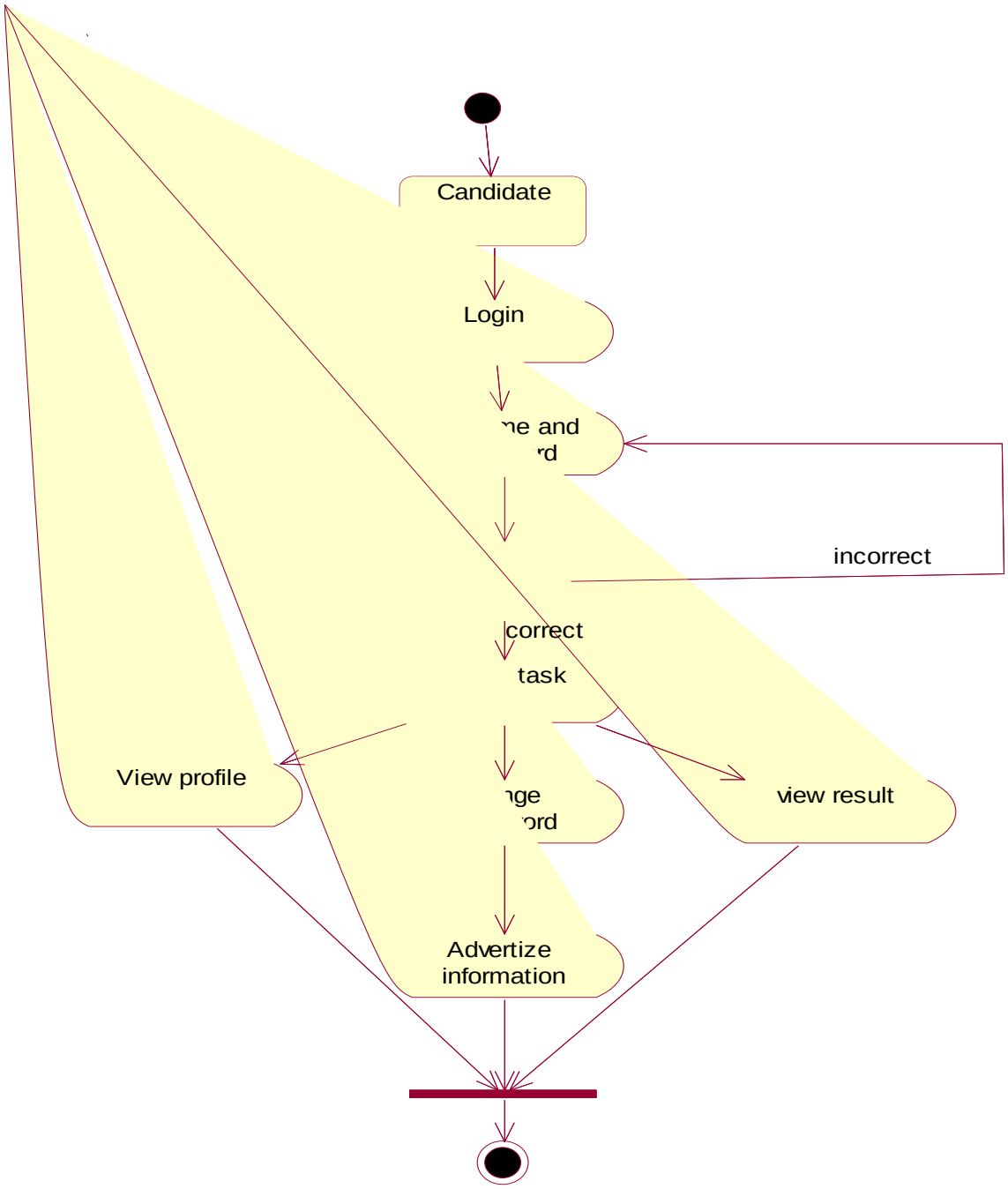


Figure 0-14Activity diagram for Candidate.

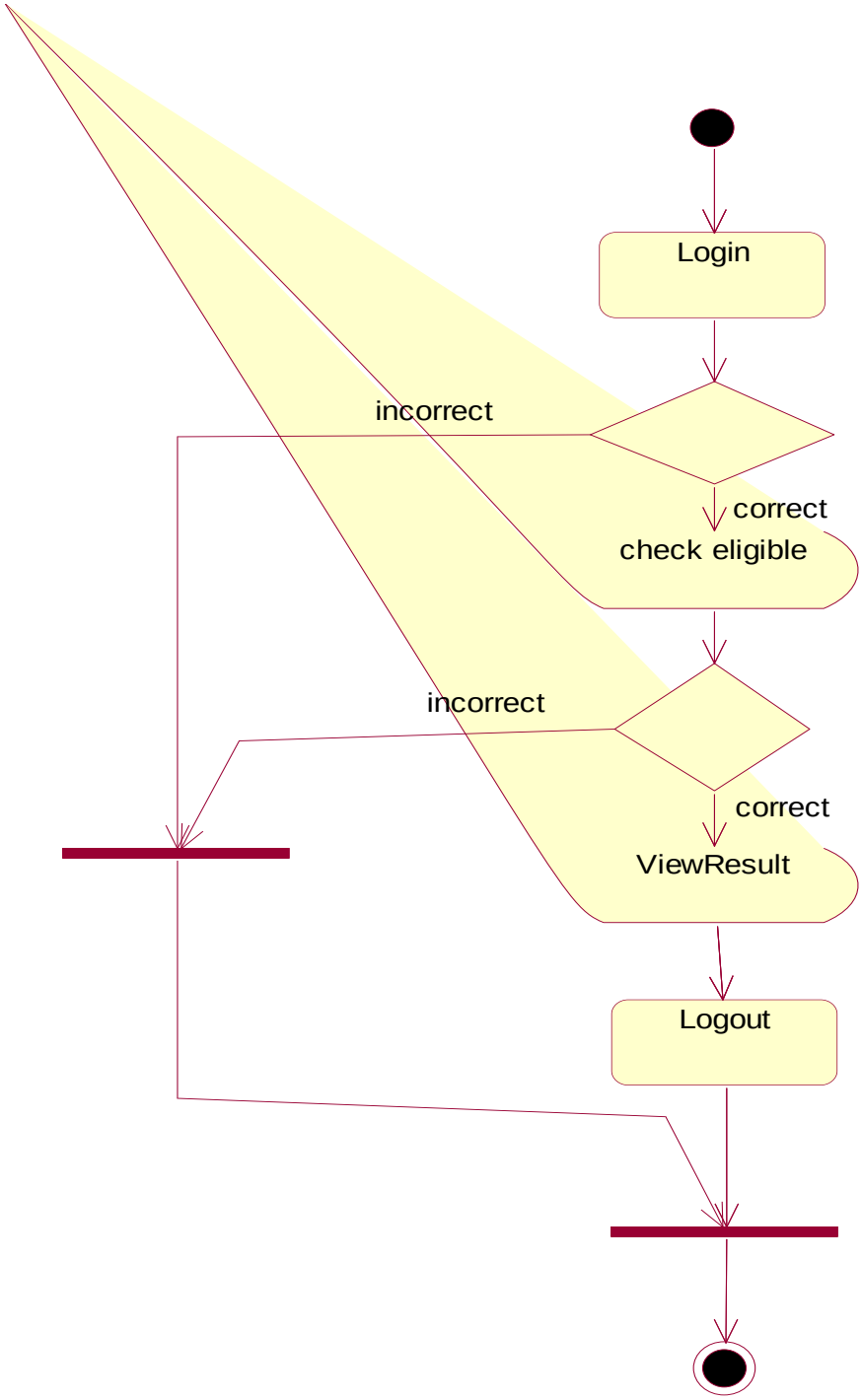
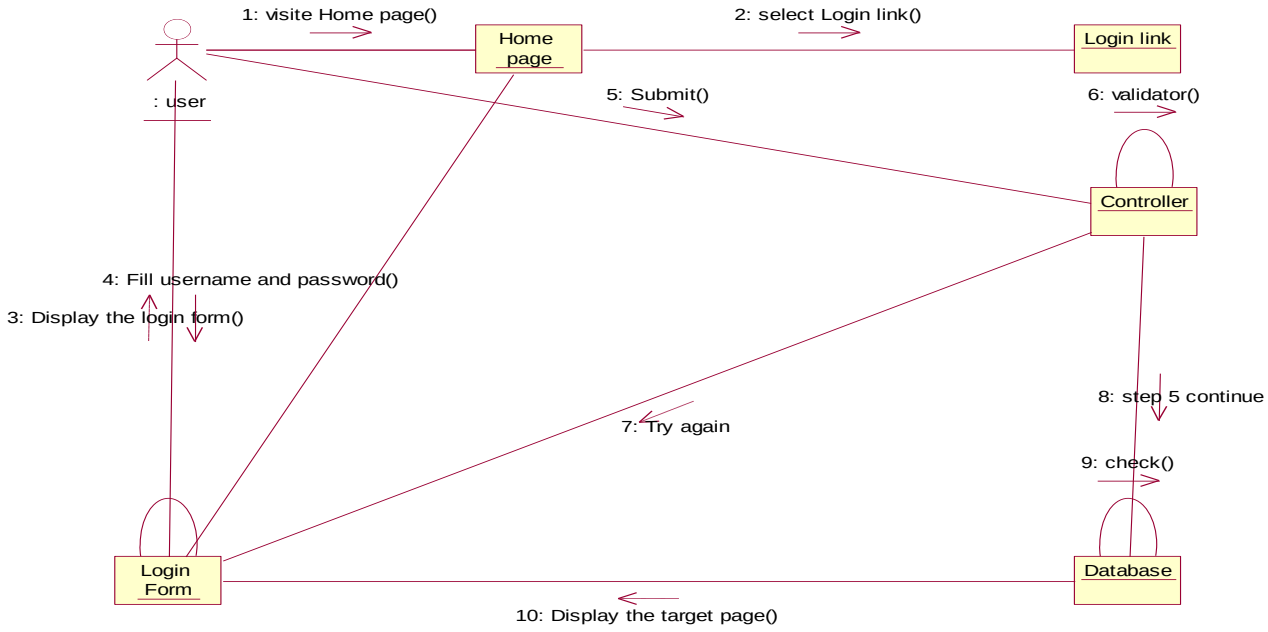


Figure 0-15Activity diagram for view result

2.9.3 Collaboration diagram

A collaboration diagram describes interactions among objects in terms of sequenced messages. Collaboration diagrams represent a combination of information taken from class, sequence, and use case diagrams describing both the static structure and dynamic behavior of a system.

The UML Collaboration diagram is used to model how objects involved in a scenario interact, with each object instantiating a particular class in the system. Objects are connected by links, each link representing an instance of an association between the respective classes involved. The link shows messages sent between the objects, and the type of message passed.



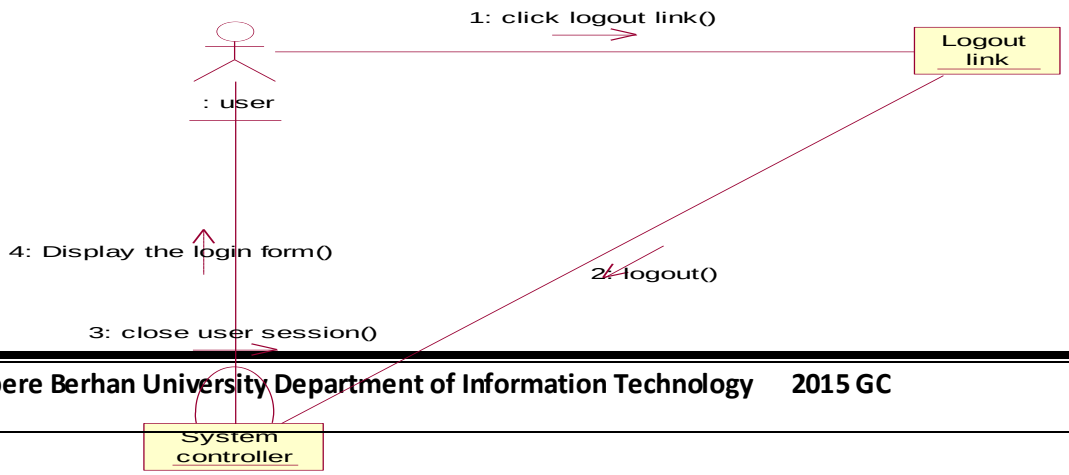


Figure 0-16 Collaboration diagram for login.

Figure 0-17 Collaboration diagram for logout.

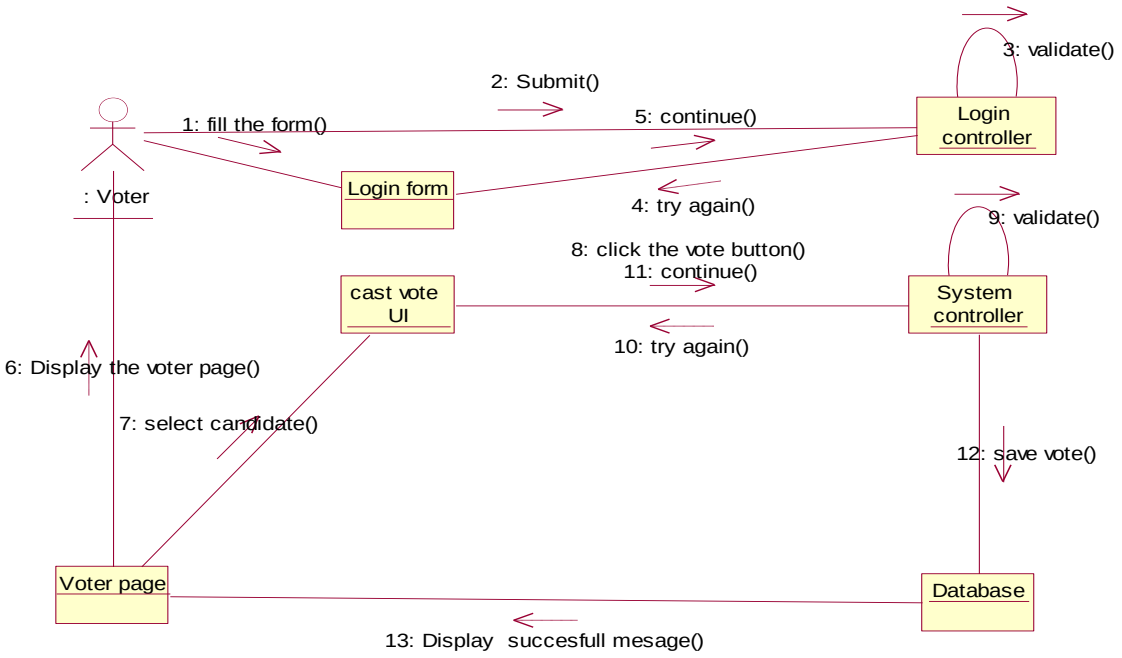


*Figure 0-18*Collaboration diagram for cast vote.

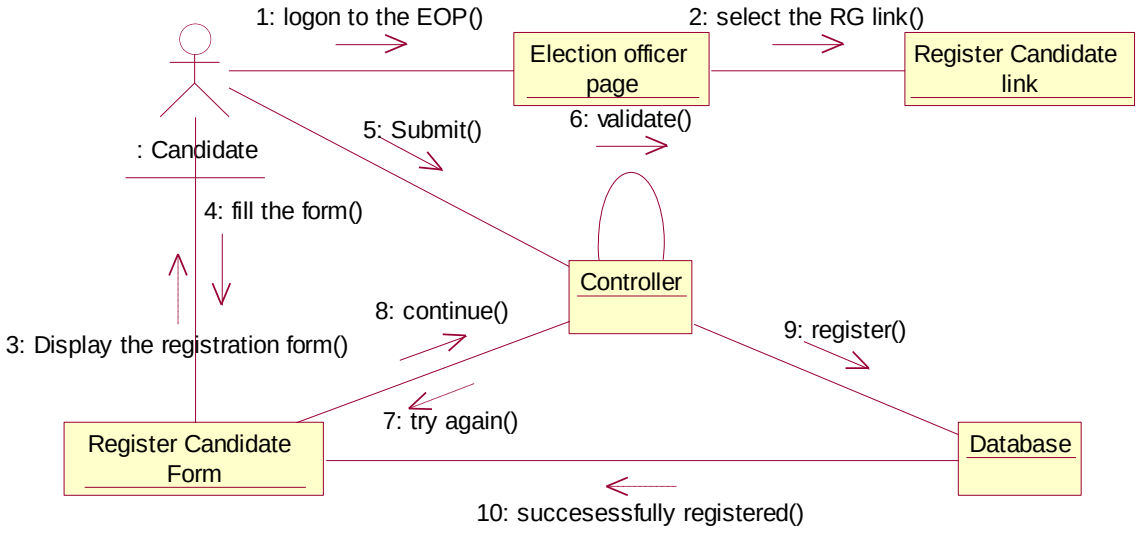


*Figure 0-19*Collaboration diagram for register candidate.

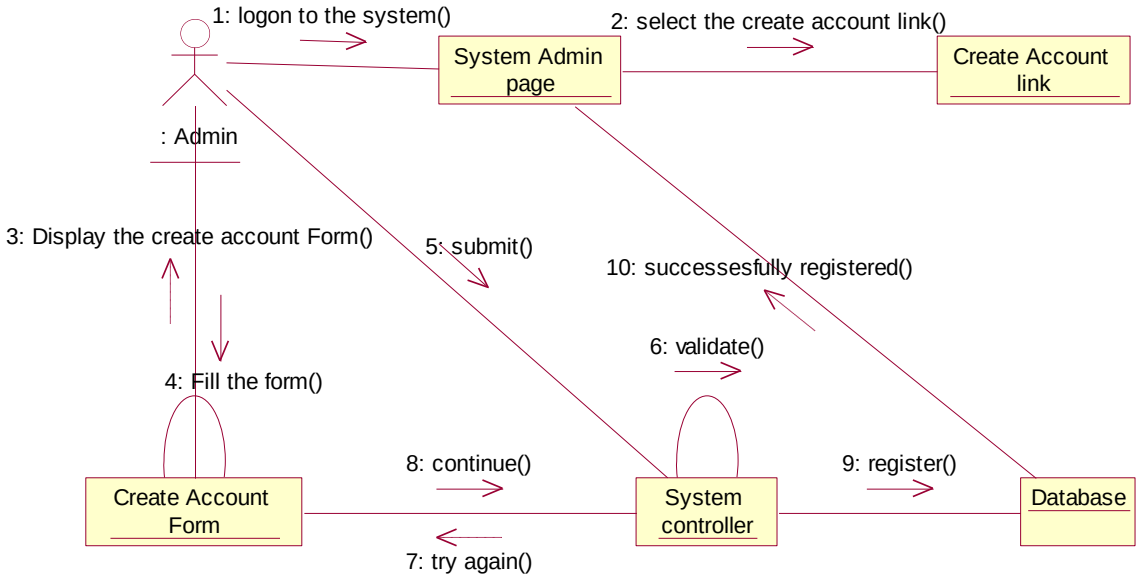


Figure 0-20 Collaboration diagram for create account.

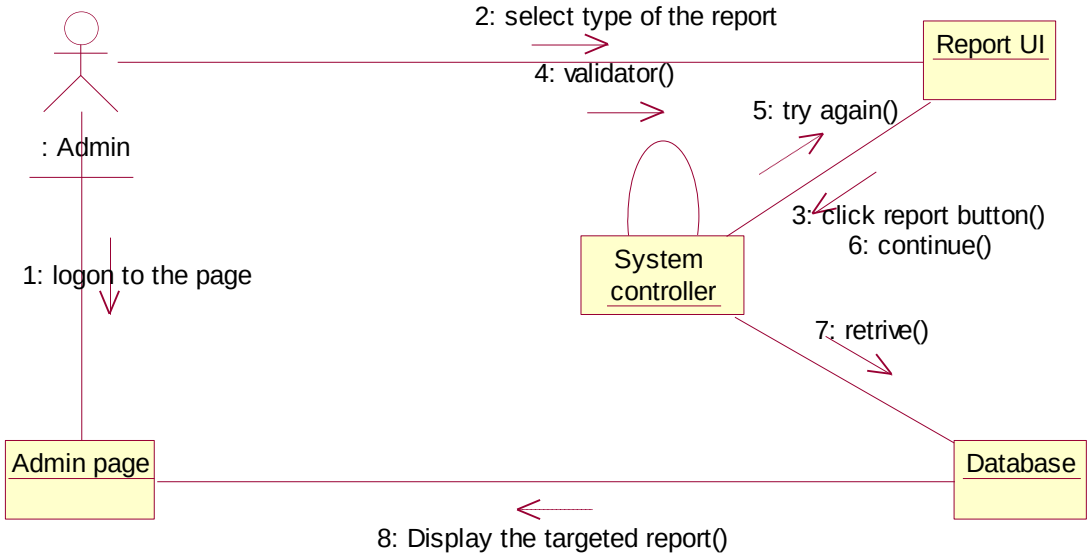


*Figure 0-21*Collaboration diagram for Generate report.

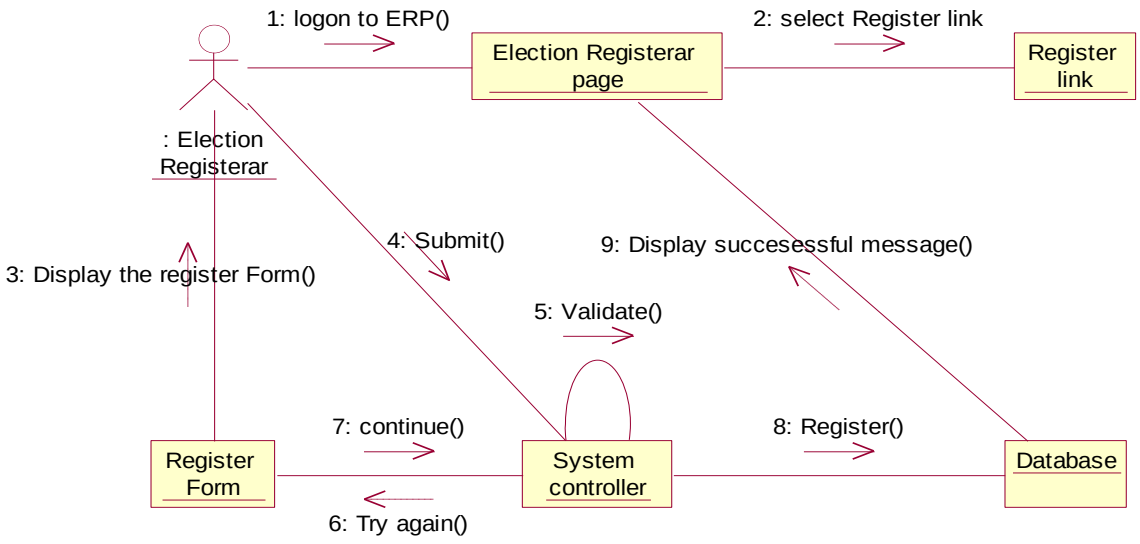


Figure 0-22 Collaboration diagram for Register Voter.

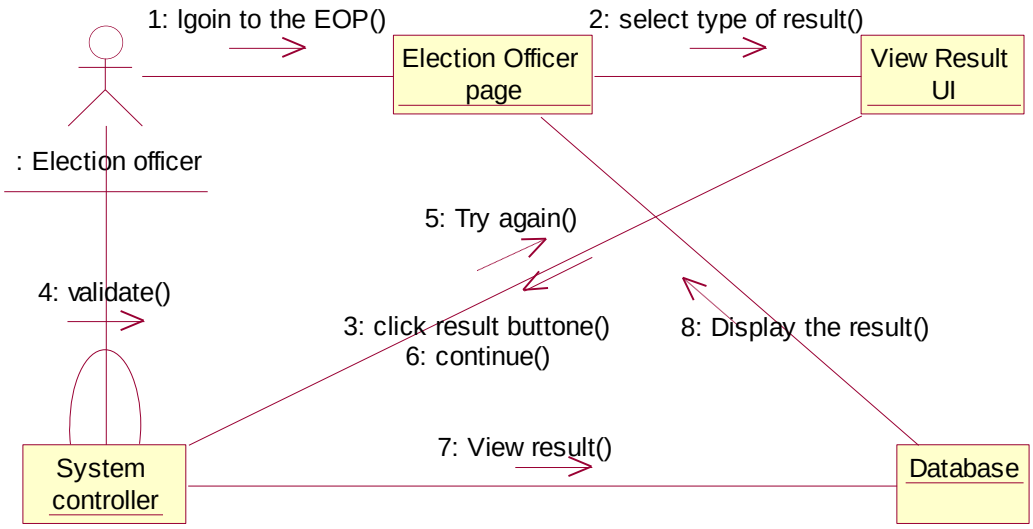


*Figure 0-23*Collaboration diagram for View result initiated by Election officer.

2.9.4 State chart diagram

A state chart diagram is a view of a state machine that models the changing behavior of a state. State chart diagrams show the various states that an object goes through, as well as the events that cause a transition from one state to another.

The common model elements that state chart diagrams contain are:

- ✓ States
- ✓ Start and end states
- ✓ Transitions

A state represents a condition during the life of an object during which it satisfies some condition or waits for some event. Start and end states represent the beginning or ending of a process.

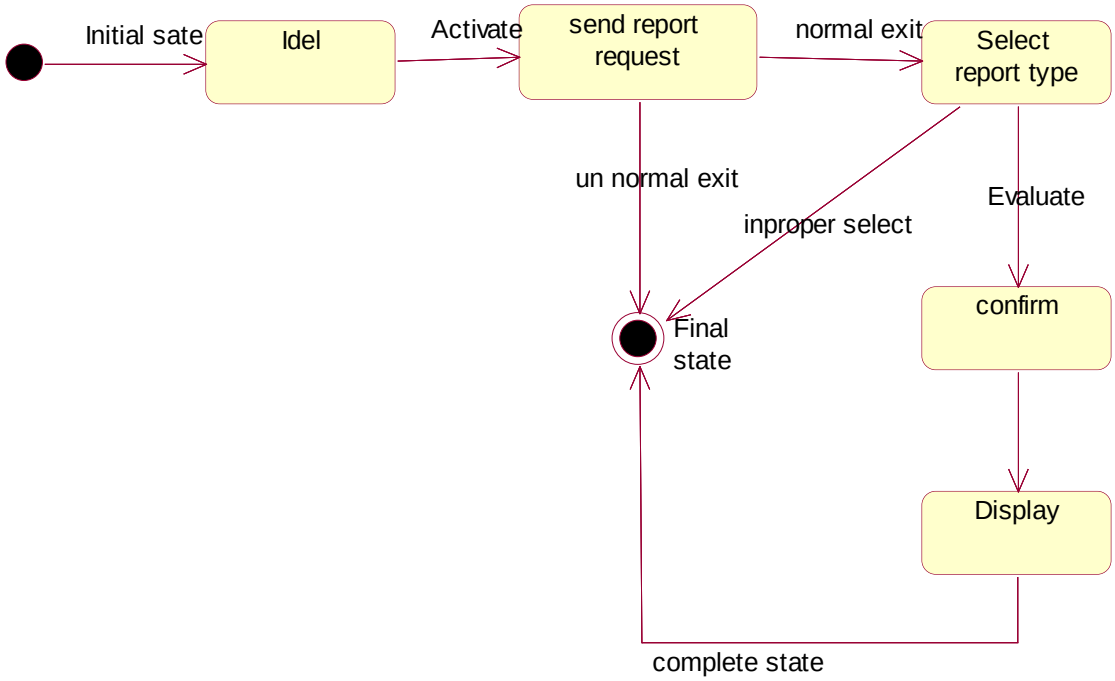


Figure 0-24 state chart diagram for login.

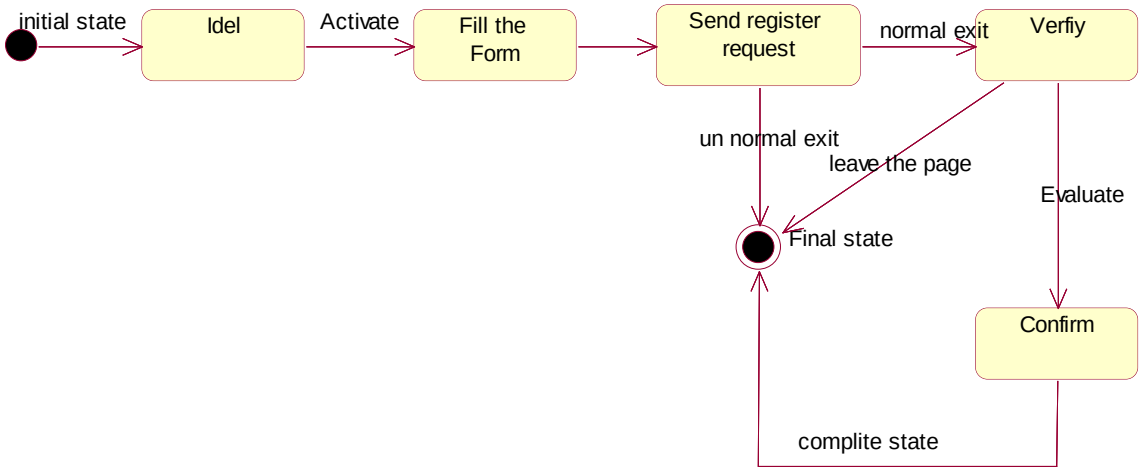


Figure 0-25 state chart diagram for Generate report.

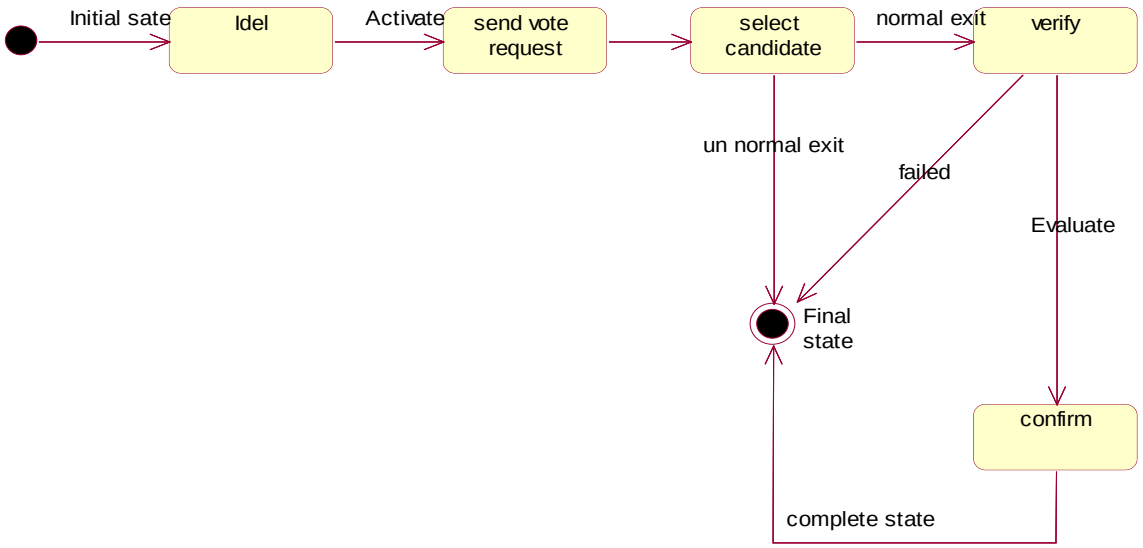


Figure 0-26State chart diagram for Register Voter.

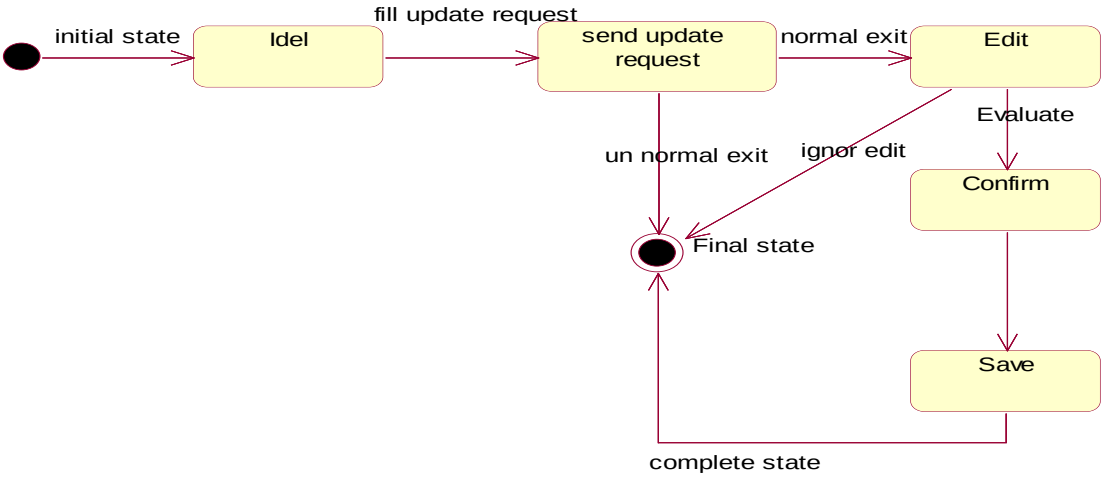


Figure 0-27 State chart diagram for profile manipulation.

2.9.5 Class Diagram

This section discusses Analysis classes and their variations, including templates and instantiated classes, and the relationships between classes association and the contents of classes (operations).Class diagrams show the static structure of the model, in particular, the things that exist (such as classes and types), their internal structure, and their relationships to other things. The class diagram design will be discussed in chapter three. It is an abstraction of the real environment class of candidate, voters, Election officer, Election Registrar and System Administrator. Have the following classes:

- System Admin -Election Officer
- Candidate -Comment
- Voter
- Vote

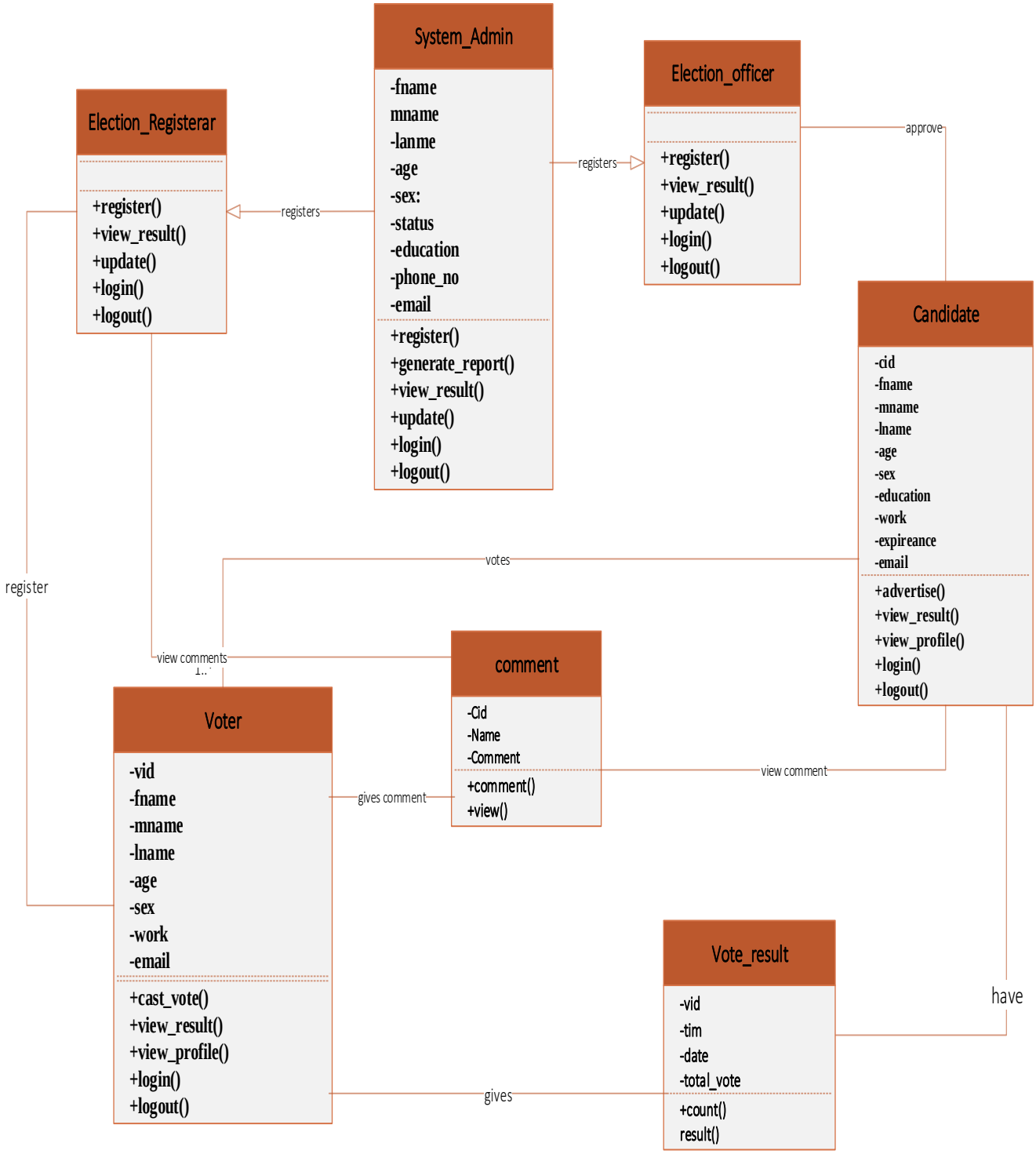


*Figure 0-28*Analysis class Diagram

CHAPTER THREE

3. SYSTEM DESIGN

3.1 INTRODUCTION

This chapter of the project document which provides a system design of this project. This chapter contains and describes about Component modelling, Deployment diagram, User interface prototyping design, Database design and Class mapping.

The purpose of designing is to show the direction how the Application is built and to obtain clear and enough information needed to drive the actual implementation of application. It is based on understanding of the model the Application built on system design also focuses on decomposing the system in to manageable parts.

3.2 Design Goals

The objectives of designing are to model a system with high quality. Implementing of high quality system depends on the nature of the design created by the designer .If one wants to make changes to the system after it has been put in to operation depends on the quality of the system design. So if the system is designed perfectly, it will be easy to make changes to it.

The goal of the system design is to manage complexity by dividing the system in to manageable pieces. Some of the goals are listed below.

- **Modifiability**: The system should be modifiable to modify different services depending on the need of the user.
- **Flexibility:** The system should be changeable to suit new condition or situation.
- **Efficiency:** The system must do what it supposed to do efficiently without the problem.
- **Accessibility** One of best feature of proposed system is its accessibility. Users can access the current information being everywhere in the country as well as on internet. To trace some of its best features related with accessibility like:
  - Its accessible without geographical location limitation
  - It is accessible without time limitation – user can share their idea every time.
  - Information or the same information accessed by multiple users at the same time.

3.3. Architecture of the System

The architecture chosen for the system is three tier. The first layer runs on the client side, the second layer at the middle layer and the third layer will be the database system. The system will run using web technology. This architecture provides greater application scalability, high flexibility, high efficiency, lower maintenance, and reusability of components. Since each tier runs on a separate machine, it improves systems performance.

The system uses dynamic web technology, i.e., adding and retrieving data to and from the data store whenever requested is possible. It requires a client side program which is accessed by the Election officer, by the registrar, by the voter and also an interface that communicate with the external system. It needs server side functions that implement the functional requirements and the database system that stores data.

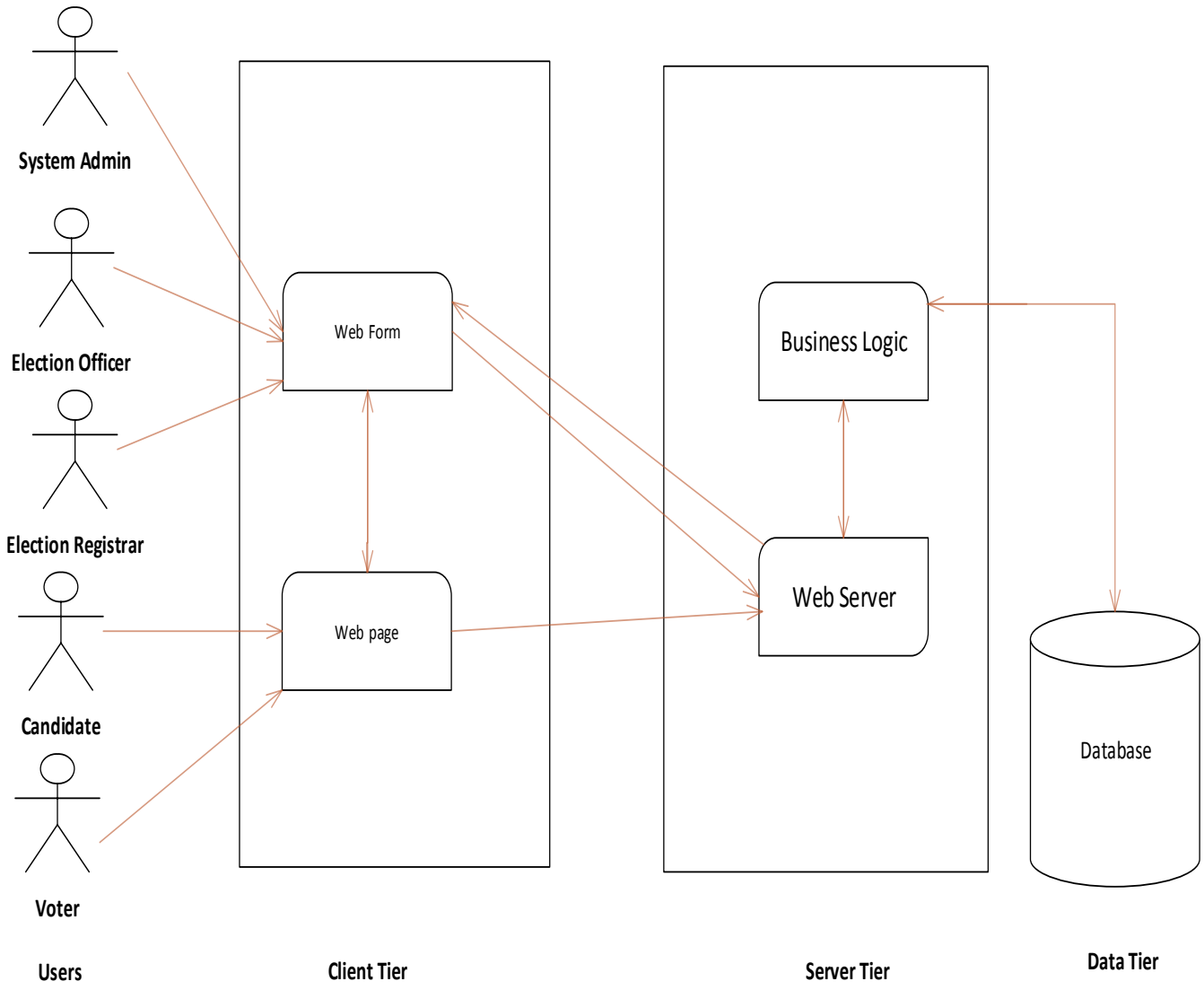


*Figure 0-1*system architecture Diagram

- ✓ **Client Tier**

As described in Fig 3.3.1as shown in Fig. 4, at the client side there are five kinds of users. The first user is the System Admin. This person is responsible for adding critical data to the system, control and activate the system. The type of data is like Election Officer' Authorization,' username and password, control and activate the system. The final report is also generated by this person.

The second user is the Election officer. This person is responsible for registering Election Registrar and approves Candidates, and manipulation the profile of the registrar and the candidate.

The third user is Election Registrar. This user is responsible for registering voter and manipulating voter's profile. And he can cast a vote.

The fourth user is the voter; the role of this voter is casting votes. The interface used by the voter is web form. As vote casting is processed at the polling stations, which are distant from the database server.

The fives user is candidate; the role of this candidate is advertising information and he also can cast a vote.

- ✓ **Middle Tier**

The middle tier will contain the core parts of the vote application, i.e., the web server and business logic. The web server will handle all requests coming from the client machines. The requests are different with its type, for example; request for data insertion, request for report generation and others. It is also the web server which the responses that is forwarded to the client machines.

The business logic part will hold the process and core functions that will be implemented in the system. When the data is submitted from the client machines, first it will be handled by the functions of the web server and then transferred to the business logic for processing. Again, the business logic processes the data and sends it either to the database or back to the web server, this is determined by the type of service required.

- ✓ **Data Tier**

The system uses one database; this database is the repository consisting of the application data. It is here that all the database tables will be stored.

3.3.1 Security Technique

When a voter registered to cast his/her vote, IDN is given to the voter for authentication.
The registered voter can login to the system with the help of the IDN code. Then, the system shows the check box, names and party symbol of the candidates. The voter checked the check box corresponding to each candidate and submits his/her vote to the system. And we will use encryption method in order to secure the use data when registering and accessing the data from the database. The suspected problem is man-in-the-middle attack. Before the data reaching at the destination, it can be trapped and modified. For the case of the channel between the web browser and the web server, SSL technology is viable solution. so we will try to use SSL technology to secure the data.

3.4. System Decomposition

System decomposition refers to the process by which a complex problem or system is broken down into parts that are easier to conceive, understand, program, and maintain. To reduce the complexity of the solution domain, we decompose our system into simpler parts, called subsystems, which are made of a number of solution domain classes. In the case of complex subsystems, we recursively apply this principle and decompose a sub- system into simpler subsystems. We decompose our system in to six subsystems. These are:

- Registration system
  - Account creation
  - Candidate registration
  - Voter registration
- Profile manipulation system
  - Update account
  - Delete Account/user
  - Change password
  - Update profile
- View system
  - View profile
  - View comment
  - View result

- Report system
- Vote system
- Comment and Advertisement system

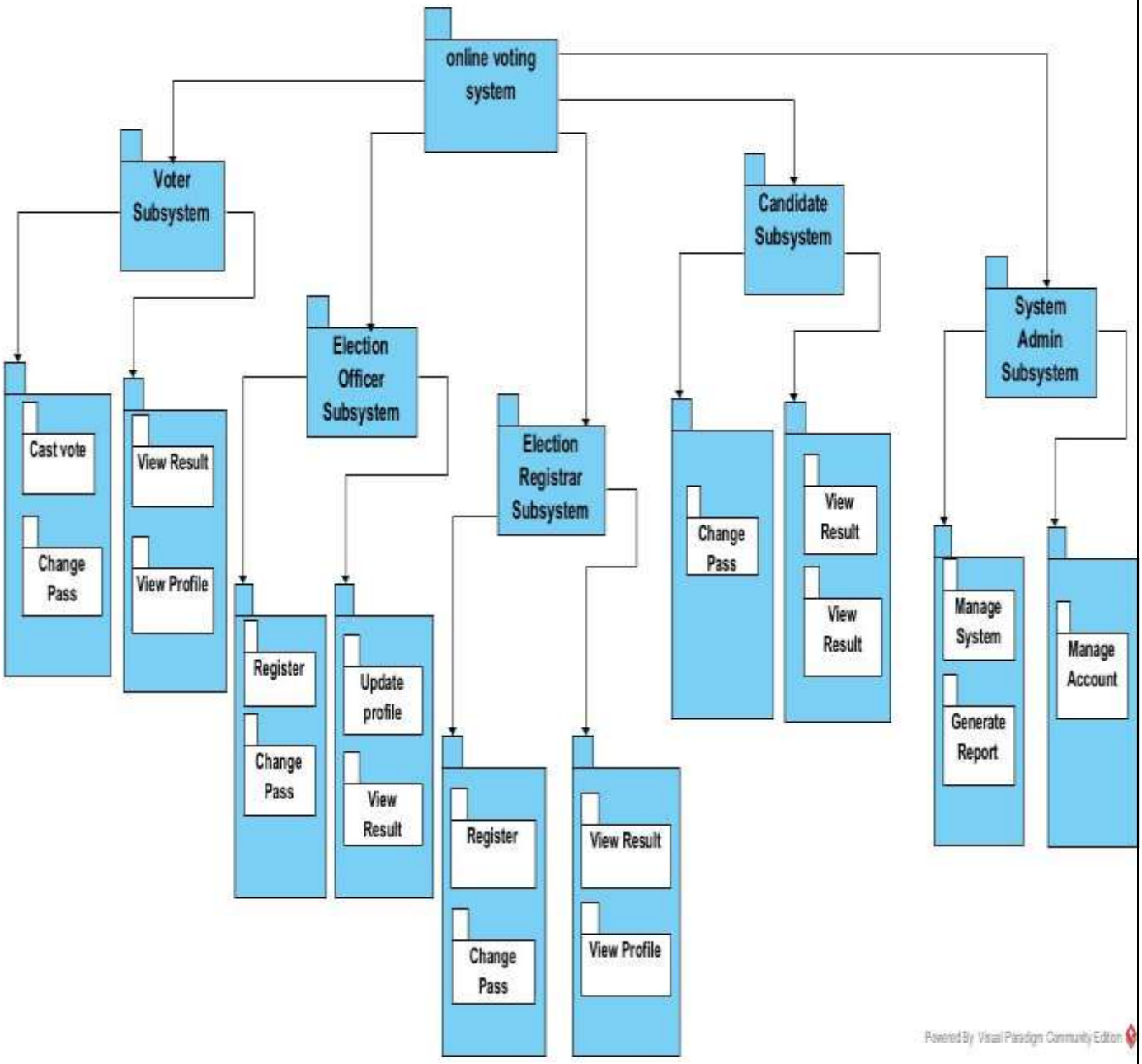


Figure 0-2 System decomposition Diagram

3.4 Component Modeling

Component based development (CBD) and object oriented development go hand in hand and it is generally recognized that object technology is the preferred foundation from which to build components the UML includes a component diagram that can be used to both analyze and design our component based software it shows the various components in a system and their dependencies.

In this Diagram components of the system will be wired showing that there is relation among components, management of the system, database and operations performed on databases such security issue. This in some extent shows which component or objects will be accessed by whom and what type of security infrastructures it is using. The diagram is simulated below.

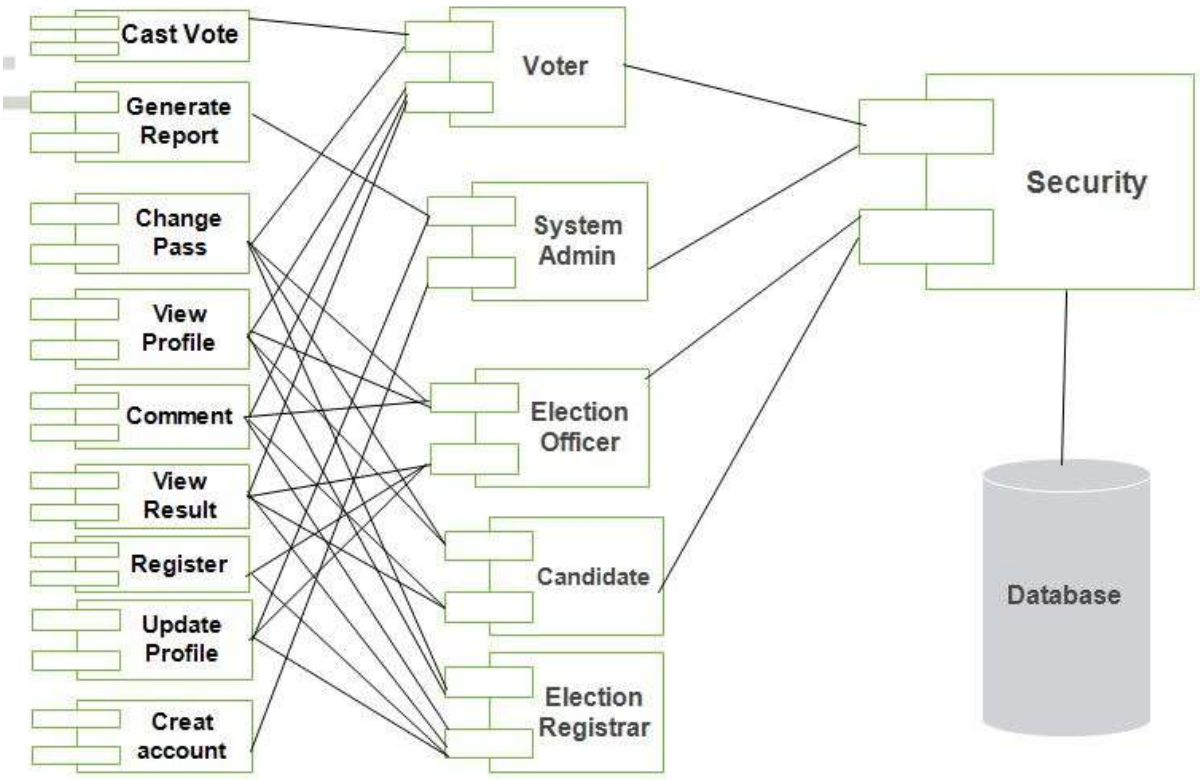


Fig 3.5.1 Component Diagram.

3.6. Deployment Diagram

Deployment modeling is used to show the hardware of the system, the software that is installed in the hardware and also the middleware that is used to connect the dissimilar machines to one and other. It also shows how the software and the hardware components work together in order perform the task.

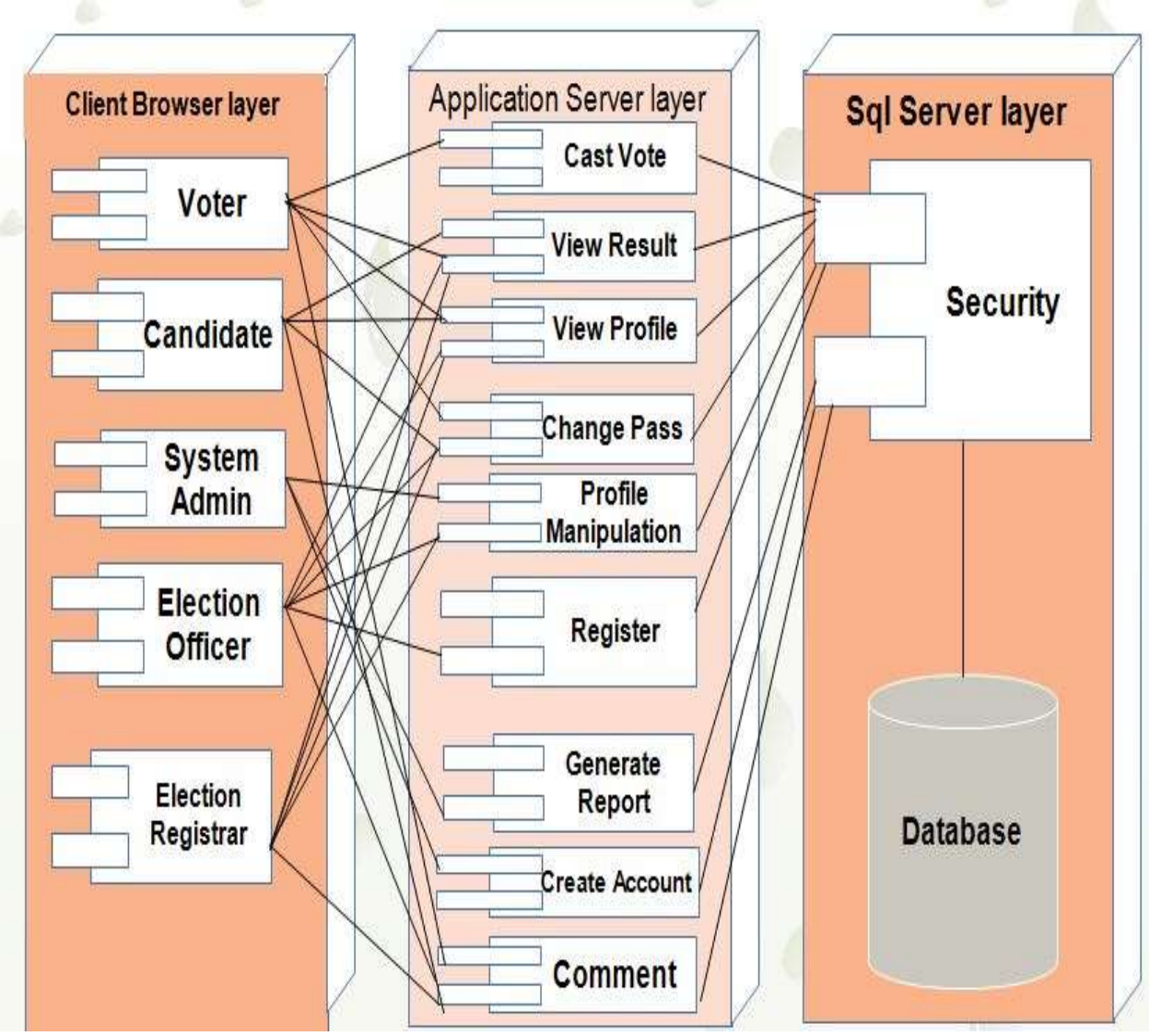


Fig 3.5.1 Deployment Diagram.

3.7. User interface prototyping design

A user-interface prototype is a prototype of the user interface. It is an iterative analysis technique in which users are actively involved in the mocking-up of the UI for a system.

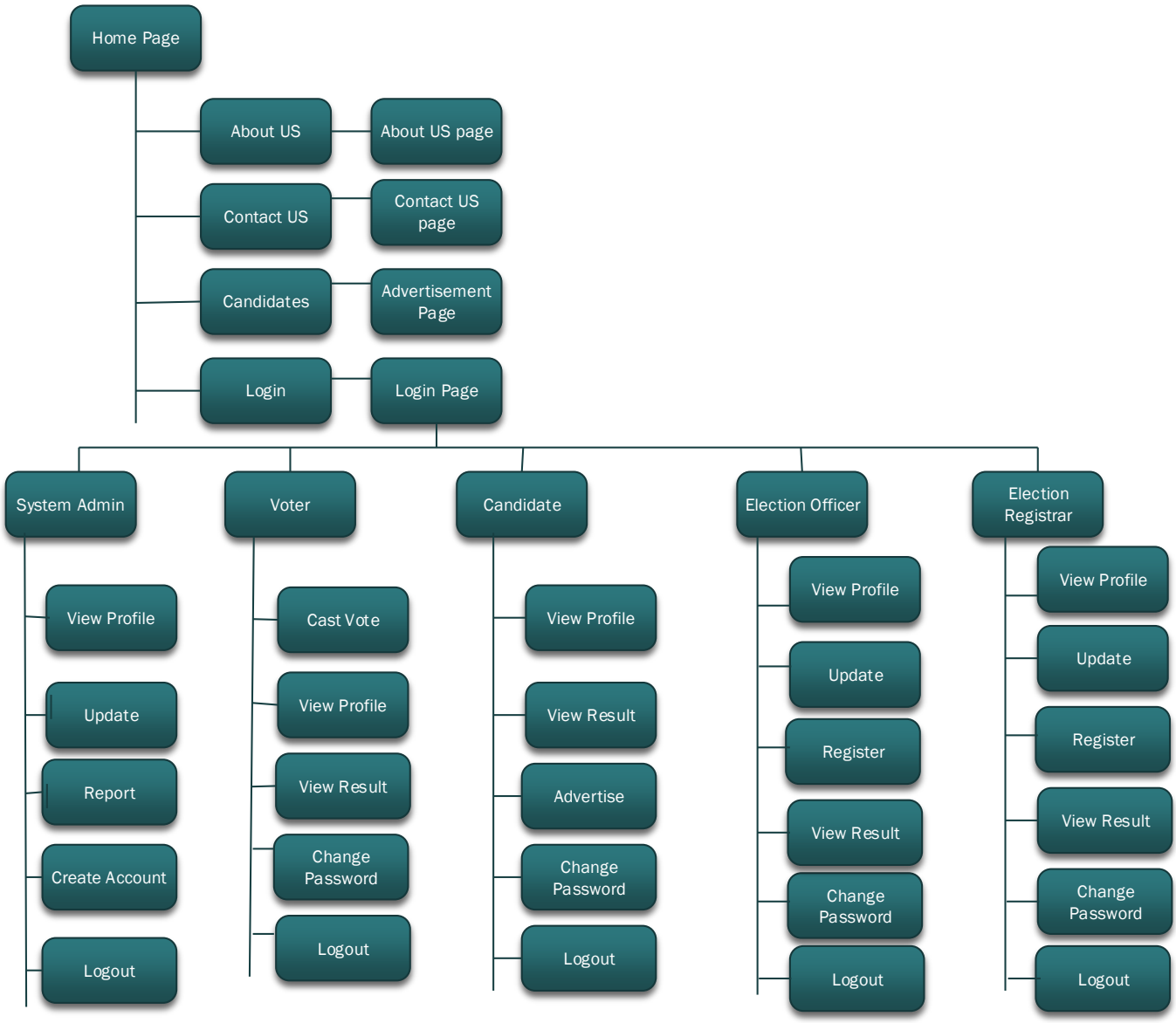


Figure 0-3 User interface Diagram.

User Interface Description

1. **Home Page**

Description:- This user interface is a place where Online Voting are viewed and links for related topics (websites) are also mentioned in this user interface.

2. **Login Page**

Description: - This page is the most important and key user interface to the system. It is a place where the system users (voters, Election Offices, Election Registrar, administrators) get access to the system by entering their user name and password. A user must provide a valid user id and password to access the next user interfaces.

3. **Voter**

Description:-This User interface is used to vote the candidates by using his encrypted code and user name.

4. **Election Officer**

Description:- This User interface is used for the Election Officers can login to the system and register the candidates.

5. **Election Registrar**

Description: - This User interface is used for the Election Registrar's can login into the system and register the voters.

6. **View Result**

Description:-This User interface is used to view the result that can generate by the Election Officer.

7. **System Administrator**

Description: - this interfaces used for Administrator only to Add, delete, and change data and user account.

8. **Create Account**

Description: - This interface allows the administrator to add workers name, id, and password to the workers list of the system.

9. **View Profile**

Description: - This interface used for the voter that can view the profile of the candidates

3.8 **Design the class diagram**

Diagrams are used to represent the structure of the system in terms of objects, their notes and nature of relationship between classes. It shows the static features of the actors and do not represent any particular processing. It is an abstraction of the real environment class of, user and Administrator.

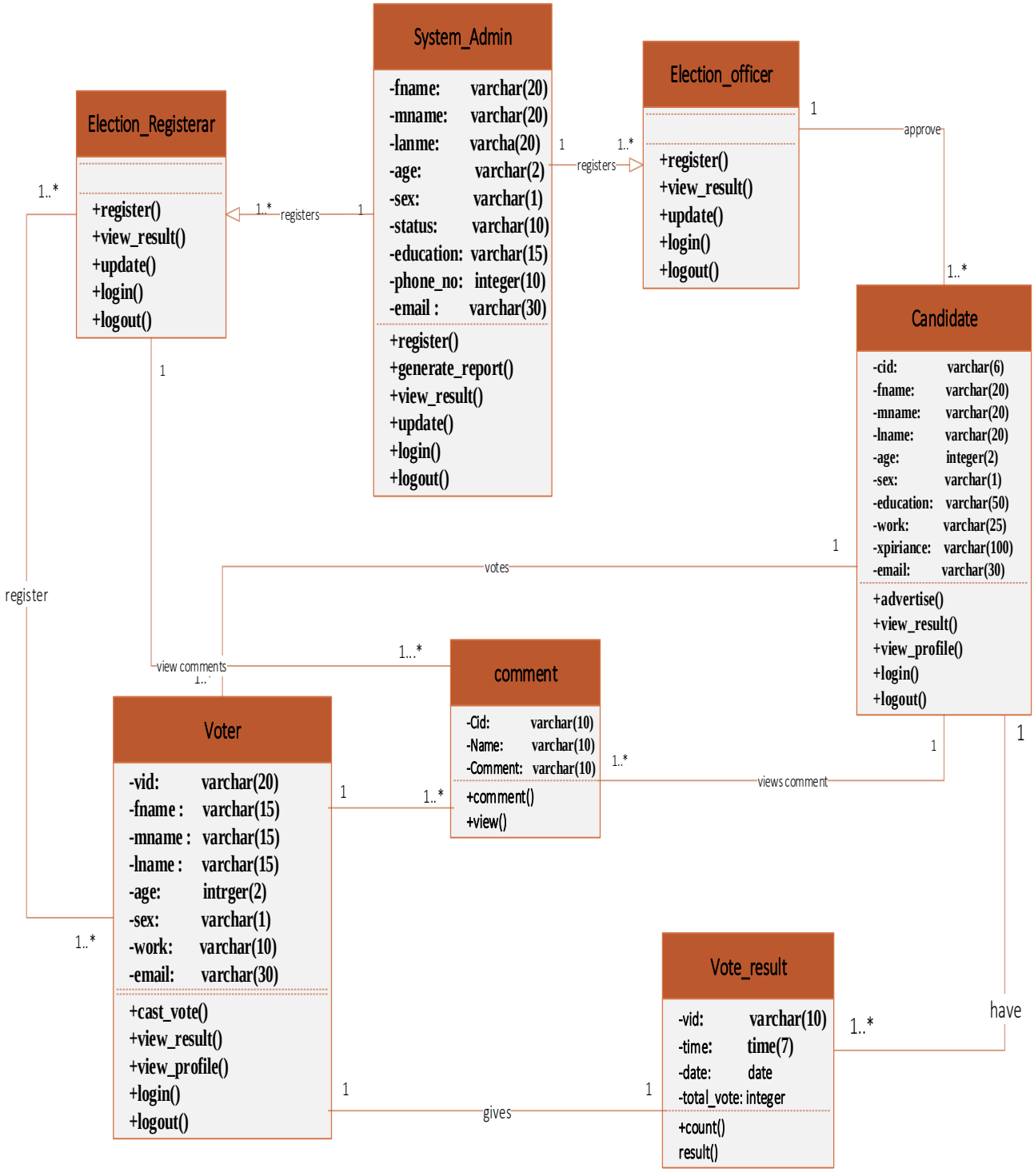


Figure 0-1 class design diagram

3.9. Database design and class mapping

Database design is the process of producing a detailed data model of a database. This logical data model contains all the needed logical and physical design choices and physical storage parameters needed to generate a design in a Data Definition Language, which can then be used to create a database. A fully attributed data model contains detailed attributes for each entity. The term database design can be used to describe many different parts of the design of an overall database system. Principally, and most correctly, it can be thought of as the logical design of the base data structures used to store the data.

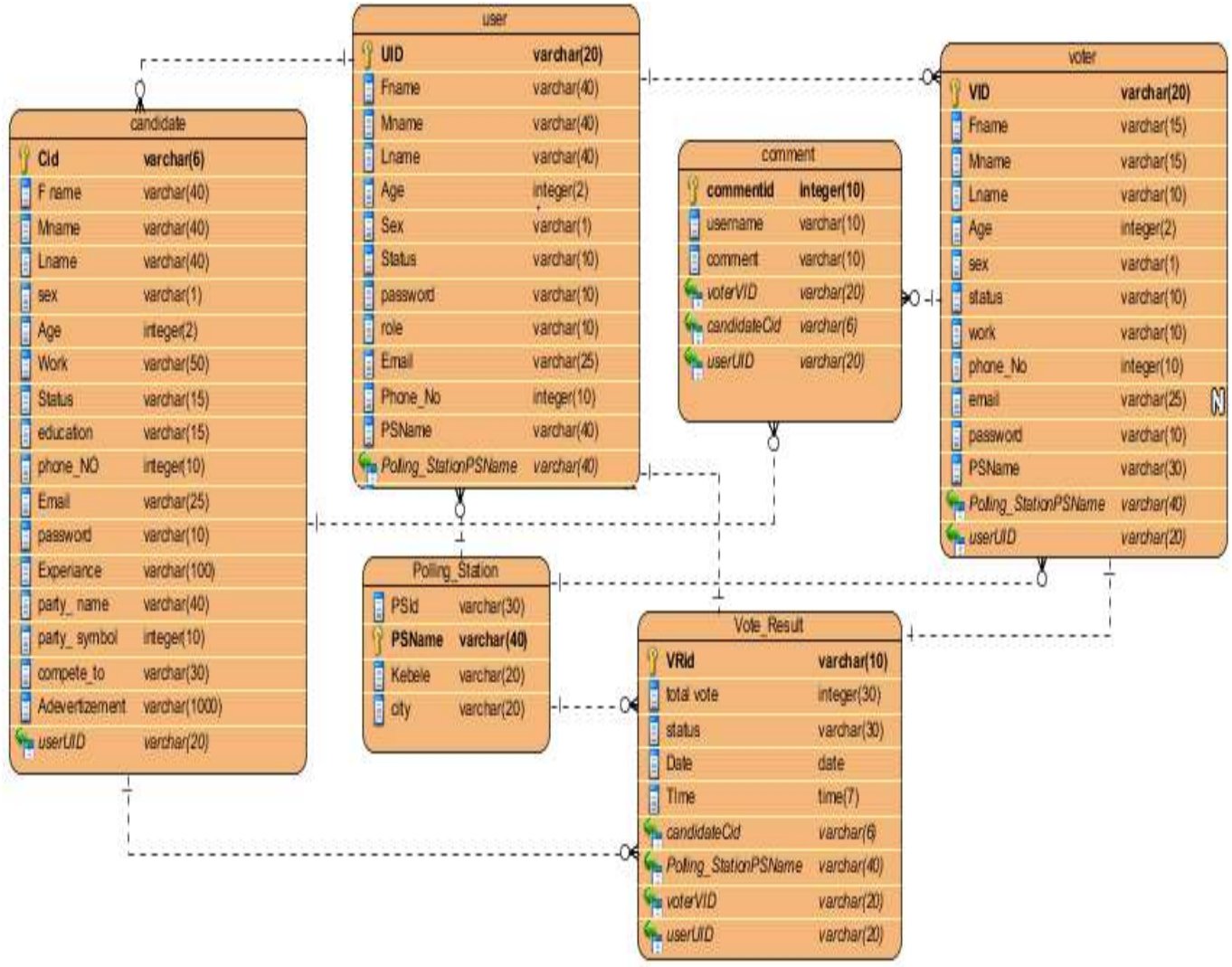


Figure 0-2 Database Design diagram.

1. Candidate

Name	Datatype	Length	Privilege constraint
CId	Variable character	6	Primary key
Fname	Variable character	40	
Mname	Variable character	40	
Lname	Variable character	40	
Sex	Variable character	1	
Age	Integer	2	
work	Variable character	50	
Status	Variable character	15	
Education	Variable character Variable character	15	
Phone_No	integer	10	
Email	Variable character	25	
Password	Variable character	10	
Experience	Variable character	10	
Party_Name	Variable character	40	
Party_Symbol	Integer	10	
Compete_To	Variable character	30	
Advertisement	Variable character	1000	
userUId	Variable character	20	Foreign key
Polling_StationPSId	Variable character	30	Foreign key

Table 13 Class mapping for candidate

2. User

Name	Datatype	Length	Privilege constraint
UId	Variable character	6	Primary key
Fname	Variable character	40	
Mname	Variable character	40	
Lname	Variable character	40	
Age	Integer	2	
Sex	Variable character	1	
Status	Variable character	10	
Password	Variable character	10	
Role	Variable character	10	
Email	Variable character	25	
Phone_No	Integer	40	

Table 14 Class mapping for user

3. Comment

Name	Data type	length	Privilege constraint
Content	Variable character	10	
comment ID	Integer	10	Primary key
Username	Variable character	10	
VoterVID	Variable character	10	Foreign key
candidateCid	Variable character	6	Foreign key
userUID	Variable character	20	Foreign key

Table 15Class mapping for comment

4. Voter

Name	Datatype	Length	Privilege constraint
VId	Integer	6	Primary key
Fname	Variable character	15	
Mname	Variable character	15	
Lname	Variable character	15	
Age	Integer	2	
Sex	Variable character	1	
Status	Variable character	10	
Work	Variable character	10	
Phone_No	Integer	10	N
Email	Variable character	25	N
Password	Variable character	10	
userUID	Variable character	20	Foreign key
Polling_StationPSId	Variable character	30	Foreign key

Table 16 Class mapping for voter

5. Polling station

Name	Datatype	Length	Privilege constraint
PSId	Variable character	30	Primary key
PSName	Variable character	40	
kebele	Variable character	20	
city	Variable character	20	

Table 17 Class mapping for comment

6. Vote Result

Name	Datatype	Length	Privilege constraint
VRId	Variable character	10	Primary key
Total_vote	Integer	30	
Vote_status	Variable character	30	
Date	Date		
Time	Time		
candidateCId	Variable character	6	Foreign key
Polling_StationPSId	Variable character	30	Foreign key
VoterVId	Variable character	20	Foreign key
UserUID	Variable character	20	Foreign key

Table 18 Class mapping for Polling station

CHAPTER FOUR

4. IMPLIMENTATION TECHNIQUE AND TOOLS

Implementation refers to the Coding of the all documents gathered starting from requirement analysis to the Design phase. So now this team will convert all documents gathered and designed into the code as a system. So that the system will be implemented for the user to be used for the purpose it developed. To implement it the user must have a server on which the system will be hosted because this system can run on internet with connection availability.

4.1Tools to be used

- ✓ The user interface will be developed using Asp.Net integrated development environment since it easily designing the front end and connected in to database realizing rapid application development with constraints on the hand, and we propose to use rational rose software to design different diagrams like. Use case, class diagram, and activity diagrams etc.
- ✓ Asp.Net, visual studio 2010 and SQL database server system will be used in developing and managing the back end.

4.2 User Interface

In this system users will communicate with it through the following user interfaces.

1. **Home Page:** This form contains some links which lead it to the concerned page, and if the user has an account he/she will directly go to concerned page by entering their username and password.

Fig 4.1 User interface for home page

2. Log In form:-this form found immediately following the home page. Home page appears as the site on which the system is deployed is opened. Only election officer and election registrar will have their own password. Those forms appeared using password and user name will not accessible by other persons except for those who have privilege.

Fig 4.2 User interface for login page

3. **Voter page:** this form found immediately following the voter page. voter page appears as the site on which the system is deployed is opened.

Fig 4.3 User interface for Voter page

Chapter Five

5.1 PROTOTYPE DEVELOPMENT

The physical design specification created by the designers is turned in to working computer code by the programmer using Asp.Net, Java script and Css.

Sample code for login:

```
<?php

include("connection.php");

session_start();

?><!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">

<html xmlns="http://www.w3.org/1999/xhtml">

<head><!--Header-->

<title>Online Voting</title>

<link rel="icon" type="image/jpg" href="img/flag.JPG"/>

<link rel="stylesheet" href="main.css" type="text/css" media="screen"/>

<link href="menu.css" rel="stylesheet" type="text/css" media="screen" />

                <script type="text/javascript">

function change_char(){

var pass = document.getElementById("pw");

var checkbox = document.getElementById("cb"); if(pass.type == "password"){

                pass.type = "text"; checkbox.checked = true;

        }else{

        pass.type = "password";checkbox.checked = false;}}

        </script><!--End of Header--></head><body>
```

```
<table align="center" style="width:900px;border:1px solid gray;background:white
url(img/tbg.png) repeat-x left top;border-radius:12px">

<tr style="height:auto;border-radius:12px;background: white url(img/tbg.png) repeat-x left
top;">

<th colspan="2">

<img src="img/logo.jpg" width="200px" height="180px" align="left" style="margin-left:10px">

<img src="img/log.png" width="450px" style="margin-left:30px;margin-top:40px"
align="center">

</th></tr><tr><td colspan="2" bgcolor="#51a351" id="Menus" style="height:auto;border-
radius:12px;"><ul>

                    <li ><a href="index.php">Home</a></li>

                    <li ><a href="about.php">About Us</a></li>

                    <li ><a href="candidate.php">Candidates</a></li>

                    <li ><a href="vote.php">Vote</a></li>

                    <li ><a href="contacts.php">Contact Us</a></li>

                    <li class="active"><a href="login.php">Login</a></li>

            </ul></td></tr></table><table align="center" style="width:900px;border:1px
solid gray;border-radius:12px;" height="500px"><tr valign="top"><td><div style="clear:
both"></div>

<div id="left"><ul>

        <li> <a href="index.php">Home</a></li><li>

          <a href="about.php">About Us</a></li><li> <a
href="candidate.php">Candidates</a></li>

        <li> <a href="vote.php">Vote</a></li><li>

          <a href="contacts.php">Contact Us</a></li><li>

          <a href="help.php">Help</a></li><li>

          <a href="comment.php">Comment</a></li><li>
```

```
            <a href="login.php">Login</a></li>   </ul> </div></td><td><div id="right">
        <div class="desk"><h1>Login page</h1>
    <?php  if (isset($_POST['log'])){
            $username=$_POST['user'];
            $password=$_POST['pass'];
            $sql ="SELECT * FROM user WHERE username='$username' AND
password='$password'";
            $result = mysql_query($sql);
                // TO check that at least one row was returned
                $rowCheck = mysql_num_rows($result);
                $row=mysql_fetch_array($result);
                $status=$row['status'];
                 if($row['role']=='admin'){
if($status==1){
                $_SESSION['u_id']=$row['u_id'];
      echo "<script>window.location='system_admin.php';</script>";}else{
                echo'<p class="wrong"> Your Account is not active Please contact the system
Admin</p>';
echo' <meta content="15;login.php" http-equiv="refresh" />';
                }}
        else if($row['role']=='officer'){
if($status==1)
{                       $_SESSION['u_id']=$row['u_id'];
                echo "<script>window.location='e_officer.php';</script>";
      //echo "<script>window.location='e_officer.php';</script>";
```

```
                }
                else
            {
            echo'<p class="wrong"> Your Account is not active Please contact the system Admin</p>';
            echo' <meta content="15;login.php" http-equiv="refresh" />';
            }}
            else if($row['role']=='registrar'){if($status==1){
            $_SESSION['u_id']=$row['u_id'];
             echo "<script>window.location='e_registrar.php';</script>";}
            else{echo'<p class="wrong"> Your Account is not active Please contact the system Admin</p>'; echo' <meta content="15;login.php" http-equiv="refresh" />';}}
else {echo'<br>';
    echo' <p class="wrong">Check Your username or/and Password!</p>';
 echo' <meta content="15;login.php" http-equiv="refresh" />';       }}mysql_close($conn);
  ?>  <!--End of PHP script--> <table class="log_table" align="center" >
<form action="login.php" method="POST"><tr bgcolor="#51a351" ><th colspan="2" ><font color="#ffffff">Login</font></th></tr><tr><td><label>User Name</label></td><td>
<input type="text" name="user" required x-moz-errormessage="Enter Username"/>
</td></tr><tr><td><label>Password</label></td><td><input type="password" name="pass" required x-moz-errormessage="Enter password" id="pw"/></td></tr><tr><td></td><td><input type="checkbox" name="checkbox" id="cb" onClick="change_char();"> Show Characters</td></tr>
<tr><td></td><td><input type="submit" name="log" value="Login" class="button_example"/>
<input type="reset" value="Reset" class="button_example"/>
</td></tr><tr><td></td>
```

```
<td><a href="forget.php">Do yo forget your
password?</a></td><br><br></tr><tr><td><br></td></tr>

</form></table><br><br></div></div></td></tr></table>

<table align="center" style="width:900px;border-radius:12px;border:1px solid
gray;background:white url(img/tbg.png) repeat-x left top;" height="70px" >

<tr><td id="link">

<p style="text-align:right;padding-right:30px;"><a href="index.php">Home</a>|<a
href="about.php">About Us</a>|<a href="contact.php">Contact Us</a></p>

<p ><hr width="350px" align="right"></p>

<p style="text-align:right;padding-right:30px;"><font color="#ffffff">Copyright &copy; 2007
Reserved.</font></p></td></tr></table></body></html>
```

Sample code for Cast Vote

```
<?php include("connection.php"); session_start();if(isset($_SESSION['u_id'])){

 $mail=$_SESSION['u_id'];}else{?><script>

 alert('You are not logged In !! Please Login to access this page');

 alert(window.location='login.php');</script><?php}

?>

<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">

<html xmlns="http://www.w3.org/1999/xhtml"><head><!--Header-->

<title>Online Voting</title>

<link rel="icon" type="image/jpg" href="img/flag.JPG"/>

<link rel="stylesheet" href="main.css" type="text/css" media="screen"/>

<link href="menu.css" rel="stylesheet" type="text/css" media="screen" />

                <!--End of Header--></head><body>
```

```
<table align="center" style="width:900px;border:1px solid gray;background:white url(img/tbg.png)
repeat-x left top;border-radius:12px">

<tr style="height:auto;border-radius:12px;background: white url(img/tbg.png) repeat-x left top;"><th
colspan="2">

<a href="system_admin.php"><img src="img/logo.jpg" width="200px" height="180px" align="left"
style="margin-left:10px"></a>


<img src="img/voter.png" width="400px" style="margin-left:30px;margin-top:0px" align="center">

</th></tr><tr><td colspan="2" bgcolor="#51a351"  id="Menus" style="height:auto;border-
radius:12px;"><ul><li><a href="voter.php">Home</a></li>

                <li class="active">

<a href="cast.php">Cast Vote</a></li><li>

<a href="voter_comment.php">Comment</a></li><li>

<a href="voter_result.php">Result</a></li><li><a
href="vlogout.php">Logout</a></li></ul></td></tr></table>

<table align="center" style="width:900px;border:1px solid gray;border-radius:12px;" height="500px">

<tr valign="top"><td><div style="clear: both"></div>

 <div id="left"><ul>

        <li><a href="v_change.php">Change Password</a></li>  <li><a
href="voter_comment.php">Comment</a></li><li>

<a href="voter_candidate.php">Candidates</a></li>

        <li><a href="voter_result.php">Result</a></li><li>

<a href="vlogout.php">Logout</a></li>  </ul></div></td><td>

<div id="right"><div class="desk"><h1 align="right"><?php

echo '<img src="img/people.png" width="40px" height="30px"> '.'<font style="text-
transform:capitalize;" face="times new roman" color="green"
size="3">Hi, '.$FirstName." ".$middleName." ".'</font>';?></h1><br><br>
```

```
<?php
        $date1 = new DateTime(date('Y/m/d'));
        $date2 = new DateTime("2015-06-10 ");
      $interval = $date1->diff($date2);
        $d=$interval->d;
        $h=$interval->h;
        $m=$interval->i;
        ?>
            <div class="panel panel-default">
              <div class="panel-heading">
                <h3 class="panel-title"></h3>
              </div>
              <div class="panel-body">
            <table class="table">
              <tr>  <th  class="blink"><div class=" <?php
              if( $date1<$date2){
                  if ($d>='3')
                      {
                      echo "alert alert-success dropdown-toggle";
                      }
                elseif($d=='2')
                      {
                         echo "alert alert-warning dropdown-toggle";
                      }
```

```
elseif($d=='1')
    {
        echo "alert alert-warning dropdown-toggle";
    }
elseif($d=='0')
    {
        echo "alert alert-danger dropdown-toggle";
    }
 else
    {
        echo "alert alert-danger dropdown-toggle";
    }
 }
  else
    {
        echo "alert alert-danger dropdown-toggle";
    }
    ?>">
```

Chapter Six

6.1 Conclusion

This project has given us vast knowledge on the different computing technologies. We have learned a lot during the documentation of this system project.

Our system project enables a voter to cast his/her vote through internet without going to voting closet and additionally registering himself/herself for voting in advance, proxy vote or double voting is not possible, fast to access, highly secure, easy to maintain all information of voting, highly efficient and flexible. Hence, by this voting percentage will increase drastically. The using of online voting has the capability to reduce or remove unwanted human errors. In addition to its reliability, online voting can handle multiple modalities, and provide better scalability for large elections. Online voting is also an excellent mechanism that does not require geographical proximity of the voters. For example, soldiers abroad can participate in elections by voting online. We were also able to learn a lot of system analysis and design of the project, and all about object oriented concept with database. We came to know the different issues that come in the way of the development of the online voting system. Security was the main issue in the development of this project and we conclude that if these issues are taken into consideration, online voting system will become and real life system from just more a project.

6.2 Recommendation

In general, this project contributes an initial work on electronic voting system for Debere Birhan City. But, this work needs to mature in other similar projects in the future, to be scaled up to the whole country. It is recommended also that the government will take this opportunity to entertain such alternative voting system with other security method.

- Integration with other sits.
- Online digital signature.
- Online facial recognition.
- SMS based E-voting.
- The system should develop the online voting system for the future

6.3 Appendix

6.3.1 Appendix 1

1. Ethiopia electoral rule

The following are some of the election rules and regulation of Ethiopia, these rules and regulations are sources of input for requirement analysis.

· Voting in any election shall be carried out in secret

· Each vote shall carry equal weight

· Any person shall be registered once and at one place only

· Registration shall be carried out at the polling station within the Keble of the elector's residence, provided however registration from house to house or in similar places outside the polling station is prohibited

· The elector shall be issued with an elector's card

· The disabled and the blind may be registered accompanied by their assistants

· Registration shall be carried out at a polling station

· Any person duly registered shall be issued with an elector's card bearing his name place of birth, designated polling station, registration number and his signature or thumb mark.

· Upon conclusion of registration, the electoral roll shall be marked with closing indications and signed by the electoral officials

· Subsequent to closure of the electoral roll, each polling station shall transfer same, or a copy of it, and other necessary documents to the respective Woreda electoral office, in accordance with directives to be issued by the Board

· Any person shall stand as a candidate only in one constituency

· In case candidates have equal number of votes, they will be identified by drawing a lot

· Every elector shall vote by appearing in person

· Each elector should vote only once

· Any elector may cast his vote only upon confirmation that he is carrying the elector's card

· Any elector may cast his vote only at the polling station where he had registered

· The elector shall hand his elector's card to the electoral coordinators of the polling station, where upon they shall proceed to verify his identity by examining the card

· After verification of the voter identity, the thumb of the elector shall be put into the ink provided for the purpose, after which he shall be handed with a ballot paper and pointed out to the voting booth;

· Any elector shall have the right to choose a person who can assist him to mark the ballot paper and put it in the ballot box during the voting process

· Soon after closure of the polls, counting of ballots shall be carried out at polling stations, in accordance with directives to be issued by the Board

· The results of counting made at a polling station shall be publicized forthwith

· Upon the conclusion of election and collection of the necessary information, the board shall forthwith issue an official declaration containing the following particulars; the number of registered electors, the number of electors having cast their vote, the number of blank and null ballot papers, the percentage of registered electors having and not having cast their vote, the percentage of unregistered electorate, the list of elected candidates and their respective constituency

· Voting shall be carried out without interruption during the voting hours

· The elector shall handover his elector's card to the election coordinators of the polling station, where upon, by referring to the electoral roll, they shall proceed to verify his identity and that he has not voted

· By examining both hands of the elector the election coordinators ascertain that there is no identifying ink that shows he has voted

· In the booth, the elector shall put, on the ballot paper, an "X" or a thumb mark in the square corresponding to the symbol of the candidate for which he wants to vote

· Counting of votes shall be conducted by the Polling Station Officers only, and others shall have the role of observers

· The counting shall be made by picking one of the arranged votes and count them three times by three different officers.

Reference

1) Doug D., How Electronic Voting Impacts the Trustworthiness of Elections, AvailableFrom: WWW.OpEdNews.com (AccessedSeptember2014/2015).
2) Electricnews.net, All internets voting is Insecure, Available from:http:www.theregister.co.uk/2004/01/23 ((Accessed September 2014/2015).
3) StevenM.,ABetterBallotBox,Availablefrom:http://www.notablesoftware.com/papers/1002evot.pdf (accessed 15 January 2007).
4) Pipaa N., Evoting as a magic Ballot, Available from: http://ksghome.harvard.edu((Accessed October 2014/2015).
5) Every One Counts PL, A Virtual Private Network for Internet Voting, Available from: http://www.everyonecounts.com (accessed 26 February 2007).
6) Joseph R., Alen E., Dermot C., Fintan F., the KOA Remote Voting System, Available from: http://secure.ucd.ie/documents/submitted/KOAEVT06.pdf (Accessed October 2014/2015).
7) 30th meeting of the working Group on 28th August 2001 in Berlin, Data Protection and Online Voting in Parliament and Other governmental elections, Available from:http:www.theregisterBerlin.co.uk (Accessed October 2014/2015

Sample question for questioner purpose

1. How the system works currently?
2. What are the current states of the system?
3. What are the problems faced using the currently available system?
4. Is it better to develop an online system?
5. What are the main objectives of the NEBE?
6. What is the mission and vision of the NEBE?
7. How many branches does the NEBE have?
8. How does your current system work?
    - Is it manual?
    - Is it computerized?
    - Is it online?
9. What are the procedures or steps to use your system easily?
10. How do you think to generate this system to the f