



**CIS 5690- ADVANCED SYSTEMS PROJECT**

**PROJECT TITLE: ONLINE VOTING SYSTEM**

**PRESENTED BY:**

Nandini Priya Kurapati

700645541

Nxk55410@ucmo.edu

**PRESENTED TO:**

Dr. Prasad Rudramuniyaiah

Computer Information Systems

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## 1. Project Proposal

**Country of use: India**

### **Statement of the Problem:**

With the growing migration of people to foreign countries in India, the Indian Government thought of conducting elections in an electronic way to make life easy for Non-Resident Indians via a Web Driven Application. It is not just limited to Non-residents, people who are busy with their routines can also vote via online Voting system, instead of standing in queue, which is the common method of voting. The main objective of this system is to minimize the errors of vote counting there by reducing congestion and to make use of all the voters. Voter has to pre-register the website before elections and can cast their vote to their party of interest. All the votes will be stored in the database, which will take very short period of time to declare the election results, which in turn results in mal-function or error of vote counting.

### **Different Modules:**

The Government of India is planning to make use of the all voters effectively by launching a new electronic web driven online voting system. In which there will be two different modules like voter module and administrator module. Administrator module contains all the data regarding the voter, like user name and password. When the user try to login to cast their vote, administrator checks whether the credentials match with the one which is in database. Voter module, where user can login to the account. Different parties participating the elections will be displayed there, voter can actually look into it and cast their vote.

Provision of Online Voting System is to improve voting services to the voters through fast, timely and convenient voting. This system brings in a lot easier way to cast their vote independently. This will make life easier, instead of standing in queues, people can cast their vote from home itself, which also brings votes from people staying in any part of the globe.

### **Technical Description:**

In this Project, I have used a login page for all the users (for all the roles), where validation will Takes place for the data entered in the login page to the data stored in the database. After logging,

I have used Xml ad rotator for moving images in the home page, below that we will display some information about the different types of elections held in India. Voter will have to functionalities here, vote now and see the results of elections. When admin opens the new contest, voter will be able to see the all the leaders and cast the vote, here by clicking on the button, he should be able to cast the vote. When no open contest is there, he will see “There are no open contests to vote” under that a return button to back to the home page. When voter clicks on results tab, should see the contest with a button to click there, when he clicks on that button, he will see the results. Here I have used **synchronous counting** to auto display the result at the end of the election. Then Admin page is where, I have used most critical process, I have **upload functionality** to upload image for the party, **Validations** will happen for mandatory fields, **Edit/Delete functionality** for all the existing voters, leaders, contest list and parties, also **drop down list** to select party name and contest name.

I have SQL server 2014 for writing all the database queries and storing the data of all the voters, parties, contests and leaders along with their details.

**Drawbacks:** I have not used Register page in this project, due to time constraints. I apologize for That and as I am not aware of how the elections held here in this country (USA) and not sure of leaders names, I have used my home country names and the party logo's over there. If there is something wrong with my theme, I apologize for that.

**What I can do better:** I didn't use register page, due to lack of knowledge at the time of started writing the application, I couldn't do it.

**Technologies Used:**

1. ASP.NET
2. JQuery

3. CSS3
4. HTML
5. Database(Microsoft SQL Server)

## 2. Introduction:

The main objective of this project is that, people who are living abroad can have a chance to vote the party whom they want to in their home country. In current voting system, we don't have the online voting system, people can't go to their home country due to their busy schedule. As a result of this many people are wasting their chance of voting and their votes are getting manipulated by some other local people. This system allows voters to use their authority from where ever they are.

The main reason for this project is that every nation has to utilize the opportunity they have and elect the government which they wish to have. There are many disadvantages of not using every one's vote. Overall percentage decreases if everyone won't participate in the elections and sometimes it may happen like some people misuse others vote. The main advantage of this is the overall percentage of the voters will increment to the persons participated. People living abroad will feel responsible towards their home country.

## 3. User Requirements

List of Actors	Major Goals
Administrator	<ol style="list-style-type: none"><li>1. Add Voter</li><li>2. View Voters</li><li>3. Add Party</li><li>4. View Party List</li><li>5. Add Contestant</li><li>6. View Leaders List</li><li>7. Add contest</li><li>8. View contests</li></ol>

Voter	1. Vote Now 2. Results 3. Contact Us
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#### 4. Scope

It is centered on to concentrate the current arrangement of voting in India and to ensure that non-resident Indians can use their voting right effectively and not just limiting to NRI's, even local aids can also use this Web application for flexibility. The main Scope of this web driven application includes, less effort and more flexibility, as the essential cost and concentrate essential on making, overseeing, and running a safe web voting gateway. Increasing number of voters as people will think that it's less demanding and more advantageous to vote, particularly those abroad. Old methods of voting

1. Paper-based voting: The voter gets a clear poll and utilize a pen or a marker to demonstrate he need to vote in favor of which applicant. Hand-numbered polls is a period and work expending process, however it is anything but difficult to fabricate paper tickets and the tallies can be held for confirming, this sort is as yet the most well-known approach to vote.
2. Lever voting machine: Lever machine is impossible to miss hardware, and each lever is relegated for a relating competitor. The voter pulls the lever to survey for his most loved applicant. This sort of voting machine can number up the tallies naturally.
3. Lever voting machine: Lever machine is impossible to miss hardware, and each lever is relegated for a relating competitor. The voter pulls the lever to survey for his most loved applicant. This sort of voting machine can number up the tallies naturally.

- i). to make use of all the votes effectively providing more comfort and less work.
- ii). cost cutting, managing and running a sub secure web voting portal.
- iii). less mal function
- iv). increasing number of voters as individuals will find it easier and more convenient to vote, especially those abroad.

“Hopefully this system could find a better way to cast vote in India”

#### 5. Problem Statement

The current election process in India is a very cumbersome process. Existing voting system is conducted manually where the voter has to visit to Booths (usually called in India) or to restricted area to vote, so people has to stop their routines and go to respective place to cast the vote, which leads to waste of time and money, which therefore leaves a very big margin of people without voting and because of that the leaders deserving some sits tend to lose them. Most of the times, students doesn't show interest to cast their vote because of long queues. Also vote counting should be done manually.

By seeing all the drawbacks, I have come up with this idea for my Masters project. This is a very attractive idea with simple UI and easy to use.

## 6. Objectives

- Develop a web driven application facilitating people to cast their vote online, without having to go and vote in Booths.
- Come up with a documentation for users.
- Come up with a voter module, voter controller module and admin module, which automate vote computations.
- By seeing the documentation provided step by step for the users, they can easily open the application and follow the steps mentioned in the document.

## 7. Use Case Diagrams:

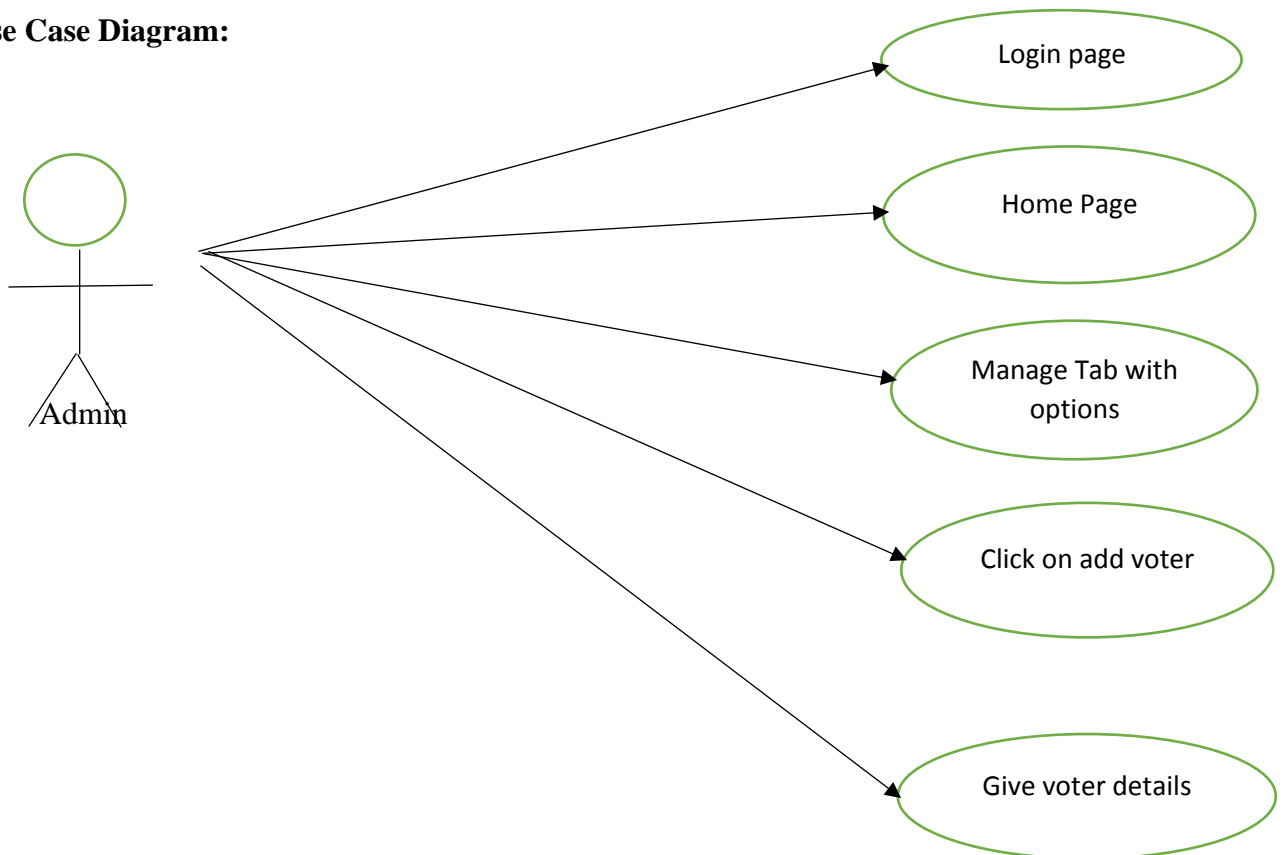
### Use Case Template and diagram:

#### 1. Use case: Add New Voter

Use Case id	NP-001
Use Case Name	Add voter to the voter list
Created By	Nandini Priya Kurapati
Date Created	03/25/2017
Actors	Administrator
Description	Admin can add the new voter to the voters list (database)
Trigger	When a voter wants to cast their vote for their party of interest

Pre-conditions	Admin has to have the Voter information and he has to be logged into his account
Post-Conditions	Voter should be able to login into his account and cast the vote
Normal Flow	<ol style="list-style-type: none"> <li>1. When a voter wants to cast their vote online using web driven application, he should be added by the admin to the voter's list.</li> <li>2. When admin adds voter to voter list and voter should be able to log in and cast the vote.</li> </ol>
Alternative Flow	Not Applicable
Includes	Not Applicable
Frequency of use	Multiple times
Assumptions	Voter should have been added and should be able to cast the vote, when logged in

### Use Case Diagram:





### Description:

- a. Add New Voter:** Administrator of the system adds new voters into the database. When he adds the new voter, voter data will be stored in the database. While adding the voter to the database, he should have all the information about the voter.

**Technical Notes:** Here there is no Register page designed, only admin has to add the new voter to the voters list

**Assumptions:** when voter try to login into his account, the credentials which he has given will be compared to the one which is in database, if the comparison is correct the he will be redirected to the home page where all the party logos along with voting has actually been done.

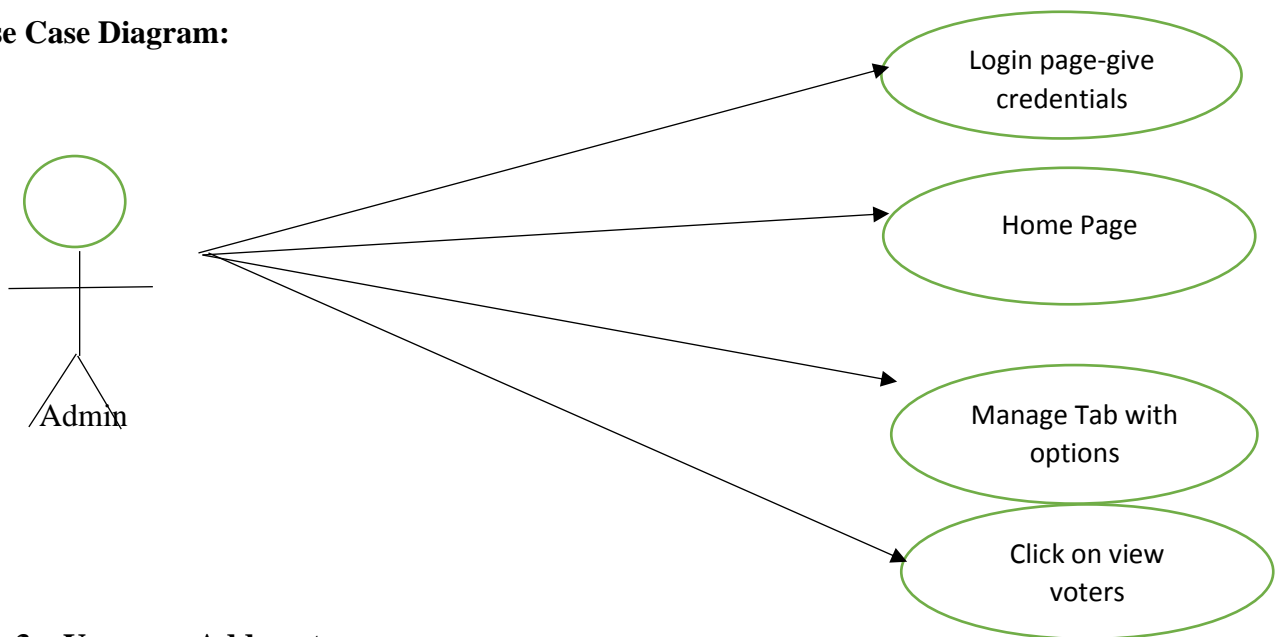
### 2. Use case: View Voters

Use Case id	NP-002
Use Case Name	View voters list
Created By	Nandini Priya Kurapati
Date Created	03/25/2017
Actors	Administrator
Description	Admin should be able to view voters list (database)
Trigger	Voter wants to cast their vote for their party of interest
Pre-conditions	Admin should have been added the voter to the voters list
Post-Conditions	Should be able to see all the list of voters
Normal Flow	<ol style="list-style-type: none"> <li>1. When Admin logs into his account, by clicking on Manage tab under which view voter's options, he should be able to see the list of voters.</li> <li>2. Those list of voters are available to vote in the contest.</li> </ol>
Alternative Flow	Not Applicable
Includes	Not Applicable
Frequency of use	Multiple times
Assumptions	Added voter should be visible in the voter's list

**Description:**

- b. View Voters:** When he wants to see the list of all the voters, he can login into his account and see the all voters list along with their details.

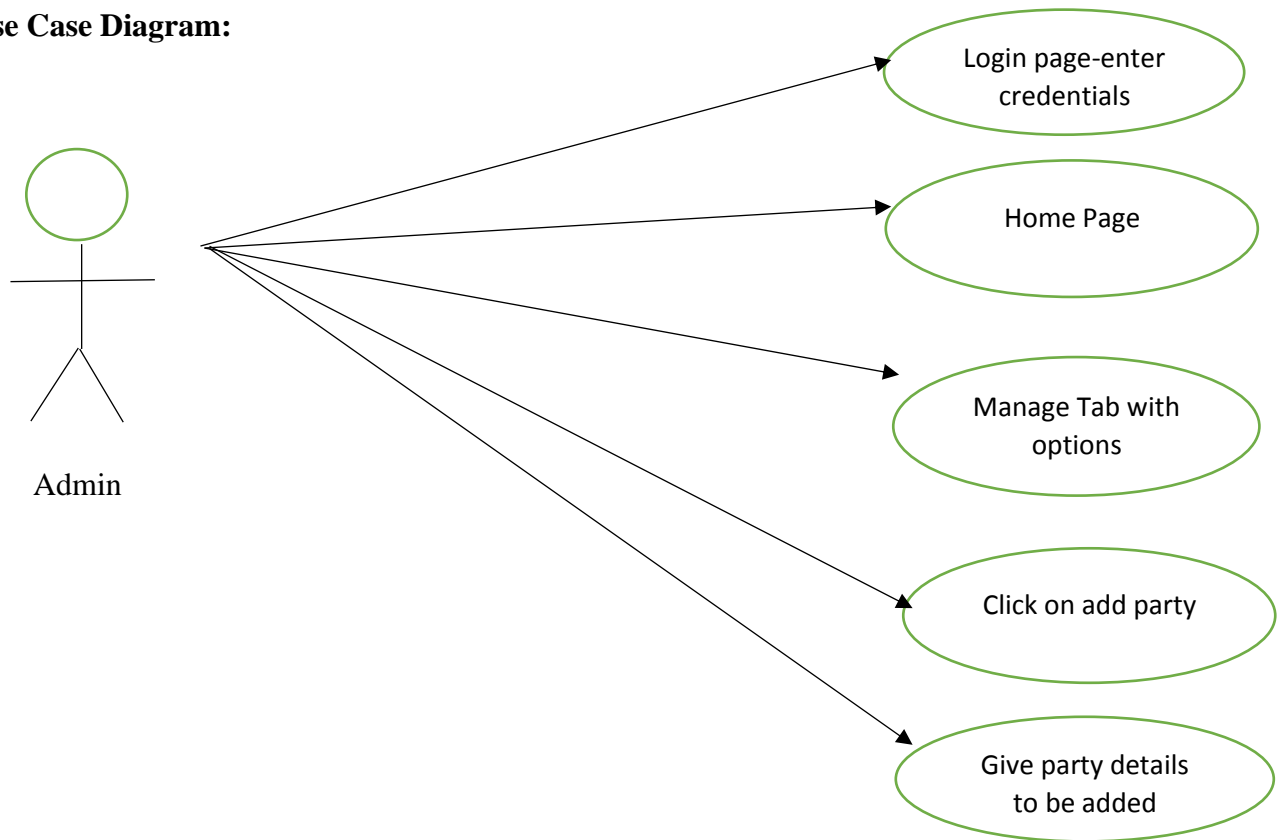
Technical Notes: He can be able to see all the voters list and may be if admin would have been removed some voter for some reason, he should not see that voter in the voter's list.

**Use Case Diagram:****3. Use case: Add party**

Use Case id	NP-003
Use Case Name	Add party
Created By	Nandini Priya Kurapati
Date Created	03/25/2017
Actors	Administrator
Description	Admin should be able to add new party to existing parties list (database)
Trigger	Voter wants to cast their vote for their party of interest
Pre-conditions	Admin should be logged into his account and he should have all the information about the party to be added.
Post-Conditions	New party should be added to existing parties list
Normal Flow	1. Admin should login to his account and click on manage tab

	2. Select add party option, by clicking on that it will ask the information to enter about the party.
Alternative Flow	Not Applicable
Includes	Not Applicable
Frequency of use	Multiple times
Assumptions	Should add new party to the parties list

### Use Case Diagram:



### Description:

- c. **Add party:** Administrator has the right to add new party to the elections, to the competencies list. He has to enter the party name and upload the party logo.

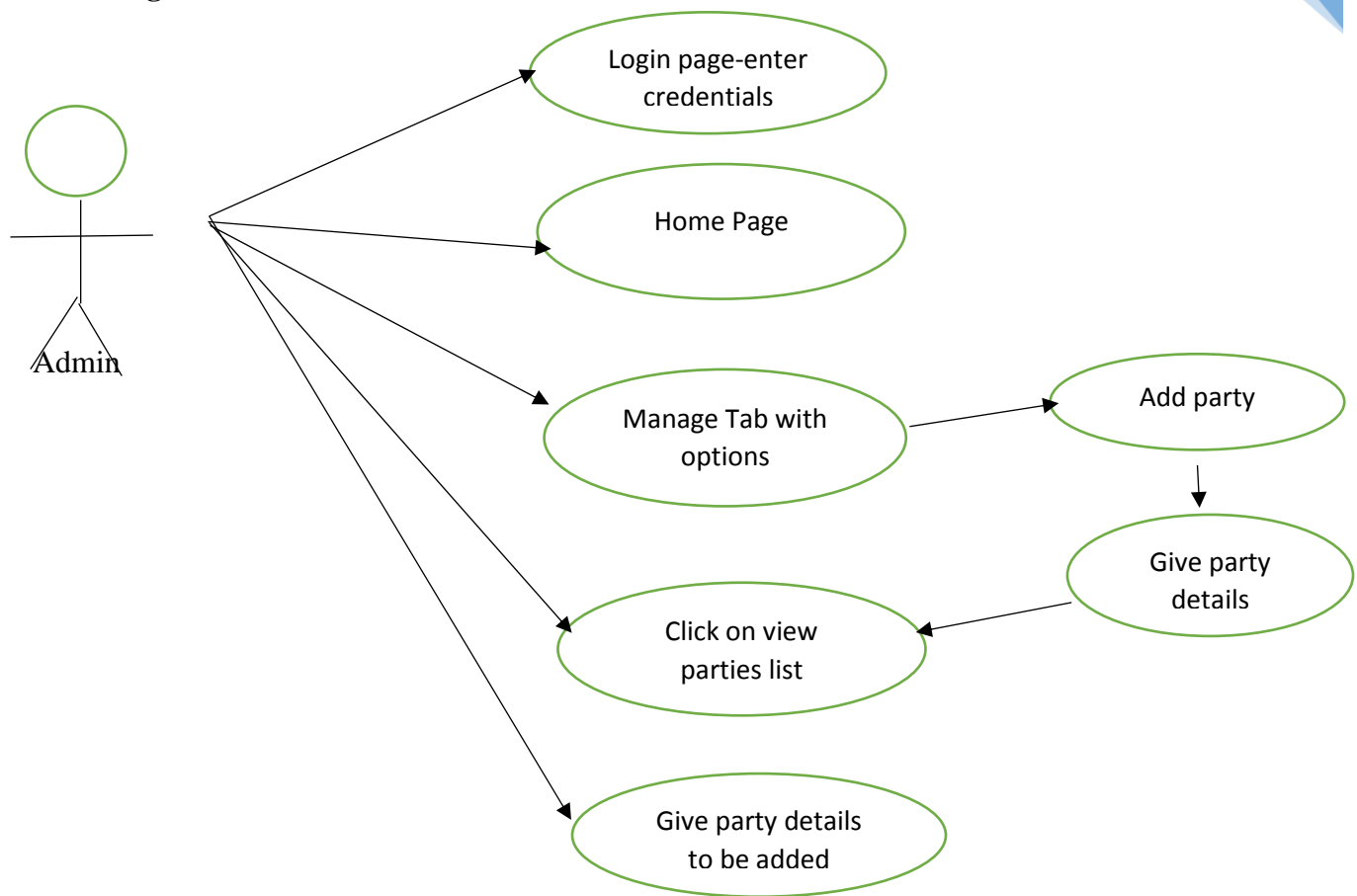
Technical Notes: When the administrator adds new party to the database, voters has to be able to see the new party added along with logo.

### 4. Use case: View Party list

Use Case id	NP-004
Use Case Name	View party list
Created By	Nandini Priya Kurapati
Date Created	03/25/2017
Actors	Administrator
Description	Admin should be able to see the list of parties participating in elections
Trigger	Check the list of parties in the database
Pre-conditions	Admin should be logged into his account and he should add the party name and their information to the database
Post-Conditions	Able to see all the list of parties available
Normal Flow	<ol style="list-style-type: none"> <li>1. When the admin wants to see the list of parties available after adding the parties.</li> <li>2. Should be able to see all the parties</li> </ol>
Alternative Flow	Not Applicable
Includes	Not Applicable
Frequency of use	Multiple times
Assumptions	Should be able to add new parties to database

### Description:

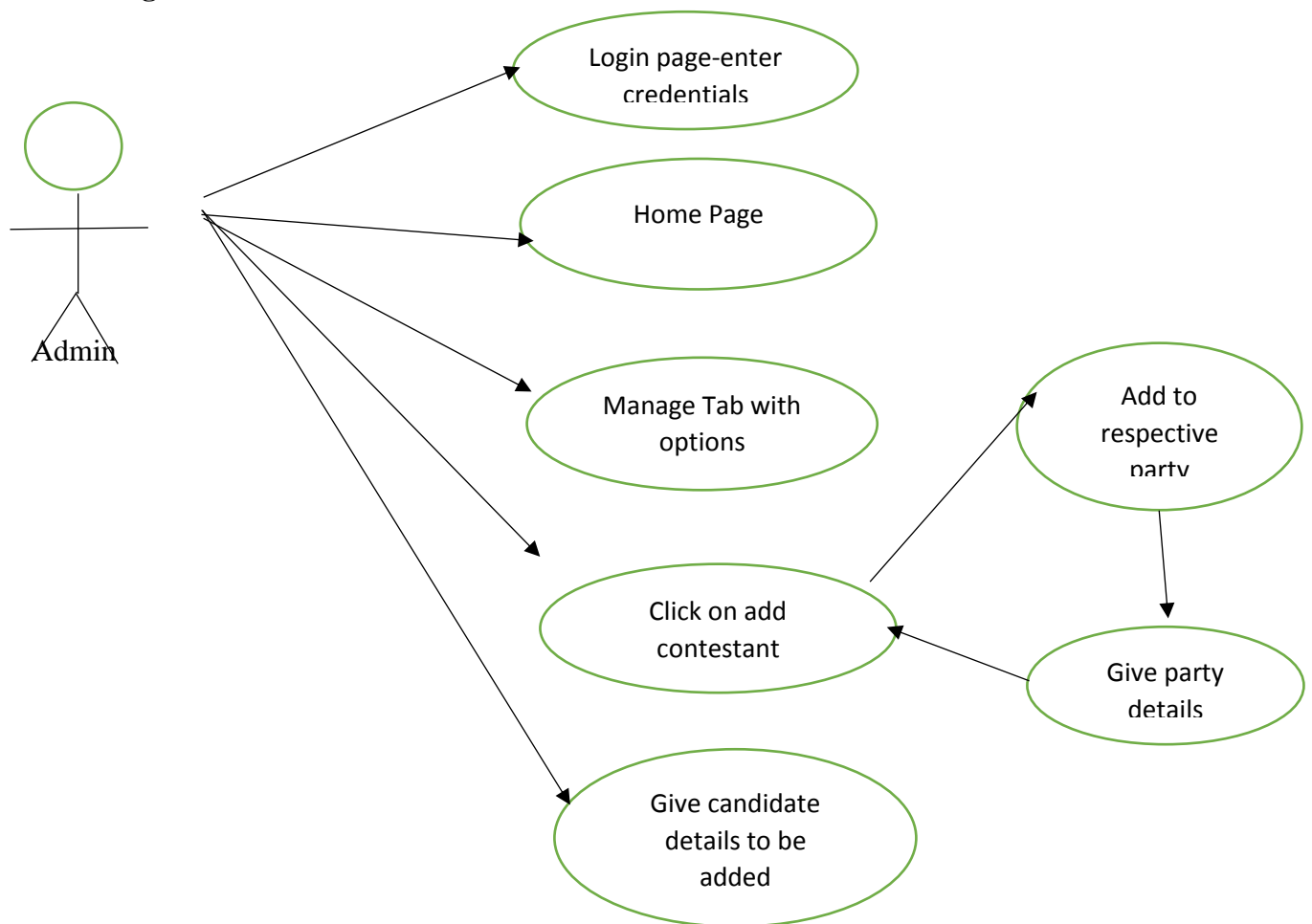
- d. View Party List:** When admin clicks on the view party list, he should see all the party names along with the party logo's. When a leader has to be party or modified for some reason, administrator is the only person or module to add or modify the party

**Use Case Diagram:****5. Use case: Add Contestant**

Use Case id	NP-005
Use Case Name	View party list
Created By	Nandini Priya Kurapati
Date Created	03/25/2017
Actors	Administrator
Description	Admin should be able to add the new contestant to the respective party
Trigger	Add new contestant to the respective to participate in elections
Pre-conditions	Admin should be logged into his account and he should add the new contestant to the party
Post-Conditions	Able to see all the list of parties available

Normal Flow	<ol style="list-style-type: none"> <li>1. When the admin was asked to add new contestants to the elections.</li> <li>2. Should add new contestant to the elections</li> </ol>
Alternative Flow	Not Applicable
Includes	Not Applicable
Frequency of use	Multiple times
Assumptions	Should be able to add new contestant to respective party

### Use Case Diagram:



**Description:**

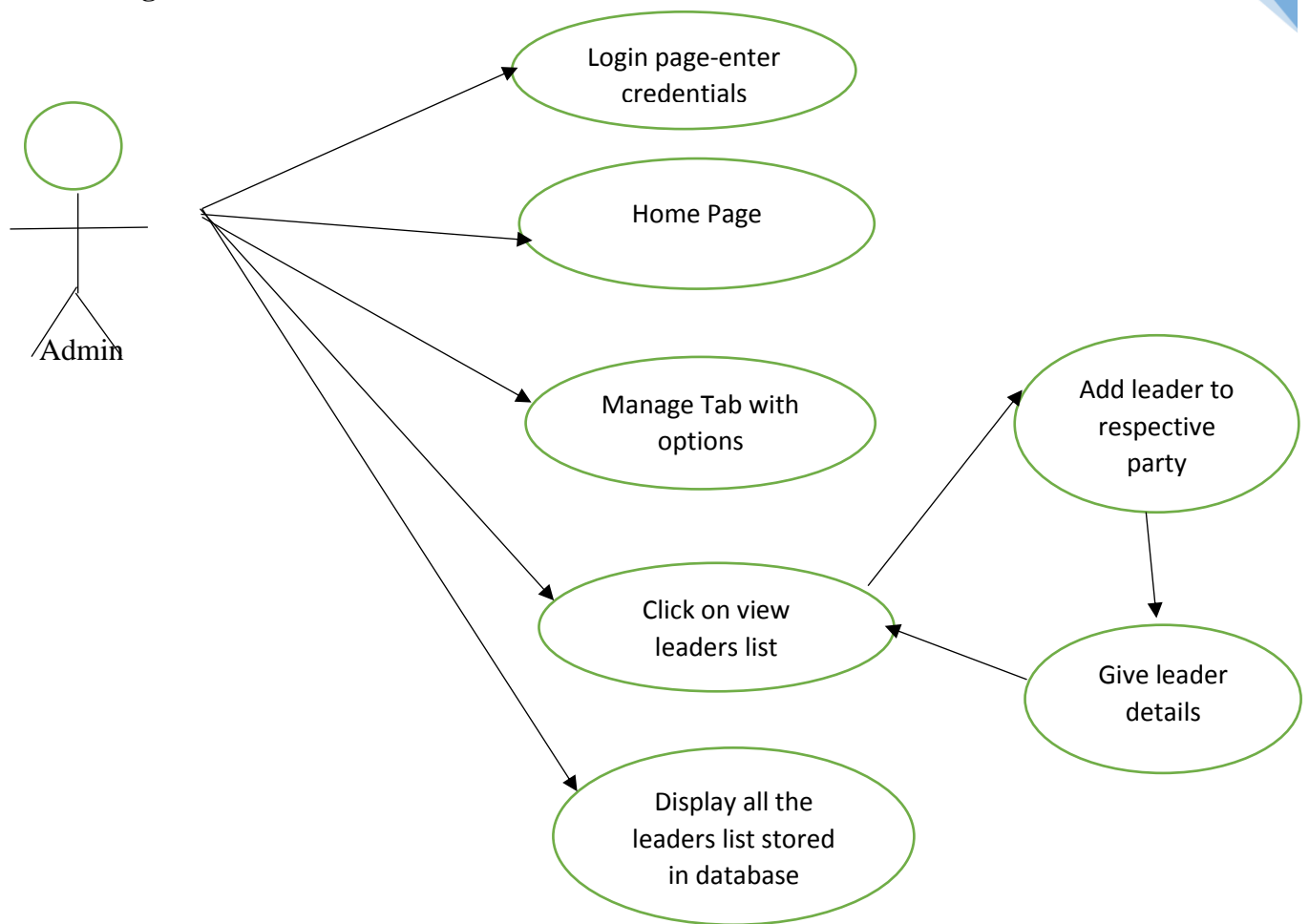
- e. Add Contestant:** Only admin role is the only role who have privilege to add a voter or leader or party to the database. When a new contestant has to be participated in the elections, admin should add he/she by assigning them to the party from which they are participating.

Technical notes: Logging into the admin account, we can add or delete the roles.

**6. Use case: View leaders list**

Use Case id	NP-006
Use Case Name	View leaders list
Created By	Nandini Priya Kurapati
Date Created	03/26/2017
Actors	Administrator
Description	Admin should be able to see the list of all the leaders
Trigger	Should see the list of available leaders
Pre-conditions	Admin should be logged into his account and he should have been added leaders to the list
Post-Conditions	Able to see all the list of leaders available
Normal Flow	<ol style="list-style-type: none"> <li>1. Admin should login to his account and add new leaders to the database.</li> <li>2. When he wants to see the list of available leaders, click on view leaders list and should see the leaders list</li> </ol>
Alternative Flow	Not Applicable
Includes	Not Applicable
Frequency of use	Multiple times
Assumptions	Should be able to see the list of available leaders

### Use Case Diagram:



**Description:** View Leaders List: All the leaders of all the parties has to be visible.

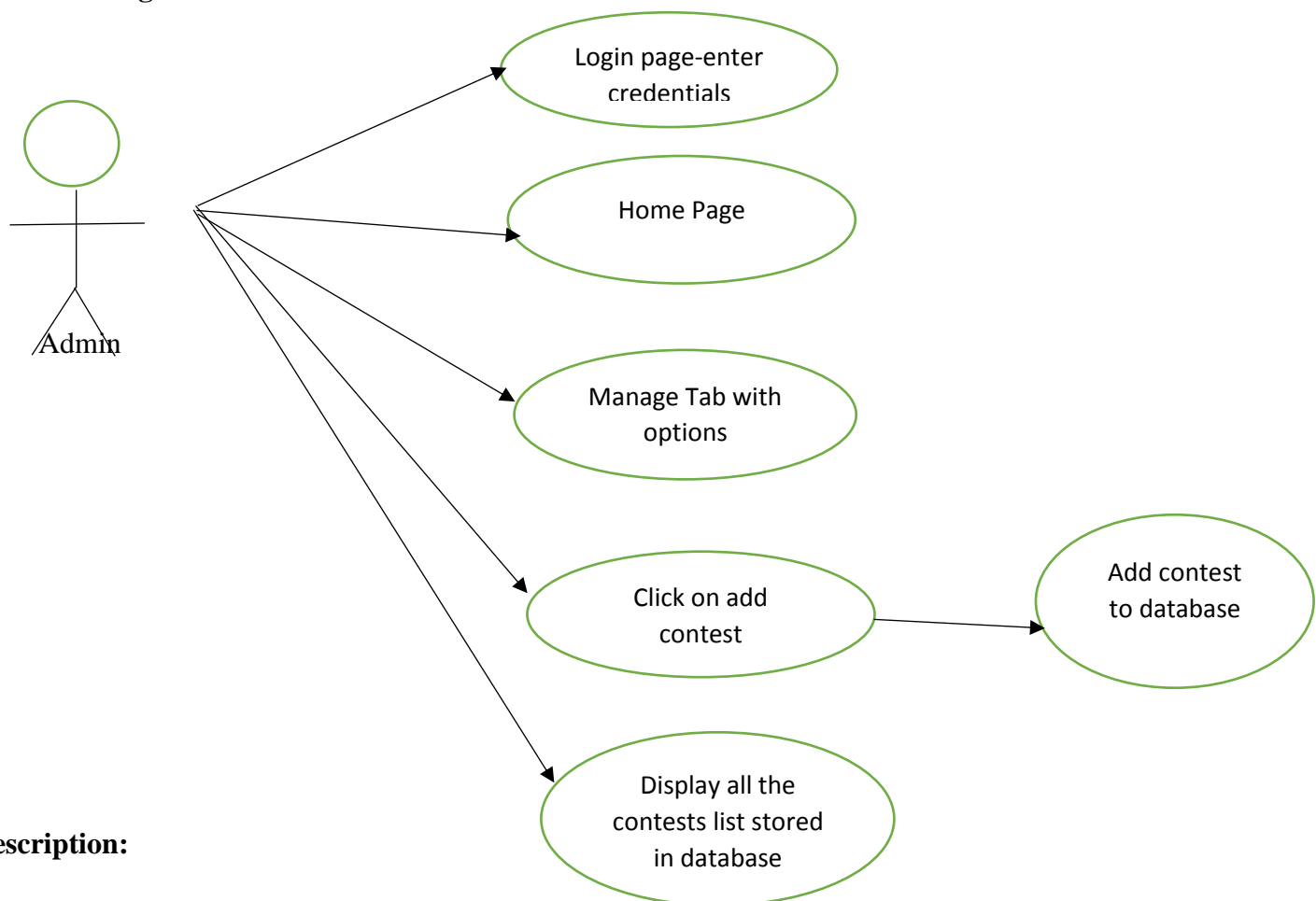
### 7. Use Case: Add contest

Use Case id	NP-007
Use Case Name	Add contest
Created By	Nandini Priya Kurapati
Date Created	03/26/2017
Actors	Administrator
Description	Admin should be able to add the new contest going to be held
Trigger	Should add the new contest to elections



Pre-conditions	Admin should be logged into his account and have information handy about the contest
Post-Conditions	Able to see the contest added
Normal Flow	1. Admin should login to his account and add the new contest that is going to be held
Alternative Flow	Not Applicable
Includes	Not Applicable
Frequency of use	Multiple times
Assumptions	Newly added contest should be visible in the view contests page

### Use Case Diagram:

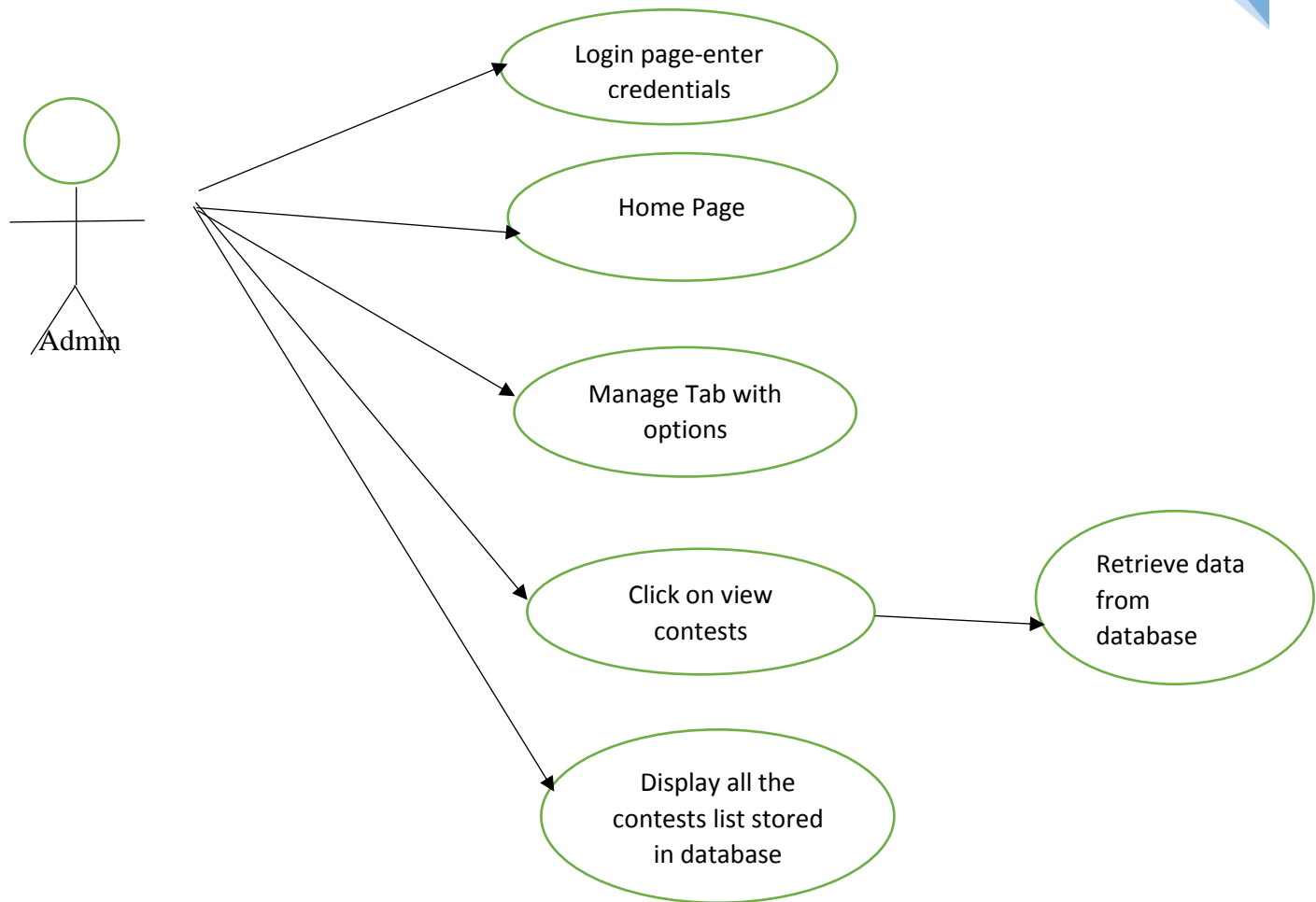


### Description:

- f. Add Contest:** Should be able to add the type of contest they are conducting. Ex: Ministry etc.,

## 8. Use case: View contests

Use Case id	NP-008
Use Case Name	View contests
Created By	Nandini Priya Kurapati
Date Created	03/26/2017
Actors	Administrator
Description	Admin should be able to see the list of contests stored in the database
Trigger	Should see all the contests
Pre-conditions	Admin should have been added the contests to the database
Post-Conditions	Able to see the list of contests
Normal Flow	<ol style="list-style-type: none"> <li>1. Admin should add the new contest to the database</li> <li>2. By clicking on the view contests list, admin can see the all the contest names</li> </ol>
Alternative Flow	Not Applicable
Includes	Not Applicable
Frequency of use	Multiple times
Assumptions	Added contest should be visible in the contest list

**Use Case Diagram:****Description:**

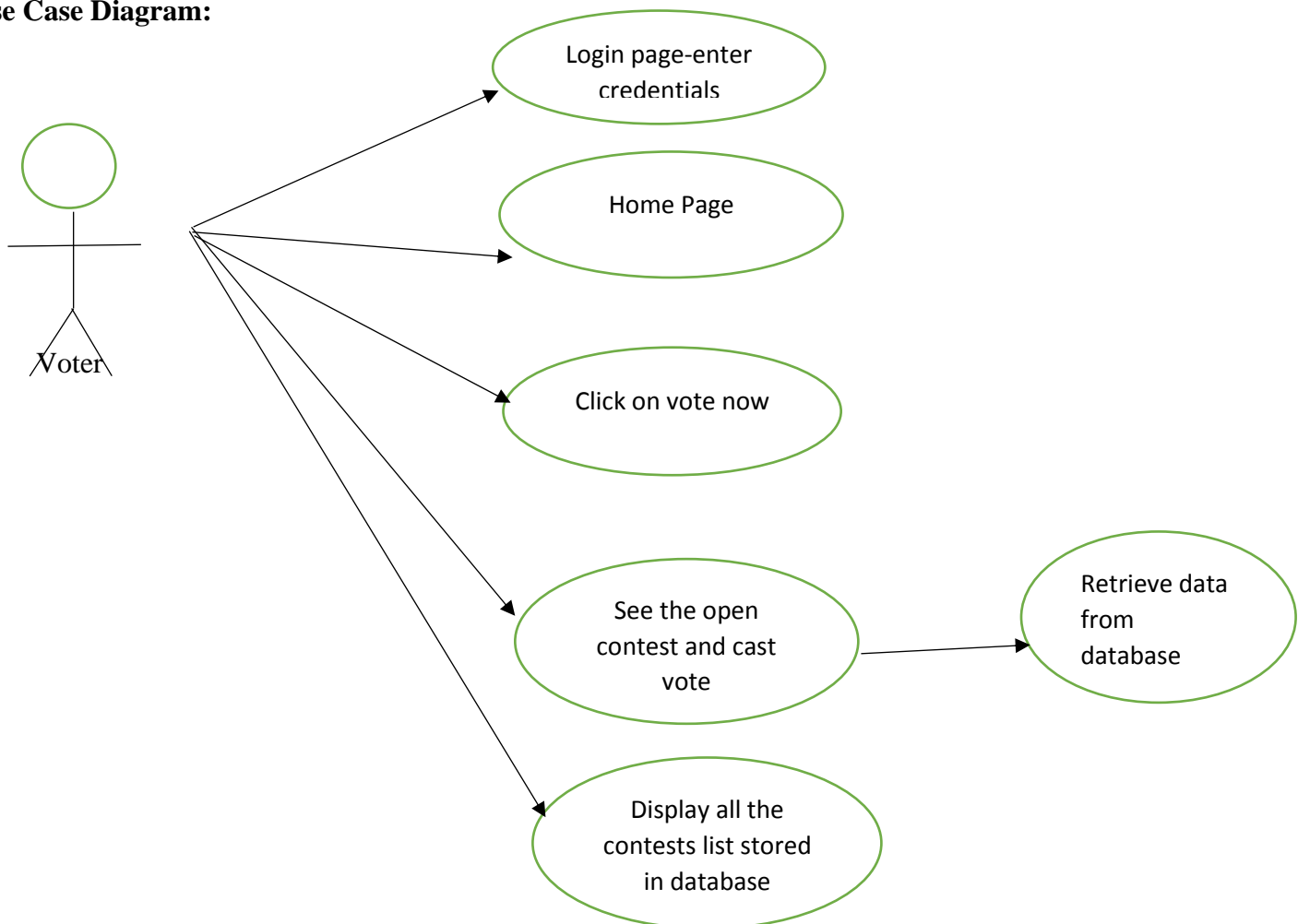
- i. **View Contests:** Should be able to see all the contests conducted till that election.

**9. Use case: Vote now**

Use Case id	NP-009
Use Case Name	Vote Now
Created By	Nandini Priya Kurapati
Date Created	03/26/2017
Actors	Voter

Description	Voter should be able to vote to their party pf interest in the particular contest held.
Trigger	Should see the contest with contestants and cast the vote
Pre-conditions	Voter should have been added to the database and logged in to his account
Post-Conditions	Able to cast the vote
Normal Flow	<ol style="list-style-type: none"> <li>1. Voter must have been added to database, prior to elections</li> <li>2. When logs in to the account, should see a tab “vote now”, by clicking on that he/she can be able to cat their vote</li> </ol>
Alternative Flow	Not Applicable
Includes	Not Applicable
Frequency of use	Multiple times
Assumptions	Voter should have been casted the vote

### Use Case Diagram:



**Description:**

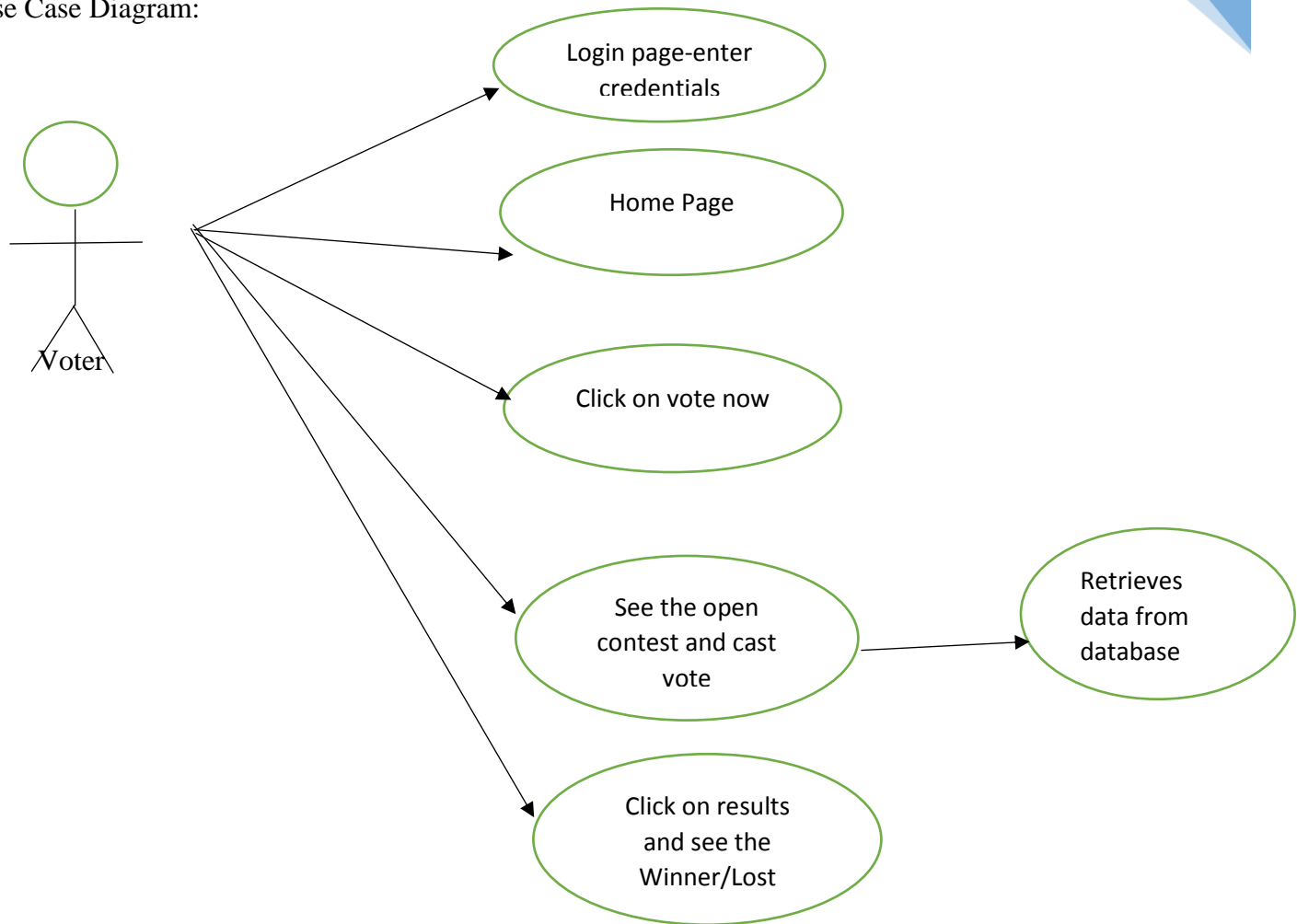
- j. **Vote Now:** Voter should be able to vote by seeing all the contestants in contest held.

Technical notes: When voter has been added to the database, as soon as he/she login, must be able to see the home page with all the leaders that are participating in the elections. The user credentials will be stored in the database that will be validated when voter enters the credentials.

**10. Use case: Results:**

Use Case id	NP-010
Use Case Name	Results
Created By	Nandini Priya Kurapati
Date Created	03/26/2017
Actors	Voter
Description	Voter should be able to see the election results
Trigger	Should see the results of the elections held
Pre-conditions	Voter should have been casted his vote and ready to see the results
Post-Conditions	Able to see the results
Normal Flow	<ol style="list-style-type: none"> <li>1. When the voter cast the vote, after completion of elections</li> <li>2. He should be able to see the election results</li> </ol>
Alternative Flow	Not Applicable
Includes	Not Applicable
Frequency of use	Multiple times
Assumptions	Voter should be able to see the election results

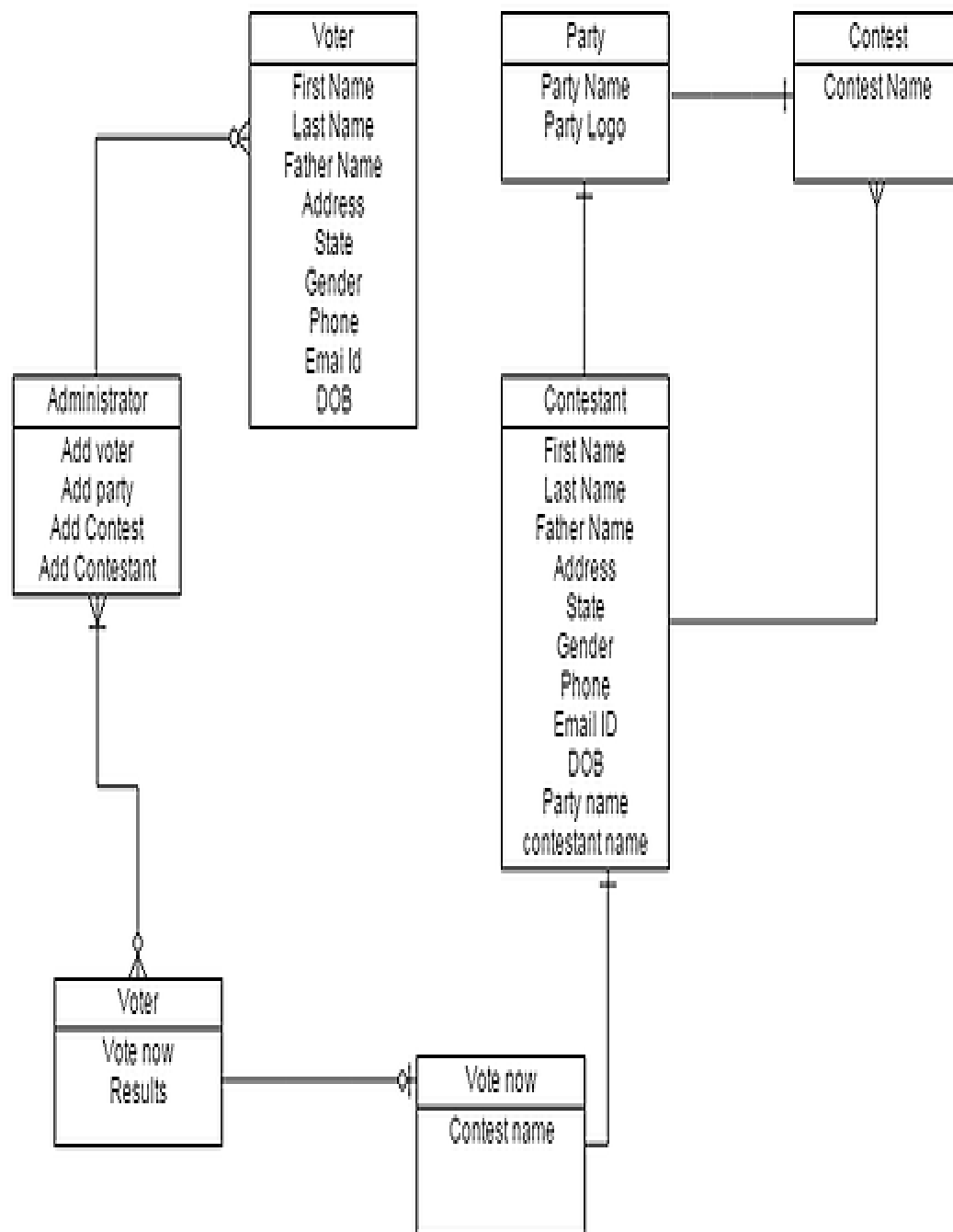
Use Case Diagram:



**Description:**

- k. **Results:** Voter should be to see all the contests and when he/she clicks on the contest, this will be navigated to another page showing the Winner/Lost information.

### Entity Relationship diagram:

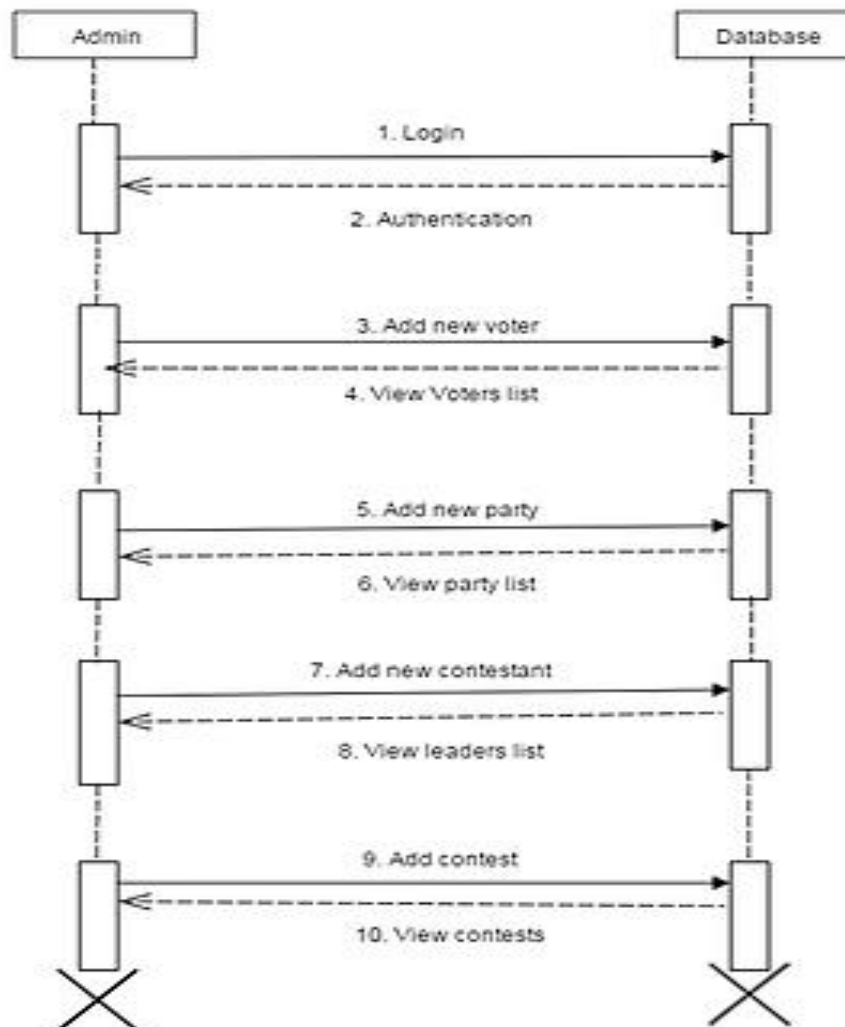


## Sequence Diagrams:

Sequence diagrams represents tracing events that operate with each other and tracks in which order it happens. It shows the interactions taken place between objects in time sequence. In short it is a message construct chart.

### Admin:

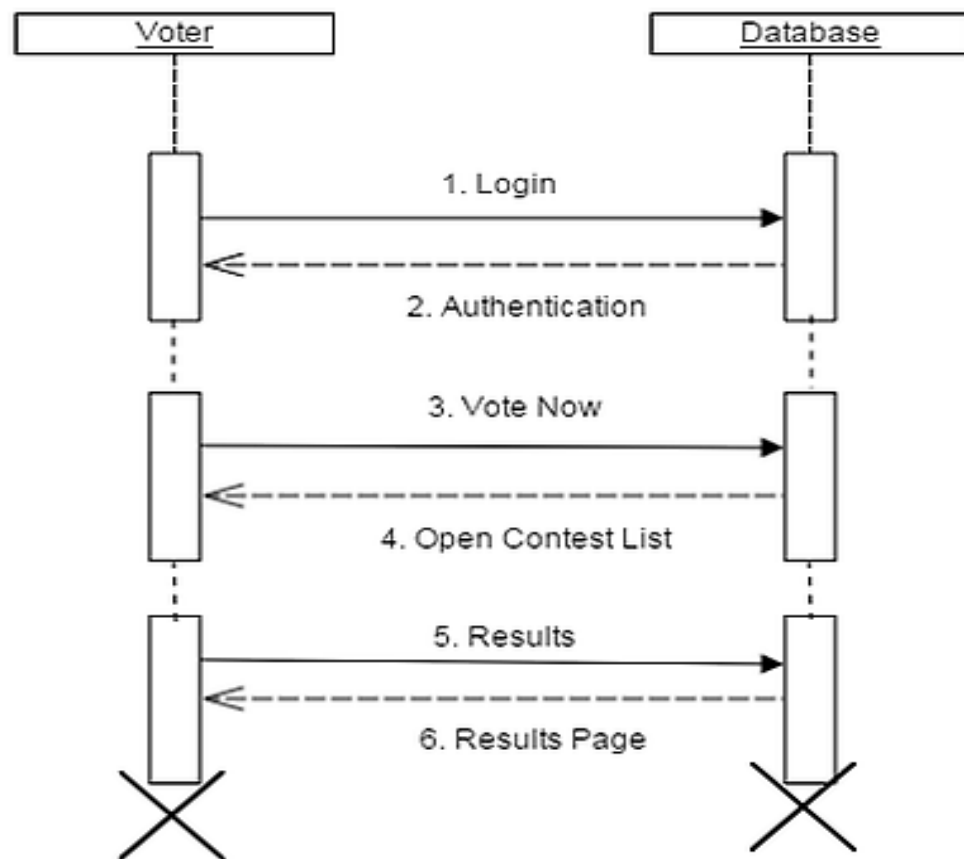
Following sequence diagram shows the different functions admin can do.





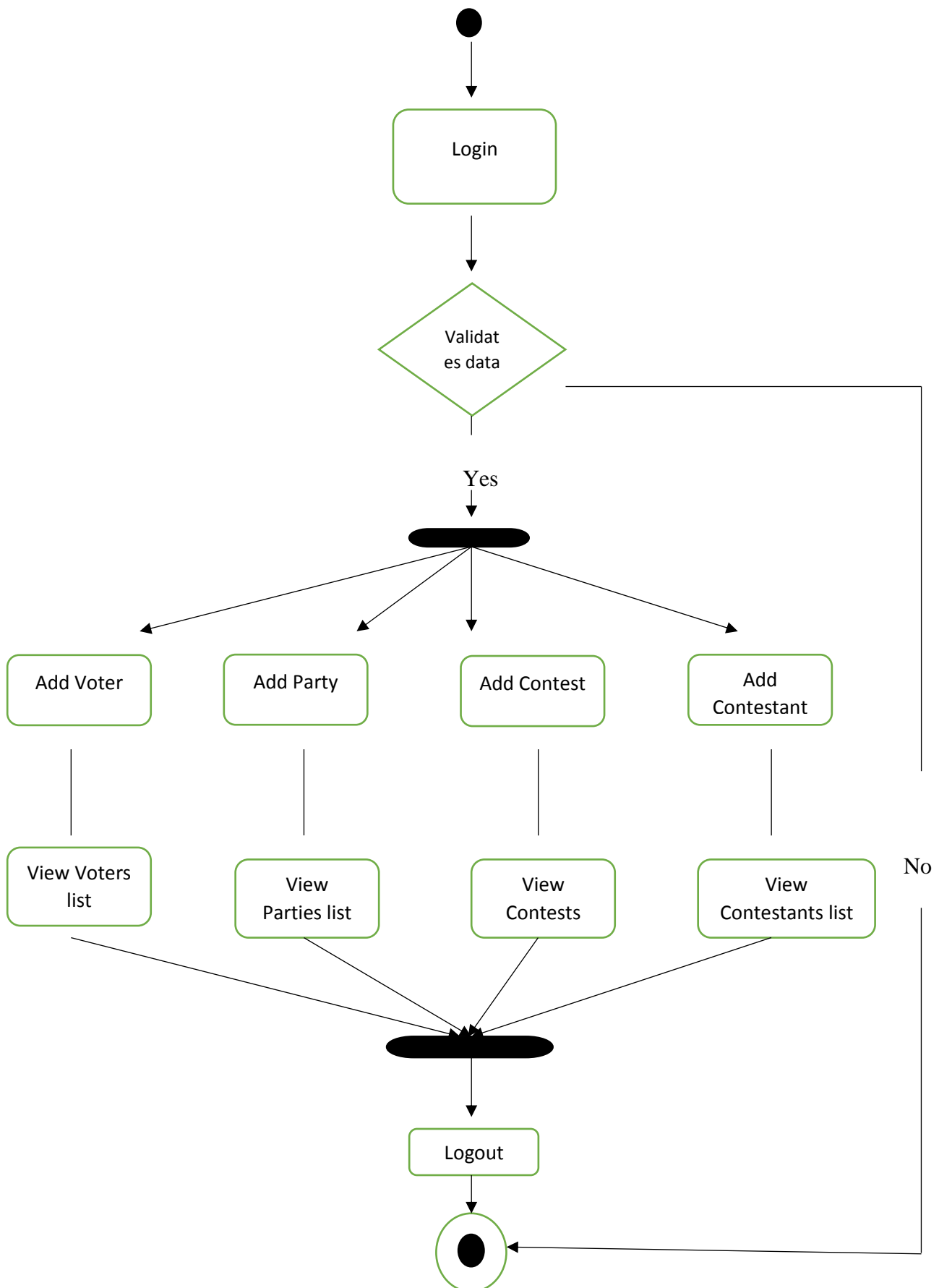
Voter:

Following Sequence diagram shows different functionalities a voter can do.

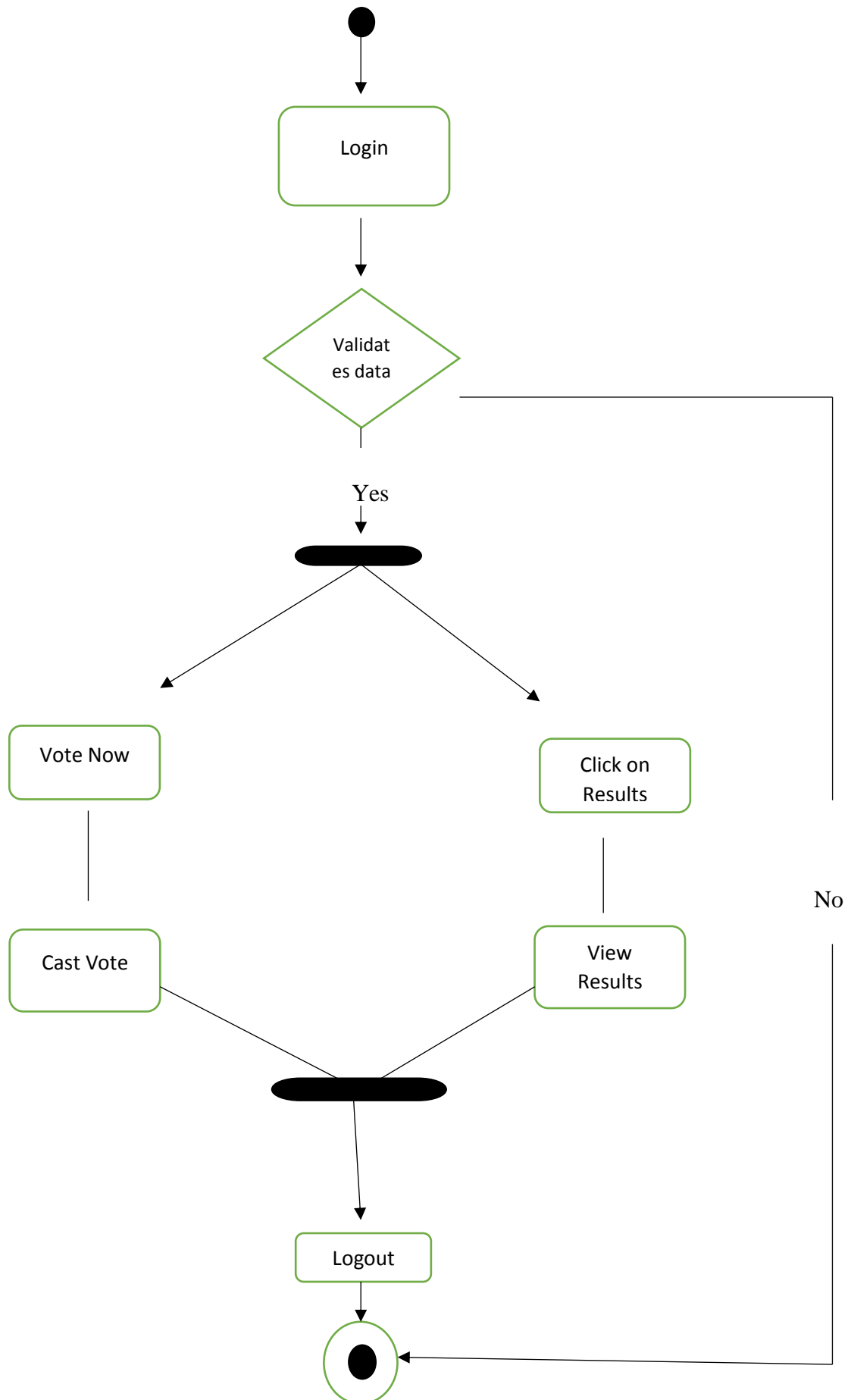


### Activity Diagrams:

Activity diagram describes the dynamic aspects of the system. It represents the flow of one activity after other. It can be described as an operation of the system.

**Admin**

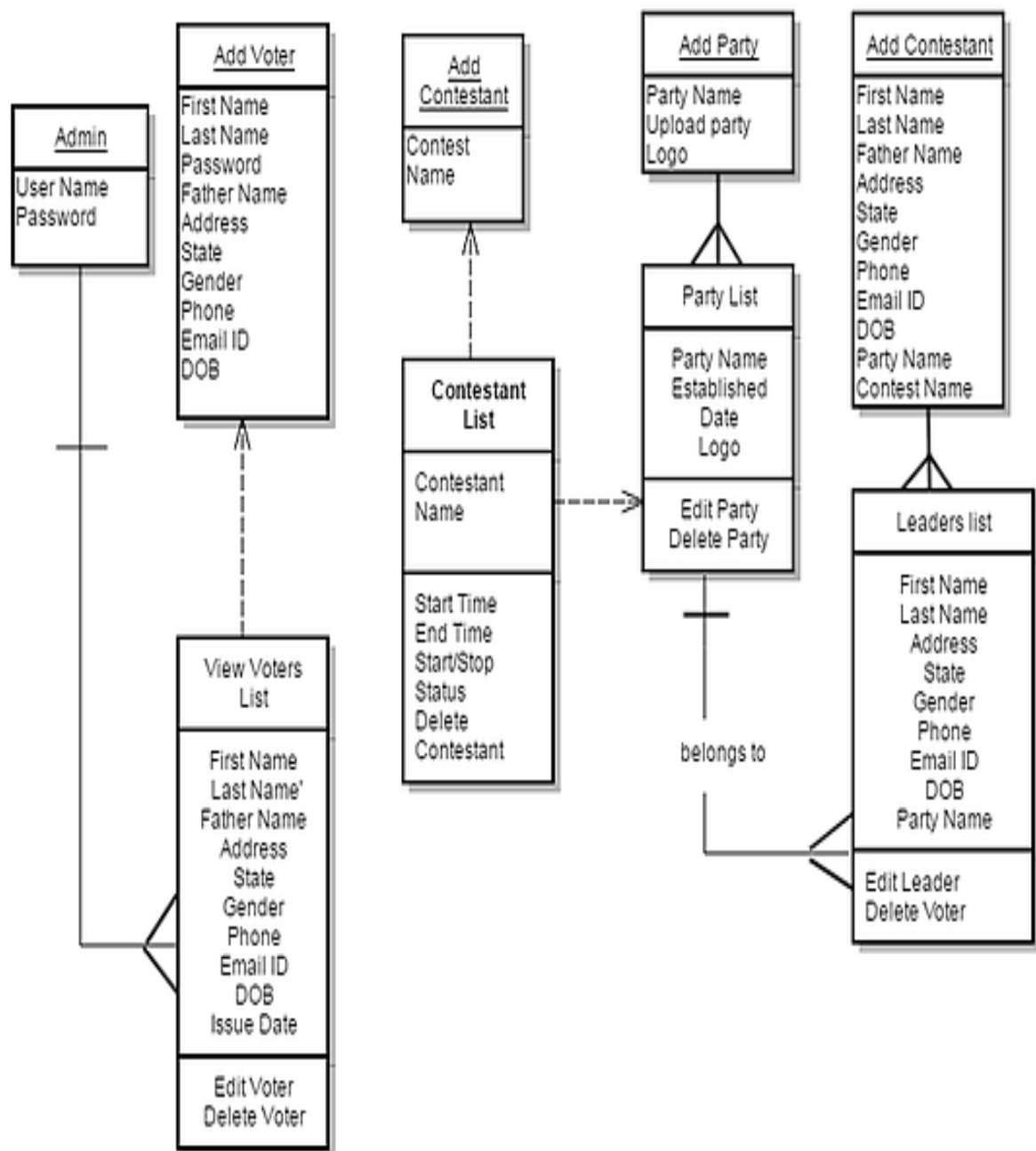
Voter



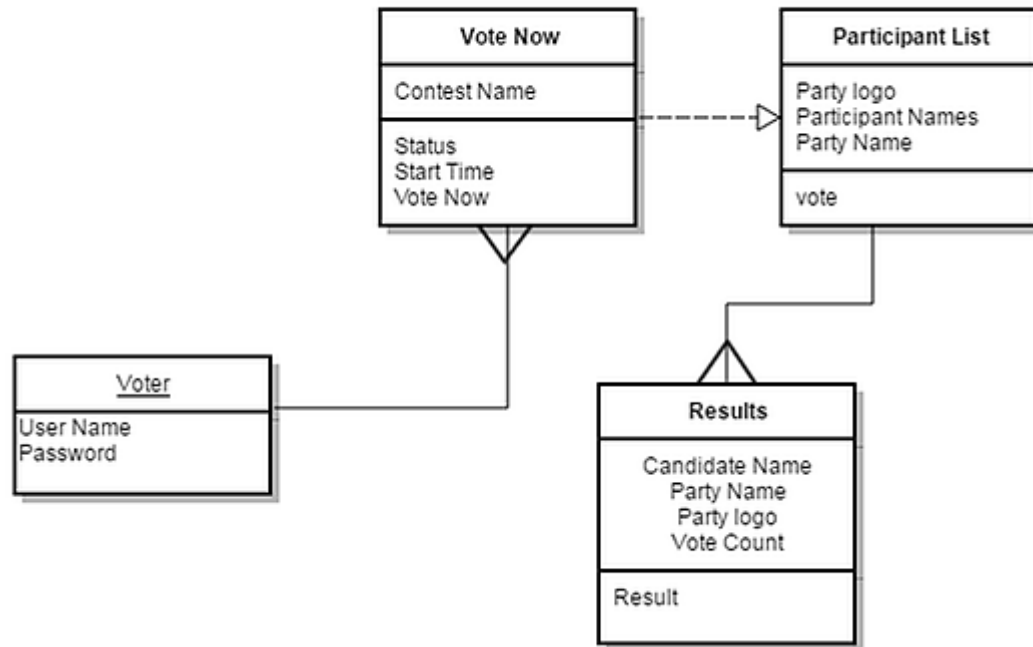
## Class Diagram:

Class diagram describes the structure of a system, by showing system classes, their attributes, operations and the relationship among objects.

### Admin:






## Voter Class diagram



## Critical Process:

There is a functionality where I have to voter after closing the elections, voter should be able to see the results of elections. It is auto counting, I initially don't know how to implement this functionality. Later after doing some research, I found the solution how to implement this based on the vote count in the view Bag. Attached is the screen shot of this. Also I Used SHA Algorithm to encrypt the password. Earlier I know that we can only select the Text mode as Password, from this I learned that there is an algorithm to encrypt the password.

## Winner of the Contest

Candidate Name	Party Name	Party Logo	Vote Count	Result
Narendra Modi	BJP		3	LOST
Sonia Gandhi	Congress		1	LOST
Chandra Shekar Rao	TRS		4	WINNER

## Scenario Level testing:

Please see the attached Online Voting Automation folder for Test Scripts. I have done scenario level testing for login page. Also please see the attached test plan documents for scenario level testing.

## Test Cases:

Name	Description	Steps to Follow	Conditions	Data:	Result
Admin Test Case	Add new voter to database	<ol style="list-style-type: none"> <li>1. Open the Web Application</li> <li>2. Enter admin user name and password</li> <li>3. Click on login</li> <li>4. Click on Manage tab and select</li> </ol>	<ol style="list-style-type: none"> <li>1. Must open web application</li> <li>2. Only Admin can has the privilege to add new voter</li> </ol>	<ol style="list-style-type: none"> <li>1.User Name: Admin</li> <li>2.Password:Admin</li> </ol>	<ol style="list-style-type: none"> <li>1. When the new voter has been, it should be visible in voters list</li> </ol>

		add new voter 5. Enter New voter details			
Voter Test Case	Voter has to cast the vote	<ol style="list-style-type: none"> <li>1. Open the web application</li> <li>2. Enter voter user name and password</li> <li>3. Click on login page</li> <li>4. Click on Vote now tab</li> <li>5. Now cast click on Thumb Symbol and cast the vote</li> </ol>	<ol style="list-style-type: none"> <li>1. Click on login page and enter user name and password</li> <li>2. See the open contest list and vote now</li> </ol>	<ol style="list-style-type: none"> <li>1. User Name: Dave</li> <li>2. Password:12345</li> </ol>	<ol style="list-style-type: none"> <li>1. Voter should be able to cast the vote</li> </ol>

### Project Notes:

- Project proposal has been submitted on 9<sup>th</sup> of June 2016.
- I was asked to choose a different topic with some suggestions
- I have submitted a new proposal on 30<sup>th</sup> of June according to professor suggestions.
- Used SQL server for creating database for Admin and voter functionalities to add voter, party, leader, and contest.

- Firstly I designed a business logic for the project, where to start off initially.
- I followed agile methodology, while managing my fall semester subjects, I spent daily 45-60 minutes designing and writing logics for different roles and functionalities.
- By the end of December, I did the project completely and sent an email to professor about the completion of my project.
- According to my knowledge and taking some help of friends and internet, I have put my 100% to do this project.

**Lessons Learned:**

Learned so many new things with this project, as I mentioned I have gone through some algorithms to solve some issues while I am working on project. Learned how to do both development and testing. I have used my Testing experience in writing test scripts for automating one of the scenario. Learned how to manage different roles and how to give privilege to one particular role.

**References from:**

1. <https://forums.asp.net/t/1336657.aspx?ASP+NET+Membership+and+User+Password+Hashing+SHA1+Issues>
2. <https://forums.asp.net/t/1676709.aspx?How+to+start+a+process+in+ASP+NET+with+administrator+privileges>
3. <https://www.tutorialspoint.com/asp.net/>