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| --- | --- |
| Name | Roll Number |
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**Problem statement:**

The traditional way of voting using paper has problems like long lines at polling stations, as the process of filling out paper ballots and manually counting them is time-consuming. Additionally, manual counting of votes and manual vote casting process etc. are time consuming and causing lack of accuracy. These problems are causing a lack of votes being cast. Another problem of following the traditional way is so many votes are wasted due to the use of ink and these votes are not counted.

**Vision:**

Develop a system named EVM (electronic voting machine) EVM will modernize the voting process making it more efficient and accurate while upholding the principles of transparency and trust in domestic elections. EVM will increase voters turn out while decreasing the vote casting time and overcoming the problem of wastage of cast votes.

**Business Requirements:**

* Ensure that 99.9% of voters can successfully authenticate their identity.
* Improve voting efficiency by reducing average voting time per voter by 50%.
* The system should count the votes 100% to ensure integrity of the election results and provide confidence to voters in the electoral process.
* The system should allow the user to change selected candidate before submission of vote.
* System should not allow user to caste vote after polling time.
* Polling officers should be allowed to see the statistical representation of casted votes for any Seat.

**User Requirements:**

* The System shall provide voters with a confirmation message upon successful submission of their vote to ensure confidentiality.
* Voters shall have the ability to review and verify their selected choices before final submission to ensure the accuracy of votes.
* The system should allow voters to cast their votes from any location with internet access, providing convenience and flexibility.
* The System shall facilitate a seamless voting experience, enabling all voters, regardless of technical proficiency, to complete the voting process within one minute.

**Functional requirements**

* The System shall verify the eligibility of voters by scanning and authenticating Their Social Security (SS) card upon insertion.
* The System shall enable voters to view the list of candidates for both National Assembly and Provincial Assembly.
* The System shall allow a voter to cast vote.
* Poling Officer should be allowed to see the statistical representation of casted votes for any seat.
* Voters shall be able to change the selected candidate before Casting vote.

**Nonfunctional requirements**

* The System shall be capable of verifying Officers through Credentials with an accuracy of 99.0%.
* The System shall provide multiple languages options for voters, including English and Urdu.
* The verification process should not be more than 2 steps.
* A machine should verify voter within 1 minute.
* Candidate's symbols should be large visible from one feat.
* The system should improve voting efficiency by reducing the average voting time per voter by 50%.

**Use cases:**

1. Verify identity.
2. Candidate List
3. vote for MPA.
4. vote for MNA.
5. Display Election Results
6. Change selected candidate.

***USE Case Diagram***

Officer

Voter

**Scenarios:**

Title**: Verify Identity**

* **Precondition**:
* Voters should be registered in the database of the Election Commission.
* **Post condition:**

The Voter’s identity is successfully verified and access to the voting interface is granted.

Include

None

Extend

None

* **Normal Flow of Event**

|  |  |
| --- | --- |
| *User Action:* | *System Response:* |
| 1. Voter insert his/her card. | 2. System verifies Voter SS Card through its Database <alt> |
|  | 3. The System prompts voters to make their candidate selection. <alt> |

* **Alternative:**

If the user is not found in the database:

**System Response**: The system indicates that the user is not registered and advises them to contact polling support for assistance.

If the user has already cast their vote:

**System Response**: The system notifies the user that they have already voted and cannot cast another vote.

Title: **Candidate List**

* Precondition:

Voter successfully Verifies their Identity.

* Postcondition:

The list of candidates for MNA and MPA seats is displayed on the screen.

Include

Verify Identity

Extend

None

**Normal Flow of Event:**

|  |  |
| --- | --- |
| *User Action:* | *System Response:* |
| 1.Voter selects option “show list of candidates” to show list of candidates. | 2.The system fetches the candidate’s information including names and party symbols <alt> |
|  | 3. The system displays list of candidates for MNA seat and MPA seat with their names and respective party symbols. |

**Alternative:**

If the system encounters a connectivity error while displaying the list of candidates for the MNA seat or MPA seat:

* The system displays error message indicating inability to display list of candidates for MNA or MPA seat due to connectivity error and system prompts voter to retry operation or notify technical support.

Title: **Vote For MNA**

* Precondition:

1.<<include>> Verify Identity.

2.<<include>> Candidate List

* Postcondition:

The system successfully records the voter’s selection for MNA seat.

Include

* Verify Identity
* Candidate List

Extend

* Change Selection

**Normal Flow of Event:**

|  |  |
| --- | --- |
| *User Action:* | *System Response:* |
| 1.User selects “Caste vote for MNA” to cast vote for MNA seat | 2. System registers the voter’s selected candidate for MNA seat<alt> |
|  | 3. System confirms successful registration of vote by showing confirmation message. |

**Alternative:**

* If the voter selects two candidates:

**System Response:** The system notifies the voter that only one candidate can be selected per seat and prompts them to choose only one candidate.

If the voter makes no selection:

**System Response**: The system returns the voter back to the Candidate list, prompting them to select.

Title: **Vote For MPA**

* Precondition:

1.<<include>> Verify Identity.

2.Voter must have verified in the system as eligible to cast vote and system has displayed list of candidates for MPA seat.

* Postcondition:

The system successfully records the voter’s selection for MPA seat.

Include

* Verify Identity
* Candidate List

**Extends**

* Change Selection

**Normal Flow of Event:**

|  |  |
| --- | --- |
| *User Action:* | *System Response:* |
| 1.User selects “Caste vote for MPA” to cast vote for MPA seat | 2. System registers the voter’s selected candidate for MPA seat <alt> |
|  | 3. System confirms successful registration of vote by showing confirmation message. |

**Alternative:**

If the voter selects two candidates:

**System Response:** The system notifies the voter that only one candidate can be selected per seat and prompts them to choose only one candidate.

If the voter makes no selection:

**System Response**: The system returns the voter back to the Candidate list, prompting them to select.

Title: **Display Election Results & Statistics**

* **precondition:**

All casted votes have been accurately counted by the system. The polling officer has successfully authenticated their identity to access the system for obtaining the static representation of results for both MNA and MPA seats.

* **postcondition**:

The results for both MNA and MPA seats are presented in suitable formats such as charts, or tables.

Include

* Verify Identity

Extend

* None

**Normal Flow of Event:**

|  |  |
| --- | --- |
| *User Action:* | *System Response:* |
| 1.Polling officer clicks “Statically representation of result for MNA seat” to view the results for MNA/MPA seat | 2. System retrieves election results data for the MNA and MPA seat <alt> |
|  | 4. System generates data in form of tables <alt>  5. Static representation includes Name of candidate on MNA seat as well MPA Seat, total number of votes received by each candidate and indicating the leading candidate. |

**Alternative:**

If the results for both MNA and MPA seats are not displayed due to a connectivity error or system fault.

**System Response:** The polling officer is notified that the results cannot be displayed due to a connectivity error or system malfunction. The system prompts the officer to check the network connection and system status. If the issue persists, the officer is instructed to contact technical support for assistance in resolving the connectivity or system error.

**Title**: **Change Selection**

Precondition:

The voter must have selected a candidate.

Post Condition:

The voters have successfully changed the selected Candidate.

Include

* Verify Identity
* Cast Vote

Extend

* None

**Normal Flow of Event:**

|  |  |
| --- | --- |
| *User Action:* | *System Response:* |
| 1. Voter deselect selected candidate. | 2. System prompts voter to select candidate again. <alt> |
| 3. Voter select new candidate from list. | 4.System confirm the voter’s selected candidate. |

**Alternative:**

If the Voter does not select a candidate.

**System Response:** System Prompts the voter to first select a candidate from the list before proceeding.

User Stories:

* As a Client I would like the system to verify voters through Social Security (SS) Card so that only legal voters are casted.
* As a Client I want the polling officer to verify their identification before accessing the system, ensuring that only authorized person can have access.
* As a voter, I want a list of candidates for MNA and MPA seats, so that I can make an informed decision while casting my vote.
* As a voter, I can cast my vote by selecting only one of the candidates MNA/MPA (his/her name, Symbol) from the available list of candidates so that my vote doesn’t go waste through multiple selection.
* As a voter, I want the option to change my selected candidate before finalizing my vote, so that I can vote for the candidate I support.
* As an Election Official, I want to be able to view the casted votes and conduct analysis for any candidate for both MPA and MNA seats, so that I can proceed with presenting the election result.

**3C’s**

As a Client I would like the system to verify voters through Social Security (SS) Card so that only legal voters are casted.

* **Conversation:**

Client: I require a mechanism to ensure that only verified voters can cast their vote.

Developer: Could you please specify how you would like voters to be verified?

Client: Voters should be verified based on their Social Security card. They should be able to insert their Card into System, which will then fetch their data and verify it using the Nadra database.

Developer: understood, Thank you for clarifying.

* **Confirmation:**

The feature to verify voters through their SS card.

As a Client I want the polling officer to verify their identification before accessing the system, ensuring that only authorized persons can gain access.

* **Conversation:**

Client: I need a robust verification mechanism for polling officers. They must confirm their identification before gaining access to the system.

Developer: could you please provide parameters used for verification process.

Client: The verification will be based on their credentials which include a username and password provided by officials.

Developer: could you clarify what kind of username and password will be?

Client: The username can be up to 20 characters long and password will be 10 characters.

Developer: alright, thank you for clarification.

* Confirmation:

Create a separate feature for election officials, allowing them to authenticate using their username and password.

As a voter, I want a list of candidates for MNA and MPA seats, so that I can make an informed decision while casting my vote.

* **Conversation:**

Voter: I need to the list of candidatesfor both MNA and MPA seats.

Developer: Could you clarify why you need access to these lists.

Voter: I want to know about candidates before I cast my vote.

Developer: Would you prefer to see a combined list for both seats, or separate lists for MNA and MPA candidates?

Voter: I think separate lists would be clearer for me.

Developer: Alright, we'll make sure to provide separate lists for MNA and MPA candidates.

* **Confirmation:**

Implement Separate lists of candidates for MNA and MPA Candidates.

As a Voter, I can cast my vote by selecting only one candidate MNA/MPA from the available list of candidates so that my vote doesn’t go waste through multiple selection.

* **Conversation:**

Voter: I must be able to cast my vote for both MNA or MPA seats.

Developer: Could you clarify if you want cast for your vote for both seats?

Voter: I want the option to vote for either MNA or MPA. If I only want to vote for MNA and not MPA, that should be okay too.

Developer: Understood.

* **Confirmation:**

The System will record voter choice for respective seat.

As a voter, I want the option to change my selected candidate before casting the vote, so that I ensure I can vote for the candidate I support.

* **Conversation:**

Voter:I want to able to change my selection in case of selected Candidate by mistake.

Developer: Can you clarify if you want to only deselect or reset process?

Voter: It should only deselect selected candidate and show the list of candidates again.

Developer: alright, thank you.

* **Confirmation:**

The system shall allow voters to deselect selected candidate and show the list again.

As an Election Official, I want to be able to view the casted votes and conduct votes and conduct analysis for any candidates for both MPA and MNA seats, so that I can proceed with presenting the election result.

* **Conversation:**

Client: I need Interface where Election official can view casted votes analyze them for candidates running for both MPA and MNA seats.

Developer: Can you clarify you want to see a breakdown of votes by candidates and constituency?

Client: Yes, election officials can see the number of votes each candidate received in each constituency both for MNA and MPA seats.

Developer: understood, could you specify what kind of analysis you’re looking for?

Client: Mainly interested in seeing the overall distribution of votes among candidates.

Developer: In terms of presenting the Results, are there specific formats?

Client: A combination of charts and tables would be useful.

Developer: Perfect, thanks for clarifying.

* **Confirmation:**

Add a feature for separate interface where Results are presented to officials.