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E-voting System Requirements Document

1. Introduction

1.1 Purpose of the System

The purpose of our e-voting system is to simplify the voting process in South Carolina for both the voter, and the election commission. It will provide support for automated tasks such as voter registration and unofficial tallies.

1.2 Current System

South Carolina's current voting system is electronic in nature, using a limited-capability software activated by a physical cartridge called a Personal Electronic Ballot (PEB). The system is activated by the PEB, and ballots are stored on the PEBs for transport to the election commission. The current system does not allow for built in registration and registration status checking, and does not provide an unofficial tally.

1.3 System Objectives

A replacement e-voting system should make it easier for citizens to vote by accessing registration information to allow a voter to vote at any South Carolina voting precinct, register to vote at the precinct (with valid South Carolina identification), and check their registration status. It should protect against voter fraud by cross-checking cast votes with registered voters' information, and by supporting recounts. Overall, the new system should streamline the voting process for all involved by automating processes that were once manual, and by increasing accessibility.

2. Proposed System

2.1 Functional Requirements

The proposed system will need to assist in:

- voter registration
    - a South Carolina resident can register to vote
    - prospective voters need to provide valid South Carolina ID in order to register
- voting management
    - the election commission should be able to edit the positions up for election, the candidates for each position, and any public propositions
- voting
    - voters need to identify themselves by providing personal information that they are registered under or their South Carolina ID
    - the system must notify the user when a selection is made or cancelled
    - before the official ballot is cast, the system must allow the voter to review, confirm, or change their choices
    - a voter can only vote once
- vote counting
    - the system must be able to provide an unofficial tally for the precinct once voting closes
    - votes will be transferred to the central election commission for the official count
    - the system must be capable of a recount

2.2 Non-functional Requirements

2.1 Security

Due to its dependence on voters' personal information, any information regarding a ballot or voter must be encrypted.

2.2 Performance

Speed is a factor, because voting slowdown could decrease voter experience and confidence, but security should be the priority to ensure no loss to voter data.

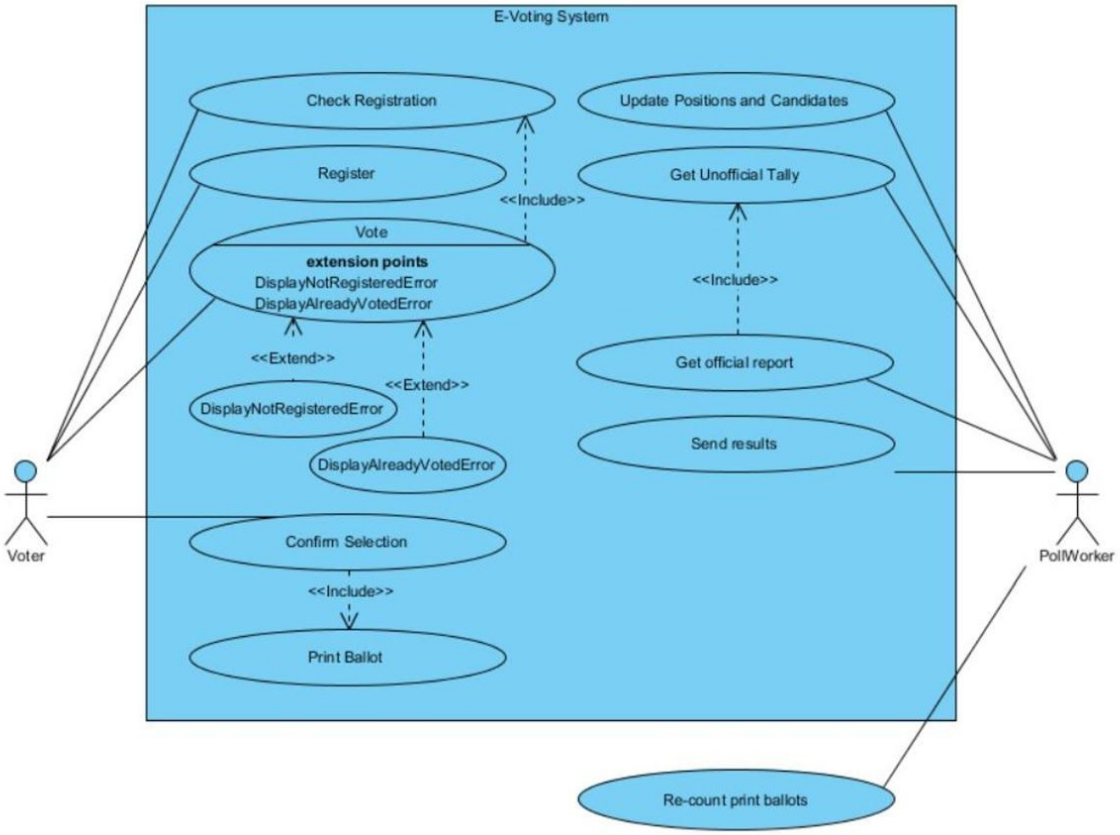
2.3 Reliability

The software must be reliable enough to accurately count votes while still being highly available available to take votes during operation.

2.4 Usability

The software will be extremely simple for users, this is because users will be of all intelligences. Text should be minimized and descriptive infographics shall be used.

3. System Models



CheckRegistration	Voters look up their registration information by some form of personal information that was used to register.
Register	A voter provides the necessary information to register to vote in South Carolina, assuming they have a form of valid South Carolina identification.
Vote	If the voter is registered, they are able to carry out the voting selection process through a series of screens displaying their options.
ConfirmSelection	After the voter goes through the selection process, they are presented with a page containing their choices, and asked whether they wish to confirm their choices, or go back and change them.
PrintBallot	While ballots are stored electronically, they are also printed for the purpose of executing an outside recount.
UpdatePositionsAndCandidates	The pollworker or other employee of the election commission sets the seats up for election, and the candidates for each seat.
GetUnofficialTally	The pollworker requests an unofficial tally of the precincts ballots once voting has concluded.
SendResults	The precinct's results are sent to the state election commission to be counted in the official results.
GetOfficialReport	An official report of the precinct's results is requested by the election commission to include in the state's official results.
RecountPrintBallots	In the event of a recount, the print ballots are examined by pollworkers in order to ensure that the system is not at fault.

CheckRegistration

Initiated by Voter

Flow of Events

1. The voter is asked for a form of their personal information.
2. The system checks the registration database for voters matching that information.
3. If the voter is found, the system displays a message that the voter is registered and able to vote.
4. Otherwise, the voter is prompted to register with their South Carolina identification.

Entry Conditions

- The Voter is present at a South Carolina voting precinct.

Exit Conditions

- The Voter is either able to proceed with voting, register to vote, or cannot register due to lack of identification.

Register

Initiated by Voter

Flow of Events

1. Ask the User if they are:
    a. A US citizen?
    b. At least 18 years old on Election Day, Nov 8?
    c. Living at a South Carolina address?
    d. Not In jail or in prison for a felony?
    e. Not Currently judged incompetent by a court?
    f. Not Serving any part of a sentence for violating an election law?
2. Records:
    a. First Name
    b. Last Name
    c. Middle Initial
    d. Sex
    e. Race
    f. SS Number
    g. Current Address
    h. Mailing Address
    i. Birth Date
    j. Phone Number
    k. Copy of ID

l. Previous Registration Information
    i. Precinct
    ii. County
    iii. State
3. Display Info entered and Asks User to Verify it is correct
4. Records User's Digital Signature
5. Submits Credentials for Approval

Entry Conditions

User is at a precinct and wants to register to vote.

Exit Conditions

User has canceled registration process or user has completed and signed registration.

Vote

Initiated by Voter

Flow of Events

1. The system presents the Voter with a screen displaying a position up for election, the candidates for that seat, and an option to abstain.
2. The Voter makes their selection.
3. The system notifies the Voter of their selection, and the Voter is prompted to move to the next page.
4. 1. - 3. are repeated 1...n times depending on how many seats are up for election
5. If any public propositions are up for a vote, they are presented to the Voter with a selection of either "Support", "Do not Support", or "Abstain".
6. *Confirm Selection* is initiated.

Entry Conditions

- The Voter is registered.

Exit Conditions

- The Voter has made valid selections on each page.

ConfirmSelection

Initiated by *Vote*

Flow of Events

1. The system takes the Voter's selections from *Vote* and shows the Voter a page detailing their selections.
2.

    a. The user will confirm their selections and officially cast their ballot.
    b. The user wishes to change one or more selections and is sent back to *Vote.*

Entry Conditions

- The Voter has carried out the voting selection process.

Exit Conditions

- The Voter officially casts their ballot, or moves back to the selection process.

PrintBallot

Initiated by the system

Flow of Events

1. The system prints out a physical copy of a Voter's ballot in addition to electronic storage.

Entry Conditions

- A Voter has cast an official ballot.

Exit Conditions

- A physical ballot is kept for certification purposes.

UpdatePositionsAndCandidates

Initiated by PollWorker

Flow of Events

1. The system presents the PollWorker with a form to submit:
    a. The title of the seat
    b. The candidates up for election
2. The PollWorker enters necessary information
3. If there is another seat to be added, 1. - 2. are repeated.
4. If there is a public proposition to be included in the election, the PollWorker provides:
    a. The title of the proposition
    b. A short description of the proposition
5. The system saves the changes to the voting selection process.

Entry Conditions

- Candidates or the seats they are running for have changed, or it is a new election.

Exit Conditions

- The selection process is up-to-date.

GetUnofficialTally

Initiated by PollWorker

Flow of Events

1. The PollWorker requests an unofficial report of votes made at the precinct.
2. The system counts the stored electronic ballots and presents results to the PollWorker prior to being sent to the election commission.

Entry Conditions

- Voting has ended at the precinct.

SendResults

Initiated by PollWorker

Flow of Events

1. The system transmits the official report of the voting precinct generated in *GetOfficialReport* to the election commission to be used in the state-wide official count.

Entry Condidions

- Voting has ended at the precinct.

GetOfficialReport

Initiated by PollWorker

Flow of Events

1. The system generates an official count of votes at the precinct with any other relevant information (e.g. demographics, activity spikes).

Entry Conditions

- Voting has ended at the precinct.

RecountPrintBallots

Initiated by PollWorker

Flow of Events

1. In the event that there is suspicion that the results are tainted due to an error in record keeping or in the system itself, the results are recounted by hand from the print copies generated during voting.
2. The results are checked with the electronic results within a reasonable margin of human error.

Entry Conditions

- An official report has been generated.
- There is some problem with the official count.

Exit Conditions

- The recount either supports or supplants the electronic count.