Software Requirements Specification

for

3W Voting System

Version 1.0 approved

Prepared by Yizhe Wang(wang5959),

Yuanli Wang(wang8662),

Dengyuan Wang(wang8660)

Team 25

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Revision History

Name	Date	Reason For Changes	Version
3W Voting System	Oct 5th 2018	First write up with preparation	0.1 Alpha
3W Voting System	Oct 6th 2018	Second edit after asking TA for our assumptions	0.2 Alpha
3W Voting System	Oct 7th 2018	Third edit in order to check uncertain part.	0.3 Alpha
3W Voting System	Oct 8th 2018	Final edit before the due date after visit professor's office hour	1.0 Beta

1. Introduction

1.1 Purpose

The purpose of this document is to present a detailed description of the Voting System. It will explain the purpose and features of the system, the interfaces of the system, what the system will do, the constraints under which it must operate and how the system will react to external stimuli. This document is intended for users (programmers, testers, and election officials) of the software and also potential developers.

1.2 Document Conventions

This Document was created based on the IEEE template for System Requirement Specification Documents.

1.3 Intended Audience and Reading Suggestions

- Typical Users, such as election officials, who want to use Voting System for getting the result of the election (e.g. winners, type of election, number of seats).
- Advanced Users, such as programmers and testers, who want to do the unit testing and system testing of the Voting System.

1.4 Product Scope

Voting System is a tool that can perform two types of voting: Instant Runoff Voting and Open Party List Voting. Election officials could use it to get the result of the election from the input file (e.g. winners, type of election, number of seats). These will be displayed on the screen. A detailed audit file about the progress of the election will also be generated. Advanced Users, such as programmers and testers could use it to do unit test and system test. So the reliability of the system will be ensured.

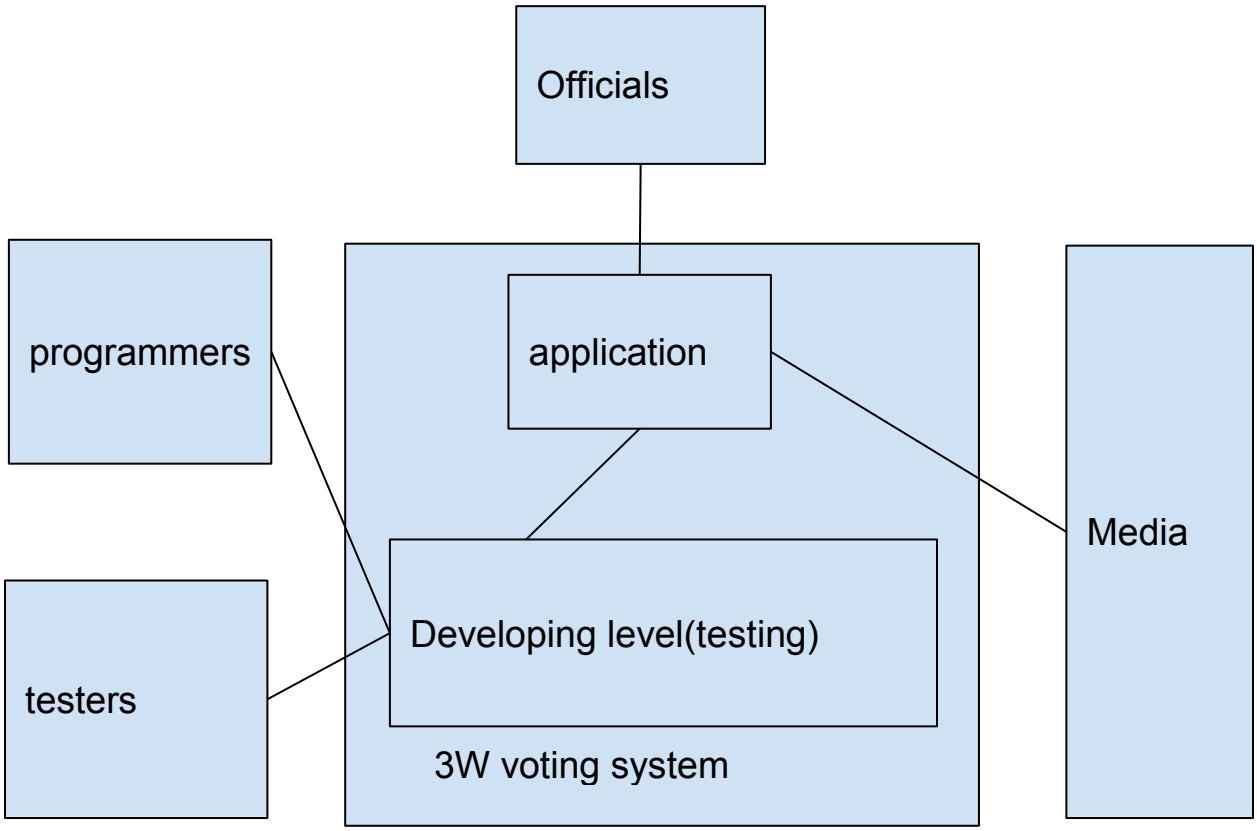
1.5 References

IEEE Template for System Requirement Specification Documents:
https://goo.gl/nsUFwy

2. Overall Description

2.1 Product Perspective

The 3W system so far will be the stand-alone system. The long-term goal is for this system to be part of an integrated online voting system. The 3W voting system is designed to handle both of the Instant Runoff Voting and Open Party List Voting. It will take the csv file and output the audit file. It was developed with Java language and need to be cable to run with command prompt and Eclipse on up-to-date CSELabs machines which has Ubuntu 18.04.1 LTS



2.2 Product Functions

- Election Officials: Officials are able to input the csv file, get the output on screen and audit file and share results to media.
- Testers: Testers are able to do system testing
- Programmers: Programmers are able to do unit testing

2.3 User Classes and Characteristics

- Typical Users, such as Election Officials, who want to use 3W voting system for handling either instant runoff voting or open party list voting.

- Advanced/Professional Users, such as testers who are in charge of doing system testing and programmers who need to do the unit testing.

2.4 Operating Environment

3W could be run on every CSE lab machine which has Ubuntu 18.04.1 LTS installed. And 3W could be run either at the command prompt or through Eclipse.

2.5 Design and Implementation Constraints

3W voting system is developed in Java, it has been built on top of the Eclipse Platform. 3W voting system will handle both Instant Runoff Voting and Open Party List Voting. 3W voting system takes a csv file and it will output the audit file, the system could run 100,000 ballots within 8 minutes. There is no communication protocols information from the requirement and there is no special safety or security requirement. All functions and components we use to develop 3W Voting System is based on this document which follow the IEEE standard.

2.6 User Documentation

The client does not ask for the User Documentation in the commission. As for responsible developers, we do not assume anything that is not provided. This section will remain incomplete and unknown until the updated information is provided with us.

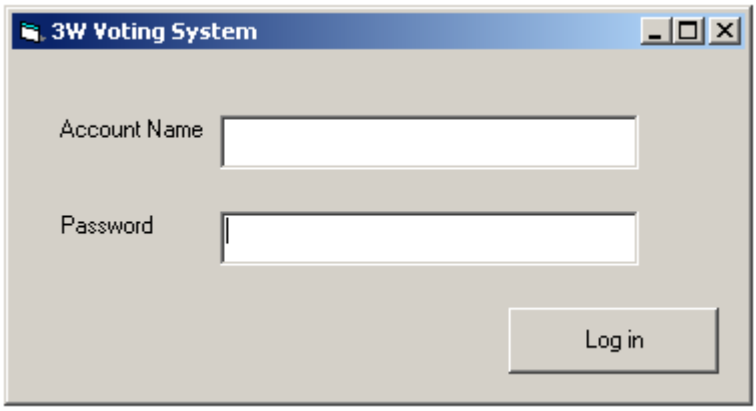
2.7 Assumptions and Dependencies

According to the commission sheet, this system will be run under three assumptions. There are no numbering mistakes in the file. There are no errors in the ballots, and the system that we will run our program will be up-to-date CSELabs machines.

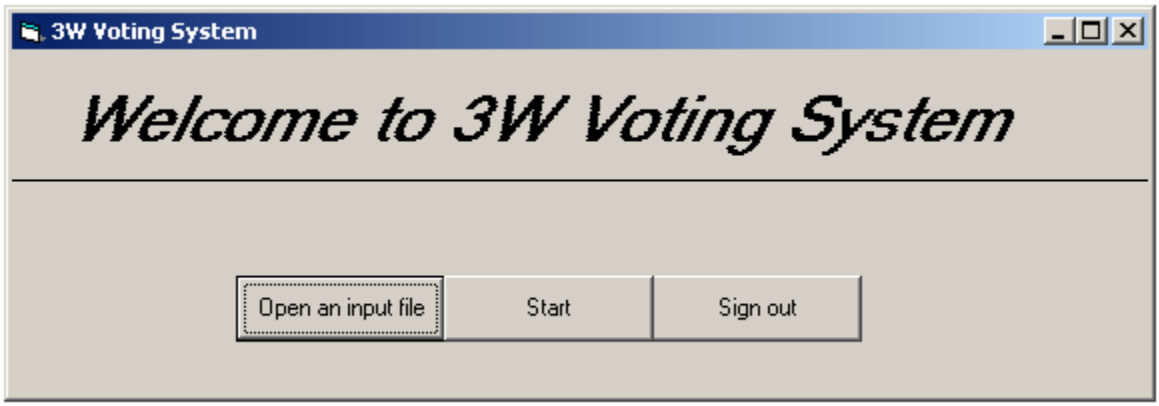
3. External Interface Requirements

3.1 User Interfaces

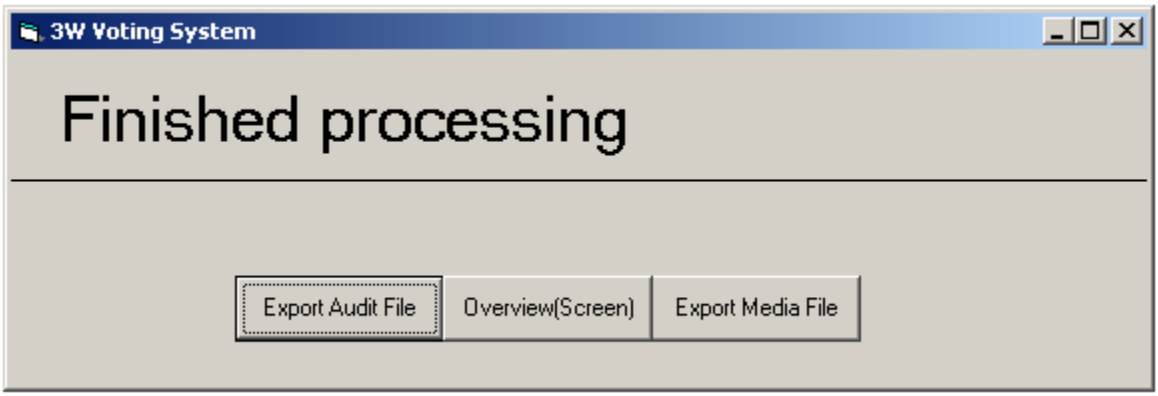
1.Sign In



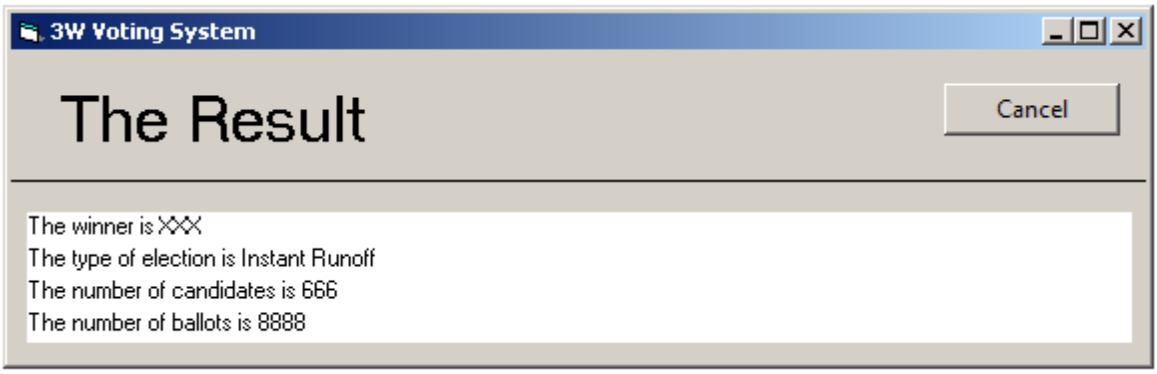
2. Load Data File



3. Process Finished

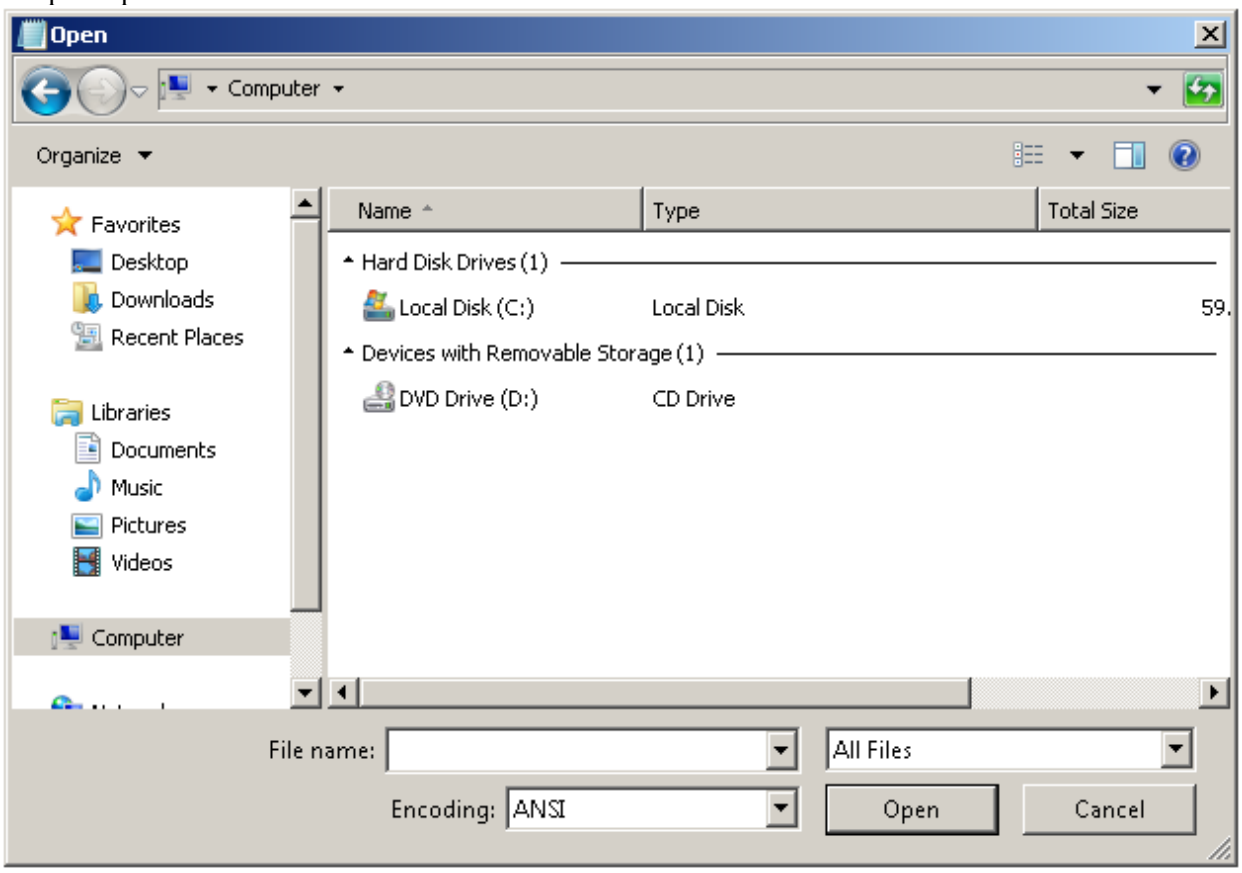


4. Overview(Screen)

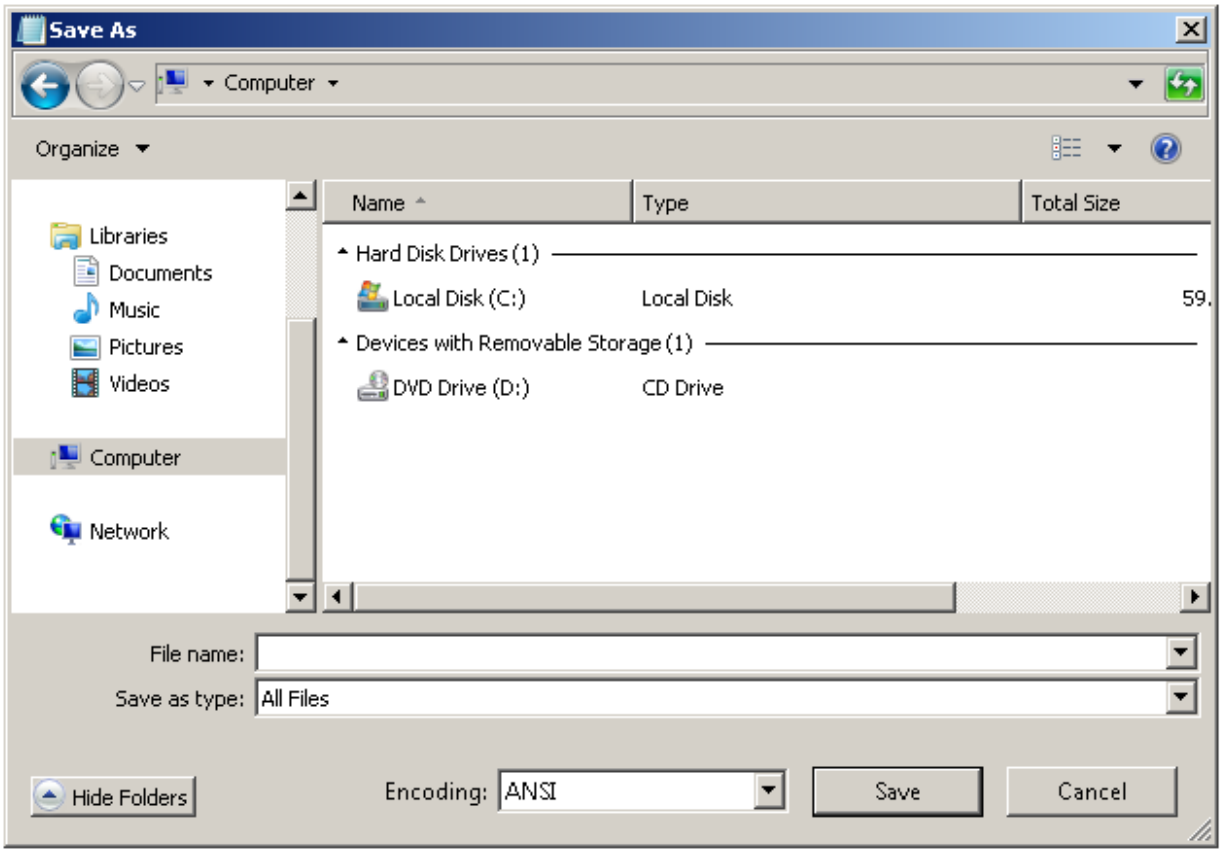


5. Sign out

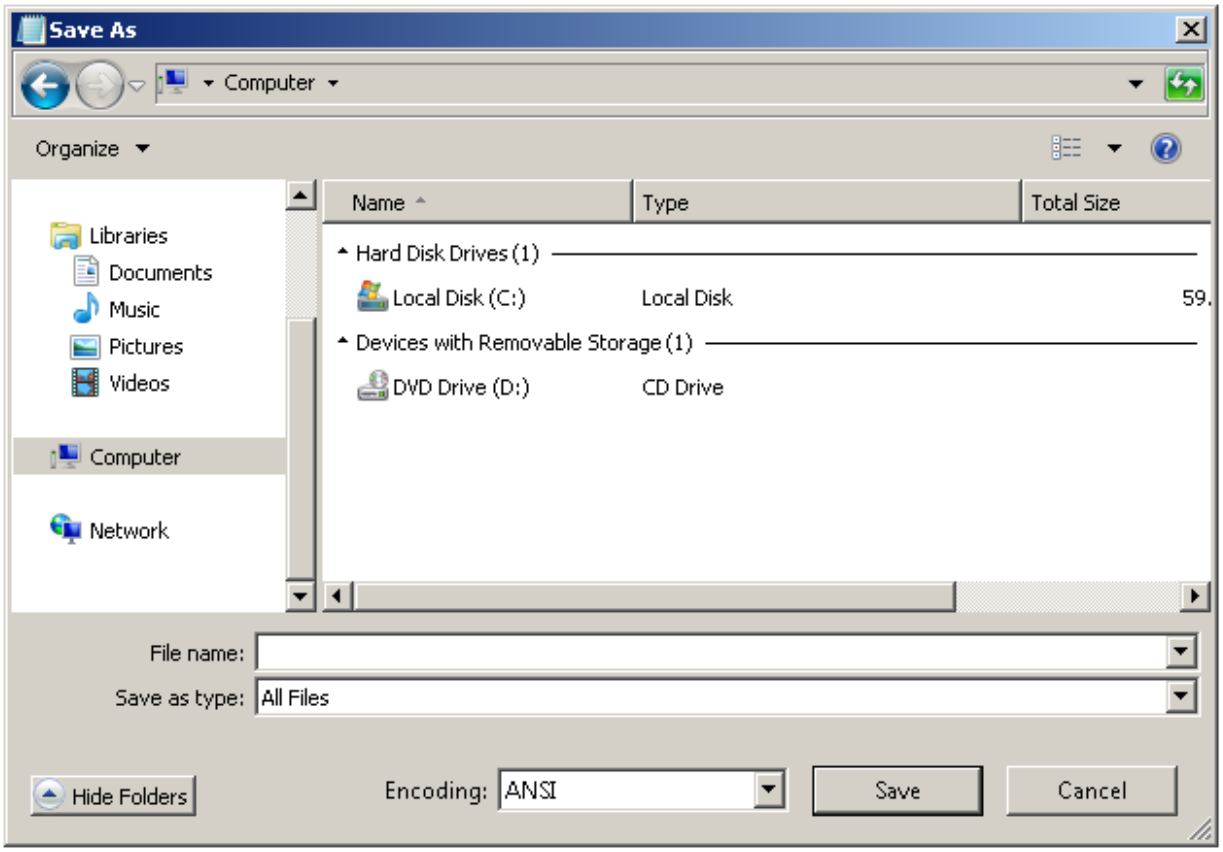
6. Open input file



7. Export Audit File



8. Export Media File



3.2 Hardware Interfaces

The minimum hardware requirements of 3W Voting System are a Intel(R) Xeon(R) CPU E5-2683 v3 @ 2.00GHz with six processors. The CPU frequency will be 2GHz and minimum cache size will be at least 35840KB. The address size will be 43 bits physical, 48 bits virtual.
Additional information can be found on section 2.7 of this document.

3.3 Software Interfaces

3W Voting System requires Java to be installed on the system, more specifically java version "1.8.0_151" or for its latest release. Additional information can be found on section 2.7 of this document.
3W Voting System can be connected with a MySQL or SQLite database to distinguish users' level by loading users' data.

3.4 Communications Interfaces

3W Voting System does not require an internet connection to perform. All actions will be done in the local machine.

4. Functional Requirements

Use Cases for all users(Officials, Testers and Programmers)

4.1 Sign in

Name	Sign in
ID	VS_U001
Description	All users, including election officials, testers and programmers, are able to sign in to the 3W voting system to accomplish their own duties
Actors	Election officials, testers and programmers
Organizational Benefits	This basic use case is one of the keystones of the system. It allows users to sign in so that the information in the system could be updated and make the election and testing process naturally and in a healthy structure
Frequency of Use	Every single time during the election when election officials open the 3W voting system to calculate the result and every single time when testers and programmers want to do system testing and unit testing.
Triggers	Users open the system and try to access any contents of it.
Preconditions	The system opens successfully with no error happened.
Postconditions	After input the account name and password, the user is able to get into the system and access other contents in it.
Main Course	1. Users are in the Sign in page(See EX_1) 2. Users input the account name(See AC_1) 3. Users input the password 4. Users click sign in (See AC_2)
Alternate Courses	AC_1 Users forget the account name or password 1. Display “You need to contact the programmer to reset your password or get your account name”. 2. Return to the main course step 1 AC_2 Users input the unmatched account name and password 1. System will notify user that we do not recognize your account name and/or password, and please try again. 2. Return to the main course step 1
Exceptions	EX_1 Users are not able to stay in the sign in page 1. System will send notification to the programmer

4.2 Load data file

Name	Load data file
ID	VS_U002
Description	It allows the election officials to specify the place where the vote data is saved. Then, load the data included into the 3W voting system.
Actors	Election officials, testers and programmers
Organizational Benefits	This basic use case is one of the keystones of the system. It allows users to specify the data source(csv file) and load them.
Frequency of Use	Every single time during the election when election officials open the 3W voting system to calculate the result.
Triggers	Users click the load data file button
Preconditions	The system opens successfully with no error happened. And the user successfully signed in as Election officials. The input file has already been in current directory.
Postconditions	After selecting the input file, the system will load the data stored in it and be ready to start generating results. The start button would be enabled
Main Course	1. User logged into the main page. 2. User click the open button 3. User pick the input file from the pop up window. 4. System loads the data included in that file, and show the file name on screen. (See AC_1, AC_2 and EX_1)
Alternate Courses	AC_1 Users pick the wrong file to load 1. Return to main course step 2 AC_2 File format picked by users are not matched 1. System will raise an alert to tell users that the file format they select are not csv 2. Return to main course step 2
Exceptions	EX_1 The file could not be opened(authorization error) 1. System will display an alert on the screen: Can not open the file: *.cvs authorization error. 2. Return to main course step 1

4.3 Start processing the vote data

Name	Start processing the vote data
ID	VS_U003

Description	Users could press the button and start to process the vote data loaded in the system
Actors	Election officials, testers and programmers
Organizational Benefits	It increases the convenience, users do not need to input the command line in the terminal
Frequency of Use	When the validation checking of input file is passed and the vote data included in that file has been successfully loaded.
Triggers	Election officials click the start button
Preconditions	Election officials sign into the system with no errors occur and the input file is validated and the vote data included has been successfully loaded.
Postconditions	After clicks the start button, the system starts running until finish. Then the Export audit button and Display info button will be enabled.
Main Course	1. Users are in the main page 2. User clicks the start button(See AC_1) 3. System starts to process the vote data based on the vote type (read from file) (See EX_1) 4. After finished, enable the Export Audit file button and Overview button. 5. Return to main page
Alternate Courses	AC_1: No voting data has been loaded 1. System will send an alert on the screen: No voting data has been loaded. 2. Exit the start process part and return to main page.
Exceptions	EX_1: Running time exceeds the threshold 1. System will send an alert on the screen: Running time exceeds the threshold. 2. Stop current processing data procedure 3. Exit the Start process part and return to main page

4.4 Export audit into file

Name	Export audit into file
ID	VS_U004
Description	Users could press the button and export the audit of the election process into file. Then, they could save it or share the file with media.
Actors	Election officials, testers and programmers
Organizational Benefits	It increases the convenience and security. Allow users to save the result which contain the details of the election.

Frequency of Use	When the user has successfully signed into the system with no error occurs and the loaded data has finished the data process procedure
Triggers	Election officials click the export audit button
Preconditions	Election officials sign into the system with no errors occur and the data loaded from the specified file has finished the data process procedure.
Postconditions	After clicks the export audit button, the system start export the audit into file.
Main Course	1. Users clicked the export audit file button 2. User specifies a file name (the format is auto-filled, and invalid characters will be auto-denied). 3. System creates a file named as specified and exports the audit into the file(See AC_1,EX_1)
Alternate Courses	AC_1 The file name is already exist 1. System will raise an alert to tell users that the file name they input are already exist 2. If the user chose to replace it: delete the existing file and return to main course 3. 3. Return to main course 1
Exceptions	EX_1 The file could not be created(authorization error) 1. System will display an alert on the screen: Can not create the file, authorization error. 2. Return to main course step 1

4.5 Display the vote report on screen

Name	Display the vote report on screen
ID	VS_U005
Description	Users could press the button and display the information about the election process on the screen.
Actors	Election officials, testers and programmers
Organizational Benefits	It increases the convenience. Allow users to view the result without exporting it into file.
Frequency of Use	When the user has successfully signed into the system with no error occurs and the loaded data has finished the data process procedure
Triggers	Election officials click the display info button
Preconditions	Election officials sign into the system with no errors occur and the data loaded from

	the specified file has finished the data process procedure.
Postconditions	After clicks the display info button, the system start display the information about the election on screen.
Main Course	1. Users clicked the Overview button 2. System displays the information about the election on the screen.(See AC_1, EX_1) 3. If the user press back button, exit the display part and return to main page. Otherwise waiting for further instruction.
Alternate Courses	AC_1 User click the wrong button 1. Users could click the cancel button from different interfaces 2. Users will back to Main Course Step 1
Exceptions	EX_1 The window is not show up 1. Sending error detection to programmers 2. Return to main course step 1

4.6 Export media file

Name	Export media file
ID	VS_U006
Description	Users could press the button and export the file for sharing with media.
Actors	Election officials, testers and programmers
Organizational Benefits	It increases the convenience and security. Allow users to save the result and they could share the first-hand result file with media.
Frequency of Use	When the user has successfully signed into the system with no error occurs and the loaded data has finished the data process procedure
Triggers	Election officials click the export media button
Preconditions	Election officials sign into the system with no errors occur and the data loaded from the specified file has finished the data process procedure.
Postconditions	After clicks the export Media button, the system start exporting the file for sharing with media.
Main Course	1. Users clicked the Export Media file button 2. User specifies a file name (the format is auto-filled and invalid characters will be auto-denied). 3. System creates a file named as specified and exports all details for sharing with media into the file(See AC_1,EX_1)

Alternate Courses	AC_1 The file name is already exist 1. System will raise an alert to tell users that the file name they input are already exist 2. If the user chose to replace it: delete the existing file and return to main course 3. 3. Return to main course 1
Exceptions	EX_1 The file could not be created(authorization error) 1. System will display an alert on the screen: Can not create the file, authorization error. 2. Return to main course step 1

4.7 Sign out

Name	sign out
ID	VS_U006
Description	Users could press the button and log out from the system for security reasons.
Actors	Election officials, testers and programmers
Organizational Benefits	It increases the security. Allow users to log out after finishing his job.
Frequency of Use	Every time when the user finishes his job and wants to quite the system
Triggers	User clicks the sign out button
Preconditions	Election officials sign into the system with no errors occur.
Postconditions	After clicks the sign out button, the system logs out current account and returns to the sign in page
Main Course	1. User clicks the sign out button 2. System asks the user to confirm his request 3. User confirms his request.(See AC_1) 4. System logs out current account and returns to the sign in page (See EX_1)
Alternate Courses	AC_1: User cancels his request 1. Exit the sign out part and return to main page;
Exceptions	EX_1: Sign out function does not work 1. System will display an alert on the screen: Can not Sign out properly, please try again. 2. Return to Main Course Step 1

5. Other Nonfunctional Requirements

5.1 Performance Requirements

3W Voting system requires a system including at least Intel(R) Xeon(R) CPU 2.00GHz and 8Gb RAM. Graphics card is optional but not required. However, an OPENGL 1.2 compatible graphics card would be recommended.

5.2 Safety Requirements

There are no special safety or security requirements. Security such as ensuring one vote for one person is handled at the voting centers.

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There are no special safety or security requirements. Security such as ensuring one vote for one person is handled at the voting centers.

5.4 Software Quality Attributes

3W Voting system provides the users with quite simple features. Due to its well designed and easy to use interface, it can be used by typical users with few instructions.
Moreover, it is quite effective and productive, which could process over 100,000 ballots within 8 minutes.

5.5 Business Rules

This system allows users to process vote data effectively. However, users need to make sure there are no numbering mistakes in the input .csv file (e.g. a voter will not make any mistakes on the ballot.). During the process, no one has the authority to modify the loaded data.

6. Other Nonfunctional Requirements

Appendix A: Glossary

- 3W Voting System - The last name of developers are all called Wang, thus three Wang means 3W
- csv file - comma separated values file
- Audit - the detail record to show the result of an election
- database - a collection of pieces of information that is organized and used on a computer

Appendix B: Analysis Models

At this moment, we are on the early requirement definition stage. So we do not have any diagrams to present this time.

Appendix C: To Be Determined List

<Collect a numbered list of the TBD (to be determined) references that remain in the SRS so they can be tracked to closure.>

- System testing for testers
- Unit testing for programmers
- Future bug report
- Whether or not to integrate with online voting system
- Include Sign up or not(sign up may cause secure and safety problem)
- Details for security and safety problem