CMSC 447

Software Test Report (STR)

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# Scope

## Identification

This project is to be a web application which when implemented will allow a user to input preferences into a questionnaire and top locations will then be outputted onto a map. When first accessing the webpage, the user will begin with the “login page.” From the login page, a user can access a “create an account page” or after authentication access their “homepage.” The homepage will allow the user to modify their account information from a “modify account page,” as well as allow the user to see the “map” and access the “questionnaire,” which are defined below.

The “questionnaire” refers to the portion of the project where the user inputs these preferences. This will be accessed from the homepage into a “questionnaire page.” The “ratings” will refer to the numerical input from a user in which they determine which statistics have a higher preference. The “statistics” refer to the set of data that our project will be accessing. The “map” refers to the portion of the project which is the visualization of data. The map is initially displayed from the homepage, but will initially be empty, and be modified as the user takes the questionnaire. After the user completes the questionnaire the map is referenced to be an “updated map” with the continuing definitions being components of the map. The map may also have markers which will be referred to as “pins.” The pins will allow the user to see an image of the location referred to as the “pin image.” In some cases where an image is not available, or if there is additional implementation, a pin may allow the user to see descriptive information on the location which will be referred to as the “pin information.”

This system will contain both unit, integration, and system tests. These will be further broken into visual and automation tests. Unit tests are generally associated with the individual components of the application. Integration test refer to the different parts of a CSCI component. System tests will refer to those which contain multiple CSCI components. Visual tests will refer to those tests, generally relating to the frontend portions, which will be verified by looking at the output on the screen. The automation tests, generally relating to the backend portions, will be verified with a simple pass/fail output. These tests are intended to ease in the verifiability of the system. These will then be used to say what progress has been made within the system, and which components need further development.

## System overview

The goal of this project is to create a web application which will allow a user to create an account, and from such account be able to evaluate different statistical values such that a list of locations within the United States will be outputted to the user which correlate to the user input. With the list, a map should be presented with pins that correlate to the location and can then be further expanded to output a location image or description.

A SQL database will be used for maintaining the user accounts. Along with this we expect to be using third party software for our output. This would include the use of GoogleMaps for our map output, and GooglePlaces for our image outputs, and GooglePlaces for a description output. Further third-party software will be expanded in this section as seems fit throughout the project.

Because the nature of this project is in the scope of a classroom project, there will not be long term maintenance of the project and will be run on a local machine. All project development will be done through GitHub and then developer preference for development environments, debuggers, etc. The web portion of the application will be run using an Angular Framework on a localhost.

This system has been developed such that testing can be done within two basic procedures. These include visual confirmation and automation. Visual confirmation is done with the frontend portion of the web application, which includes verification that components on the web pages are properly located. Automation is used within the backend portion of the system to verify the algorithmic procedures of the system. Visual output was done using print statements such that one could verify a test was passed with a simple pass/fail printout to the tester.

## Document overview

This document will serve to provide the results from the tests described within the Software Test Description. The results should be based on the completion of requirements described in the Software Requirements Specification. Any final test should directly correspond to the acceptance of a CSCI component described in the Software Design Document. Finally, the test should be cross referenced with the Requirements Traceability found at the completion of each document. These completed tests correspond to successful completion of the corresponding requirement. Upon completion of the requirements the system will be successfully completed.

Furthermore, this document will be used to show the progress of the system. Because the tests correspond to the requirements, the tests show the progress of the different CSCI components. Test outputs are to be used to show what components of the system have been completed, and what components need further development. This is to be implemented within the team scheduler such that new task can be sent to the development team. These tasks are to be maintained within the home directory of the project repository. These will be allowed further access by the client to see the development progress of the team.

**1.3.1 Version Modification**

The following section will show versions of this document.

Version 1.0: Original Document. Was completed at the point of separation of frontend and backend within the system.

Version 1.1: Update reflecting new test which have been passed. Also included an updated requirements traceability section.

Version 1.2: Removed skeletal template. Updated Table of Contents.

Version 2.3: Updated numbering to correspond to the other documents. Updated sections 1.1-1.3

# Referenced documents

The following are previous documents which may be referenced within this report.

SDP – Software Development Plan

SRS – Software Requirements Specification

SDD – Software Design Description

STD – Software Test Description

# Overview of test results

## Overall assessment of the software tested

The following are descriptions of functionalities of the different CSCI components. This section is expected to be modified as different functionality and tests are completed.

CSCI component 1 contained the login portion of the system. At this point the system is successfully processing the creation and authentication of accounts. The creation of account verifies that the desired username and password are not NULL as well as that the username is unique. The login portion also successfully confirms that when the user submits their username and password on the login page, the password must be mapped from the username in the login database. This confirms the authentication of the user. Further requirements that are to be done within the context of CSCI component 1 would include the option requirement of have different user types including regular users and administrators. This was to be done using a new field within the login database which could be mapped from the username.

CSCI component 2 contained the modify account portion of the system. At this point the system allows user to modify their username, password, about me text field, and the user avatar image. There is further verification that new username and passwords meet the non-NULL check as done during the account creation. There was a modification with the requirements stating referencing the required change of username and password. If the user would want to change one portion of their account, this requirement was removed as documented within the SRS.

CSCI component 3 contained the questionnaire and algorithm portion of the system. At this point the system can have the user input their desired preference rating per a statistic and outputted is a list of the top ten counties for their preferences. Furthermore, it has been confirmed that changing the user inputted variable significantly does cause varying output. Finally, the list of outputs is successfully being sent to the front end which then interacts with the map on the homepage.

Finally, CSCI component 4 contains the homepage portion of the system. This includes the original map output, the updated map after the questionnaire is completed, and a printing of the list of locations from the questionnaire. Currently, the system is successfully presents the map when the user first enters the homepage. If they have saved data, then that is loaded within the map as well. Furthermore, if the user completes the questionnaire the map is updated with the new locations. Finally, the user can click on the map pins and is presented with a location description or image. Currently, there is a bug if the GooglePlaces API call does not return a description or image. With further development we would like to have a try, catch, throw cause to handle any exceptions that may occur when calling the GooglePlaces API.

## Impact of test environment

The environment for a successful test should be setup in the same manner as described in the STD. This requires setup for the using of the local host. This is required to enter any of the webpages associated with the system. Furthermore, the test environment must be setup with the MYSQL server as described in the STD. This is required for any of the account modification portions of the application. This includes the login authentication, as well as the account modification. Further information regarding the environment setup can be found within the README files.

## Recommended improvements

Further improvements to the system would include migration from the localhost to a server, and the implementation of user permissions. Migration from the localhost to a server would allow for the publishing of the web system. This would limit the required amount of setup related to the web environment setup as well as the SQL server setup. The implementation of user permissions was an optional requirement added later within the project. This is something that we think could have been implemented with more time, by adding a new field within our login database. This could be a simple Boolean field recognizing a user as an administrator or not. This usability was to allow for different search criteria allowing users to share their location results.

# Detailed test results

## (Project-unique identifier of a test)

### Summary of test results

The following is a modification of the test table found in section 4.1.1.1 of the SDP. The modification is the ‘Test Result’ column which should have one of the following statements: “as expected”, “problems encountered”, or “deviation required.” These will be abbreviated in the respective order as ‘AE’, ‘PE’, or ‘DE.’ Further comments on the not as expected results are then addressed within the details column where necessary.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Requirement Number | Requirement Summary | Test Number | Test Result | Details |
| 3.1 | State Requirements | 1-5 | PE | Handle Null pins |
| 3.1.a | Login page | 1,5 | AE |  |
| 3.1.a.1 | Access account creation | 5a,5b | AE |  |
| 3.1.a.2 | Username input | 1.a | AE |  |
| 3.1.a.3 | Password input | 1.b | AE |  |
| 3.1.a.4 | Authentication | 1.d | AE |  |
| 3.1.b | CAP | 5.b |  |  |
| 3.1.b.1 | Create username | 1.a | AE |  |
| 3.1.b.2 | Unique username | 1.c | AE |  |
| 3.1.b.3 | Create Password | 1.b | AE |  |
| 3.1.b.4 | About me | 1.d | AE |  |
| 3.1.c | Homepage | 5.c | PE | Handle Null pins |
| 3.1.c.1 | Original Map | 5.g | AE |  |
| 3.1.c.2 | Access modify account page | 5.b | AE |  |
| 3.1.c.3 | Access questionnaire | 5.d | AE |  |
| 3.1.c.4 | Updated Map | 4.a-g | AE |  |
| 3.1.d | Modify Account Page | 2.a-e | AE |  |
| 3.1.d.1 | Change username | 2.a | AE |  |
| 3.1.d.2 | Change password | 2.b | AE |  |
| 3.1.d.3 | Change about me | 2.d | AE |  |
| 3.1.e | Questionnaire | 3.a-e | AE |  |
| 3.1.e.1 | Display Statistics | 3.a | AE |  |
| 3.1.e.2 | Rate statistics | 3.b | AE |  |
| 3.1.e.3 | Updated Map Algorithm | 3.d,4,5 | AE |  |
| 3.1.e.3.a | List top 10 | 3.a | AE |  |
| 3.1.e.3.b | Pin Information | 4.f,4.g | PE | Null pin info |
| 3.1.e.3.c | Multiple Questionnaires | 5.e | AE |  |
| 3.2 | Capability Requirements | 1-5 | DE | Optional admin accounts |
| 3.2.a | Login Page | 1 | AE |  |
| 3.2.a.1 | Successful login | 1.b | AE |  |
| 3.2.a.2 | Unsuccessful login | 1.e | AE |  |
| 3.2.b | Create Account | 1.d | AE |  |
| 3.2.b.1 | Unique username | 1.c | AE |  |
| 3.2.b.2 | Non-unique username | 1.c | AE |  |
| 3.2.b.3 | Empty Username | 1.a | AE |  |
| 3.2.b.4 | Empty Password | 1.b | AE |  |
| 3.2.c | Homepage | 5.c | AE |  |
| 3.2.c.1 | Empty Map | 5.g | AE |  |
| 3.2.c.2 | Top 10 | 4.a | AE |  |
| 3.2.c.3 | Pin Info | 4.f,4.g | PE | Null pin info |
| 3.2.d | Modify Account | 2.a-e | AE |  |
| 3.2.d.1 | Empty Username | 2.a | AE |  |
| 3.2.d.2 | Unique Username | 2.c | AE |  |
| 3.2.d.3 | Empty Password | 2.b | AE |  |
| 3.2.e | Questionnaire | 3.a-e | AE |  |
| 3.2.e.1 | Display Statistics | 3.a | AE |  |
| 3.2.e.2 | Empirical Statistics | 3.a | AE |  |
| 3.2.e.3 | Statistical Priority | 3.b | AE |  |
| 3.2.e.4 | Varied Output | 3.d | AE |  |
| 3.2.e.5 | Updated Map | 4.d | AE |  |
| 3.5 | Data Requirements | 1.d | AE |  |
| 3.5.a | Database usernames | 1.d | AE |  |
| 3.5.b | Database passwords | 1.d | AE |  |

### Problems encountered

#### (Project-unique identifier of a test case)

There is currently one problem as described earlier, when the GooglePlaces returns a NULL value for the location description or image. This becomes an issue when a single county does not have a stored value from the GooglePlaces API. Going further we would like to use a try, catch, throw block to handle the possible errors. This error occurs when hovering over specific pins on the map. This is not occurring for all counties, but for locations that are not within the GooglePlaces API database. This is shown throughout the tables when testing requirements 3.1, 3.1.c, 3.1.c.3.b, and 3.2.c.3. Requirements, 3.1 and 3.1.c are those relating to the homepage, and is otherwise completed. Requirement 3.2.c.3 is also the same failing test which is dependent on the success of the map and is otherwise completed. This error was occurring infrequently and was occurring for roughly 1~2% of the counties. To resume further in the testing, we assumed that we did not have one of these occurrences, however this is the most detailed of the task and as such we are currently not needing to make this assumption.

The other current modification that needs to be implemented is the user permissions. This is an optional requirement which has not yet been implemented. Moving forward we would need to maintain another field within our login database which would contain a Boolean modeled by a 0 or 1. This would represent whether the user is an administrator or not. The user would have a further ability to query the users and see their location results. This implementation could be further implemented to model user friends, by storing a list of friend users for each user. This test is represented by requirement 3.2 which deals with the account modification and login database. This occurs for all users since it has yet to be implemented. To move on with testing we will assume that no users have the administrative privileges. This does not have further tests that require the use of the privileges and thus there is no need to make the above assumption.

### Deviations from test cases/procedures

#### (Project-unique identifier of a test case)

The testing procedures were slightly modified for the testing of user account login and modification. This was done by multiple test cases and manually testing such accounts. We found that the errors would not allow for the next test in our testing script. The only cases that needed to be tested with this functionality were NULL username, NULL passwords, and non-unique usernames.

# Test log

The following table is a representation of the tests done on the system. The table is formatted following the table found in section 4.1.1. These will show the requirement being tested, the date, a description of the test, test number, and result of the test. These tests are assumed to be the latest tests and will be updated as new testing cases are passed, or new failures occur.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Requirement Number | Date | Requirement Summary | Test Number | Test Result |
| 3.1 | 5/3 | State Requirements | 1-5 | PE |
| 3.1.a | 5/1 | Login page | 1,5 | AE |
| 3.1.a.1 | 5/1 | Access account creation | 5a,5b | AE |
| 3.1.a.2 | 5/1 | Username input | 1.a | AE |
| 3.1.a.3 | 5/1 | Password input | 1.b | AE |
| 3.1.a.4 | 5/1 | Authentication | 1.d | AE |
| 3.1.b | 5/1 | CAP | 5.b |  |
| 3.1.b.1 | 5/1 | Create username | 1.a | AE |
| 3.1.b.2 | 5/1 | Unique username | 1.c | AE |
| 3.1.b.3 | 5/1 | Create Password | 1.b | AE |
| 3.1.b.4 | 5/1 | About me | 1.d | AE |
| 3.1.c | 5/1 | Homepage | 5.c | PE |
| 3.1.c.1 | 5/1 | Original Map | 5.g | AE |
| 3.1.c.2 | 5/1 | Access modify account page | 5.b | AE |
| 3.1.c.3 | 5/1 | Access questionnaire | 5.d | AE |
| 3.1.c.4 | 5/5 | Updated Map | 4.a-g | AE |
| 3.1.d | 5/1 | Modify Account Page | 2.a-e | AE |
| 3.1.d.1 | 5/1 | Change username | 2.a | AE |
| 3.1.d.2 | 5/1 | Change password | 2.b | AE |
| 3.1.d.3 | 5/1 | Change about me | 2.d | AE |
| 3.1.e | 5/3 | Questionnaire | 3.a-e | AE |
| 3.1.e.1 | 5/5 | Display Statistics | 3.a | AE |
| 3.1.e.2 | 5/3 | Rate statistics | 3.b | AE |
| 3.1.e.3 | 5/3 | Updated Map Algorithm | 3.d,4,5 | AE |
| 3.1.e.3.a | 5/1 | List top 10 | 3.a | AE |
| 3.1.e.3.b | 5/5 | Pin Information | 4.f,4.g | PE |
| 3.1.e.3.c | 5/1 | Multiple Questionnaires | 5.e | AE |
| 3.2 | 5/3 | Capability Requirements | 1-5 | DE |
| 3.2.a | 5/1 | Login Page | 1 | AE |
| 3.2.a.1 | 5/1 | Successful login | 1.b | AE |
| 3.2.a.2 | 5/1 | Unsuccessful login | 1.e | AE |
| 3.2.b | 5/1 | Create Account | 1.d | AE |
| 3.2.b.1 | 5/1 | Unique username | 1.c | AE |
| 3.2.b.2 | 5/1 | Non-unique username | 1.c | AE |
| 3.2.b.3 | 5/1 | Empty Username | 1.a | AE |
| 3.2.b.4 | 5/1 | Empty Password | 1.b | AE |
| 3.2.c | 5/1 | Homepage | 5.c | AE |
| 3.2.c.1 | 5/1 | Empty Map | 5.g | AE |
| 3.2.c.2 | 5/3 | Top 10 | 4.a | AE |
| 3.2.c.3 | 5/5 | Pin Info | 4.f,4.g | PE |
| 3.2.d | 5/1 | Modify Account | 2.a-e | AE |
| 3.2.d.1 | 5/1 | Empty Username | 2.a | AE |
| 3.2.d.2 | 5/1 | Unique Username | 2.c | AE |
| 3.2.d.3 | 5/1 | Empty Password | 2.b | AE |
| 3.2.e | 5/1 | Questionnaire | 3.a-e | AE |
| 3.2.e.1 | 5/3 | Display Statistics | 3.a | AE |
| 3.2.e.2 | 5/3 | Empirical Statistics | 3.a | AE |
| 3.2.e.3 | 5/3 | Statistical Priority | 3.b | AE |
| 3.2.e.4 | 5/5 | Varied Output | 3.d | AE |
| 3.2.e.5 | 5/5 | Updated Map | 4.d | AE |
| 3.5 | 5/1 | Data Requirements | 1.d | AE |
| 3.5.a | 5/1 | Database usernames | 1.d | AE |
| 3.5.b | 5/1 | Database passwords | 1.d | AE |