CMSC 447

Software Test Report (STR)

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# Scope

This section shall be divided into the following paragraphs.

## Identification

This paragraph shall contain a full identification of the system and the software to which this document applies, including, as applicable, identification number(s), title(s), abbreviation(s), version number(s), and release number(s).

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.”

## System overview

This paragraph shall briefly state the purpose of the system and the software to which this document applies. It shall describe the general nature of the system and software; summarize the history of system development, operation, and maintenance; identify the project sponsor, acquirer, user, developer, and support agencies; identify current and planned operating sites; and list other relevant documents.

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 GooglePlace 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. Throughout this document the term sponsor will refer to John Winder who is the group’s client throughout the project. Similarly, the group refers to the group of developers working on the project including Matthew Hearn, Aaron Lewis, Alex Rochford, Cathy Poore, Ben Kittner, and Steven Heckman. The project will refer to the software and documentation created for this assignment.

All project development will be done through GitHub and then developer preference for development environments, debuggers, ect. The web portion of the application will be run using an Angular Framework on a localhost.

## Document overview

This paragraph shall summarize the purpose and contents of this document and shall describe any security or privacy considerations associated with its use.

This document will serve to provide the results from the test 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 as a whole will be successfully completed.

# Referenced documents

This section shall list the number, title, revision, and date of all documents referenced in this report. This section shall also identify the source for all documents not available through normal Government stocking activities.

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

This section shall be divided into the following paragraphs to provide an overview of test results.

## Overall assessment of the software tested

This paragraph shall:

1. Provide an overall assessment of the software as demonstrated by the test results in this report
2. Identify any remaining deficiencies, limitations, or constraints that were detected by the testing performed. Problem/change reports may be used to provide deficiency information.
3. For each remaining deficiency, limitation, or constraint, describe:
4. Its impact on software and system performance, including identification of requirements not met
5. The impact on software and system design to correct it
6. A recommended solution/approach for correcting it

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

This paragraph shall provide an assessment of the manner in which the test environment may be different from the operational environment and the effect of this difference on the test results.

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

This paragraph shall provide any recommended improvements in the design, operation, or testing of the software tested. A discussion of each recommendation and its impact on the software may be provided. If no recommended improvements are provided, this paragraph shall state "None."

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 a 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

This section shall be divided into the following paragraphs to describe the detailed results for each test. Note: The word "test" means a related collection of test cases.

## (Project-unique identifier of a test)

This paragraph shall identify a test by project-unique identifier and shall be divided into the following subparagraphs to describe the test results.

### Summary of test results

This paragraph shall summarize the results of the test. The summary shall include, possibly in a table, the completion status of each test case associated with the test (for example, "all results as expected," "problems encountered," "deviations required"). When the completion status is not "as expected," this paragraph shall reference the following paragraphs for details.

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 expectd”, “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 | Group Initials | Client Initials | 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

This paragraph shall be divided into subparagraphs that identify each test case in which one or more problems occurred.

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

This paragraph shall identify by project- unique identifier a test case in which one or more problems occurred, and shall provide:

* + - * 1. A brief description of the problem(s) that occurred
        2. Identification of the test procedure step(s) in which they occurred
        3. Reference(s) to the associated problem/change report(s) and backup data, as applicable
        4. The number of times the procedure or step was repeated in attempting to correct the problem(s) and the outcome of each attempt
        5. Back-up points or test steps where tests were resumed for retesting

There is currently one problem as, described earlier, when the GoogleImages 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 GoogleImages 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 GoogleImages 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 test that require the use of the privileges and thus there is no need to make the above assumption.

### Deviations from test cases/procedures

This paragraph shall be divided into subpara- graphs that identify each test case in which deviations from test case/test procedures occurred.

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

This paragraph shall identify by project- unique identifier a test case in which one or more deviations occurred, and shall provide:

* + - * 1. A description of the deviation(s) (for example, test case run in which the deviation occurred and nature of the deviation, such as substitution of required equipment, procedural steps not followed, schedule deviations). (Red-lined test procedures may be used to show the deviations)
        2. The rationale for the deviation(s)
        3. An assessment of the deviations’ impact on the validity of the 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

This section shall present, possibly in a figure or appendix, a chronological record of the test events covered by this report. This test log shall include:

1. The date(s), time(s), and location(s) of the tests performed
2. The hardware and software configurations used for each test including, as applicable, part/model/serial number, manufacturer, revision level, and calibration date of all hardware, and version number and name for the software components used
3. The date and time of each test-related activity, the identity of the individual(s) who performed the activity, and the identities of witnesses, as applicable

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 |

# Notes

This section shall contain any general information that aids in understanding this document (e.g., background information, glossary, rationale). This section shall include an alphabetical listing of all acronyms, abbreviations, and their meanings as used in this document and a list of any terms and definitions needed to understand this document.

# Appendixes

Appendixes may be used to provide information published separately for convenience in document maintenance (e.g., charts, classified data). As applicable, each appendix shall be referenced in the main body of the document where the data would normally have been provided. Appendixes may be bound as separate documents for ease in handling. Appendixes shall be lettered alphabetically (A, B, etc.).

DESCRIPTION/PURPOSE

he Software Test Report (STR) is a record of the qualification testing performed on a Computer Software Configuration Item (CSCI), a software system or subsystem, or other software-related item.

The STR enables the acquirer to assess the testing and its results.

APPLICATION/INTERRELATIONSHIP

Portions of this plan may be bound separately if this approach enhances their usability. Examples include plans for software configuration management and software quality assurance.

The Contract Data Requirements List (CDRL) should specify whether deliverable data are to be delivered on paper or electronic media; are to be in a given electronic form (such as ASCII, CALS, or compatible with a specified word processor or other support software); may be delivered in developer format rather than in the format specified herein; and may reside in a computer-aided software engineering (CASE) or other automated tool rather than in the form of a traditional document.

PREPARATION INSTRUCTIONS

General instructions.

a. Automated techniques. Use of automated techniques is encouraged. The term "document" in this means a collection of data regardless of its medium.

b. Alternate presentation styles. Diagrams, tables, matrices, and other presentation styles are acceptable substitutes for text when data required can be made more readable using these styles.

c. Title page or identifier. The document shall include a title page containing, as applicable: document number; volume number; version/revision indicator; security markings or other restrictions on the handling of the document; date; document title; name, abbreviation, and any other identifier for the system, subsystem, or item to which the document applies; contract number; CDRL item number; organization for which the document has been prepared; name and address of the preparing organization; and distribution statement. For data in a database or other alternative form, this information shall be included on external and internal labels or by equivalent identification methods.

d. Table of contents. The document shall contain a table of contents providing the number, title, and page number of each titled paragraph, figure, table, and appendix. For data in a database or other alternative form, this information shall consist of an internal or external table of contents containing pointers to, or instructions for accessing, each paragraph, figure, table, and appendix or their equivalents.

e. Page numbering/labeling. Each page shall contain a unique page number and display the document number, including version, volume, and date, as applicable. For data in a database or other alternative form, files, screens, or other entities shall be assigned names or numbers in such a way that desired data can be indexed and accessed.

f. Response to tailoring instructions. If a paragraph is tailored out of this document, the resulting document shall contain the corresponding paragraph number and title, followed by "This paragraph has been tailored out." For data in a database or other alternative form, this representation need occur only in the table of contents or equivalent.

g. Multiple paragraphs and subparagraphs. Any section, paragraph, or subparagraph in this DID may be written as multiple paragraphs or subparagraphs to enhance readability.

h. Standard data descriptions. If a data description required by this document has been published in a standard data element dictionary specified in the contract, reference to an entry in that dictionary is preferred over including the description itself.

i. Substitution of existing documents. Commercial or other existing documents, including other project plans, may be substituted for all or part of the document if they contain the required data.