

# Project Title: System Verification and Validation Plan for REVITALIZE

Team 13, REVITALIZE

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# 1 Revision History

Date		Version	Notes
October 2022	31st,	Bill Nguyen	Added Functional Requirements Tests for Login Page
October 2022	31st,	Bill Nguyen	Added Non Functional Requirements Tests for Look and Feel, Usability and Performance
October 2022	31st,	Bill Nguyen	Added 3 Questions to Usability Survey

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## List of Tables

[Remove this section if it isn't needed —SS]

## List of Figures

[Remove this section if it isn't needed —SS]

## 2 Symbols, Abbreviations and Acronyms

symbol	description
T	Test

[symbols, abbreviations or acronyms – you can simply reference the SRS  
(?) tables, if appropriate —SS]

This document ... [provide an introductory blurb and roadmap of the Verification and Validation plan —SS]

## **3 General Information**

### **3.1 Summary**

[Say what software is being tested. Give its name and a brief overview of its general functions. —SS]

### **3.2 Objectives**

[State what is intended to be accomplished. The objective will be around the qualities that are most important for your project. You might have something like: “build confidence in the software correctness,” “demonstrate adequate usability.” etc. You won’t list all of the qualities, just those that are most important. —SS]

### **3.3 Relevant Documentation**

[Reference relevant documentation. This will definitely include your SRS and your other project documents (MG, MIS, etc). You can include these even before they are written, since by the time the project is done, they will be written. —SS]

?

## **4 Plan**

[Introduce this section. You can provide a roadmap of the sections to come. —SS]

### **4.1 Verification and Validation Team**

[You, your classmates and the course instructor. Maybe your supervisor. You should do more than list names. You should say what each person’s role is for the project. A table is a good way to summarize this information. —SS]

## 4.2 SRS Verification Plan

[List any approaches you intend to use for SRS verification. This may just be ad hoc feedback from reviewers, like your classmates, or you may have something more rigorous/systematic in mind.. —SS]

[Remember you have an SRS checklist —SS]

## 4.3 Design Verification Plan

[Plans for design verification —SS]

[The review will include reviews by your classmates —SS]

[Remember you have MG and MIS checklists —SS]

## 4.4 Implementation Verification Plan

[You should at least point to the tests listed in this document and the unit testing plan. —SS]

[In this section you would also give any details of any plans for static verification of the implementation. Potential techniques include code walk-throughs, code inspection, static analyzers, etc. —SS]

## 4.5 Automated Testing and Verification Tools

[What tools are you using for automated testing. Likely a unit testing framework and maybe a profiling tool, like ValGrind. Other possible tools include a static analyzer, make, continuous integration tools, test coverage tools, etc. Explain your plans for summarizing code coverage metrics. Linters are another important class of tools. For the programming language you select, you should look at the available linters. There may also be tools that verify that coding standards have been respected, like flake9 for Python. —SS]

[The details of this section will likely evolve as you get closer to the implementation. —SS]

## 4.6 Software Validation Plan

[If there is any external data that can be used for validation, you should point to it here. If there are no plans for validation, you should state that here. —SS]

## 5 System Test Description

### 5.1 Tests for Functional Requirements

Subsections of the requirements will be divided into the events from our SRS, which are Login Page, Sign up Page, Main Page, Diet Section, Workout Section and Rest Section. There will be 1 test per functional requirement, and will follow the same order as functional requirements in SRS (ex. FR1 in VnV plan is the test for FR1 in SRS).

#### 5.1.1 Login Page Testing

Testing all functional requirements for login page of REVITALIZE. (Refer to BE1 in SRS)

##### 1. FR-LP-1

Control: Manual

Initial State: Loading stage of the login page

Input: An event that loads the login page

Output: Login page is displayed with all necessary components

Test Case Derivation: Request is made to load login page

How test will be performed: Tester will open REVITALIZE application and login page should be displayed

##### 2. FR-LP-2

Control: Manual

Initial State: Login page is displayed with username textbox

Input: Enter username information in textbox

Output: Username information entered is displayed in textbox

Test Case Derivation: User can enter information in username textbox

How test will be performed: Tester will enter information in username textbox and checks if textbox displays what the tester entered.



### 3. FR-LP-3

Control: Manual

Initial State: Login page is displayed with password textbox

Input: Enter password information in textbox

Output: password information entered is displayed in textbox via hidden text

Test Case Derivation: User can enter information in password textbox

How test will be performed: Tester will enter information in password textbox and checks if textbox displays what the tester entered via hidden text.

### 4. FR-LP-4

Control: Manual

Initial State: Login page is displayed with login button

Input: Click login button

Output: Intended events occurs. Refer to FR9

Test Case Derivation: User clicks login button and a request is made based on username and password text-boxes

How test will be performed: Tester will click on login button and check if request is made correctly

### 5. FR5

Control: Manual

Initial State: Login page is displayed with forgot password button

Input: Click forgot password button

Output: Display forgot password screen with textbox to enter email

Test Case Derivation: User clicks forgot password button and request is made to display forgot password screen with textbox to enter email

How test will be performed: Tester will click on forgot password button and checks if forgot password screen is displayed with textbox to enter email

#### 6. FR-LP-6

Control: Manual

Initial State: Login page is displayed with stay logged in checkbox that is empty

Input: Click stay logged in checkbox

Output: Display a check-mark in the stay logged in checkbox if checkbox is empty, else if checkbox contains check-mark already it will then display an empty checkbox

Test Case Derivation: User clicks on stay logged in checkbox and displays appropriate action

How test will be performed: Tester will click on checkbox and checks to see if check-mark is displayed if checkbox was empty and if an empty checkbox appears if checkbox contained a check-mark

#### 7. FR-LP-7

Control: Manual

Initial State: Loading stage of REVITALIZE where previous state had stay logged in checkbox checked

Input: An event that loads REVITALIZE

Output: Display main page, with same data from previous state of main page

Test Case Derivation: User can load REVITALIZE and main page is displayed with same data as the previous time user opened REVITALIZE main page

How test will be performed: Tester will check stay logged in checkbox go to main page, leave REVITALIZE, reopen REVITALIZE and check whether same data from main page is the same from the last time tester opened main page

## 8. FR-LP-8

Control: Manual

Initial State: Login page is displayed with sign up button

Input: Click sign up button

Output: Loads and displays sign up page

Test Case Derivation: User can click sign up button which loads and displays sign up page

How test will be performed: Tester will click on sign up button and checks if sign up page is displayed

## 9. FR-LP-9

Control: Manual

Initial State: Login page is displayed with inputted information in username and password text-boxes

Input: Click login button

Output: if failure state, display an invalid password or username banner, else if success state, load and display main page

Test Case Derivation: User clicks login button and request is made based on username and password, and will proceed to main page only if username and password are valid

How test will be performed: Tester will click on login button and test for scenarios when login should be successful and when login should fail

### 5.1.2 Signup Page Testing

Testing all functional requirements for sign page of REVITALIZE. (Refer to BE2 in SRS)

## 1. FR-SP-1

Control: Manual

Initial State: Signup page is displayed with username textbox

Input: Enter username information in textbox

Output: Username information entered is displayed in textbox

Test Case Derivation: User can enter information in username textbox

How test will be performed: Tester will enter information in username textbox and checks if textbox displays what the tester entered

## 2. FR-SP-2

Control: Manual

Initial State: Signup page is displayed with password textbox

Input: Enter password information in textbox

Output: Password information entered is displayed in textbox via hidden text

Test Case Derivation: User can enter information in password textbox

How test will be performed: Tester will enter information in password textbox and checks if textbox displays what the tester entered via hidden text

## 3. FR-SP-3

Control: Manual

Initial State: signup page is displayed with email textbox

Input: Enter email information in textbox

Output: Email information entered is displayed in textbox

Test Case Derivation: User can enter information in email textbox

How test will be performed: Tester will enter information in email textbox and checks if textbox displays what the tester entered

## 4. FR-SP-4

Control: Manual

Initial State: Signup page is displayed with signup button

Input: Click signup button

Output: Intended events occurs. Refer to FR14

Test Case Derivation: User clicks signup button and a request is made based on username, password and email text-boxes

How test will be performed: Tester will click on signup button and check if request is made correctly

#### 5. FR-SP-5

Control: Manual

Initial State: Signup page is displayed with inputted information in username and password text-boxes

Input: Click signup button

Output: if failure state, display an invalid username, password or email banner, else if success state, load and display login page

Test Case Derivation: User clicks signup button and request is made based on username, password and email, and will proceed to login page only if username, password and email are valid

How test will be performed: Tester will click on signup button and test for scenarios when signup should be successful and when signup should fail

### 5.1.3 Main Page Testing

Testing all functional requirements for main page of REVITALIZE. (Refer to BE3 in SRS)

#### 1. FR-MP-1

Control: Manual

Initial State: Main page is displayed with calender of current date

Input: An event that loads the main page

Output: Main page is displayed with all necessary components

Test Case Derivation: Request is made to load main page

How test will be performed: Tester will successfully login to the RE-VITALIZE application and will visually check if the correct calender data is loaded

## 2. FR-MP-2

Control: Manual

Initial State: Main page is displayed with previous day and next day buttons

Input: An event that loads the main page and the previous day and next day buttons are clicked

Output: Main page is displayed with previous day and next day buttons. Once the next day button is clicked, the calender refreshes to a new calender with the next day. Once the preivous day button is clicked, the calender refreshed to a new calender with the previous day

Test Case Derivation: Request is made to load main page and the previous day and next day buttons are clicked

How test will be performed: Tester will successfully login to the RE-VITALIZE application and will visually check if the previous day and next day buttons are visible. The tester will click the previous day button and visually check if the calender is updated to the date of the previous day. The tester will click the next day button and visually check if the calender is updated to the date of the next day

## 3. FR-MP-3

Control: Manual

Initial State: Each interaction after leaving the main page must have a visible back button

Input: An event that loads the next user interface after leaving the main page and the back button is clicked

Output: The next user interface after leaving the main page iis displayed with a back button. Once the back button is clicked, the main page is loaded

Test Case Derivation: Request is to leave the main page and the back button is clicked

How test will be performed: Tester will leave the main page by selecting any of the options on the page. The tester will visually check if a back button is visible on every page that is entered through the main page interaction. The tester will click the back button and visually check if the current page is closed and the main page is loaded. The tester will repeat this process with every page that is loaded from clicking an interaction from the main page

#### 4. FR-MP-4

Control: Manual

Initial State: Main page is displayed with Diet, Exercise and Rest buttons available to click

Input: An event that loads the main page and the Diet, Exercise and Rest buttons are clicked

Output: Main page is displayed with Diet, Exercise and Rest buttons. If the Diet button is clicked, the Diet interface is loaded. If the Exercise button is clicked, the Exercise interface is loaded. If the Rest button is clicked, the Rest interface is loaded

Test Case Derivation: Request is made to load main page and the Diet, Exercise and Rest buttons are clicked

How test will be performed: Tester will successfully login to the REVITALIZE application and will visually check if the Diet, Exercise and Rest buttons are visible. The tester will click the Diet button and visually check if the Diet interface is loaded. the tester will click the Exercise button and visually check if the Exercise interface is loaded. The tester will click the Rest button and visually check if the Rest interface is loaded

#### 5.1.4 Workout Section Testing

Testing all functional requirements for workout section of REVITALIZE. (Refer to BE5 in SRS)

### 1. FR-WS-1

Control: Manual

Initial State: Workout section is initialized with a preset list of exercises of the current calendar day

Input: An event that loads the workout section

Output: A preset list of exercises is loaded for the current calendar day

Test Case Derivation: Request is made to enter workout section

How test will be performed: Tester will enter the workout section and will visually check if a list of preset exercises are loaded for the current calendar day

### 2. FR-WS-2

Control: Manual

Initial State: Workout section is displayed with add exercise button

Input: Click add exercise button

Output: A dialog box is launched that lets the user fill custom exercise information. the exercise is added to the exercise list of the current calendar day

Test Case Derivation: User clicks add exercise button

How test will be performed: Tester will click on add exercise button and will visually check if a fillable dialog box is launched. The tester will fill the dialog box information and click the add exercise button. The tester will visually check if the exercise has been added to the list of exercises for the current calendar day

### 3. FR-WS-3

Initial State: Each exercise in the workout section is displayed with a delete exercise button

Input: Click delete exercise button

Output: The exercise is deleted from the exercise list of the current calendar day



Test Case Derivation: User clicks delete exercise button

How test will be performed: Tester will click on delete exercise button and will visually check if the exercise is deleted from the list of exercises for the current calendar day.

#### 4. FR-WS-4

Initial State: Each exercise in the workout section is displayed with an edit exercise button

Input: click edit exercise button

Output: A fillable dialog box is launched with information of the exercise. Once the edit exercise button is clicked, the dialog box will close and update the exercise information in the list of exercises for the current calendar day

Test Case Derivation: User clicks edit exercise button

How test will be performed: Tester will click on edit exercise button and will change the information on the fillable dialog box. The tester will click the edit exercise button and will visually check if the information is changed on the exercise list for the current calendar day.

#### 5. FR-WS-5

Control: Manual

Initial State: Workout section is displayed with list of exercises for current calendar day

Input: An event that loads the workout section

Output: If repetition and sets for exercises not logged, dialog box for exercise is launched and the missing repetition and set values are highlighted

Test Case Derivation: User launches the workout section. User adds an exercise and does not input repetition and set values.

How test will be performed: Tester will add exercise without inputting values for set and repetitions. The user will visually check if the exercise dialog is launched with highlighted missing repetitions and set values.

### 5.1.5 Rest Section Testing

Testing all functional requirements for rest section of REVITALIZE. (Refer to BE6 in SRS)

#### 1. FR-RS-1

Control: Manual

Initial State: Rest section is initialized with the sleep statistics of the current calendar day

Input: An event that loads the rest section

Output: Sleep statistics are loaded for the current calendar day

Test Case Derivation: Request is made to enter rest section

How test will be performed: Tester will enter the rest section and will visually check if sleep statistics are loaded for the current calendar day

#### 2. FR-RS-2

Control: Manual

Initial State: Rest section is initialized with the sleep statistics of the current calendar day

Input: Alter sleep data

Output: The sleep data is updated with user changes

Test Case Derivation: User alters sleep data

How test will be performed: Tester will alter the sleep data and will visually check if the new values are correctly displayed in the sleep statistics

...

## 5.2 Tests for Nonfunctional Requirements

[The nonfunctional requirements for accuracy will likely just reference the appropriate functional tests from above. The test cases should mention reporting the relative error for these tests. —SS]

[Tests related to usability could include conducting a usability test and survey. —SS]

### **5.2.1 Look and Feel Testing**

#### **1. LF1**

Type: Dynamic, Functional, Manual

Initial State: User is using REVITALIZE features

Input/Condition: REVITALIZE features are in use

Output/Result: All UI/UX design and elements matches original design and are displayed correctly and neatly

How test will be performed: All related stakeholders will test application with the focus on neatness and attractiveness of UI/UX design of REVITALIZE and answer question 1 of the Usability Survey. Would need an average rating of 8.5 or above out of 10 and assess all stakeholders responses to make improvements

#### **2. LF2**

Type: Static, Manual

Initial State: A display of all pages in REVITALIZE

Input/Condition: All displays for all pages in REVITALIZE are at a common point during a user session

Output/Result: All colours are considered appealing, contrasting and non-intrusive

How test will be performed: All related stakeholders will test application with the focus on colour and answer question 2 of the Usability Survey. Would need an average rating of 8.5 or above out of 10 for each factor and assess all stakeholders responses to make improvements

### **5.2.2 Usability and Humanity Testing**

#### **1. UH1**

Type: Dynamic, Functional, Manual

Initial State: User is using REVITALIZE features

Input/Condition: REVITALIZE features are in use, using one hand/one finger

Output/Result: REVITALIZE features are displaying correct outputs and results

How test will be performed: All related stakeholders with varying size hands/fingers can use all aspects of REVITALIZE using one hand/finger and have an average rating of 9.5 or above for question 3 of the Usability Survey

## 2. UH2

Type: Dynamic, Functional, Manual

Initial State: Main page of application is displayed

Input/Condition: User uses main page to access features (Diet, Workout and Rest Section)

Output/Result: All features take less than 10 seconds to access

How test will be performed: Stakeholders will navigate to the Diet, Workout and/or Rest section from the main page in 10 seconds or less. 90% of stakeholders need to be able to navigate to any of the sections in 10 seconds or less

## 3. UH3

Type: Dynamic, Functional, Manual

Initial State: REVITALIZE is loaded but not in use

Input/Condition: Users in targeted demographic will use all features of REVITALIZE

Output/Result: Results gathered from survey

How test will be performed: Primary stakeholders such as teenagers and young adults 14 years or older will test application and fill in survey, with the goal of an approval rating of 85% or above

## 4. UH4

Type: Dynamic, Functional, Manual

Initial State: REVITALIZE is loaded but not in use

Input/Condition: User will use all features of REVITALIZE

Output/Result: User can use and understand basic/common aspects of all features after 3rd iteration

How test will be performed: Stakeholders will use all features/aspects of REVITALIZE and 85% of stakeholders should be able to use and understand basic/common aspects of all features in 3 iterations or less.

#### 5. UH5

Type: Dynamic, Functional, Manual

Initial State: REVITALIZE is loaded but not in use

Input/Condition: User will use all features of REVITALIZE

Output/Result: Results gathered from survey based on consistency of UI aspects such as buttons, drop-downs, words etc.

How test will be performed: Stakeholders will test application with focus on consistency of UI aspects and fill in survey, with the goal of an approval rating of 85% or above

### 5.2.3 Performance Testing

#### 1. PE1

Type: Dynamic, Functional, Manual

Initial State: REVITALIZE is loaded but not in use

Input/Condition: All REVITALIZE features are loaded with appropriate data

Output/Result: loading time of all REVITALIZE features

How test will be performed: Developers will run performance tests and ensure that all output data loads within 5 seconds or less for 95% of all API responses and outputs

## 2. PE2

Type: Dynamic, Functional, Automatic

Initial State: REVITALIZE is loaded but not in use

Input/Condition: User uses all features of REVITALIZE where output contain data/numbers

Output/Result: data/numbers of used features in floating points

How test will be performed: Developers will run accuracy tests to ensure output data/numbers are accurate for double precision floating points and pass all test cases

## 3. PE3

Type: Dynamic, Functional, Manual

Initial State: REVITALIZE is loaded but not in use

Input/Condition: Multiple (More than 50) users using REVITALIZE

Output/Result: Performance metrics (ex. loading time, frames per second etc.)

How test will be performed: 50 or more users (does not have to be actual people) use/send requests to REVITALIZE application simultaneously and analyze performance trends based on the number of users

## 4. PE4

Type: Dynamic, Functional, Manual

Initial State: REVITALIZE is loaded but not in use

Input/Condition: User will use all features of REVITALIZE

Output/Result: Storage percentage of data

How test will be performed: Developers will try to add as much data as possible to user account and application should be able to store 1 million or more data points for all users

### 5.3 Traceability Between Test Cases and Requirements

[Provide a table that shows which test cases are supporting which requirements. —SS]

## 6 Unit Test Description

[Reference your MIS and explain your overall philosophy for test case selection. —SS] [This section should not be filled in until after the MIS has been completed. —SS]

### 6.1 Unit Testing Scope

[What modules are outside of the scope. If there are modules that are developed by someone else, then you would say here if you aren't planning on verifying them. There may also be modules that are part of your software, but have a lower priority for verification than others. If this is the case, explain your rationale for the ranking of module importance. —SS]

### 6.2 Tests for Functional Requirements

[Most of the verification will be through automated unit testing. If appropriate specific modules can be verified by a non-testing based technique. That can also be documented in this section. —SS]

#### 6.2.1 Module 1

[Include a blurb here to explain why the subsections below cover the module. References to the MIS would be good. You will want tests from a black box perspective and from a white box perspective. Explain to the reader how the tests were selected. —SS]

1. test-id1

Type: [Functional, Dynamic, Manual, Automatic, Static etc. Most will be automatic —SS]

Initial State:

Input:

Output: [The expected result for the given inputs —SS]

Test Case Derivation: [Justify the expected value given in the Output field —SS]

How test will be performed:

2. test-id2

Type: [Functional, Dynamic, Manual, Automatic, Static etc. Most will be automatic —SS]

Initial State:

Input:

Output: [The expected result for the given inputs —SS]

Test Case Derivation: [Justify the expected value given in the Output field —SS]

How test will be performed:

3. ...

### 6.2.2 Module 2

...

## 6.3 Tests for Nonfunctional Requirements

[If there is a module that needs to be independently assessed for performance, those test cases can go here. In some projects, planning for nonfunctional tests of units will not be that relevant. —SS]

[These tests may involve collecting performance data from previously mentioned functional tests. —SS]



### 6.3.1 Module ?

1. test-id1

Type: [Functional, Dynamic, Manual, Automatic, Static etc. Most will be automatic —SS]

Initial State:

Input/Condition:

Output/Result:

How test will be performed:

2. test-id2

Type: Functional, Dynamic, Manual, Static etc.

Initial State:

Input:

Output:

How test will be performed:

### 6.3.2 Module ?

...

## 6.4 Traceability Between Test Cases and Modules

[Provide evidence that all of the modules have been considered. —SS]

## 7 Appendix

This is where you can place additional information.

### 7.1 Symbolic Parameters

The definition of the test cases will call for SYMBOLIC\_CONSTANTS. Their values are defined in this section for easy maintenance.

### 7.2 Usability Survey Questions?

[This is a section that would be appropriate for some projects. —SS]

1. How would you rate overall neatness of UI/UX design of REVITALIZE out of 10? What are elements you like related to neatness? What are elements you would improve related to neatness?
2. Are colours used in REVITALIZE non-intrusive, appealing and/or contrasting? Rate each factor of non-intrusive, appealing and contrasting out of 10? What are elements you like that elevate these factors? What are elements you would improve to elevate these factors?
3. How would you rate the overall ability to use REVITALIZE with only one hand/one finger out of 10? What are elements that help with this? What are elements you would improve?