Verification and Validation Report: Software Engineering

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1 Revision History

Date	Version	Notes
Mar 4	1.0	Add functional requirements evaluation

2 Symbols, Abbreviations and Acronyms

symbol	**description**
JMeter	Load testing tool for analyzing and measuring the performance
SRS	Software Requirements Specification
UI	User Interface
VnV	Verification and Validation

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This document describes the test results of the verification and validation (VnV) plan for CampusConnections. The VnV plan was continuously updated as the project evolved. The following document records the results of the current version of the VnV plan. It provides results of functional and non-functional requirements tests, unit tests, changes that will be implemented in the system as a result of the tests, and various traceability tables.

3 Functional Requirements Evaluation

The following section outlines the results of functional requirements testing. The process and test performed follow the VnV Plan. To summarize, all the tests are tested manually and passed, indicating that all the functional requirements in the Software Requirements Specification (SRS) document are covered.

3.1 Pre-Registration Settings

This section covers all tests related to functional requirements about pre-registration settings.

1. **FRT-PR1**

   Name: Agree To Consent Form

   Initial State: The user does not have an account, and they starts to register an account. A consent form appears asking for access to the device and permission to collect user data

   Input: The user agrees to all the terms and conditions and clicks 'Agree' and continues to complete the registration process

   Expected Output: A notification shows the registration succeeds and the user is redirected to the login screen

   Actual Output: A notification shows the registration succeeds and the user is redirected to the login screen

   Results: Pass

2. **FRT-PR2**

   Name: Disagree To Consent Form

Initial State: The user does not have an account, and they starts to register an account. A consent form appears asking for access to the device and permission to collect user data

Input: The user rejects the terms and conditions and clicks 'Disagree' and continues to complete the registration process

Expected Output: The registration fails and a warning will show up notifying the user that they cannot create an account unless they agree to the consent form

Actual Output: The registration fails and a warning will show up notifying the user that they cannot create an account unless they agree to the consent form

Results: Pass

3.2 User Account

This section covers all tests related to functional requirements about the account and user profile.

1. **FRT-UA1**

   Name: Successful Account Creation

   Initial State: The user does not have an account and is not logged in to the application

   Input: All information needed to create an account:

   - Email: testUA1@gmail.com
   - password: FRT-UA1
   - nickname: UA1

   Expected Output: An Account with corresponding information is created in the database with the account initialized to INITIAL_USER_STATE

   Actual Output: An Account with corresponding information is created in the database with the account initialized to INITIAL_USER_STATE

   Results: Pass

2. **FRT-UA2**

   Name: Unsuccessful Account Creation

   Initial State: The user does not have an account and is not logged in to the application

   Input: All information needed to create an account:

   - Email: qtest@gmail.com (this is an existing test account)
   - password: FRT-UA1
   - nickname: UA1

   Expected Output: Account creation fails with a warning telling the user the email has already been used

   Actual Output: Account creation fails with a warning telling the user the email has already been used

   Results: Pass

3. **FRT-UA3**

   Name: Successful Account Login

   Initial State: The user has an account and is not logged in to the application

   Input: All information needed to login:

   - Email: FRT-UA3@test.com (this account exists in the system already)
   - password: FRT-UA3

   Expected Output: User successfully logs into the application and goes to the menu page

   Actual Output: User successfully logs into the application and goes to the menu page

   Results: Pass

4. **FRT-UA4**

   Name: Unsuccessful Account Login

Initial State: The user has an account and is not logged in to the application

Input: All information needed to login:

- Email: FRT-UA3@test.com (this account exists in the system already)
- password: FRT321 (wrong password)

Expected Output: Login fails with a warning telling the user the password is wrong

Actual Output: Login fails with a warning telling the user the password is wrong

Results: Pass

5. **FRT-UA5**

   Name: Account Deletion

   Initial State: The user has an account and is logged into the application

   - Email: FRT-UA5@gmail.com (this is an existing test account)
   - password: FRT-UA5
   - nickname: UA5

   Input: User clicks on the delete account button on the profile page and confirms the deletion

   Expected Output: The user is redirected to the login page and the account cannot be logged in any more

   Actual Output: The user is redirected to the login page and the account cannot be logged in any more

   Results: Pass

6. **FRT-UA6**

   Name: Reset Password

   Initial State: The user has an account:

- Email: campusconnections@gmail.com (this is an existing test account)
- password: qtesting

Input: Email address and new password

- new nickname: QTesting

Expected Output: Password is successfully reset

Actual Output: Password is successfully reset

Results: Pass

7. **FRT-UA7**

   Name: Avatar Creation and Modification

   Initial State: The user has an account with DEFAULT_AVATAR

   Input: URI represents the new avatar:

   - URI: https://upload.wikimedia.org/wikipedia/commons/2/2f/Google_2015_logo.svg

   Expected Output: The user changes the avatar to a Google logo

   Actual Output: The user changes the avatar to a Google logo

   Results: Pass

8. **FRT-UA8**

   Name: Email Verification

   Initial State: The user has an account whose email has not been verified yet

   - Email: fuz15@mcmaster.ca (this is an existing test account)
   - password: password

   Input: User clicks on 'Verify Email' button on user profile page and follows instructions on the email sent from the system

   Expected Output: That email above is verified as a valid email address

   Actual Output: That email above is verified as a valid email address

   Results: Pass

9. **FRT-UA9**

   Name: Edit Profile

   Initial State: The user has an account

   - Email: qtest@gmail.com (this is an existing test account)
   - password: qtesting
   - newProgram: Computer Science

   Input: New Profile:

   - newProgram: Computer Science
   - newLevel: 4

   Expected Output: The program and level are updated

   Actual Output: The program and level are updated

   Results: Pass

3.3 Social Networking System

This section covers all tests related to functional requirements about interactions between friends.

1. **FRT-SN1**

   Name: Successful Friend Request

   Initial State: The user is logged in with the following account:

   - Semail: FRT-SN1@test.com
   - password: testing

   Input: A valid email to send the request:

   - Temail: FRT-SN1-F@test.com

   Expected Output: A Request is sent to the target user

   Actual Output: A Request is sent to the target user

   Results: Pass

2. **FRT-SN2**

   Name: Friend Request Acceptance

   Initial State: A friend request was sent from an account (Semail) to the target account (Temail):

   - Semail: FRT-SN1@test.com
   - Temail: FRT-SN1-F@test.com

   Input: The request is accepted

   Expected Output: Two users are added to each other's friend lists

   Actual Output: Two users are added to each other's friend lists

   Results: Pass

3. **FRT-SN3**

   Name: Successful Friend Rejection

   Initial State: A friend request was sent from an account (Semail) to the target account (Temail):

   - Semail: FRT-SN1@test.com
   - Temail: FRT-SN1-F@test.com

   Input: The request is rejected

   Expected Output: The request is declined and no friend is added for both accounts

   Actual Output: The request is declined and no friend is added for both accounts

   Results: Pass

4. **FRT-SN4**

   Name: Friend Deletion

   Initial State: A friend (Femail) exist in the friend list of the test account (Temail):

   - Temail: FRT-SN4@test.com
   - Femail: FRT-SN4-F@test.com

Input: User deletes the chosen friend

Expected Output: The corresponding friend is deleted from the list

Actual Output: The corresponding friend is deleted from the list

Results: Pass

5. **FRT-SN5**

   Name: Friend Messaging

   Initial State: A friend (Femail) exist in the friend list of the test account (Temail):

   - Temail: FRT-SN5@test.com
   - Femail: FRT-SN5-F@test.com

   Input: Message: 'Hello World'

   Expected Output: The corresponding message is sent to the friend

   Actual Output: The corresponding message is sent to the friend

   Results: Pass

6. **FRT-SN6**

   Name: Friend Sharing Event

   Initial State: A friend (Femail) exist in the friend list of the test account (Temail):

   - Temail: FRT-SN6@test.com
   - Femail: FRT-SN6-F@test.com

   Input: Message that contains event name and follows some specific pattern: Hey, check this event: _E_[EXPO]

   Expected Output: User is redirected to the event page with that event once they click on the message

   Actual Output: User is redirected to the event page with that event once they click on the message

   Results: Pass

7. **FRT-SN7**

   Name: Friend Sharing Lecture

   Initial State: A friend (Femail) exist in the friend list of the test account (Temail):

   - Temail: FRT-SN7@test.com
   - Femail: FRT-SN7-F@test.com

   Input: Message that contains lecture code and follows some specific pattern: 'Hey, are you in this lecture: _L_[SFRWENG 4G06]'

   Expected Output: User is redirected to the lecture page with that lecture once they click on the message

   Actual Output: User is redirected to the lecture page with that lecture once they click on the message

   Results: Pass

3.4 Lectures and Events

This section covers all tests related to functional requirements about lectures and events and how users can interact with them.

1. **FRT-LE1**

   Name: Save Event

   Initial State: A sample event:

   - Name: EXPO

   Input: On the event page, user clicks on the save button on the pop-up window with details of the sample event

   Expected Output: The event is saved to the user's event list

   Actual Output: The event is saved to the user's event list

   Results: Pass

2. **FRT-LE2**

   Name: Unsave Event

   Initial State: A sample event that is already been saved:

- Name: EXPO

Input: On the event page, user clicks on the unsave button on the pop-up window with details of the sample event

Expected Output: The event is removed from the user's event list

Actual Output: The event is removed from the user's event list

Results: Pass

3. **FRT-LE3**

   Name: Save Lecture

   Initial State: A sample lecture:

   - Code: SFWRENG 4G06

   Input: On the lecture page, user clicks on the save button on the pop-up window with details of the sample lecture

   Expected Output: The lecture is saved to the user's lecture list

   Actual Output: The lecture is saved to the user's lecture list

   Results: Pass

4. **FRT-LE4**

   Name: Unsave Lecture

   Initial State: A sample lecture that is already been saved:

   - Code: SFWRENG 4G06

   Input: On the lecture page, user clicks on the unsave button on the pop-up window with details of the sample lecture

   Expected Output: The lecture is removed from the user's lecture list

   Actual Output: The lecture is removed from the user's lecture list

   Results: Pass

5. **FRT-LE5**

   Name: Administrator Add Event

   Initial State: User is logged in as an administrator

- email: campusconnections@gmail.com
- password: testing

Input: Sample event:

- name: Test event
- description: Sample event for system test
- time: 0
- duration: 0
- location: Online
- isPublic: true
- organizer: Team 2

Expcted Output: The event is added to the event list
Actual Output: The event is added to the event list
Results: Pass

6. **FRT-LE6**
   Name: Administrator Edit Event
   Initial State: User is logged in as an administrator

   - email: campusconnections@gmail.com
   - password: testing

   Input: Sample event name and new location:

   - name: Test event
   - location: ITB AB102

   Expected Output: The test event location is updated to the new one
   Actual Output: The test event location is updated to the new one
   Results: Pass

7. **FRT-LE7**
   Name: Administrator Delete Event
   Initial State: User is logged in as an administrator

- email: campusconnections@gmail.com
- password: testing

Input: Sample event (already in the system) name:

- name: Test event

Expected Output: The event is deleted and disappears from the list

Actual Output: The event is deleted and disappears from the list

Results: Pass

8. **FRT-LE8**

   Name: Administrator Add Lecture

   Initial State: User is logged in as an administrator

   - email: campusconnections@gmail.com
   - password: testing

   Input: Sample lecture:

   - code: TEST 1T03
   - name: Test lecture
   - time: 12:00 - 13:00, Mon
   - location: Online
   - instructor: NA

   Expected Output: The lecture is added to the lecture list

   Actual Output: The lecture is added to the lecture list

   Results: Pass

9. **FRT-LE9**

   Name: Administrator Edit Lecture

   Initial State: User is logged in as an administrator

   - email: campusconnections@gmail.com
   - password: testing

Input: Sample lecture name and new location:

- code: TEST 1T03
- location: ITB AB102

Expected Output: The test lecture location is updated to the new one

Actual Output: The test lecture location is updated to the new one

Results: Pass

10. **FRT-LE10**

    Name: Administrator Delete Lecture

    Initial State: User is logged in as an administrator

    - email: campusconnections@gmail.com
    - password: testing

    Input: Sample lecture (already in the system) name:

    - code: TEST 1T03

    Expected Output: The lecture is deleted and disappears from the list

    Actual Output: The lecture is deleted and disappears from the list

    Results: Pass

11. **FRT-LE11**

    Name: Event Information

    Initial State: A sample event exists:

    - name: EXPO

    Input: User clicks on the sample event

    Expected Output: All event information is shown in a pop-up window

    Actual Output: All event information is shown in a pop-up window

    Results: Pass

12. **FRT-LE12**

    Name: Lecture Information

    Initial State: A sample lecture exists:

    - code: SFWRENG 4G06

    Input: User clicks on the sample lecture

    Expected Output: All lecture information is shown in a pop-up window

    Actual Output: All lecture information is shown in a pop-up window

    Results: Pass

13. **FRT-LE13**

    Name: Lecture Filter by Code

    Initial State: Some software engineering lecture exists:

    - SFWRENG 4G06
    - SFWRENG 4E03

    Input: Filter:

    - FilterString: SFWRENG

    Expected Output: All lectures which do not contain the FilterString in the code are removed from the list

    Actual Output: All lectures which do not contain the FilterString in the code are removed from the list

    Results: Pass

14. **FRT-LE14**

    Name: Event Filter by Name

    Initial State: Some job fair event exists:

    - Job Fair: March 4
    - Job Fair: March 10

    Input: Filter:

- FilterString: Job Fair

Expected Output: All events which do not contain the FilterString in the name are removed from the list

Actual Output: All events which do not contain the FilterString in the name are removed from the list

Results: Pass

3.5 AR Camera

This section covers all tests related to functional requirements about AR camera.

1. **FRT-AR1**

   Name: Successful Building Recognition

   Initial State: User is at the front door of JHE

   Input: Clear camera view

   Expected Output: The building is recognized with name and description shown as an AR object

   Actual Output: The building is recognized with name and description shown as an AR object

   Results: Pass

2. **FRT-AR2**

   Name: Unsuccessful Building Recognition

   Initial State: User is out of campus

   Input: Clear camera view

   Expected Output: No AR objects are shown

   Actual Output: No AR objects are shown

   Results: Pass

3. **FRT-AR3**

   Name: Building Lectures/Events

   Initial State: User is in JHE lobby

Input: Clear camera view

Expected Output: Event and lecture information separated by room number at the corresponding locations of the building

Actual Output: Event and lecture information separated by room number at the corresponding locations of the building

Results: Pass

3.6 Map and Location

This section covers all tests related to functional requirements about the map and location tracking in the system.

1. **FRT-MAP1**

   Name: User Location

   Initial State: User allows the user to use their real-time location

   Input: User enters the map page

   Expected Output: A model representing the user shows up on the map and moves correspondingly when the user moves

   Actual Output: A model representing the user shows up on the map and moves correspondingly when the user moves

   Results: Pass

2. **FRT-MAP2**

   Name: Friend Locations

   Initial State: User has some friends who are willing to share locations:

   - email1: MAP2-1@test.com
   - email2: MAP2-2@test.com

   Input: User enters the map page

   Expected Output: Additional models representing friends show up on the map and move correspondingly when friends move

   Actual Output: Additional models representing friends show up on the map and move correspondingly when friends move

   Results: Pass

4 Nonfunctional Requirements Evaluation

The following section outlines the results of non-functional requirements testing. The process and test performed follow the VnV Plan. Most of the tests are tested manually while some of them are tested in another way, for instance, load testing is tested with JMeter while some UI requirements are tested by conducting a survey, etc. Some of the tests fail because their related requirements are removed due to the change of the project's scope, these tests will be marked in red. In general, most of the tests in the plan succeed, indicating that non-functional requirements in the Software Requirements Specification (SRS) document are covered.

4.1 Usability

4.2 Performance

4.3 etc.

5 Comparison to Existing Implementation

This section will not be appropriate for every project.

6 Unit Testing

7 Changes Due to Testing

[This section should highlight how feedback from the users and from the supervisor (when one exists) shaped the final product. In particular the feedback from the Rev 0 demo to the supervisor (or to potential users) should be highlighted. —SS]

Appendix — Reflection

The information in this section will be used to evaluate the team members on the graduate attribute of Reflection. Please answer the following question:

1. In what ways was the Verification and Validation (VnV) Plan different from the activities that were actually conducted for VnV? If there were differences, what changes required the modification in the plan? Why did these changes occur? Would you be able to anticipate these changes in future projects? If there weren't any differences, how was your team able to clearly predict a feasible amount of effort and the right tasks needed to build the evidence that demonstrates the required quality? (It is expected that most teams will have had to deviate from their original VnV Plan.)