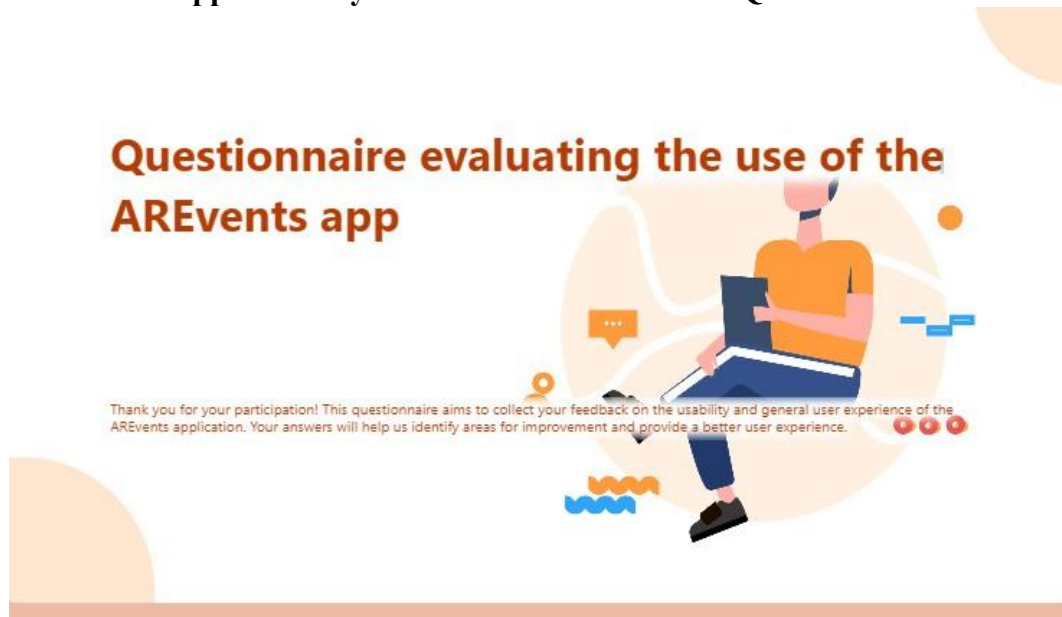


Supplementary S1 – Post-Task Evaluation Questionnaire Used



1. What is your full name? *

Enter your answer

2. What is your age group? *

- ☐ Under 18 years old.
- ☐ Between 18 and 29 years old.
- ☐ Between 30 and 44 years old.
- ☐ Between 45 and 59 years old.
- ☐ 60 years old or over.

Figure S1: Evaluation questionnaire – Part 1

3. What is your gender? *

☐ Male.

☐ Female.

☐ Other.

☐ Prefer not to say.

4. How would you rate the ease of use of the application? *

Very difficult ☆ ☆ ☆ ☆ ☆ Very easy

5. What is your opinion of the following statements? *

| | Strongly disagree | Slightly disagree | Neutral | Slightly agree | Strongly agree |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| It was easy and intuitive to find the functionalities I needed. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| The application interface is visually pleasing. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| The application was fast and responsive during use. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Interaction with virtual characters was intuitive and satisfying. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Figure S2: Evaluation questionnaire – Part 2

6. How long did it take you to familiarise yourself with the application? *

☐ Less than 5 minutes.

☐ Between 5 and 10 minutes.

☐ More than 10 minutes.

7. Did you need help to use the application for the first time? *

☐ Yes.

☐ No.

8. Did you encounter any specific problems? If yes, please describe.

Enter your answer

9. Do you have any suggestions for improving the application?

Enter your answer

10. In general, how would you rate the application? *

Very bad ☆ ☆ ☆ ☆ ☆ Very good

Figure S3: Evaluation questionnaire – Part 3

Supplementary S2 – Detailed Protocol of Tasks Performed

Task 1: Create an account by providing personal information such as name, email, and password.

Estimated Time:

- Easy: Less than 2 minutes
- Moderate: 2 to 3 minutes
- Difficult: More than 3 minutes

Task 2: Navigate back to the home page.

Estimated Time:

- Easy: Less than 30 seconds
- Moderate: 30 seconds to 1 minute
- Difficult: More than 1 minute

Task 3: Log in using the newly created account.

Estimated Time:

- Easy: Less than 2 minutes
- Moderate: 2 to 3 minutes
- Difficult: More than 3 minutes

Task 4: Navigate to the section of available events and view the map displaying available events.

Estimated Time:

- Easy: Less than 30 seconds
- Moderate: 30 seconds to 1 minute
- Difficult: More than 1 minute

Task 5: Select an event from the map and view its details.

Estimated Time:

- Easy: Less than 1 minute
- Moderate: 1 to 2 minutes
- Difficult: More than 2 minutes

Task 6: Participate in the event until the virtual character appears, and take a photo.

Estimated Time:

- Easy: Less than 2 minutes
- Moderate: 3 to 4 minutes
- Difficult: More than 4 minutes

Task 7: Navigate back to the dashboard (the page following registration or login, featuring buttons for events, history, and gallery).

Estimated Time:

- Easy: Less than 1 minute
- Moderate: 1 to 2 minutes
- Difficult: More than 2 minutes

Task 8: Navigate to the section for viewing the history of participated events and display the event list.

Estimated Time:

- Easy: Less than 30 seconds
- Moderate: 30 seconds to 1 minute
- Difficult: More than 1 minute

Task 9: Select the most recent event from the event history list and view its details.

Estimated Time:

- Easy: Less than 1 minute
- Moderate: 1 to 2 minutes
- Difficult: More than 2 minutes

Task 10: Evaluate the event after participation.

Estimated Time:

- Easy: Less than 1 minute
- Moderate: 1 to 2 minutes
- Difficult: More than 2 minutes

Task 11: Navigate to the photo gallery in the application and view the photos taken.

Estimated Time:

- Easy: Less than 30 seconds
- Moderate: 30 seconds to 1 minute
- Difficult: More than 1 minute

Task 12: Log out of the application.

Estimated Time:

Easy: Less than 1 minute

Moderate: 1 to 2 minutes

Difficult: More than 2 minutes

Supplementary S3– Functional Test

Protocols Test Protocol 1: User Registration

Test 1.1: Verify that new user registration functions correctly.

Steps:

1. Navigate to the registration screen.
2. Enter a valid name, email, and password.
3. Click the registration button.

Expected Outcome: The user should be successfully registered.

Test 1.2: Verify that the system handles existing usernames during registration.

Steps:

1. Navigate to the registration screen.
2. Enter an already used username.
3. Input email and password.
4. Click the registration button.

Expected Outcome: The system should display an error message indicating that the username is already taken.

Test 1.3: Verify that the system handles existing emails during registration.

Steps:

1. Attempt to register using an email that has already been registered.
2. Enter a name and password.
3. Click the registration button.

Expected Outcome: The system should display an error message indicating that the email is already registered.

Test 1.4: Verify that the system handles passwords that do not meet the defined criteria.

Steps:

1. Attempt to register using a password that does not meet one or more of the following requirements: minimum of 8 characters, including at least one symbol, one uppercase letter, and one digit.
2. Enter a name and email.

3. Click the registration button.

Expected Outcome: The system should display an error message indicating that the password does not meet the necessary requirements.

Test Protocol 2: User Authentication

Test 2.1: Verify that login with correct credentials functions as expected.

Steps:

1. Navigate to the login screen.
2. Enter a valid email or username and the correct password.
3. Click the login button.

Expected Outcome: The user should be successfully authenticated and redirected to the main page.

Test 2.2: Verify that the system handles invalid email or username during login.

Steps:

1. Navigate to the login screen.
2. Enter an invalid email or username.
3. Input a password.
4. Click the login button.

Expected Outcome: The system should display an error message indicating invalid credentials.

Test 2.3: Verify that the system handles unregistered emails during login.

Steps:

1. Attempt to log in using an unregistered email.
2. Enter a password.
3. Click the login button.

Expected Outcome: The system should display an error message indicating invalid credentials.

Test 2.4: Verify that the system handles incorrect passwords during login.

Steps:

1. Navigate to the login screen.

2. Enter a valid email.
3. Input an incorrect password.
4. Click the login button.

Expected Outcome: The system should display an error message indicating invalid credentials.

Test Protocol 3: Event Viewing

Test 3.1: Verify that events are displayed correctly.

Steps:

1. Navigate to the main screen.
2. Access the event section.

Expected Outcome: A map with events marked at the correct locations should be displayed properly.

Test 3.2: Verify that event details are displayed correctly.

Steps:

1. Select an event from the map.

Expected Outcome: The event details should be displayed correctly.

Test Protocol 4: Event Participation

Test 4.1: Verify that users can select and participate in an event.

Steps:

1. Click the participation button.

Expected Outcome: The user should be able to participate in the event.

Test Protocol 5: Interaction with Virtual Characters

Test 5.1: Verify that it is possible to interact with virtual characters and take photos.

Steps:

1. Arrive at the event location.
2. Ensure the virtual character is correctly displayed.
3. Take a photo with the virtual character.

Expected Outcome: The user should be able to interact with the virtual character, and the photo should be saved in the app's gallery.

Test Protocol 6: Viewing Event History

Test 6.1: Verify that the history of past events is displayed correctly.

Steps:

1. Navigate to the event history section.

Expected Outcome: The list of past events the user participated in should be displayed correctly.

Test Protocol 7: Event Rating

Test 7.1: Verify that users can rate an event after participation.

Steps:

1. After participating in an event, navigate to the event history section.
2. Select the event to be rated.
3. Enter a rating.
4. Click the submit button.

Expected Outcome: The user should be able to rate the event, and the rating should be successfully recorded.

Test Protocol 1 (Web Service): Organizer Registration and Authentication

Test Web 1.1: Verify that new organizer registration functions correctly.

Steps:

1. Navigate to the registration page.
2. Enter a valid name, email, and password.
3. Click the registration button.

Expected Outcome: The organizer should be successfully registered.

Test Web 1.2: Verify that the web service handles existing organizer names during registration.

Steps:

1. Navigate to the registration page.

2. Enter an already used organizer name.
3. Input an email and password.
4. Click the registration button.

Expected Outcome: The web service should display an error message indicating that the organizer name is already taken.

Test Web 1.3: Verify that the web service handles existing emails during registration.

Steps:

1. Attempt to register using an already registered email.
2. Enter a name and password.
3. Click the registration button.

Expected Outcome: The web service should display an error message indicating that the email is already registered.

Test Web 1.4: Verify that the web service handles passwords that do not meet the defined criteria.

Steps:

1. Attempt to register using a password that does not meet one or more of the following requirements: minimum of 8 characters, including at least one symbol, one uppercase letter, and one digit.
2. Enter a name and email.
3. Click the registration button.

Expected Outcome: The web service should display an error message indicating that the password does not meet the necessary requirements.

Test Web 1.5: Verify that login with correct credentials functions correctly.

Steps:

1. Navigate to the login screen.
2. Enter a valid email or organizer name and the correct password.
3. Click the login button.

Expected Outcome: The organizer should be successfully authenticated and redirected to the main page.

Test Web 1.6: Verify that the web service handles invalid email or organizer name during login.

Steps:

1. Navigate to the login screen.
2. Enter an invalid email or organizer name.
3. Input the password.
4. Click the login button.

Expected Outcome: The web service should display an error message indicating that the credentials are invalid.

Test Web 1.7: Verify that the web service handles unregistered emails during login.

Steps:

1. Attempt to log in using an unregistered email.
2. Enter a password.
3. Click the login button.

Expected Outcome: The web service should display an error message indicating that the credentials are invalid.

Test Web 1.8: Verify that the web service handles incorrect passwords during login.

Steps:

1. Navigate to the login screen.
2. Enter a valid email.
3. Input an incorrect password.
4. Click the login button.

Expected Outcome: The web service should display an error message indicating that the credentials are invalid.

Test Protocol 2 (Web Service): Event Creation

Test Web 2.1: Verify that event creation functions correctly.

Steps:

1. Log in as an organizer.
2. Navigate to the event creation page.

3. Enter the event details (location, time, virtual characters, etc.).
4. Click the create event button.

Expected Outcome: The event should be successfully created and listed correctly on the events page.

Test Protocol 3 (Web Service): Event Management

Test Web 3.1: Verify that event editing functions correctly.

Steps:

1. Log in as an organizer.
2. Navigate to the events page.
3. Select an existing event.
4. Edit the event details.
5. Click the save button.

Expected Outcome: The changes should be saved correctly and reflected on the events page.

Test Web 3.2: Verify that event deletion functions correctly.

Steps:

1. Log in as an organizer.
2. Navigate to the events page.
3. Select an existing event.
4. Click the delete button.
5. Confirm the deletion.

Expected Outcome: The event should be successfully deleted and should no longer appear in the event list.

Test Protocol 4 (Web Service): Access Control

Test Web 4.1: Verify that access control functions correctly.

Steps:

1. Log in as an organizer.
2. Navigate to the access control page.
3. Set permissions for event participation.

Expected Outcome: The access control settings should be saved correctly and applied to the events.

Test Protocol 5 (Web Service): Report Generation

Test Web 5.1: Verify that report generation functions correctly.

Steps:

1. Log in as an organizer.
2. Navigate to the reports page.
3. Generate a report on event performance.

Expected Outcome: The report should be generated correctly, containing all necessary metrics and details.