

Evaluation Assignment Four: Usability Test Plan

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Introduction

This documentation provides a detailed usability test plan for a smartphone app. First, it provides a summary of the app or software that is being developed by a team of undergraduate students, the Quadrilateral Cowboys. Then it outlines the usability test events in order. The documentation also includes some forms in the Appendix sections. These forms will be used throughout the test process.

Design Description

The undergraduate students are working with Massachusetts state marine fisheries specialist to create a web-based mobile application that will replace the paper datasheets used by marine biologists and citizen scientists in the collection of eelgrass data during monitoring events. The app covers the following scenarios:

1. Users can sample and record the data in a progressive manner as per the instructions prompted on the screen. This can be repeated for multiple samples.
2. Scientists and Marine specialists can download the data in the form of CSV to analyze it.

The intent is to create an intuitive and user-friendly app that the users can easily navigate and record their observations while reducing the number of errors. The users are provided with a help text to guide throughout the navigation of application.

Outline of The Usability Test Schedule

1. Introductory Events
2. Signing of the consent form
3. Pre-Test questionnaire
4. Usability Testing
5. Post-Test Questionnaire

Introductory Events

The tester will welcome the participant and have the participant sit at a desk or a table. The participant will sit at this location while they complete their initial paperwork. The tester will then describe the objective of the app and why it has been developed. The tester will ascertain the participant that **“This test imposes minimal risk, no harm should come to you performing the test, the results of the usability test are anonymized, and if at any time you wish to terminate the testing you may. We will be using a video recorder and keylogger apps for testing purposes. Please let me know if you have any concerns”**. The tester will also mention

that **“The data being collected will be kept confidential and any link to trace the identity of the participant will be destroyed”**.

Signing of the Consent Form

The tester will hand out the consent form to the participant. The participant will read the consent form and return it to the tester. The consent form is included in **Appendix A**.

Pre-Test Questionnaire

Before the usability testing, the participant will fill out a Demographic/Pre-Test questionnaire. A pre-test questionnaire has been included in **Appendix B**.

Usability Testing

Any two of the following scenarios will be evaluated during usability testing. After the tasks pertaining to a scenario is completed the participant will be asked to fill out the questionnaire specific to that scenario.

Test Scenario 1: Evaluating the size of elements and functionality

Goals:

- To check if the elements are of appropriate size for easy data entry on a moving boat
- To check if the fonts are visible and the text is easy to understand
- Determine if the form elements are appropriate for capturing a particular record

Quantitative Measurement:

- Number of cases where an element seemed too big or small
- Number of cases where the text was ambiguous and not visible
- Number of cases where an element was ambiguous and the user the required help to capture the record
- Number of bugs recorded in this process

Scenario Description:

The participant will be asked to imagine as if they are on a moving boat. They will be requested to launch the app and start capturing a new trip. He/She will be asked to navigate through the natural flow of the app and complete all the fields with relevant random details. They will be asked to note down any irregularity in text and elements displayed on the page and record the number of times they required help to capture a particular record.

The participant will be asked to refer **Appendix F** for Sample Data

Task List:

1. Open the Eelgrass Monitoring App
2. Select Add a New Trip
3. Start filling the form and navigate through the pages with relevant random details
4. Observe the inconsistencies with sizes of elements and functionality
5. Record them
6. Click on Submit

Qualitative Measurement:

- Facial expressions and comments of the participants while recording the form
- Difficulties in reading the text or understanding the functionality of a particular element
- Ease of use

Potential Observations of Participant:

- Is the distance between the smartphone and participant's eyes inconsistent?
- If the participant is asking questions?
- If the participant is feeling confused at any moment?
- Overall feedback from the participant

Bug Report Form:

A sample form is presented in **Appendix C** and will be used to capture the bugs.

Post Scenario Interview and questionnaire questions:

Scenario specific questionnaire for **Test Scenario 1** can be found in **Appendix D**.

Test Setup Details:

The users will be performing this test in a large room using a smartphone. They will be provided with necessary instructions and guidance as required.

Test Scenario 2: Text input validation, feedback and errors**Goals:**

- To check if the app validates user input for range specific/alphanumeric values
- To check what kind of feedback the app provides
- To check if the app has a fail-safe mechanism in case of an unusual event

Quantitative Measurement:

- Number of text fields where user can input arbitrary data
- Number of events a user is not provided with any feedback while trying to input invalid data
- Number of bugs encountered around the process

Scenario Description:

The participant will be asked to imagine as if they are on a moving boat. They will be requested to launch the app and start capturing a new trip. He/She will be asked to navigate through the natural flow of the app and complete all the fields with relevant random details. They will be asked to note down any fields where they are able to enter arbitrary or invalid data and the app does not give a proper feedback. Further they will be asked to turn on/off airplane mode to disable/enable network connection and record their observations.

The participant will be asked to refer **Appendix F** for Sample Data

Task List:

1. Open the Eelgrass Monitoring App
2. Select Add a New Trip
3. Start filling the form and navigate through the pages
4. Try entering erroneous data
5. Observe the inconsistencies with validation mechanisms
6. Turn on/off Airplane mode
7. Click on Submit

Qualitative Measurement:

- Facial expressions and comments of the participants while recording the form
- Does the app crash on losing network?
- Does the user find difficulty in entering data in a particular element?

Potential Observations of Participant:

- If the participant is asking questions?
- If the participant is feeling confused at any moment?
- Overall feedback from the participant

Bug Report Form:

A sample form is presented in **Appendix C** and will be used to capture the bugs.

Post Scenario Interview and questionnaire questions:

Scenario specific questionnaire for **Test Scenario 2** can be found in **Appendix D**.

Test Setup Details:

The users will be performing this test in a large room using a smartphone. They will be provided with necessary instructions and guidance as required.

Test Scenario 3: Login Page and Download Trip Data**Goals:**

- To check if the user can login without any glitches
- To verify if the user can download and view submitted trip data
- To verify data consistency

Quantitative Measurement:

- Number of events where a user faced login issues
- Number of events where the user was not able to download and view the required data
- Number of instances where data inconsistencies were found

Scenario Description:

The participant to imagine as if they he/she is a scientist analyzing the collected data. They will be requested to launch the app and download trip data. They will be asked to login and an instance of trip record. They will be asked to note down any issues they have faced until downloading the data. After downloading the data, they will be asked to verify the accuracy and note down any inconsistencies found within the data.

Task List:

1. Open the Eelgrass Monitoring App
2. Select Download Trip Data
3. Login with provided credentials
4. Select a trip record and download it
5. Open the file and view the data
6. Note down any data inconsistencies found / problems faced until here
7. Report

Qualitative Measurement:

- Facial expressions and comments of the participants while logging in and downloading the data
- Does the app behave abnormally when logging in and downloading data?
- Accessibility of the process

Potential Observations of Participant:

- If the participant is asking questions?
- If the participant is feeling confused at any moment?
- Overall feedback from the participant

Bug Report Form:

A sample form is presented in **Appendix C** and will be used to capture the bugs.

Post Scenario Interview and questionnaire questions:

Scenario specific questionnaire for **Test Scenario 3** can be found in **Appendix D**.

Test Setup Details:

The users will be performing this test in a large room using a laptop/computer. They will be provided with necessary instructions and guidance as required.

Post Test Questionnaire

The participant will fill out a general questionnaire after two of the above scenarios have been completed. The general questionnaire is included in **Appendix E**

Appendix A

Computer User Interface Usability Testing Consent Form

You are being invited to participate in a research study to determine the usefulness and usability of computer user interfaces. This study is being conducted by Dr. Robert Pastel of Michigan Technological University Computer Science Department and students in Dr. Pastel's Human-Computer Interaction (MCI) courses. The students are performing the usability tests as part of their project and to fulfill the HCI course requirements.

There are no known risks if you decide to participate in this research study. There are no costs to you for participating in the study. The information you provide and tasks that you will perform will determine the usefulness and usability of user interfaces. The questionnaires and the tasks should take less than an hour to complete. The information collected may not benefit you directly, but the information learned in this study should provide more general benefits.

The questionnaires and test are anonymous. Do not write your name on the survey. No one will be able to identify you or your answers, and no one will know whether or not you participated in the study except for the instructor of the class that is giving you credit for participating. Should the data be published, no individual information will be disclosed.

Your participation in this study is voluntary. By completing the questionnaires and performing the tasks, you are voluntarily agreeing to participate. You are free to decline to answer any particular question you do not wish to answer or not to perform a task for any reason.

If you have any questions about the study, please contact Dr. Robert Pastel, Assistant Professor, Computer Science Department, Michigan Technological University, Houghton, MI 49931.

The MTU Institutional Review Board has reviewed my request to conduct this project. If you have any concerns about your rights in this study, please contact Joanne Polzien of the MTUIRB at 906-487-2902 or email jpolzien@mtu.edu.

Participant signature and date:

Appendix B

PRE TEST QUESTIONNAIRE

Test Date/Time:

Age:

Gender:

Please answer the following questions by checking against the choice you feel is appropriate

Q1. I have been using a smartphone for (only check one):

1. less than a year
2. 1~2 years o 2~3 years
3. more than 3 years
4. Not applicable (check only if you do not use a smartphone)

Q2. I have been using a computer for (only check one):

1. less than a year
2. 1~2 years o 2~3 years
3. more than 3 years
4. Not applicable (check only if you do not use a computer)

Q3. I normally use a smartphone with the following operating system:

1. iOS
2. Android
3. Do not use smartphone

Q4. The physical size of my smartphone screen is (only check one):

1. 3.7 ~ 4.7 inches
2. 5.0 ~ 5.2 inches
3. > 5.2 inches
4. Not applicable (check only if you do not use a smartphone)

Q5. Did you participate in a usability testing before?

1. Yes
2. No

Appendix C
Bug Report Form

Number	Bug Name	Uniqueness	Location	Description

Definitions

NUMBER: A bug number is an identifier provided by the usability test administrator when a user encounters a bug.

BUG NAME: The name of an encountered bug which can easily be distinguishable and comprehensible later on.

UNIQUENESS: An asterisk is assigned if the user is encountering the bug for the first time and no other user has encountered it before.

LOCATION: The page where the bug was encountered.

DESCRIPTION: A formal description of the bug that has been encountered.

Appendix D

POST SCENARIO QUESTIONNAIRE (Scenario 1)

Please indicate your level of satisfaction with the app you have just worked on. Check the option that reflects your satisfaction level:

Q1. I thought the size of texts were accurate

1. Strongly Disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

Q2. I thought the size of elements were accurate

1. Strongly Disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

Q3. I found the elements relevant to the record

1. Strongly Disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

Q4. I could complete the form without help

1. Strongly Disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

In the space below provide any comment you like to share about this test scenario:

POST SCENARIO QUESTIONNAIRE (Scenario 2)

Please indicate your level of satisfaction with the app you have just worked on. Check the option that reflects your satisfaction level:

Q1: I thought I could not enter invalid information

1. Strongly Disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

Q2: I thought the app provided reasonable feedback

1. Strongly Disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

Q3: I thought the app did not crash all of a sudden

1. Strongly Disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

Q4: I thought the app provided useful help information

1. Strongly Disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

In the space below provide any comment you like to share about this test scenario:

POST SCENARIO QUESTIONNAIRE (Scenario 3)

Please indicate your level of satisfaction with the app you have just worked on. Check the option that reflects your satisfaction level:

Q1: I did not face any issues while logging in or downloading data

1. Strongly Disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

Q2: I was able to find and download the trip data I was looking for

1. Strongly Disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

Q3: I thought the app did not crash all of a sudden

1. Strongly Disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

Q4: I found the data consistent and as expected

1. Strongly Disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

In the space below provide any comment you like to share about this test scenario:

Appendix E

POST TEST QUESTIONNAIRE

Please indicate your level of satisfaction with the app you have just worked on. Check the option that reflects your satisfaction level:

Q1. I thought I clearly understood the objective of the app

1. Strongly Disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

Q2. I thought the app was precise with its response and interactions

1. Strongly Disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

Q3. I thought the app did not behave abnormally

1. Strongly Disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

Q4. I thought I was satisfied with the app's interface and design

1. Strongly Disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

Based on your experience please provide some feedback on the following questions:

Did you like the app? 1. YES 2. NO

In your opinion, is there anything that you did not like and would like to be improved?

Is there anything that you liked very much and why?

Please share any comments you have about the study in general:

Appendix F

Sample Data (For Reference Only)

Field	Data
Date of Trip	04/21/2019
Harbor	Hancock
Crew Members	Jack, James, Hannah
Boat Name	Titanic
Station Number	1157
Latitude	47.1306
Longitude	-88.5912
GPS Device	Garmin
Wind Direction	W
Wind Speed	0-5 Knots
Sea State	Glass Calm
Tide	Low
Secchi (1) Water Depth	10.5
Secchi (1) Time	09:00:00
Secchi (1) Secchi Depth	9.5
Secchi (1) Did disk touch the bottom?	Check
Secchi (2) Water Depth	15.5
Secchi (2) Time	12:00 AM
Secchi (2) Secchi Depth	8.5
Secchi (2) Did disk touch the bottom?	No
Is this an Indicator Station?	Yes
Drop Frame (1) - Picture Taken?	Yes
Drop Frame (1) - Picture Timestamp	09:10:00
Drop Frame (1) - Sediment	Sand
Drop Frame (1) - Eelgrass Percent Cover	1-10
Indicator Station only: (1-Shoot 1) length	20
Indicator Station only: (1-Shoot 1) width	3
Indicator Station only: (1-Shoot 2) length	30
Indicator Station only: (1-Shoot 2) width	4
Indicator Station only: (1-Shoot 3) length	25
Indicator Station only: (1-Shoot 3) width	2
Indicator Station only: (1) Wasting disease	High
Indicator Station only: (1) Epiphyte cover	Medium
Drop Frame (2) - Picture Taken?	Yes
Drop Frame (2) - Picture Timestamp	09:15:00
Drop Frame (2) - Sediment	Sand
Drop Frame (2) - Eelgrass Percent Cover	0
Indicator Station only: (2-Shoot 1) length	10.5
Indicator Station only: (2-Shoot 1) width	3

Indicator Station only: (2-Shoot 2) length	30.5
Indicator Station only: (2-Shoot 2) width	4
Indicator Station only: (2-Shoot 3) length	20
Indicator Station only: (2-Shoot 3) width	2.5
Indicator Station only: (2) Wasting disease	Low
Indicator Station only: (2) Epiphyte cover	None
Drop Frame (3) - Picture Taken?	Yes
Drop Frame (3) - Picture Timestamp	09:20:00
Drop Frame (3) - Sediment	Cobble
Drop Frame (3) - Eelgrass Percent Cover	0
Indicator Station only: (3-Shoot 1) length	40.5
Indicator Station only: (3-Shoot 1) width	3
Indicator Station only: (3-Shoot 2) length	10
Indicator Station only: (3-Shoot 2) width	4
Indicator Station only: (3-Shoot 3) length	20
Indicator Station only: (3-Shoot 3) width	2
Indicator Station only: (3) Wasting disease	None
Indicator Station only: (3) Epiphyte cover	Low
Drop Frame (4) - Picture Taken?	Yes
Drop Frame (4) - Picture Timestamp	09:25:00
Drop Frame (4) - Sediment	Gravel
Drop Frame (4) - Eelgrass Percent Cover	75-100
Indicator Station only: (4-Shoot 1) length	15
Indicator Station only: (4-Shoot 1) width	3
Indicator Station only: (4-Shoot 2) length	20.5
Indicator Station only: (4-Shoot 2) width	4.5
Indicator Station only: (4-Shoot 3) length	30
Indicator Station only: (4-Shoot 3) width	2
Indicator Station only: (4) Wasting disease	High
Indicator Station only: (4) Epiphyte cover	High