Usability Test Plan

Green Space Team

Team members:

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1 Introduction

The report presents a comprehensive usability test plan for a green space application created by a team of 6 undergraduate students (referred to as "team 4"), which serves both educational and research purposes. The report starts by providing an overview of the application and its features, followed by a detailed description of the usability testing process. This includes information on instructions, consent forms, questionnaires, test scenarios, and bug reporting procedures.

2 App Description

This app allows users to locate and track green spaces such as wetlands, public gardens, greenways, etc. Users can upload information such as photos, location, green space categorization to update the database of the app. There are several purposes of the app: 1) improve general population's knowledge and awareness about the green infrastructure; 2) improve the quality of data points from users via the user interaction; 3) provide a large amount of high-quality data for research in term of wetland map, indicators, and model.

3 Outline of the Usability Test

The ordinary test procedures are as follows:

1. Instructions to participants
2. Signing consent form
3. Demographic questionnaire
4. Performing the experiment
5. Post-experiment questionnaire

The testing will consist of 8 sessions that will be conducted online using the Zoom application. Each session will last for around 30 minutes to 50 minutes (depending on the participants' using situation). Participants are required to use their computer devices that with a video camera (recording via the camera during the whole test is required) to access the URL web application for testing purposes.

Dates and time for testing sessions:

1. 4/9/2023 1:00 PM
2. 4/11/2023 12:00 PM
3. 4/11/2023 1:00 PM
4. 4/11/2023 1:00 PM
5. 4/13/2023 11:00 AM
6. 4/13/2023 12:00 PM
7. 4/13/2023 1:00 PM
8. 04/14/2023 3:00 PM

4 Instructions to Participants

Prior to conducting the test sessions and experiment, the experimenter must provide an explanation of the purpose and procedures of the application to the participants. The tasks that the participants will be performing should also be briefly explained to them. The experimenter must ensure that there are no risks associated with using the application, and that all data obtained from the application will be kept confidential. It should be noted that this application has educational purposes, and information about it may be shared with the professors of the class for educational and real testing purposes. However, there is no risk involved in using the application. At the end of the session, the participants will be asked about their experience with the usability tasks.

5 Consent Form Signing

Participants must sign a consent form acknowledging that they can withdraw from the experiment at any time if they feel uncomfortable with the test or for any other reason. The privacy of their identity will be safeguarded throughout the experiment. Participation in the experiment is only permitted once the consent form has been signed. The consent form can be found in Appendix A.

6 Usability Questions

Two different types of questionnaires were provided for the usability test. The first questionnaire is a demographic questionnaire, which is to be completed prior to the scenarios experiment. The second questionnaire is the post-experiment questionnaire, which will be given after the scenarios experiment has been conducted and tested.

6.1 Demographic Questionnaire

Once the consent form has been filled out, participants will be asked to complete a demographic questionnaire. This questionnaire includes basic tasks such as the participant's gender, age, major, and level of familiarity with using smartphones or laptops (mostly smartphone experience is required). The demographic questionnaire can be found in Appendix B.

6.2 Post Experiment Questionnaire

Upon completion of the experiment, participants will be asked to fill out another questionnaire regarding their experience with using the application. This questionnaire will also include a section where participants can provide any suggestions or comments about their experience with the application. The post-experiment questionnaire can be found in Appendix C.

7 Bug Report

If an error occurs during the program running, it is considered a bug. The bug form can be found in Appendix D. Every time a participant encounters an error during the program running, a unique bug number and name will be given. If a bug appears for the first time, an asterisk will be placed next to the bug. For multiple occurrences of the same bug, no description will be written except for the bug's name. Additionally, the bug location will be provided to indicate which part and page of the website/application has the bug.

8 Test Scenarios

Three test scenarios have been provided for testing the application, and each of these tests has been described in the following sections. One of these tests will be conducted during each usability testing session, which will be conducted online.

8.1 Test Scenario 1:

8.1.1 Test Goals

- To check if website page's style is feeling comfortable for the user.
- To check if the App description on the homepage is easy to understand for the user.
- To test the time for user to complete reading the App description on the homepage.
- To check if the navigation bar is working properly for the user to access different sections of the App.

8.1.2 Scenario Description

We suppose the user has no idea about what the App is used for. The user must read the introduction of the App on the homepage to understand the App background knowledge. Then the user will begin to explore the website and learn more about the App.

8.1.3 Task List

- Open the App and login the personal account.
- Click into the education page and read the information.
- Click into the map page.
- Try some manipulation like zoom in and zoom out on the map.
- Click some location on the map to view location information.

8.1.4 Quantitative Measurement List

- The time the user spends on reading the introduction information on the App.
- The number of the times the App crashed.

8.1.5 Qualitative Measurement List

- User's understanding about the development motivation of the App.
- User's understanding about the different functionalities of the App.
- User's ease to navigate different pages of the App website.

8.1.6 Potential observations of participants

- The user does not understand what the App is used for.
- The user is confused about the information that provide on different pages.
- The user has difficulties on using the navigation bar to go through different pages on the website.

8.1.7 Bug Report Form

To report functional software problems, a Bug report form will be used. This form will include information about the person reporting the problem, the nature of the problem, and instructions for replicating the problem. The Bug report form can be found in Appendix D.

8.1.8 Post Experiment Questionnaire

Once all the tasks have been completed, participants will be asked to fill out a post-experiment questionnaire. The post-experiment questionnaire for this scenario can be found in Appendix C.

8.1.9 Test Set up Details

To conduct the online usability testing, we have set up and scheduled a Zoom meeting. At the beginning of the session, participants will be asked to fill out the consent form and demographic questionnaire. The instructor and students will run the application on their laptop or mobile, with a preference for laptops to better see the details on the shared screen. Verbal instructions will be given to the participants during the explanation parts of the test. Each participant will be given a turn to share their screen and perform the tasks on the application. After the test is completed, participants will fill out the post-experiment questionnaire.

8.2 Test Scenario 2:

8.2.1 Test Goals

- To check if the App is useful for user's educational purpose.
- To check if the App really help user to learn knowledge about green space and infrastructure.
- To check if the quiz functionality works properly.

8.2.2 Scenario Description

We suppose the user made their effort to learn as much as possible knowledge about green space and infrastructure from the provided information. Thus. Based on these information we set a quiz for the user to exam the learning effect. The user will do the quiz after they go through the information.

8.2.3 Task List

- Open the App and login the personal account.
- Click into the education page and read the information.

- Read and learn the provided information.
- Finish the quiz and submit it.
- Note the score and compare the response answer with the correct answer.

8.2.4 Quantitative Measurement List

- The time the user spends on doing the quiz.
- The score the user attained in the quiz.
- The number of the times the App crashed.

8.2.5 Qualitative Measurement List

- User's understanding about the contents on the App.
- User's learning experience through the App.
- User's performance in the quiz.

8.2.6 Potential observations of participants

- The user is confused about the information that provide on the App.
- The user shows difficulty in selecting the answer in the quiz.
- The user does not performance well in the quiz.

8.2.7 Bug Report Form

To report functional software problems, a Bug report form will be used. This form will include information about the person reporting the problem, the nature of the problem, and instructions for replicating the problem. The Bug report form can be found in Appendix D.

8.2.8 Post Experiment Questionnaire

Once all the tasks have been completed, participants will be asked to fill out a post-experiment questionnaire. The post-experiment questionnaire for this scenario can be found in Appendix C.

8.2.9 Test Set up Details

To conduct the online usability testing, we have set up and scheduled a Zoom meeting. At the beginning of the session, participants will be asked to fill out the consent form and demographic questionnaire. The instructor and students will run the application on their laptop or mobile, with a preference for laptops to better see the details on the shared screen. Verbal instructions will be given to the participants during the explanation parts of the test. Each participant will be given a turn to share their screen and perform the tasks on the application. After the test is completed, participants will fill out the post-experiment questionnaire.

8.3 Test Scenario 3:

8.3.1 Test Goals

- To evaluate the functionality of the map feature in the Greenspace app.
- To check if the location functionality is working properly.

- To check how accurate the location displays.
- To check if the App is useful for the user to locate a specific green space and infrastructure.

8.3.2 Scenario Description

We suppose the user is interested in using the App to look for green space information and place. The user will try to use the App to locate some green space and infrastructure. They will identify the place on the map.

8.3.3 Task List

- Open the App and login the personal account.
- Click into the map page and try to manipulate the map.
- Allow the App to locate the user's location.
- Search for some green spaces on the map.
- Check the detailed information that display on the map.

8.3.4 Quantitative Measurement List

- The time the user spends on using the map functionality.
- The time that needs to load the map.
- The time that the user identifies a green space on the map from start to search it.

8.3.5 Qualitative Measurement List

- User's understanding about how to use the map features.
- User's ease to locate and identify a specific green space.
- User's understanding about the information that display on the map.

8.3.6 Potential observations of participants

- The user is confused about the information that provide on the map.
- The user shows difficulty in some manipulation on the map.
- The user find that the location feature does not work properly.

8.3.7 Bug Report Form

To report functional software problems, a Bug report form will be used. This form will include information about the person reporting the problem, the nature of the problem, and instructions for replicating the problem. The Bug report form can be found in Appendix D.

8.3.8 Post Experiment Questionnaire

Once all the tasks have been completed, participants will be asked to fill out a post-experiment questionnaire. The post-experiment questionnaire for this scenario can be found in Appendix C.

8.3.9 Test Set up Details

To conduct the online usability testing, we have set up and scheduled a Zoom meeting. At the beginning of the session, participants will be asked to fill out the consent form and demographic questionnaire. The instructor and students will run the application on their laptop or mobile, with a preference for laptops to

better see the details on the shared screen. Verbal instructions will be given to the participants during the explanation parts of the test. Each participant will be given a turn to share their screen and perform the tasks on the application. After the test is completed, participants will fill out the post-experiment questionnaire.

8.4 Test Scenario 4:

8.4.1 Test Goals

- To evaluate the functionality of data uploading in the App.
- To check if the upload feature works properly with the map feature.
- To check if the data uploading process is user-friendly.

8.4.2 Scenario Description

We suppose the user is interested in sharing green space information and places on the App. The user will try to upload some photos of green space and infrastructure. They will also provide the location and categorize the green space they upload.

8.4.3 Task List

- Open the App and login the personal account.
- Click into the upload pictures page and try to begin the upload process.
- Select a green space photo from their device to upload.
- Allow the App to locate the user's location.
- Enter the location and category information.

8.4.4 Quantitative Measurement List

- The time the user spends on using the upload pictures feature.
- The time that needs to load the map.
- The time that the user identifies a green space on the map from start to search it.

8.4.5 Qualitative Measurement List

- User's understanding about how to complete the upload process.
- User's understanding about the information that required to upload a new data point for green space.
- User's understanding the importance of their uploaded information for the research purpose.

8.4.6 Potential observations of participants

- The user is confused about the upload data process.
- The user does not understand the importance of their uploaded information for the research purpose.
- The user has difficulties in reselect a photo that is going to upload.

8.4.7 Bug Report Form

To report functional software problems, a Bug report form will be used. This form will include information about the person reporting the problem, the nature of the problem, and instructions for replicating the problem. The Bug report form can be found in Appendix D.

8.4.8 Post Experiment Questionnaire

Once all the tasks have been completed, participants will be asked to fill out a post-experiment questionnaire. The post-experiment questionnaire for this scenario can be found in Appendix C.

8.4.9 Test Set up Details

To conduct the online usability testing, we have set up and scheduled a Zoom meeting. At the beginning of the session, participants will be asked to fill out the consent form and demographic questionnaire. The instructor and students will run the application on their laptop or mobile, with a preference for laptops to better see the details on the shared screen. Verbal instructions will be given to the participants during the explanation parts of the test. Each participant will be given a turn to share their screen and perform the tasks on the application. After the test is completed, participants will fill out the post-experiment questionnaire.

9 Appendix A - 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 (HCI) 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 will provide more general benefits. The questionnaires and tests 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 MTU-IRB at 906-487-2902 or email jpolzien@mtu.edu.

Participant signature and date:

10 Appendix B - Demographics Questionnaire

1. Age:

2. Gender.

3. How many years have you used a smartphone?

4. Do you have any difficulties with viewing colors, contrast, or fonts on a smartphone or computer screen that you are aware of?

(a) Yes

(b) No

5. I am very interested in the testing of this application.

(a) Strongly agree

(b) Agree

(c) Neutral

(d) Disagree

(e) Strongly disagree

11 Appendix C - Post Experiment Questionnaire

Please indicate your level of agreement to the following statements:

1. Overall, this application was easy to perform the task.

(a) Strongly agree

(b) Agree

(c) Neutral

(d) Disagree

(e) Strongly disagree

2. I enjoyed using this application.

(a) Strongly agree

(b) Agree

(c) Neutral

(d) Disagree

(e) Strongly disagree

3. The toggle buttons are clear and easily navigable.

(a) Strongly agree

(b) Agree

(c) Neutral

(d) Disagree

(e) Strongly disagree

4. The text was easy to read and understand.

(a) Strongly agree

(b) Agree

(c) Neutral

(d) Disagree

(e) Strongly disagree

5. I was able to complete my tasks efficiently.

(a) Strongly agree

(b) Agree

(c) Neutral

(d) Disagree

(e) Strongly disagree

6. I would use this application again.

(a) Strongly agree

(b) Agree

(c) Neutral

(d) Disagree

(e) Strongly disagree

7. What did you like most about this application?

8. Do you have any suggestions for the improvement of this application?

12 Appendix D - Bug Report Form

To compare test results across teams, a bug reporting form is being used as part of the usability test. When a bug is first encountered, an asterisk is put by the bug to mark it. If the bug occurs across multiple users or even the same user, you do not put an asterisk by the bug. The test assistants will aid in identifying the bugs throughout the testing session.

Bug Description:

Steps to reproduce:

Reported By:

Date: _____

Time: _____