Usability Test Report
Team(1) - Stream and Trail Application

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Contents

1) Introduction To The Application

Stream and Trail app is a mobile based web application. The target users for this application are trail visitors, trail managers and scientists/researchers. Coming to the functionality of this application the trial visitors can see the trail condition before visiting the trail through this application. If the user visits the trail they can report the trail condition using this application, which alerts the other trail users and also the trail managers regarding the trail condition. This app is specifically designed for the McDonald trail, where the river flows across the trail. The scientists/researchers can download or upload the sensor reports of the trail. This is the basic outline of the application.

2) Description of the User Interface

2.1 Normal User
1. The Normal users will have access to the basic features of the applications.
2. They can see the trail condition and they can report the trail condition.

2.2 Authenticated User
1. The Authenticated users will have more features available when compared to the normal users. They have their own credentials to login.

2. The Authenticated users not only can see the trail condition and report the trail condition they can also see the statistics of the trails.
3. The Authenticated users add other users to have the same privileges.
4. The Authenticated users can download and upload the trail reports which consists of the trails sensor information.

3) Test Plans

3.1. Test Process

There are seven testing sessions scheduled: April 12th at 2:00pm, 3:00pm and 4:00pm, April 14th at 2:00pm, 3:00pm, 4:00pm and 5:00pm. The test will be administered by the graduate student, and at least two undergraduate group members will be present to assist with the test. The test will take place remotely using Zoom. Participants will be given the link to the application via the chat, then asked to share their screen as they complete the scenarios in the test. Pre-test and Post-test questionnaires will be distributed through the chat using a link to a Google form. The test process is as follows:

1. Provide the participant with the Zoom meeting link two days prior to the test.
2. Administrator and undergraduate group members arrive at the Zoom meeting early.
3. Administrator makes sure the screen sharing is enabled.
4. Greet the participant. Explain the purpose of the test and the application.
5. Get verbal consent from the participant.
6. Share the link to the pre-test questionnaire in the chat. Allow the participant to fill it out.
7. Prompt the participant to use the think aloud technique while completing the scenario.
8. Share the link to application.
9. Instruct the participant to share their screen.
10. Read the scenario to the participant.
11. Allow the participant to perform the scenario.
12. Perform the post-scenario interview.
13. Ask the participant to refresh their page to reset the application.
14. Repeat 10 – 12 for remaining scenarios.
15. Share the link to the post-test questionnaire in the chat. Allow the participant to fill it out.
16. Thank the participant.

The test requires the participant to have access to a computer that has internet access, Zoom installed, and a working microphone. The administrator and undergraduate team members must also have access to a computer with internet access, Zoom installed, and a working microphone. The administrator must also have Google forms with the questionnaires created, printed copies of the bug report and technical challenges forms, a stopwatch, and pen and paper for notes. The undergraduate team member must also have a pen and paper for notes.

3.2 Consent Form

3.2.1 About the Consent Form

The participant should sign the consent form that acknowledges that participants can cease 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. The participant can participate in the experiment only if they signed the consent form.

3.2.1 Online 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 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 and the 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 tests are anonymous. No one will be able to identify you and your answers, and no one will know whether or not you participated in the study except for the instructor of the class who 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. The testing may make use of video conferencing software which will record your tasks on the computer screen and from your webcam. The webcam recordings will not be shared, and you may mute the webcam at any time. Before sharing your screen, you should clear your desktop of any open apps except your browser. Also, you should clear your desktop of any icons or widget that you wish not to be observed. If you have any questions about the study, please contact Dr. Robert Pastel, Associate Professor, Computer Science Department, Michigan Technology University, Houghton, MI 49931.

3.3 Demographic Questionnaire

3.3.1 About Demographic Questionnaire

After filling out the consent form participants will be asked to do a demographic questionnaire. It has basic tasks such as participants name, email, and familiarity with using the smartphone or laptop (mostly smartphone experience needed).

3.3.2 Demographics Questionnaire Questions

1. Name
2. Email
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

3.4 Post Experiment Questionnaire

3.4.1 About Post Experiment Questionnaires

After completing all the tasks, the participants will be asked to fill up a post-experiment questionnaire.

3.4.2 Post Experiment Questionnaire Questions

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?

3.5 Bug Report

A Bug report form will be used to indicate functional software problems, including the person reporting the problem, the nature of the problem, and instructions for replication.

App Name: Stream & Trail
Reported By: Naveen Boinapelly
Date:_____
Time:_____

Bug Number	Bug Name	Bug Location	Bug Description (short description of the bug for replication)

4) Limitations For Usability Test Sessions

Some features of the application have not been implemented due to the time limitation for developers team including:
1. Uploading and the downloading of the reports in the authenticated view.
2. Deleting the false reviews.

5) Test Scenarios

Actually there were three test scenarios,but few features were not implemented so we made it into two test scenarios which covers all the features of the application.

5.1 Test Scenario 1: Checking The Basic Features of the Application as a Normal User

5.1.1 Test Goals

1. To check if the user can see the trail condition in the home page.
2. To check if the user can report the particular trail condition using his current location.
3. Check the reports of individual trails.
4. To check the reported trail condition is reflected on the home screen or not.

5.1.2 Scenario Description

You are now considered as the normal user. You want to visit a trail so use this application to see the trail condition before your visit. After that, now consider you visited a few trails where some of them are good and some of them are bad, so now you report the trail conditions using your current location and check whether the report is reflected on the home page so that other users will be alerted. And also check whether your report is recorded or not.
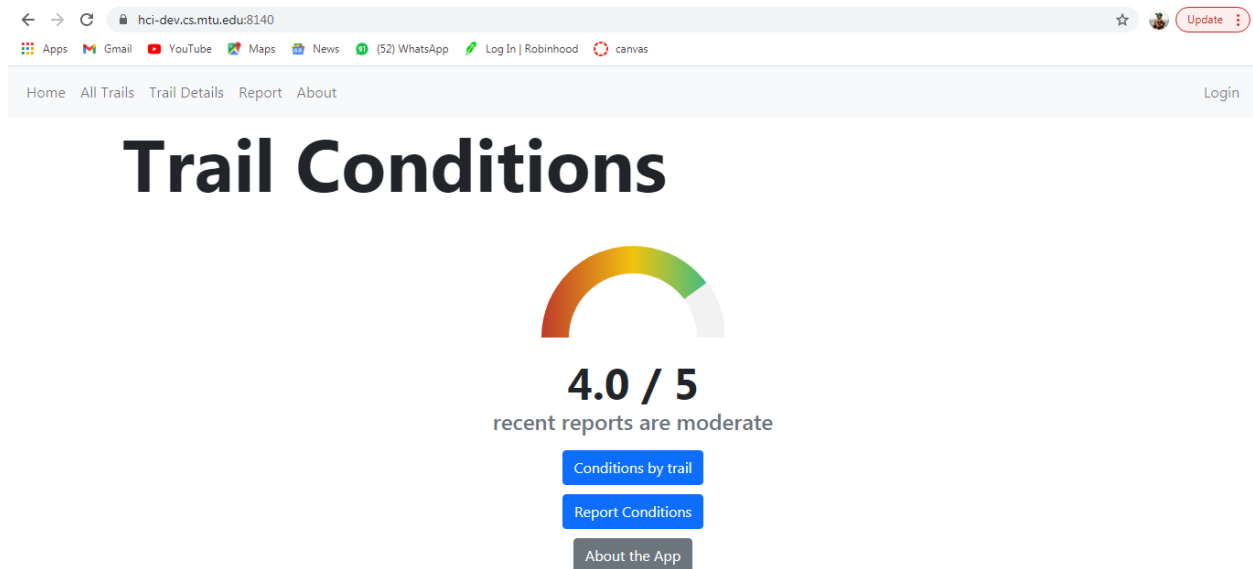

Fig.1 Home page for the Normal user.

Trail Report

Where did you visit?

| Select Trail | ⌄ |

Geolocation:

Include your current coordinates on the trail?

When did you visit?

| 26-04-2021 | 📅 |

| 12 ⌄ | : | 57 ⌄ | PM ⌄ |

Rate your visit:

☆　　　☆　　　☆　　　☆　　　☆

Terrible Experience　　　　　　　　　　　　　Excellent Experience

Maintenance:

Does the trail need maintenance?

Any notes on your experience?

Notes about your experience (optional)

Submit Report

Fig 2. Trail report form.

5.1.3 Task List

1. When the user opens the homepage should be able to see the trail condition.
2. The user should click on the report button on the top left side of the page and can add the trail report using the current location.
3. The user clicks on the Trail Details and is able to see whether his trail report is recorded or not with respect to the time constraint.
4. The user clicks on All Trails and views the individual trail reports.

5.1.4 Quantitative Measurement List

1. Number of times the application crashed.

2. Time taken to perform this scenario.
3. Time taken to add one report.
4. Number of participants who successfully complete the scenario.

5.1.5 Qualitative Measurement List

1. How much participant satisfaction with the application functions?
2. Are students easily interacting with the application?
3. Is there any difficulty in viewing the colours, font and buttons?
4. Whether the participant is confused and if so, why?

5.1.6 Potential Observations of Participant

1. Participant's ability to understand application general functions and ideas and perform the tasks.
2. Participant's level of confusion.
3. Participant's understanding of the user interface.

5.1.7 Post Scenario Interview Questions

1. Do you find any difficulty in performing the operations?
2. Do you have any suggestions in making this interface more interactive?

5.2 Test Scenario 2: Checking the features of the application as an Authenticated User.

5.2.1 Test Goals

1. After logging in using his credentials, the user should be able to see the trail condition in the homepage similar to that of the Normal User interface.
2. To check if the user can be able to perform all the tasks that he/she performed in the Normal user interface.
3. In addition to the features that are similar to the Normal user interface, the user should be able to add the new users by sending an invite to them.
4. To check if the user is able to check the trail statistics.

In addition to this we also want to check the upload and the download report feature, but due to the time limitation for undergrad students in the development process, we could not run these and they have not implemented these features.

5.2.2 Scenario Description

Now you are considered as an Authenticated/privileged user. Here you'll be given the credentials where you'll login. Go through all the features like checking the trail condition, reporting the trail similar to the tasks that you performed as a Normal User. Check the Statistics of the trails and also add yourself as another authentic user by sending an email invite for the registration.
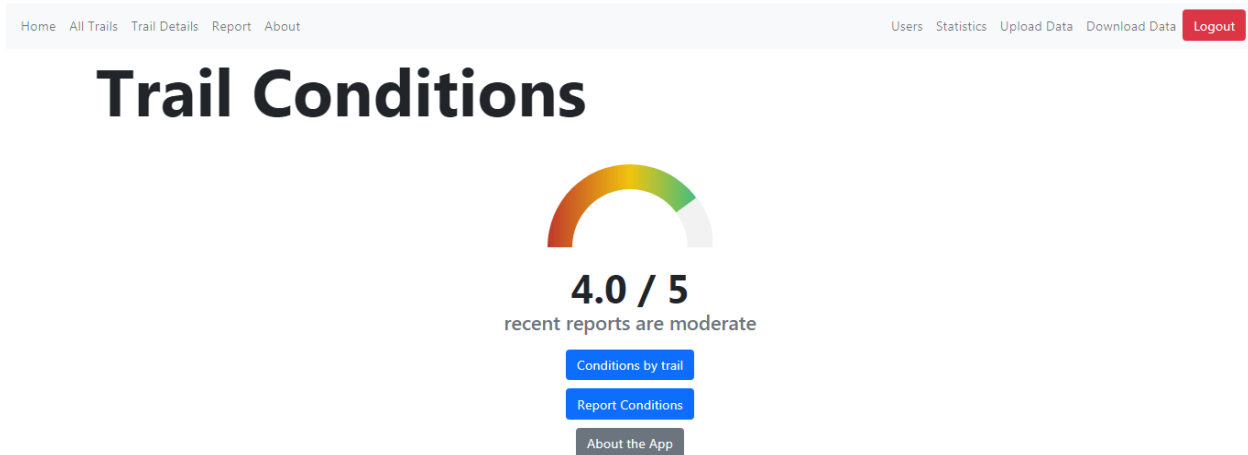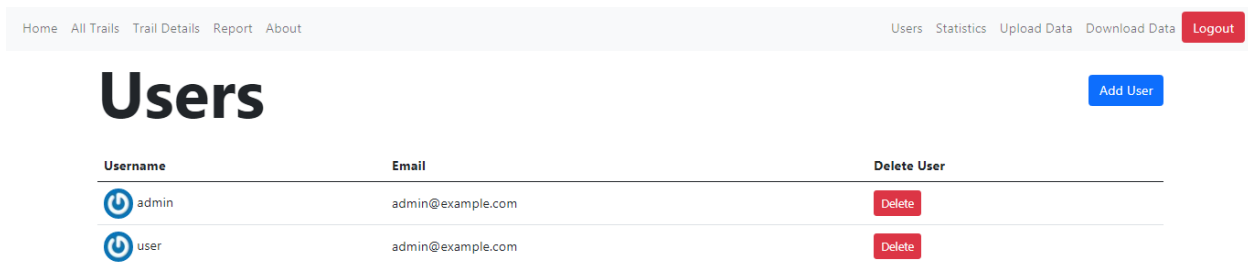

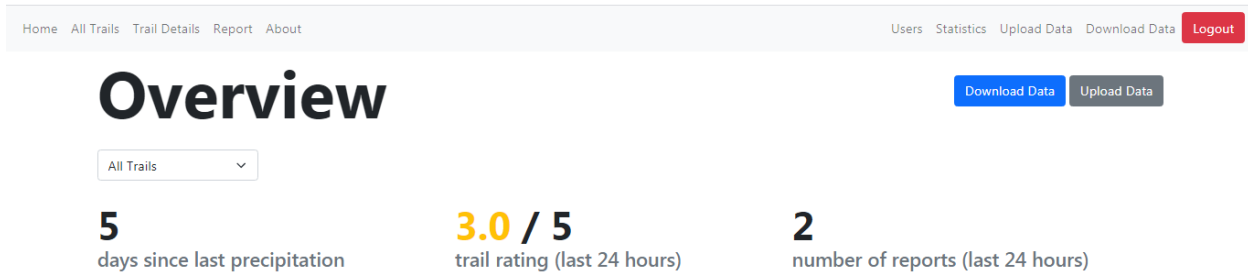Fig 3. Homepage of an Authenticated User.

Fig 4. Add User page.

Fig 5. Statistics page.

5.2.3 Task List

1. Open the application, on the top right side you'll find the login button. Click on it.
2. Repeat the steps of 5.1.3.
3. Click on the Users on the top right, then click on add user(you can send an email invite to register a user).
4. And then click on the statistics button on the top right to see the statistics of the trail.

5.2.4 Quantitative Measurement List

1. Number of times that application crashed.
2. Time taken to complete this scenario.
3. Number of questions asked by the participant.
4. Number of participants who successfully complete the scenario.
5. Number of participants who unsuccessfully complete the scenario.

5.2.5 Qualitative Measurement List

1. How much participant satisfaction with the application functions?
2. Can the participant's easily interact with the application?
3. Level of confusion.

5.2.6 Potential Observations of Participant

1. Their ability to understand application general functions and ideas and perform the tasks.
2. Participant's understanding of the user interface.

5.2.7 Post Scenario Interview Questions

1. Do you need any filters in checking the statistics of the trail reports?
2. Do you find it easy to use this application?
3. Do you have any suggestions to improve this application and make it more user friendly?

6) Test Results

Total 6 test sessions were conducted. Before the test, a pre-test survey was administered to collect answers to common usability test questions. Quantitative and qualitative data was collected for all scenarios to determine the participant's level of confusion and understanding of the interface. After the test, a post-test survey was administered to collect answers to common usability test questions and their opinions about the application.

### 6.1 Results from Pre-test Questionnaire

There were a total of 6 participants. All of them are Michigan Tech students. All participants are using the smartphones, but the years they've been using the smartphones varies, you can see it in the below graph:
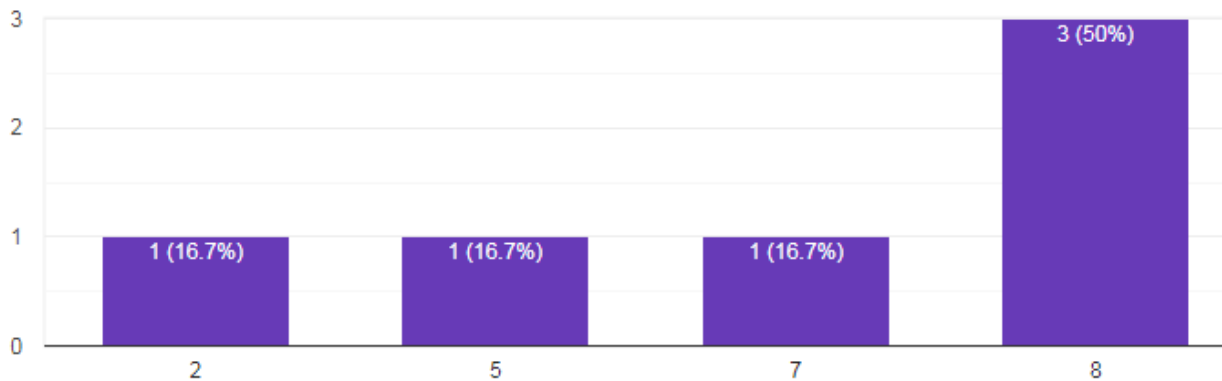

Just only one participant has a difficulty in viewing the colours, fonts and text, rest of the participants have no issue with it. All of the participants are interested in testing this application.

6.2 Results of Measurements

When we started the testing sessions initially the IT server was down, so for the first two participants we ran the application in the local machine and gave remote access to the participants, to perform the tasks. The application never crashed in the testing process. The entire process went smooth. The time taken for the participants to report the trail condition in seconds is shown below:
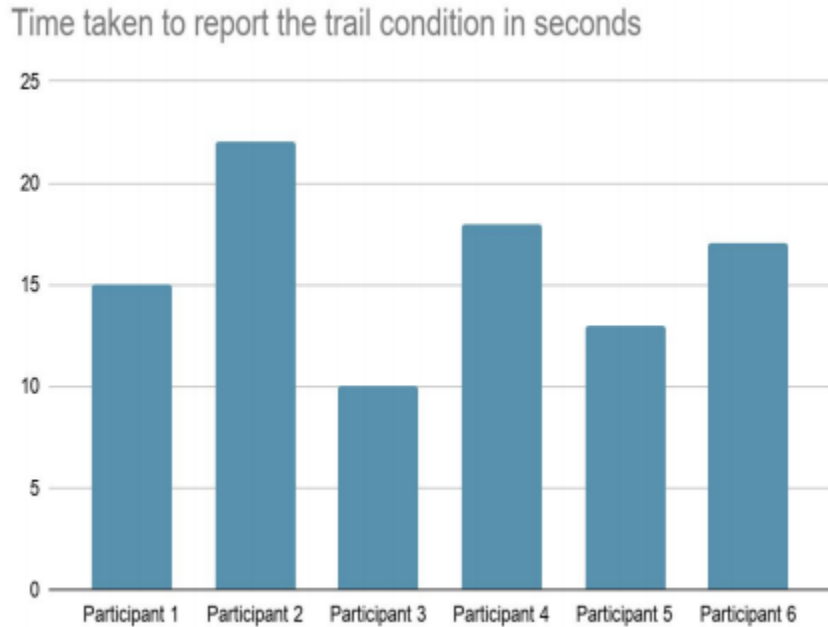
The time taken to complete the scenario one in minutes is shown below:
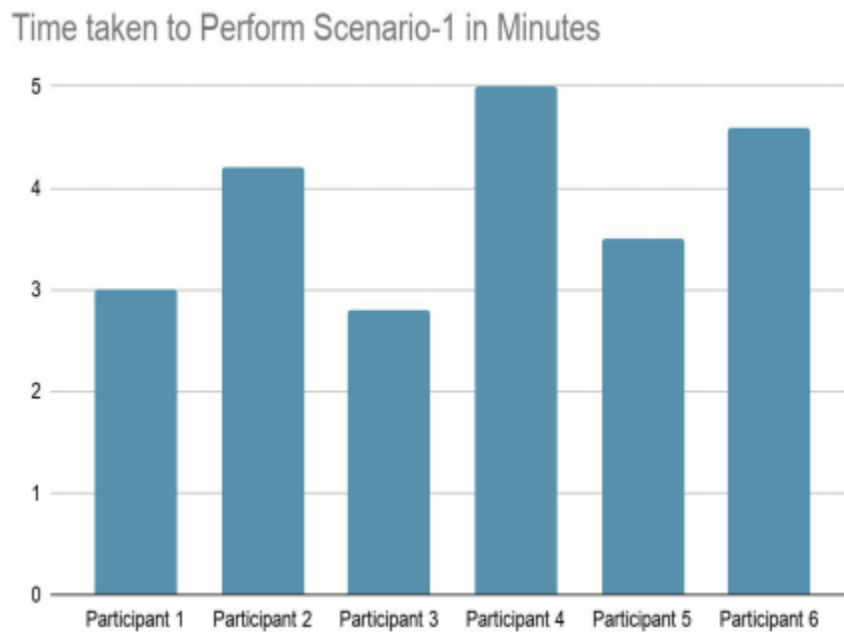
The participant's didn't have any questions after completion of the first scenario. But we found a couple of bugs in the testing process, I will mention them in the bug report form. If we consider the second scenario now, the time taken to complete this scenario is shown in the graph below:


Time taken to perform Scenario-2 in minutes
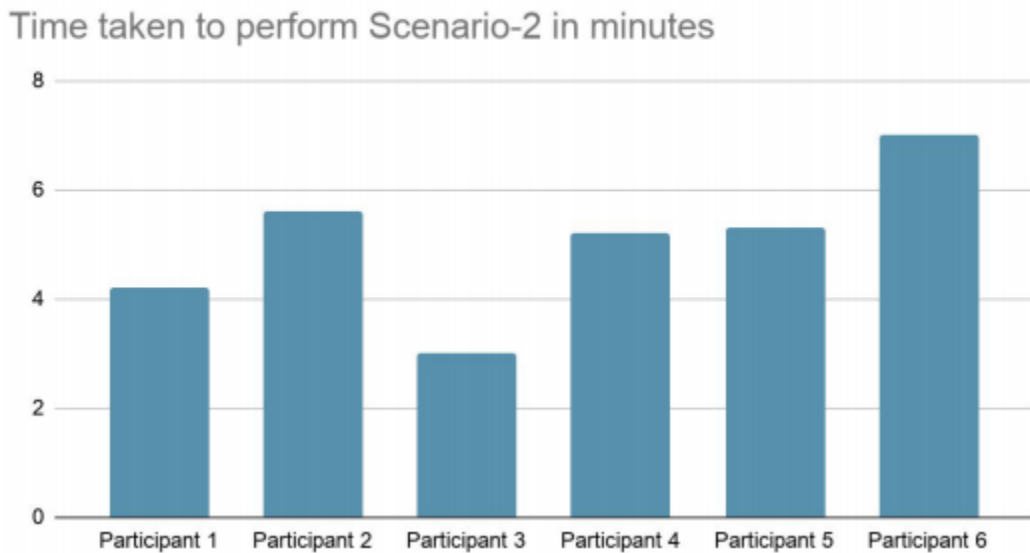
As the application is quite straightforward the participants didn't have any questions.

6.3 Results from Post-test Questionnaire

The results from the post-test questionnaire are summarized in the pie-charts below. 83.3% of the participants agreed that the app is easy to use. Almost everyone agreed that the font and the buttons are clear and they enjoyed using this application. Everyone agreed that they completed their tasks efficiently but 83.3% of the people want to use this application again. The below pie-charts gives more detailed idea:
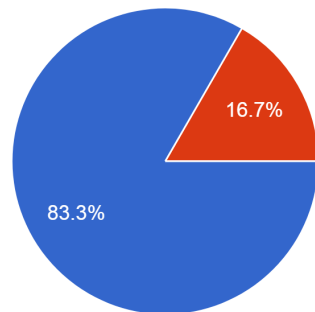

I was able to complete my tasks efficiently.
6 responses

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

16.7%

83.3%
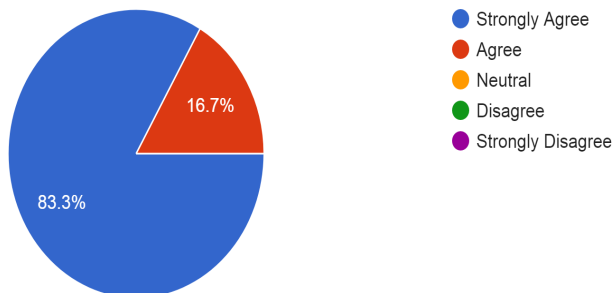
Overall, this application was easy to perform the task.
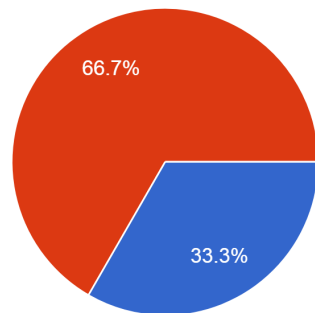
6 responses

- ● Strongly Agree
- ● Agree
- ● Neutral
- ● Disagree
- ● Strongly Disagree

16.7%

83.3%

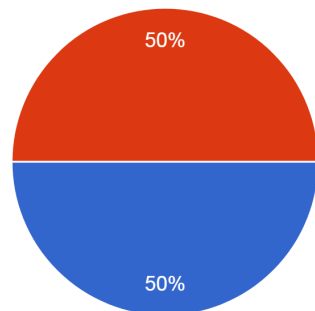I enjoyed using this application.

6 responses

- ● Strongly Agree
- ● Agree
- ● Neutral
- ● Disagree
- ● Strongly Disagree

66.7%

33.3%

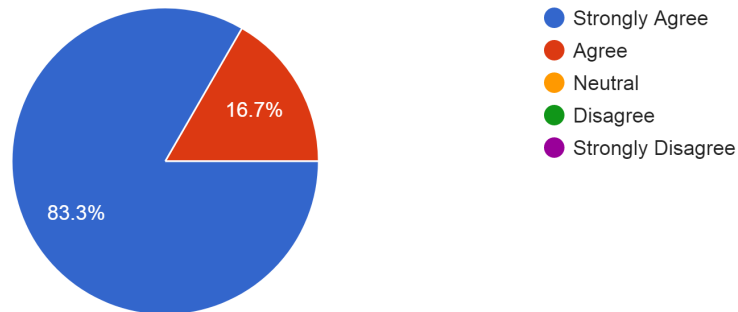The toggle buttons are clear and easily navigable.

6 responses

- ● Strongly Agree
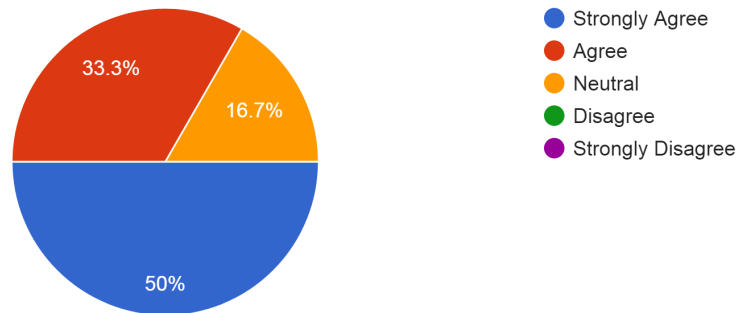- ● Agree
- ● Neutral
- ● Disagree
- ● Strongly Disagree

50%

50%

The text was easy to read and understand.
6 responses

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

16.7%

83.3%

I would use this application again.
6 responses

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

33.3%

16.7%

50%

7) What did participants like about the Stream and Trail application?

1. The lists.
2. The easy homepage with the compiled stats.
3. The rating on the homepage.
4. Seeing the trail conditions and overall user experience.
5. Trail reporting feature using the current location.
6. Easy to use without any experience.
7. The app is user friendly, straightforward and easy to use.

8) Suggestions for the improvement of the Application.

1. In the all trails details section the middle parts are not aligned, it looks better if they are aligned.
2. Specifications or expanding to more trails in more areas in the future.
3. Checkbox needed at the trail maintenance. Dropdown menus would be convenient for easier individual trail data access.
4. Changing the maintenance button. Adding more figures on the statistics on the admin UI.
5. Needs a back button after going into a page.

9) Appendix A - Undergraduate Students Attendance

Date	Time	Team Members	Participant's Name
4/12/2021	2pm	Nels Raisanen, Sam VanderArk	Olivia O'Brien
4/12/2021	3pm	Nels Raisanen, Matthew Schaumberg	Ina Klasner
4/12/2021	4pm	Nels Raisanen, Max Isom	Gina Adragna
4/14/2021	5pm	Emily Marchek, Sam VanderArk	Jordan Craven
4/14/2021	3pm	Matthew Schaumberg, Max Isom, Emily Marchek	Trent Peterson
4/17/2021	8pm	Nels Raisanen	Jonathan Rabideau

10) Appendix B - Bug report

Bug Number	Bug Name	Bug Uniqueness	Bug Description
1	Error on trail reporting.	Once	Clicking on trail details then switching to a different trail directly (not all trails) then clicking add report will generate a 404 error
2	Report with the future date.	Always	The Overview tab gives incorrect number of reports in last 5 hours (one was in the future).

11) Appendix C - Testing Challenges and Limitations

Online Test Sessions - We can't observe the expressions of the participants when they are performing the operations. In a couple of testing sessions the IT server was down, then had to run the application in our local machine and gave the remote access permissions to the participants. The participant may lose his interest in testing the application. One person didn't show up because his laptop is not working.

12) Useful links and References

The link for the Stream and Trail application is:

https://hci-dev.cs.mtu.edu:8140/