Cover Page

COMPSCI 345 / SOFTENG 350 Human-Computer Interaction

Assignment One: Usability Evaluation

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Note: To ensure a fair playing field for all students in the class the University of Auckland will not tolerate cheating or assisting others to cheat, and views cheating in coursework as a serious academic offence.

Student Declaration:

- I declare that this work is my own work and reflects my own learning.
- I declare that where work from other sources (including sources on the world-wide web) has been used, it has been properly acknowledged and referenced.
- I understand that my assessed work may be reviewed against electronic source material using computerised detection mechanisms.

Place this page in the front as the first page of your document that you are submitting to Canvas

Part One: Evaluating the App

1. **Add a stop** – Adds a new bus stop to the list of monitored stops.

   Search Stop – Finds a specific stop by entering either a stop number or address in the search bar, when navigating the map on the find a stop screen.

   Location Services - Centres the map to the users' current location, depending on whether they have location services enabled on their smartphone.

   Delete stop - Removes the indicated stop from the list of monitored stops.

   Edit stop - Edits a chosen stop the user is currently tracking, enabling the user to label that stop as well as add or remove routes via selecting a check button for each route that is scheduled to arrive.

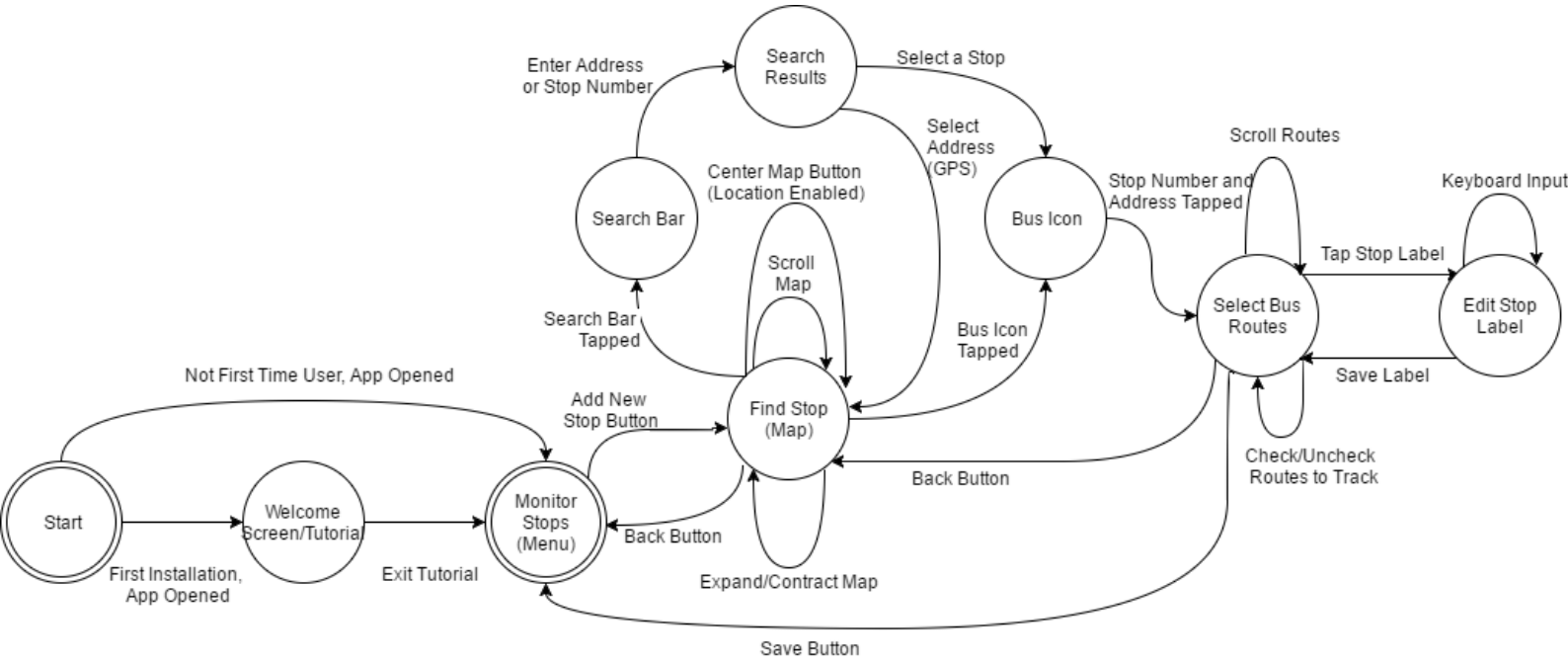
   Change Stop Order – Changes the ordering of bus stops from the list of monitored stops, enabling the user to simply drag/swipe up or down the ordering of a chosen stop. It is a button found at the top right corner of the menu, next to the add a stop button (android).

   Check Bus Schedule – Checks the schedule of busses about to arrive at that stop from the list of monitored stops.

   Real Time Bus Tracking – When a bus is nearby, on the bus schedule screen, the user will be able to see how many stops away is their bus.

   Locate Bus - Tapping on a scheduled bus that is a few stops away, will allow users to check where that bus is located currently in real time, via the map screen.

2. A State Transition Network (STN) of adding a new stop.



3. **Visibility of system status:**
   On the main home page, the stops that are added for tracking are clearly labelled and distinct from one another. On the top right corner, there is a visible plus button to add stops making it easy for users to add another stop to their list of stops to track. On the find a stop page, the user can clearly tell which bus stops there are to track based on their current location. There is also a visible search bar near the top of the page to enable the user to enter a stop number or address when searching for a specific stop. The user can clearly see several bus stops based around their current location, from the map.

   The map clearly shows areas where there are bus stops with circles labelled with a count of how many bus stops there are at that location. When the user taps on a circle, the user will clearly see which bus stops there are to choose from, as the map is zooms slightly further in towards that location. By tapping on the bus stop the user can clearly see the stop number as well as the address of where that bus stop is. Tapping again, will bring the user to another page where there is a list of bus routes to track for that specific stop. Each bus in the list is labelled distinctly from one another, with a route number, name of destination and time of arrival. The text on this page is large and organised well on each row, helping the user understand which route is to arrive next. After saving a stop the user will be returned to home menu, where they can see all the stops they had created. Overall users are well informed about what is happening when navigating throughout the app.

   Match between system and the real world:
   The application is English based, unlikely to struggle as there are simple buttons that signify universal meanings, such as the plus button to add a stop or a back button to return from the current page they are on. Also, when choosing a stop from the map the user can clearly identify which stops are nearest to them since the application has location based functionality, as well as bus icons scattered around the map along the roads. The app is also real time based so the bus schedules and times are shown when tracking a bus route.

   When tracking the chosen bus stop there isn't any difficulty when reading which busses are coming as everything is labelled and listed out clearly, where the user can simply read which bus number and what time it is scheduled to come. As there is no required vocabulary to understand when a bus is about to arrive.

   User control and freedom:
   There are clearly labelled back arrow buttons at the top left of the screen outside of the main menu when tracking stops. This would help the user go back from an error they had made when either going into the wrong stop they are tracking or choosing the wrong stop to add to their list of stop to track. When the user is adding a stop, they have the freedom to navigate by expanding/contracting or scrolling through the map to find a specific stop, as well as search a stop number or address in the search bar. Also, the app gives users control, allowing them to label a specific stop they have chosen to track, for example, a stop can be labelled "home" for users who want to check the bus schedule from a stop near their house.

   Consistency and standards:
   Each page of the app is consistent, with all stops being tracked is similar when monitoring i.e. A list of the bus schedule is displayed for every monitored stop. Adding and editing a stop is consistent and follows similar conventions.

   Error prevention:
   When searching an invalid bus stop, the app will show an unchanged field after loading. This eliminates any error prone issues and messages from popping up with an empty response and no follow up query.

Recognition rather than recall:
The app simply shows a plus icon at the top right corner and back arrow on the top left for ease of comfort when going forward and back within the app. When tracking a bus stop, the user can simply tap on the stop they made to quickly retrieve a schedule of busses that are coming in one simple action. By doing this enough times it can become muscle memory to get which stops you'd like to track.

Flexibility and efficiency of use:
On the adding bus stop page, a centre location button on the top right can efficiently snap to the users' location, which may help a more experienced user who knows what the button does, quickly go to their current location when adding a new bus stop to track.

Aesthetic and minimalist design:
The app is very minimalistic with little to no cluttering of dialogue. The app only shows relevant information such as the route, bus name and time it is scheduled to arrive at the stop, keeping things well organised and consistent. Colours are light with text and function buttons being clearly visible.

Help users recognize, diagnose, and recover from errors:
If the user has no internet access, a message in red will pop up at the top of the screen informing the user that they are currently offline and warning them that certain functionalities won't work.

Help and documentation:
When the user first installs the application, the user is prompted with a brief tutorial on how to add a bus stop, which he/she can then close and proceed to use the app.

Part Two: A Usability Test Plan

Product under test:

The product under test is a free Android or Apple application named AT Metro Track My Bus. The core functionality of the app is to allow users to save, edit and locate their favourite bus routes and stops. This helps the user monitor their stops as part of their daily commute as part of Auckland Transport.

Test Objectives:

The objective of this usability test is to ensure that users can effortlessly navigate throughout the app, using its core functionalities, i.e. Add a stop. This may help establish any flaws found in the app and provide a basis for further improvements in development.

Participants Required:

The participants required for this usability test are individuals who are currently living in Auckland. These individuals should be living in different suburbs in Auckland of each other as well as have different occupations, to help evaluate the app towards a broader range of users. The individuals must also have a smartphone with either Android or Apple operating systems on the required firmware for the app. The number of participants for this usability test will consist of a sample of 12 individuals divided into 2 groups, those who are on Android and those who are on iOS. It is also suggested that the users who are picked for the test should also have moderate age gaps across the groups of android and apple users, ranging from young to elderly. It is also suggested that both groups should have an even number of males as there are females.

Tasks to Undertake:

The task to undertake is for the participants to add a stop to and from a specific location. First the 12 users will be asked to meet up at a location like Britomart for a quick briefing on the task to undertake. The participants will be required to download and walkthrough a small tutorial upon first opening of the application on their smartphones. Here, each user will be required to perform the add a stop function from the appropriate bus stop at Britomart, which can take them home. Here, the users will be asked to take note of any issues found when performing this task, for instance, if the bus was on time, or otherwise, or if the app wasn't performing as intended. After everyone has done this task, they are then required to return to Britomart the following day, performing the same task as they did before, however this time from home before their commute. As they arrive at a chosen time at Britomart, i.e. 12:00pm, the users will then be handed a questionnaire to complete, providing any feedback for the application under test.

Data Collection:

The data collected would include results from the questionnaire given at the end of the task that the participants undertook. Here, for each question, the participants will be asked to choose from a selection of closed answer questions. This will help pin point any issues found when using the app. Followed by a few open answered questions for any feedback or missed issues found in the app. Below, is a list of questions that would be asked:

- What type of phone did you use? Android or Apple (Check Box)
- Are you male or females? (Check Box)
- Would you recommend this app to another person? Yes/No
- Was the bus on time? Yes/No
- Was the position of the bus stop on the map accurate? Yes/No
- Was the application easy to understand? Yes/No
- Did you like the design of the app? Yes/No
- Was it easy to find a stop? Yes/No
- Was the app confusing at times? Yes/No
- Was the app overall difficult to use? Yes/No
- Do you find the app helpful when finding a specific stop? Yes/No
- Would you use this app more frequently? Yes/No
- Were there any errors when using the app, i.e. freezing, crashing. If Yes, please state the issue in the feedback form at the end of this questionnaire.

And finally, an open answer question to provide feedback at the end of the questionnaire. This could help suggest any new ideas or find any issues missed, i.e. the effect of traffic on the app, or if there were any errors that affected the usability of the app:

- Please provide any feedback on how you found the test and/or state any issues you found when using the app.

The test procedure:

Welcome to the AT Metro Track My Bus User Test Procedure! Here, users will be expected to add a stop to track their saved bus routes on the go. Users involved in this test will be privately tested as part of a group of 12 users and will be observed on the use of the applications functionalities. Any personal information will be private and results from the test kept confidential. The participant is required to arrive at the testing location in Britomart, in the Auckland CBD at 12:00pm. From here, users will be required to follow a list of steps to perform a simple task of adding a stop to track a schedule of bus routes. These participants will be instructed to take a bus home and return to the testing location on the following day. Below is a step by step guide to initially add a stop to track your preferred routes.

1. Download and open the app: AT Metro Track My Bus.
2. Carefully read the introduction tutorial once you have open the app.
3. Navigate through the main menu by adding a stop, which will take you to the find a stop screen/map screen.

4. Navigate your way through the map and choose a stop from your current location. You can either enter a stop number or address in the search bar. Or, by navigating through one of the stops located near you on the map.
5. Once you have selected a stop and are now on the add routes screen, select which routes you would like to track.
6. Once you are satisfied with the choices you have made, save it to the menu.
7. Now that you have saved your stop, you should now be back at the main menu where you can monitor your bus stops.
8. Check the stop to see which the busses are scheduled to arrive.
9. Take that bus home and repeat steps 3 – 8 the following day to return to the testing location.
10. Congratulations, you have completed the test! Please tell us your opinion by taking the questionnaire at the end of the test and feel free to write down any suggestions or note any issues to further improve this application.

Analysis:

The analysis of the data collected from the questionnaire will help provide an insight on what issues we need to focus on when developing the app. For each of the questions in the questionnaire, a collection of the users who chose yes or no on a specific question will be summarised and placed into tables. The data from the questionnaire can be displayed in a frequency table to show the frequency and percentage of users who agree or disagree with a certain question could be analysed. Relationships between two categorical variables i.e. Question and Yes or No answer, or Question and Number Males Who Chose Yes, can also be graphed to visually display a population percentage divided into the two specific groups that depend on a chosen question. This may help us analyse how the users responded to the app and/or test, as well as could potentially find any issues by either showing us a proportion of users who said Yes or No to a question. This will help further develop the app from the data provided by finding any problems by evaluating the data from the participants, enabling room for adjustments within the app.

Results:

The results from the test will be evaluated on the user's feedback from the questionnaire after completing the task. This feedback can help develop the application by taking in suggestions or issues and fixing them from the results provided from the test. The results may be tallied on a spreadsheet for further analysis which can remain for the next usability test, and could be further implemented and developed to help reduce any flaws within the app. Follow up tests by more groups would be recommended for a more accurate observation.