The efficiency of accessing parking information in Green P Parking mobile application

Usability Test Plan

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Document Overview

This document describes a test plan for conducting a usability test during the development of Green P parking mobile application. The goal of usability testing is to identify potential design concerns to be addressed in order to improve the effectiveness, efficiency, productivity, and end-user satisfaction.

The usability test objectives are:

- To determine design inconsistencies and usability problem areas within the user interface and content areas. Potential sources of error may include:
  - Navigation errors – failure to locate functions, excessive keystrokes to complete a function, failure to follow recommended screen flow.
  - Presentation errors – failure to locate and properly act upon desired information in screens, selection errors due to labeling ambiguities.
  - Control usage problems – improper toolbar or entry field usage.
- Exercise the application under controlled test conditions with representative users. Data will be used to access whether usability goals regarding an effective, efficient, and well-received user interface have been achieved.
- Establish baseline user performance and user-satisfaction levels of the user interface for future usability evaluations.

The Green P parking mobile application is launched to the user group that drives and needs to park their vehicles in the public of Toronto downtown area. The age range of the user group could be from 18 years old to 50 years old, since most of the people in this age range develop their basic skills in using mobile application and they are more inclined to use applications to solve daily problems. The location of the user group is assumed from GTA area.
Based on the limitation of the usability test context, the number of participants is set to 5. The user group that will participate in the usability test are targeted on the people whose age from 18 to 50 years old who are active in GTA area. The participants are required to have basic skills in using mobile applications. The testing will occur in a usability lab and the expected date range for testing is November 25 of 2019 to December 10 of 2019.

Executive Summary

Summary of the usability test:
Significance:
As a fact, people in Toronto downtown area always meet the difficulty in looking for parking spots. To solve this problem effectively, the usability test will be applied on the Green P parking application. The usability test is to evaluate the efficiency of the application and identify potential design problems.

Context:
The usability test will take approximately 20 minutes in the lab environment. There will be 5 participants take the test individually with the data logger. During the test, participants will be asked to accomplish three tasks in their

preferred mobile system. Participants also need to finish one pre-test questionnaire, three post-task questionnaires and one post-test questionnaire during the test. In the process of the task, the interaction between participant and the screen will be video recorded. The data logger will also write down all the valuable information and data. After all the tasks are completed, participants are welcomed to talk about their feedback and data logger will mark down valuable information.

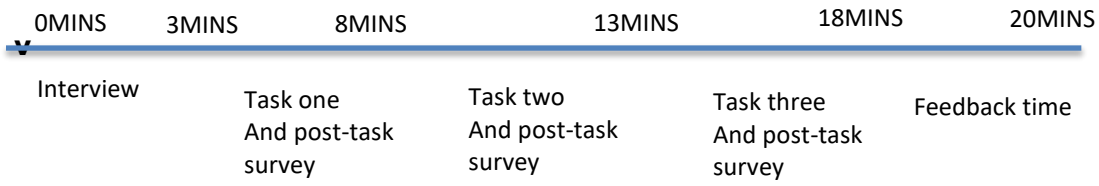
Evaluated functions:

In the usability test, the efficiency of accessing parking spot information function will be evaluated. This involves the find parking function, search function and accessing information function. Each individual function will be evaluated during the test to identify if there are any design concerns.

Goals:
The goals of the usability test are to testify the effectiveness and efficiency of the find parking function in the Green P parking application.

Upon review of this usability test plan, including the draft task scenarios and usability goals for the Green P parking application, documented acceptance of the plan is expected.

Timeline:



Methodology

The usability test will involve 5 participants and the setting of the usability test will be the lab room. Participant will interact with the application in either the IOS mobile system or Android mobile system based on participant's preference. The satisfaction assessment and suggestions for improvement will be collected through the process of accomplishing the tasks and surveys.

Participants

Based on the limits of the test context, there will be no needs for participants recruitment. The participants are satisfied with the eligibility as their ages and locations are similar with the user groups. All the participants are from 18 to 50, and they are active in GTA area. In the test, they are expected to have the basic skills of using mobile applications.

The participants' responsibilities will be to attempt to complete a set of representative task scenarios presented to them in as efficient and timely a manner as possible, and to provide feedback regarding the usability and acceptability of the user interface. The participants will be directed to provide

honest opinions regarding the usability of the application, and to participate in post-session subjective questionnaires and debriefing.

Training

The participants will receive and overview of the usability test procedure, equipment and software. There is no training need for participants.

Procedure

Participants will take part in the usability test at the George Brown College lab room in level 3 of 3 Lower Javaris street in Toronto. IOS mobile devices and Android mobile devices with the application and supporting software will be used in a typical office environment. The participant's interaction with the application will be monitored by the facilitator seated in the same office. Note takers and data logger(s) will monitor the sessions in observation room, connected by video camera feed. The lab also has one-way mirror for observing. The test sessions will be videotaped.

The facilitator will brief the participants on the application and instruct the participant that they are evaluating the application, rather than the facilitator evaluating the participant. Participants will sign an informed consent that acknowledges: the participation is voluntary, that participation can cease at any time, and that the session will be videotaped but their privacy of identification will be safeguarded. The facilitator will ask the participant if they have any questions.

Participants will complete a pretest demographic and background information questionnaire. The facilitator will explain that the amount of time taken to complete the test task will be measured and that exploratory behavior outside the task flow should not occur until after task completion. At the start of each task, the participant will read aloud the task description from the printed copy and begin the task. Time-on-task measurement begins when the participant starts the task.

The facilitator will instruct the participant to 'think aloud' so that a verbal record exists of their interaction with the application. The facilitator will observe and enter user behavior, user comments, and system actions in the data logging application.

After each task, the participant will complete the post-task questionnaire and elaborate on the task session with the facilitator. After all task scenarios are attempted, the participant will complete the post-test satisfaction questionnaire.

Usability Tasks

The application's test is based on the developed mobile application. The data collected from the test will not affect the test application's availability or performance.

The task descriptions below are required to be reviewed by the application owner, business-process owner, development owner, and/or deployment manager to ensure that the content, format, and presentation are representative of real use and substantially evaluate the total application. Their **acceptance is to be documented** prior to usability test.

Task descriptions:

1. Brief and Interview

In the beginning of the test, observer will introduce the brief of the usability test to participants. Then observer will have a short interview with the participant.

---Interview questions:

1. Do you have any experiences of using the Green P parking application?
2. Are you familiar with using the Green P Parking application?
3. How often you will need the assistance from application in looking for parking spots?

---Scenario:

The participant will play as a college student who needs to find parking spots around the waterfront campus of George Brown college on the current time with the Green P parking application.
The scenario could represent most of the cases that user needs to find parking spots in the surrounding. Through the process, the interactions between participant and the test application will contribute data and information for further analysis.

In the first task, the participant will be asked to search parking spots around the school area. The participant will testify the search function in the application to finish the task.

2. Task one and post-task survey:

Post-task questions for task one:

1. How do you feel of the ease of accomplish this task? (Likert question)
2. Are there any obstacles that affect you to accomplish your task?
3. Could you describe the obstacles that bother you to finish the task?

3. Task two and post-task survey:

The second task will ask the participant to find a parking spot available in the same selected area. After the task, the participant will be asked to fill the post-task survey for the task two. (same questionnaire as task one)

4. Task three and post-task survey:

The last task is required the participant to pick the cheapest parking spot on the current time. After the task, the participant will be asked to fill the post-task survey for the task three. (same questionnaire as task one)

5. Post-test survey

After accomplishing all the tasks, participants will need to fill out the post-test questionnaire.

1. How do you like the Green P parking application based on this test experience? (Likert question)
2. What is the ease level do you feel by using Green P parking application to accomplish all the tasks? (Likert question)
3. What are the main obstacles that affect you to achieve your task?

Usability Metrics

Usability metrics refers to user performance measured against specific performance goals necessary to satisfy usability requirements. Scenario completion success rates, error rates, and subjective evaluations will be used.

Scenario Completion

Each scenario will require, or request, that the participant obtains or inputs specific data that would be used in course of a typical task. The scenario is completed when the participant indicates the scenario's goal has been obtained (whether successfully or unsuccessfully) or the participant requests and receives sufficient guidance as to warrant scoring the scenario as a critical error.

Critical Errors

Critical errors are deviations at completion from the targets of the scenario. Obtaining or otherwise reporting of the wrong data value due to participant workflow is a critical error. Participants may or may not be aware that the task goal is incorrect or incomplete.

Independent completion of the scenario is a universal goal; help obtained from the other usability test roles is cause to score the scenario a critical error. Critical errors can also be assigned when the participant initiates (or attempts to initiate) and action that will result in the goal state becoming unobtainable. In general, critical errors are unresolved errors during the process of completing the task or errors that produce an incorrect outcome.

Non-critical Errors

Non-critical errors are errors that are recovered from by the participant or, if not detected, do not result in processing problems or unexpected results. Although non-critical errors can be undetected by the participant, when they are detected they are generally frustrating to the participant.

These errors may be procedural, in which the participant does not complete a scenario in the most optimal means (e.g., excessive steps and keystrokes). These errors may also be errors of confusion (ex., initially selecting the wrong function, using a user-interface control incorrectly such as attempting to edit an un-editable field).

Noncritical errors can always be recovered from during the process of completing the scenario. Exploratory behavior, such as opening the wrong menu while searching for a function, will be coded as a non-critical error.

Subjective Evaluations

Subjective evaluations regarding ease of use and satisfaction will be collected via questionnaires, and during debriefing at the conclusion of the session. The questionnaires will utilize free-form responses and rating scales.

Scenario Completion Time (time on task)

The time to complete each scenario, not including subjective evaluation durations, will be recorded.

Usability Goals

The next section describes the usability goals for the Green P parking application.

Completion Rate

Completion rate is the percentage of test participants who successfully complete the task without critical errors. A critical error is defined as an error that results in an incorrect or incomplete outcome. In other words, the completion rate represents the percentage of participants who, when they are finished with the specified task, have an "output" that is correct. Note: If a participant requires assistance in order to achieve a correct output then the task will be scored as a critical error and the overall completion rate for the task will be affected.

A completion rate of 100% is the goal for each task in this usability test.

Error-free rate

Error-free rate is the percentage of test participants who complete the task without any errors (critical **or** non-critical errors). A non-critical error is an error that would not have an impact on the final output of the task but would result in the task being completed less efficiently.

An error-free rate of 80% is the goal for each task in this usability test.

Time on Task (TOT)

The time to complete a scenario is referred to as "time on task". It is measured from the time the person begins the scenario to the time he/she signals completion. In this test, the data of time on task will not be used to evaluate the test application.

Subjective Measures

Subjective opinions about specific tasks, time to perform each task, features, and functionality will be surveyed. At the end of the test, participants will rate their satisfaction with the overall system. Combined with the interview/debriefing session, these data are used to assess attitudes of the participants.

Problem Severity

To prioritize recommendations, a method of problem severity classification will be used in the analysis of the data collected during evaluation activities. The approach treats problem severity as a combination of two factors - the impact

of the problem and the frequency of users experiencing the problem during the evaluation.

Impact

Impact is the ranking of the consequences of the problem by defining the level of impact that the problem has on successful task completion. There are three levels of impact:

- High - prevents the user from completing the task (critical error)
- Moderate - causes user difficulty but the task can be completed (non-critical error)
- Low - minor problems that do not significantly affect the task completion (non-critical error)

Frequency

Frequency is the percentage of participants who experience the problem when working on a task.

- High: 80% or more of the participants experience the problem
- Moderate: 40% - 60% of participants experience the problem
- Low: 20% or fewer of the participants experience the problem

(percentages are adjusted for the study with 5 participants)

Problem Severity Classification

The identified severity for each problem implies a general reward for resolving it, and a general risk for not addressing it, in the current release.

Severity 1 - High impact problems that often prevent a user from correctly completing a task. They occur in varying frequency and are characteristic of calls to the Help Desk. Reward for resolution is typically exhibited in fewer Help Desk calls and reduced redevelopment costs.

Severity 2 - Moderate to high frequency problems with moderate to low impact are typical of erroneous actions that the participant recognizes needs to be undone. Reward for resolution is typically exhibited in reduced time on task and decreased training costs.

Severity 3 - Either moderate problems with low frequency or low problems with moderate frequency; these are minor annoyance problems faced by a number of participants. Reward for resolution is typically exhibited in reduced time on task and increased data integrity.

Severity 4 - Low impact problems faced by few participants; there is low risk to not resolving these problems. Reward for resolution is typically exhibited in increased user satisfaction.

Reporting Results

The Usability Test Report will be provided at the conclusion of the usability test. It will consist of a report and/or a presentation of the results; evaluate the usability metrics against the pre-approved goals, subjective evaluations, and specific usability problems and recommendations for resolution. The

recommendations will be categorically sized by development to aid in implementation strategy. The report is anticipated to be delivered to the school professor by Dec 10 of 2019.