Team Minerva

User Usability Testing Protocol

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Research Question

Will our changes to the UGA app provide new UGA students and faculty with a more effective navigation solution than competitor apps when trying to navigate the UGA campus?

We believe that this question, along with our user interface changes, can be generalized to apply to other institutions as well, as many colleges and universities have their own mobile apps similar to that of UGA.

Methodologies

Due to the nature of our research question, we believe that a mix of a user survey and a usability test would be the optimal methods for testing the effectiveness of our proposed solution. The user experience study component of our experiment will be a usability test comparing our proposed solution to the existing generic solutions, such as Google Maps and Apple Maps, which currently define the status quo.

Method 1 - Survey (Phase 1)

We choose to include user surveys within our app since this can reduce friction for users. They can give instant feedback upon request so that they do not need to leave the app; this should hopefully encourage more users to give us their evaluation of our solution. A user survey is both easy to set up and distribute to a large number of users. It will allow us to quantify user satisfaction with our proposed solution, which will help supplement the results of our experiment in determining the effectiveness of our solution. Additionally, a user survey could potentially give valuable context regarding how to structure our second experiment by giving us an idea on what factors might be affecting the performance of our solution in the experiment and take those into account when conducting the usability test.

Method 2 - Usability Test (Phase 2)

In addition to surveys, we also felt it was important to include some form of user experience study in order to gauge how well our new solution fares against the status quo. To accomplish this, we plan to design an experiment involving a usability test where three groups of students and faculty would be given a period of time to experience one of three navigation solutions (new UGA app, Google Maps app, or Apple Maps app) in their day-to-day lives. This will give us a rough understanding of how the app will perform in the real world, and also how it will improve upon and compete against the status quo ("7 Reasons Why Surveying Users Is Important."). The crucial component in making this determination will be to collect both assessment feedback and comparative feedback to understand what works and what doesn't in our current solution, while also getting useful

information about how competitive our solution is against mainstream navigation apps such as Google Maps and Apple Maps.

Testing Procedure - Survey

Informed Consent

An informed consent is not needed for the in app survey since the user is not subjected to any kind of experiment as we are just asking the user to provide feedback. The user will be given an "yes" or "no" option of whether they would like to take the survey or not after their first completion of a route using our proposed solution.

Data Being Collected

Questions regarding the overall usefulness of the app, the viability of our proposed changes to the UGA app, and how likely users are willing to use our solution in their day-to-day commute around campus. The users will be asked to respond by choosing a number from a scale of 1 to 5 with 1 being a "no" or some negative response to our questions, 3 being a "maybe" or some neutral response to our question, and 5 being a "yes" or some positive response to our question.

The survey will be served to the user in two different locations within the app. The first is through the notifications dropdown on the homepage of the app, where a notification will be added to their unread notifications list. This notification will offer them an opportunity to complete the survey. The second location where the survey will be served to the user is after the completion or cancellation of a navigation route. After the user exits the step-by-step directions service, either by completion of the route or by user cancellation, they will be offered an opportunity to complete the feedback survey through a small banner popup at the bottom of the screen.

Questions posed to the user would be both general and specific in nature. General questions would include: "Did you find what you were looking for?" "How easy was the app to use?" and "Would you recommend this app to other students or faculty?" More specific questions in the survey would include questions tied to specific features, such as: "Have you tried X feature of the app?" "How useful did you find X feature?" and "How would you rate your experience with X feature?" Users will be given a choice to skip any feature-related questions when taking the survey in case the user has not used a particular feature yet; we only want feedback from users who have tried the specified feature previously. In order to ensure that any bias regarding how users respond to a question are kept to a minimum, it is vital that the asked questions are either non-leading or asked twice both negatively and positively.

Analysis to be Performed

With the results of the survey collected, the data will be aggregated by question type (either general or feature-specific) and by user type (either anonymous, student, or faculty). Data gathered from general questions will be viewed as a collective based on each user type to give us a better understanding of each group's general feelings about the app overall. Feature-specific questions will be grouped based on the feature they cover to give us a better understanding of the feelings of each user group about each feature. More specifically, these questions will tell us what each user group values more in terms of features and how each user group feels about the implementation of each feature. Using a consistent five-point scale across all of the questions will not only make questions easier to answer for the respondent, but will also make data easier to parse at large volumes, as free response answers would typically require significantly more effort to interpret (Ponto).

The survey analysis will help in discovering the widespread consensus regarding our proposed solution. By looking at the percentages of positive to negative responses in each of the categories for the survey results, potential pain points may be discovered along with knowledge on what worked well for certain user baseses. This information will help us determine what topics we should target more heavily when conducting our usability test after the survey.

Potential Biases

A potential bias could arise as a result of how quickly we survey the user, as the user will have limited experience with the app prior to receiving the survey. We chose to show the user the survey after their first experience with the directions function of the app because it limits the chance that we lose opportunities to survey those who may dislike the app and will never use it again. As research has shown users who have negative first experiences are unlikely to reuse the app (Chen). Therefore, by surveying the user after their first experience, rather than after multiple uses, we eliminate the potential positive bias that could come as a result of only surveying users who come back and repeatedly use the app. However, surveying the user early on has the potential to skew our results in the negative direction, as many users will be unfamiliar with many of the new changes and may not have adequate time to learn the app's layout.

Another potential bias may result from how the survey questions are worded. This could unconsciously cause users to lean towards certain responses more often. To prevent this, care must be taken when creating the questions being asked in order to minimize this potential bias.

Safety During Pandemic

There are no safety issues with taking a survey as the user can complete the survey at the comfort of their own home and other locations. Of course, the app will provide users with reminders to wear face coverings in public locations or when taking the bus.

Testing Procedure - Usability Test

Informed Consent

Since this is a usability test involving human subjects, an informed consent is needed to ask for permission from the subjects. Participants will be asked to sign an informed consent document prior to the usability test portion of the experiment. Without the document signed, the participant will not be considered for the experiment. In order to keep the participants anonymous, the informed consent document will be securely stored, and only the researchers will be able to access them. More information regarding what participants will be agreeing to when signing the document are outlined in the included [informed consent document](#).

Data Being Collected

Qualitative data will be collected through verbal interviews both at the start and end of the two-week long real-world test. The participant group for our usability test will consist of UGA students and faculty members who have joined UGA within the past two academic years, as this group is the target of our research question. The usability test will heavily involve interviews and in-app statistics. Prior to starting the experiment, participants will be asked open-ended questions regarding their level of experience using each of the apps covered in the test and their general knowledge of the UGA campus layout. Participants will also be asked about their familiarity with their current class schedule and class locations both at the beginning and end of the experiment. In the post-experiment interview, participants will be questioned about their specific experiences with the app and which features they found most helpful or unhelpful. Features that were pain points in the initial survey portion will be covered more heavily in the post-experiment interview questions of the usability test. For analysis purposes, each of the interviews will be recorded and transcripts of the interviews will be generated.

Quantitative data regarding the accuracy of the estimated route time for our proposed solution compared to how long it actually took for the participant to travel to their destination will also be collected. Similarly, the app will also log the user's button presses and time spent in the app. During the course of the experiment, this information

will be collected in the background as the participants are actively using our proposed solution.

Analysis to be Performed

The qualitative data obtained from the interviews will be reviewed and categorized into different groups based on the topic and themes brought up during the interview in regards to any specific features of our proposed solution and/or any feelings that the user experiences when using our app. By analyzing the sentiments that the user had regarding our app, we will be able to determine whether there are any deviations in the opinions that the participants gave during the usability test compared to the results of our survey. If the results of our survey and usability test match up, we will be able to use the results of the usability test to help us determine the root cause behind any potential pain points regarding our app. If the results did not match for a given feature, this could imply that the particular component of our solution is potentially more/less geared towards new students and faculty members, rather than the general UGA population which supplied the survey data. We will also use the data gathered from groups assigned to the mainstream navigation apps as a point of comparison against the responses to our new UGA app. This will help us determine whether our app is competitive in the market, and whether our UGA-specific features provide any significant advantages over the status quo.

The quantitative data about the accuracy of the estimated route time for our version of the UGA app can be tied back to the qualitative data obtained from the interview with the participants. This quantitative data will serve as a metric to evaluate how efficiently the user was able to perform a given task and to determine in which locations within the app the user may have gotten stuck or lost. Using the direct feedback collected from participants during post-experiment interviews, we can better evaluate the quantitative data to highlight data at specific time points which reflect the experiences described by the participant. For example, we can imagine a participant who, during a post-experiment interview, highlights a difficulty they had while attempting to navigate from the SLC to the MLC. Using this information, we can search the quantitative data collected from that user to find the point in time that they were referencing so that we can directly evaluate their actions and how the app responded. By doing this, we can obtain a better idea of how the user expected the app to respond to a given action, and how the app actually behaved in response to the user's action. This information can then be used to improve the overall user experience of our app.

Potential Biases

One potential bias that could impact the results of the app could be the participants prior experience with a particular navigation app. If a participant actively uses one of the apps that we are comparing like Google Maps or Apple Maps, the

participant is more likely to give more favorable responses to those apps and could potentially give more of a negative response testing an unfamiliar navigation application. In order to counteract this potential bias, test participants will be surveyed during their initial interview on their comfortability with each of three navigation apps (the old UGA mobile app, the Apple Maps mobile app, and the Google Maps mobile app). The data obtained from their responses will allow participants to be grouped such that no group is heavily skewed in terms of skill level with each app.

Another potential bias that will need to be factored into the data analysis is the time period over which the experiment is run. The later the test is performed into a given school year, the more general familiarity a group of participants will have with their current class schedules and class locations. By running the test as close to the first few weeks of an academic semester as possible, we can reduce the degree to which this prior knowledge will impact the results of the experiment.

Safety During Pandemic

Because users will be physically moving around the UGA campus, masks will be encouraged for the participants as they travel around the campus whether by driving, walking, or taking public transit. Participants will be asked to take a COVID test prior to any meetings or interviews; if a participant is found to have COVID at any point during the experiment, the participant will be asked to self-quarantine and removed from the experiment in order to protect the public health. The participants will be provided with resources regarding the pandemic prior to the experiment in order to ensure all participants are capable of following the CDC pandemic recommendations.

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