Team 1: #ShowUpShowOut
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Preston Akwule
Christian Hughey
Kristen Ingram
Terrance Law

P4: User Testing and Prototype Presentation

1.a. Provide a one-paragraph summary reminding us of your target user group, what your prototype does, and how it is expected to be used (e.g., on what platform, mobile, stationary, wearable parts, etc.) (4 points).

Our target user group consists of students with mobile disabilities (in particular, students in a wheelchair) on Tech's campus, and our prototype is a mobile application intended to help them navigate through the campus. For example, users can search for routes to a selected destination on campus and the phone will provide information about the accessibility of the routes detailing whether or not there are obstacles present such as construction that make it difficult for students to maneuver. They can also schedule a Stingerette 24/7 and on demand using the mobile application, a service that is currently only available to students with disabilities if booked 24 hours in advance. The mobile app is expected to be used on a mobile phone mounted on a wheelchair.

1.b. Describe who (which team member) did what (took notes, facilitated interaction, etc.) during each user test and take at least one photo of each user test of P3 in action (do not photograph identifying information about the user). Include these images (which will total at least four) in your report as images with captions to describe what they depict. (4 points)

User Testing #1

Facilitator: Terrance
Notetaker: Diana (a volunteer from the other group)

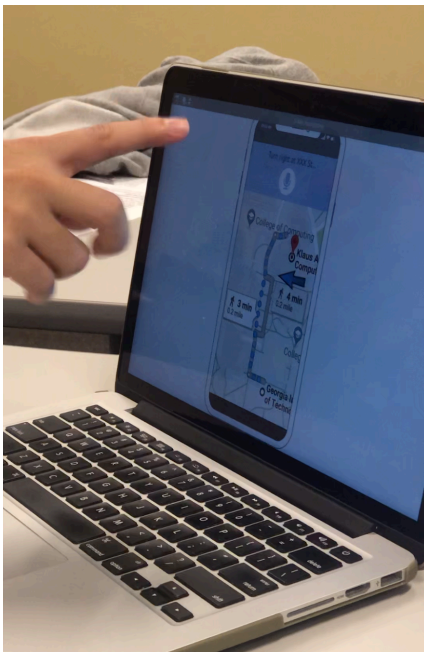

Figure 1. The participant is asking if users are able to touch the screen or if speech is the only modality supported by the mobile app.

User Testing #2

Facilitator: Terrance
Notetaker: Preston
Observer: Christian and Kristen

Figure 2. The participant is interacting with the prototype using speech.

User Testing #3

Facilitator: Terrance
Notetaker: Preston and Christian
Observer: Kristen

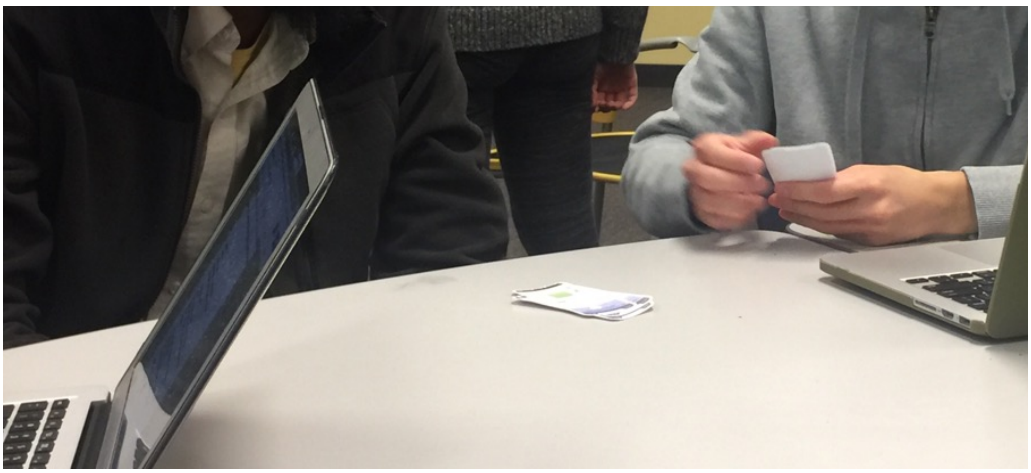

Figure 2. Using a wizard of oz method, the facilitator (right) is playing the role of the system while the participant (left) is interacting with the prototype using speech.

User Testing #4

Facilitator and Notetaker: Terrance

Figure 4. The participant is giving comments on each screen by laying out the screens at the end of the session.

1.c. Provide the following information in the report as a summary of what you observed in your user testing (15 points):

- **Describe the task(s) they performed.**
- **Explain why you chose the task(s) that you did for your users.**
- **Describe where (if at all) the users struggled to complete parts of the task.**
- **Describe where (if at all) the users easily completed parts of the tasks.**
- **Provide example think-aloud data you collected.**

In P3, we outlined two scenarios based on which our prototype was designed.

Scenario 1: Jane is a wheelchair user. It is the first day of the semester. Jane wants to go to a classroom but is unsure about where it is. She asks her friend to drop her off somewhere close to the classroom. As her friend has something to do, she needs to go to the classroom on her own. Luckily, she has our mobile app! Using the app, she searches for possible routes to navigate from where her friend can drop her off near the classroom.

Scenario 2: As Jane's first class of the semester finishes, she wants to go to the MARTA station to meet her friend. She wants to request a Stingerette ride again using the mobile app.

During the user testing, participants attempted both scenarios (i.e. they used the prototype to search for routes and request a Stingerette ride). These two tasks were chosen because they are the two core tasks supported by our system, so we would like to know if users are able to finish them smoothly. In the following, we outline the comments of the participants along with the think-aloud data.

1. U1 found it difficult to tell the app which route he wanted to choose because the routes on the screen were not numbered. He said, *"I think the app should assign a number for each route so that it is easier for users to refer to it. For example, by saying 'I want to choose route #1'."*
2. U3 felt that the first part of initiating the ride process *"is a little confusing"*.
3. U2 was annoyed by the app midway through the searching for routes task because he felt that the phone asked users *"too many questions about the same subject"*.
4. U2 and U4 was a bit frustrated when they realized that they could not select a pick-up when while they were doing the scheduling Stingerette task. U2 said, "there was not an option to customize the pick up point easier."
5. Overall, the participants were satisfied by the capability of the app to accomplish the tasks. For example, U2 commented that *"the process was pretty smooth".*

1.d. For each user (at least four), provide the responses to the usability testing questions you asked, as well as to the SUS questions (if you chose to use those too). Questions should follow your user testing plans, so we will look for answers that correspond to the plans you made for P3. If you ended up adding any testing resources after turning in P3, or adding any usability testing questions describe these changes here. (18 points)

In our P3 report, there were more than 10 questions that pertain to the usability of the prototype. In the semi-structured interviews, we selected some questions from the list based on the observation during the sessions.

User Testing #1

- Did you encounter any difficulties while using the interface?

He felt that the app should allow users to interact with the phone using their hands because users are not moving all the time and their hands are sometimes free. He also thought that the the virtual assistant should have a name so that users can call on it. Another issue he had was that the routes returned by the app were not numbered. He suggested to assign a number to each route so that it is easier for users to refer to it (e.g., by saying "I want to choose route #1").

User Testing #2

- Did you encounter any difficulties while using the interface?

For the second scenario (i.e. requesting a Stingerette ride), he commented that there was not an option to customize the pick up point easier.

- What were the easily completed parts of the tasks? What features in the interface facilitate that?

He said that the process was pretty smooth.

- Assume that you have disabilities, could you see yourself using this product?

He said that he could see himself using this product if he actually had a disability.

User Testing #3

- Did you encounter any difficulties while using the interface?

He commented on a few major issues with the interface. First, for people with disabilities, safety is important and it may not make sense to ask people in a wheelchair to use voice commands on the way to new destination. He suggested do the voice commands before rather than while on the way to new destination. Second, he saw a bad route but the app does not explain why it was bad. He wished that the app told him that the route was blocked before he made the selection. Finally, in reference to the first part of initiating the ride process, he found the screen a little confusing.

- What were the easily completed parts of the tasks? What features in the interface facilitate that?

Overall, he did not have a problem with scenario one but he felt that he app should be a little more accessible for a person in a wheelchair.

- Assume that you have disabilities, could you see yourself using this product?

He said that he could see himself using this product if he actually had a disability because he knew that it would be hard to find good routes and make the accessibility on Georgia Tech's campus easier (from the perspective of disabled students).

User Testing #4

- Did you encounter any difficulties while using the interface?

He thought that when the system found a bad route, it should offer reasons for why it is bad early. Furthermore, concerning the visual design of how the routes are presented, he found it difficult to understand the bar chart and suggested to use color to encode information such as route accessibility (e.g., low accessibility = red, high accessibility = green). He also thought that the app should allows users to type in case of technical problems (e.g., when the app fails to recognize users' speech).

- What were the easily completed parts of the tasks? What features in the interface facilitate that?

He appreciated the speech interaction offered by the prototype: "Even not looking at it, might be hearing it."

- Assume that you have disabilities, could you see yourself using this product?

Positive. He could see how it might be useful for people with mobile disabilities.

- Do you have other comments?

He suggested us to add several features to the app:
1. Allowing emergency call in case of misevent during the trip
2. Allowing users to call to request Stingerette when Internet is not available
3. Allowing users to select a pick-up location after they request a Stingerette
4. Perspective view like Google Map

1.e. Describe any changes that you made to the P3 prototype to prepare a higher-fidelity version of all or a portion of the prototype. Along with the change descriptions, you should provide the rationale for your changes, tied to your usability testing feedback. For example, "We added instructional tool tips to explain what icons meant due to user confusion about icon meaning." (4 points)

Here is a link to our P3 prototype: https://balsamiq.cloud/sovcnqq/pqhxrv0
Here is a link to our P4 prototype: https://balsamiq.cloud/sovcnqq/p9tn9sj

Based on the user feedback, we have made the following changes:

1. In the P3 prototype, the routes returned by the app are not numbered. U1 commented that numbering the routes make it easier for users to select a route using speech (e.g., by saying “I want to choose the first route.”) In the P4 prototype, all the routes are numbered.
2. U4 thought that it could be dangerous for people with mobile disabilities to navigate the campus on their own and suggested to provide a button for emergency call. An emergency call button has been added to the app.
3. U1, U3, U4 commented that besides speech interaction, the app should allow touch. For example, there should be a virtual keyboard that allows users to type a destination in case the app fails to recognize users’ speech. Besides allowing speech interaction, the P4 app allows users to input using touch interaction.
4. U4 suggested that to allow users to call to book Stingerette because internet may not be always available. This functionality is also added to the P4 prototype.
5. U3 found the first screen in the old prototype confusing. It was blank and he did not know what he could do with the app simply by looking at the screen. He suggest us to create several options to allow users to choose. Based on his comments, we added three options: “Search Routes”, “Request Stingerette”, and “Emergency Call” in the first screen in the new prototype.

2.a. A 2-3 minute video of a member of your team interacting with the prototype, with some spoken elaboration on how the prototype enables user interaction. If you have created an interactive digital prototype that has a Web URL, provide the link. (15 points)

The video has been attached as a supplementary material.

Here is a link to our P3 prototype: https://balsamiq.cloud/sovcnqq/pqhxrv0
Here is a link to our P4 prototype: https://balsamiq.cloud/sovcnqq/p9tn9sj

b. Written justification of your choice of prototyping methods. (4 points)

We used Balsamiq to create the higher-fidelity prototype for the following reasons:

1. Links between screens and elements in the interface (e.g., buttons) can be created. This allows us to create a more interactive prototype, using which users can click on a button to jump to another screen.

2. The elements in the prototype look more realistic than when paper prototypes are used. We can upload images (e.g., a real map captured from Google Map) to make the prototype even more realistic.