P4

Death & Taxes

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INFO-I403 Mobile HCI

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Evaluation Techniques

We approached our evaluation with an emphasis on collecting equal quantitative and qualitative data on our design. For our device we needed both a test for the interactive map and the mobile map. We decided to have a think aloud used for the interactive map so we could better understand whether the orientation of the map was seamless for users. One of our first tasks before users even begin interacting with the map is to present two screens of the map layout in order to get them to select which part of the map they would place the QR code for best accessibility. Our initial ideas to actually place the QR code and map on an outdoor interface and asking users to find other information from that starting point didn't seem quite as useful as just asking them to give us more actionable data that can affect how we build out the map for others. The think aloud was also designed as the first part of our evaluation since it can make users more comfortable with sharing ideas and their thought process early into the process.

Our second portion of the evaluation involved timed tasks where we would time how long it took each participant to complete the tasks we gave to them. Many of the tasks mirror the basic functions that are also on the map, with some extra features that are specific to the mobile design. Although these are only timed tasks by this portion of the interview many participants felt comfortable enough talking aloud about problems or navigation issues after they had completed performing the task. This was what we were hoping for, so it was great to see how successful it was to build a comfortable setting for some study participants by this stage..

The final portion of our evaluation consists of several open-ended questions for users to answer. As a group we discussed the approach of having a semi-moderated evaluation so that we could all feel free to ask more specific questions of our participants if we felt we could get more useful data that way. We also determined after our first three or so participants had finished our evaluation that it would be good to add a question in the closing script that allowed participants to have space to share anything they hadn't shared before with us.

The intention of our design and focus of our project was based around trying to appeal to the IU community in order to make those on campus aware of the tree map data and to encourage more general awareness and care for the environment around us all. The application and map interface would be available to all that visit campus, but ultimately we designed it more with a focus on students since many of those in our initial research were students and most walked daily around campus. For this portion of testing we were open to accepting all those who actively walked around IU's campus weekly at least in the present or in the past, and mostly undergraduate students ended up in our participant base as well as one former employee. We will be glad to get more graduate students, staff, and faculty members in future tests.

Participant Demographics

Undergraduate students:
- 4 freshmen
- 1 sophomore
- 3 seniors

Other:
- 1 former undergraduate student
- 1 former employee

Gender:
- 4 males
- 6 females

Evaluation Rationale

Our rationale for evaluation tasks was centered around what data points could give us conclusive information on how to improve our design. The timed tasks and QR code placement on a map tasks give us quantitative data to use for identifying which portion of the mobile application's navigation to redesign or make better. The statements during the think aloud and questions at the end provide us with qualitative data that helps us form a better story of what portions of our map are useful and what are not. This feedback can help us determine what pieces of the overall flow work for users and what issues we hadn't anticipated or hadn't thought of as barriers.

We operated all of our interfaces off of the Figma platform due to its ease of use for simulating prototype workflow with responsive buttons. While it would have been nice to have also built out a small stand in order to test out the real world materiality of our device, we did not have the materials to withstand the temperature swings at this time. Testing out the device during different seasons would be a great part of phase two of testing, but for now we decided to have users test in the more comfortable climate indoors. In order to still get some information on how users felt about taking part in the interactive map during different stages of weather we did include this question in our open-ends.

Please note after getting feedback during our initial user testing we decided to update the mobile prototype. We added a screen indicating what the nature trail was, made more options in the hamburger menu, added a button that took you to a debrief of the tree map data on the home page, and a button describing what the audio icon was indicating. We felt since these were relatively easy fixes that we should invest time into instituting them before conducting the rest of our research.

Pain Points

Initial Testing:

- make navigation on mobile match aesthetic of rest of prototype
- make sure the user has the ability to back out of every screen
- make the flow more easy to comprehend- tend to skip around which causes confusion
- reorganize the directions and the start tour to integrate the two
- 2019 Tree Map info should be available to read on homepage of mobile device
- It was hard for participants to understand that hamburger and home menu could lead back to the home screen on mobile, maybe make only one screen that leads back to home for easy navigation
- Add description for what will be on tour before participants start the tour
- Change script or interface from "IU Fact" to "Tree Fact", and "Directions" to "Trail Directions"
- Add description for audio tour in mobile application so users understand what it is on screen

Second Round of Testing:

- Problems with structure of mobile
- Begin tour should lead right to tour without other buttons to press
- Trying to find out how to find 3 types of trees was really confusing
- Some participants said they wouldn't use in fall/winter, but two said they would
- Colors on map data were too faded and it was hard to really register what tree species was which
- Trying to find polls was not intuituve
- Make it more specific on all screens what QR code is actually for because it was hard to determine what would happen just by scanning it
- Would not use audio feature due to liking the idea of just being in nature, but do like the accessibility of the feature
- Mobile interface was better design then map interface
- Confusing that allergen map was a checkmark but unchecking it didn't lead back to home screen - maybe change the checkmark feature
- All participants felt students especially would engage and like the tree map

Data
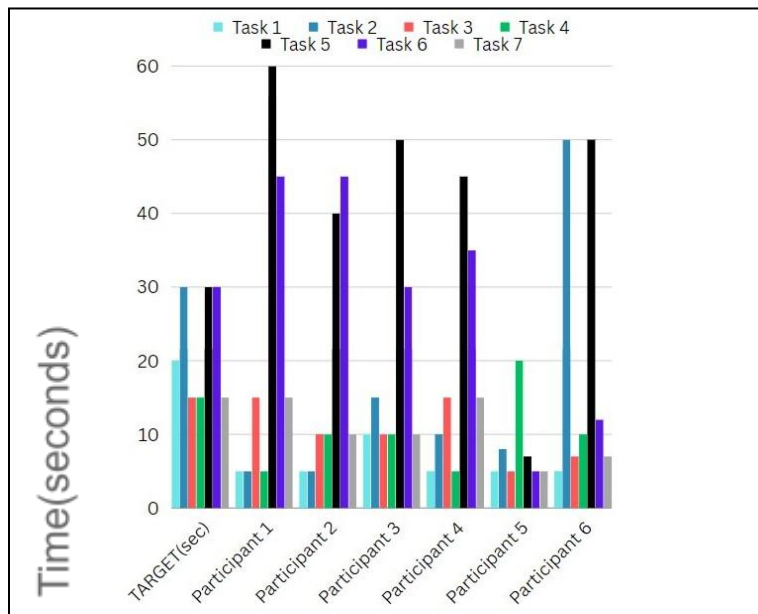
Task 1: Make data on screen available on their phone.
- Our projected time exceeded what each participant was able to accomplish by an average of 15 seconds, meaning that this task can be completed much quicker than we anticipated.

Task 2: Identify at least three different plant/tree species.
- Our projected time far exceeded every participant except for one outlier, participant 6.

Task 3: How long does it take to find the closest map.
- The projected time for this task was more accurate, yet some participants were able to accomplish it five-ten seconds faster.

Task 4: Length of time to vote on plant life.
- All of the participants were able to accomplish this task five-ten seconds faster than our target, except for participant 5 who was five seconds slower than the target.

Task 5: Understand IU's departments.
- Our projected target time for this task was underestimated, with every participant besides number 5 going over the time by ten-30 seconds. Participant 5 completed the task nearly 25 seconds faster than the target.

Task 6: Understand where the data is coming from.
- Three of the participants exceeded the target time by five-ten seconds, one participant was exactly on target, and the other two were far below the target time, completing it about 20 seconds faster than expected.

Task 7: Access directions to the next stop.
- This task had two participants meet the target time while the other four participants were below the target by five-ten seconds.

Many of the decided target times for our chosen tasks were overestimated, resulting in the participants completing the tasks much quicker than we expected. The outlier in this situation, task 5, shows us that our system doesn't clearly show users how to find the information about IU's departments on campus. These results also show us that participants may have different and more skewed times for certain tasks depending on the environment they completed them in.

Design Implications

We were able to learn an immense amount about our users through testing. We were able to physically see their engagement in certain parameters of our prototype and build out more design ideas based on these results. We saw how our wants or desires for this prototype came to life. We were anticipating a slower reaction time for most of our user tasks, however this tended to be an overkill as our participants were mostly well under the desired timeline. These reaction times, as depicted above, gave us insight as to how accessible and recognizable the interface is to a variety of possible users. The feature usage within our interface was efficient and properly placed, this is supported by user testing data showing benchmark tasks' timing coming in under par. We were able to successfully guide the user through the experience using our system.

However, there were two main areas of improvement that we needed to fix, retainability and learnability benchmarks relating to the origin of the data. Our prototype data was powered by the 2019 Tree Map data collected by IU students and faculty. We wanted this prevalent in the prototype, but according to the timing data, it was difficult to achieve. We saw consistently slower times for the benchmark tasks of finding the origin of the dataset they are viewing. Likewise, this prototype was in potential partnership with the IU Landscaping Department. We wanted the user to be able to know who to go to for areas of interest such as this. Once again, due to extendedly slower times beyond the initial estimated value, this proved to be not immediately apparent.

The post questionnaire gave us the most insight as to the functionality and design of our prototype. People were rather honest in their proposed usage of this design during the winter time. Our design has the potential issue of less traffic during the winter months. This is expected as anything outdoors has to pertain to the weather. We do still believe the functionality of this design would allow for users to participate if they so desired during these months. Another well touched topic was the practicality of this application to Bloomington. There were freshmen interviewed on campus that told us they wished they had had this tool starting out to use as another tool when navigating campus. On the other hand, there were some negative comments on the design and flow between the physical map and the mobile application. They understood where they were connected, but not how the entire map system worked as a whole. If the user is thrown into the experience on one portion of it, it could cause a fractured understanding of the entire experience and a subsequent write off. We got various answers for our first task of the QR code placement, but all users were able to navigate to it quickly so we felt it's currently placement was well suited after all.

Prototype Improvements

Following the feedback from the user studies, benchmark task assessment, and post questionnaire, we were able to postulate on improvements with our final prototype moving forward. Beginning with the benchmark task data, we were able to see a trend in the learnability and retainability task times being way over the allotted value. These were the tasks of identifying the IU Landscaping department as well as the origination of the data which is the 2019 Tree Map. Following these results, we postulated wider logos present on the main screen as well as department associated screens. These labels identifying data can be placed as watermarks on screens, graphs, and polls within the application. This repetition and noticeability will draw user attention to these areas.

The next implication we sought to change was the flow and functionality between the mobile and stable interfaces. Ideally, the user would be aware of the fact that there are multiple stationary screens displayed across campus. These screens each allow you to see the entirety of Bloomington along with the 2019 Tree Map Data and specified data about the trees around the stationary screen itself. These stationary screens can be used in tandem with your mobile device providing a more immersive personalized experience. To make this apparent to the user, as well as how each of these sets of devices interact, we should include a welcome or onboarding screenset for the mobile application. The download process would be started via the QR code. Once the application is downloaded, the user will be guided through a tour explaining the experience in its entirety then identifying where the user is currently located. These crucial first steps will help to eliminate confusion of being placed within the experience with no context. This implication will also allow users to more logically think through the interface that they are using. This helps to intuitively guide the user through the experience.

Lastly, we had mixed reviews over the design of the interface. There were many who said that the mobile interface design was complicated. This would come in the form of visual design as well as placement of functionality components. Overall, in the future implications of this application we should seek to make it simple both in design and functionality. Giving the user less tasks to choose from will result in a quicker more convenient interaction with the interface. This design would still cater to the nature surrounding Bloomington to maintain its integrity, however it could be simplified and redesigned to be seamless to the user as well as aesthetically pleasing. Throughout these user interviews and prototype interactions we were able to further iterate on this idea to instantiate an application that solved the issue of having a personal stake in the nature around the user.

Appendix

Evaluation Task Script:
https://docs.google.com/document/d/1AxGbBY8NSaB2brKnhzT1arURxJ8sG0rRVAhEIrihh9g/edit

Interactive Map Prototype:
https://www.figma.com/file/iCeX8EeAZEk4KYyGo61Nag/Interactive-Map-Prototype?type=design&node-id=0%3A1&mode=design&t=ZnYTe7E0vPUxhdPb-1

Mobile Application Prototype:
https://www.figma.com/proto/6xEaqIcdpr2y8jQvuqRdFT/P3-Prototype-INFO-I403?type=design&node-id=1-2&t=wkISjQsweW4lEPHj-1&scaling=scale-down&page-id=0%3A1&starting-point-node-id=1%3A2&mode=design