GP4 - Final Report

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Problem

Description

The isolation of quarantine has been difficult for all of us. We've had our routines disrupted. We're stuck inside, working from home. We've had to cancel plans and rarely get to see our friends. It's nearly impossible to discover new places. This stagnation is a detriment to so many people's mental health and happiness, and that is why it's more important than ever to make an effort to be active, get out of the house, and see new things. People lack the reason to go outside and explore when working and socializing from home, and even when they leave the house it's normally for not very long and to familiar places.

Users

Jerry:

An older but active man who is bored with the paths he walks/runs normally. He lives in a rural environment where it might not always be the best weather for a walk/run but he has the gear and determination to almost always go. His day is very scheduled and he likes to walk/run in the morning, but sometimes might slip and go later in the day. He knows his local wilderness and neighborhood quite well but still finds new things. He likes to talk to friends about interesting places/things he has found while out and about.

Rebecca:

She wants to be more active outside but doesn't know what to do or where to go. She is young and lives in an urban environment that she doesn't know extremely well. There's good weather out most of the time and she wants to find a way to force herself to go out. She lives alone besides a pet cat and doesn't have many local friends besides colleagues. She feels more comfortable with routine and wants to find somewhere nice that she can walk to every day.

Sam:

They want to find interesting places close to them. They have kids and live in a suburban environment where it gets quite cold in the winter. They live near a park and like to go out into it, but don't know more than a few paths/places. They want to try and find activities to do with their kids who are preteen/teen, especially during the summer when it is nice. Family vacations often include camping and are usually pretty unstructured.

Tasks

1. Leave a rating on a point of interest.
2. Customize a path by adding a point along the way.
3. Go on a 20-minute walk.

Design

Final design description:

Our app generates paths for the user to walk. First, the user customizes their path. From the path customization menu, the user can specify their path's length, what kinds of places they want recommended, and what particular points are on their path. The user can view information about a point, rate it, or add it to their path by clicking on a pin on the map. Second, the user presses the Find Path button to generate a few path options. Third, the user presses Start and the app navigates the user along that path. During navigation, when the user is near a point, the app offers a fun fact about the location and prompts the user to rate it. The app will also prompt the user for ratings after they finish a walk.

Design decisions:

The most important design decision we discussed was what the process should be to add a point to a path. This is one of the most important aspects of our app and one that caused many issues for our users. The user may not realize they can click on pins on the map, or not notice that the list of points has changed, or not understand what the list of points means. We ultimately decided that these problems come down to the user not being able to distinguish intractable objects and follow state changes. We decided that these problems would be solved with a higher fidelity prototype that uses color, animation, and correct data.

We also discussed what customization options the user would want, and how much control over the path the user should have. At first we allowed the user to specify time, distance, rating, and points. We decided our app should be more like a travel guide than Google Maps, so the user shouldn't have exacting control. Also, we changed the path customization options to either time or distance, high or low popularity, points, and tags for what types of locations they are interested in.

One of our evaluators brought up a good point that it is unclear how the thumbs up/down rating system connects to the star rating system. We could fix this by only using stars, only using thumbs, or using a different system such as YouTube's like/dislike ratio bar. Or possibly we could remove ratings altogether. We also discussed whether constantly prompting the user for ratings is annoying. We decided to keep the rating system because that data is necessary for a good recommendation system, but to make it easy for the user to skip them.

Paper prototyping: What did you learn?

While testing our paper prototype, users frequently had difficulty understanding the information presented to them by the app. For example, they might not recognize that an object is interactable, or understand what happened when they clicked something. Part of this is because our paper prototype did not have color or animations. We used all static screens which made it difficult for users to follow state changes. This is especially evident when trying to add a point.

We also learned a lot about how to run good user tests. Our brief and tasks could have been worded better to better explain our app and what we wanted the user to do. We also later added a section in our brief setting expectations for how a prototype is different from a real functioning product.

Heuristic evaluation: What did you learn?

- It is not clear how the thumbs up/down and star rating systems interact
  - Rating: Cosmetic
  - Fixes: We need to unify the systems. We could change the rating system to all thumbs, all stars, or a new system using a like/dislike ratio like on Youtube.
  - Implementation: Took a quite similar approach to Youtube's bar system. The ratio bar has the actual number of likes on the end and if the user has liked/disliked the point that part of the bar is highlighted.
- X button should always take the user to the previous screen
  - Rating: Minor
  - Fixes: There are multiple ways to enter and exit a screen so we need to keep track of the path the user takes instead of always going back to a particular screen.
  - Implementation: Simply made the x button on the point of interest screen go to whatever the previous screen was as that was the most problematic one.
- Make the app remember ratings
  - Rating: Major
  - Fixes: Keep the state of the rating a user made between screens.
  - Implementation: Did just that! Made sure to have it updated everywhere a like/dislike button is.
- Make the app remember points added to the path
  - Rating: Catastrophic
  - Fixes: We need to actually add the point the user clicked to the list of added points. We could make the points on the "Add points" screen just buttons that add them and get highlighted when they are in the list. We could also make point screens for each point that can be added and just have the points added from there (maybe still do the highlighting).
  - Implementation: Took the second approach as we wanted the point screen for each anyways. Though we didn't add the highlight.
- Make the app remember path customization settings
  - Rating: Cosmetic

- ○ Fixes: Simply keep the state of all the variables.
- ○ Implementation: Didn't do this one as Unity is annoying with keeping state between scene transitions. (It's not terrible but this change was just too low priority for the work it needed).
- Display remaining time/distance during walk
    - ○ Rating: Cosmetic
    - ○ Fixes: We should look at what Google directions do to display the time left, should be just adding some text boxes in places. We might want to make these numbers change based on our moving dot?
    - ○ Implementation: Just added a distance text box in the next direction box and a tiny time remaining text box the mirrors the "Finish" button.
- Display names of points on the map
    - ○ Rating: Cosmetic
    - ○ Fixes: Add a little text box over the point marker.
    - ○ Implementation: Did that!

Implementation

We used Unity, a free game engine, to implement our interface. We chose this tool for a number of reasons:

1. Each of our group members had either some or a lot of prior Unity experience.
2. Unity comes with a fully-fleshed UI system that allows us to iterate quickly by making changes in a visual editor, rather than by changing code.
3. Unity prefabs allow us to make blueprints for different UI elements and re-use them across screens. Changing the prefab updates all the copies in each scene.
4. Unity allows us to easily deploy our interface across platforms (web, desktop, mobile, etc.).

Our project is split into a number of different "scenes", each representing a major view of the interface. Within each scene are some collection of static and interactive elements. Some interactive elements modify the layout of the current scene, while others switch the user to a different scene.

Unity's UI system allowed us to organize our UI elements in such a way that they're able to dynamically resize for different size screens, which is especially important considering our application is designed for mobile platforms. Using layout groups, it's easy for us to add new elements to existing screens and have the other elements adjust to create space for the new elements.

While Unity makes developing for cross-platform very easy, it's not perfect. There were multiple occasions where issues with our app would not materialize until we exported to a web format to upload on our site. Additionally, Unity does not provide easy ways to visualize or test the different task flows in our app, meaning it was easy for some flows to be broken without us realizing if we weren't especially thorough in checking every possible permutation of actions.

Evaluation

Were it not for COVID, we likely would have done many things differently when evaluating our interface. For one, we would have held all our interviews face-to-face, where it's more natural to maintain a back-and-forth conversation with our interviewees and gain a wider understanding of their thoughts. Additionally, we would have been able to involve a wider variety of people in our evaluation process. Because of COVID, we could only hold face-to-face interviews with people in our quarantine bubbles, and not all of our group members could be there in-person. We might have been able to go around on campus and recruit strangers for evaluations, freeing us from the limitations of our own social circles.

Our next steps would likely involve integrating our prototype more closely with the actual behavior our app interacts with: walking. Doing evaluations where users interact with the prototype while walking around would provide a lot more insight into the actual effectiveness of our interface. We would be able to evaluate how our interface benefits or suffers from the situational impacts of using a mobile app while navigating around a real-world environment.

There are a few usability issues we were not able to address given the timeframe and nature of this project. For one, our interface doesn't use any real location info since the backend is all faked. This can actually be surprisingly jarring, since users are accustomed to map applications displaying familiar landmarks and street layouts from the surrounding area. A simple solution to this would be to try replicating a static version of the nearby Boston area, since most of our test subjects will likely be more familiar with that map. On a related note, the app doesn't actually respond to your real-life movement, resulting in a disconnect between the user being stationary and the application showing movement and progress along a route.

Additionally, customizing the preferences for finding a path currently doesn't affect the path you're given, since, again, everything is hard-baked in the app. This lack of feedback based on the user's actions can cause confusion about whether they were successful in customizing their path preferences. One way we could address this would be to have the user select from a few preference presets and design different paths for each preset.

Reflection

Were we to start over, we would do many things differently. Firstly, during the paper prototype stage, we could have done a much better job at promoting our testers to think aloud. This kind of interaction is harder to facilitate when interviewing remotely, but that doesn't mean it's impossible. We also could have done more in the paper stage to replicate the types of animation and movement present in our design; instead, our paper prototype was entirely static screens, which makes it hard for the user to maintain a sense of where they are in the app.

In terms of our more general prototyping process, we definitely got too set on our first prototype design. Rather than creating multiple radically different designs and testing all of them to determine which ones to pursue further, we ended up more or less sticking with our first design. Additionally, when we received feedback on our design, we were too hesitant to want to make changes. Major issues such as the confusion resulting from trying to add/remove points of

interest took far too many iterations to address, and the final results are still fairly similar to what we started with. We really needed to be less afraid of making drastic changes.