Team Sporks Heuristic Evaluation of Team Slotted Spoons

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Overall Evaluation

The design is a really exciting idea, and a much-needed solution to the indoor navigation issue. The application is innovative in its use of tactile notifications and offers a range of uses from in-pocket to in-hand navigation. However, we found the buzzing confusing because this kind of tactile feedback is not typically associated with positive reinforcement. Other major weaknesses include the framing of the images, no clear way of changing the destination or going back in the app, and the lack of help and documentation. Another change that would be highly beneficial to include is having a route overview that is intuitive and can be checked any time. We're excited to see future progress!

Issues with the Heuristic

The following are the issues we as a team noticed with the design and experience in relation to the heuristic:

1. **[H2 Match between system and the real world] (Severity 4) - 5 of us**
   In many systems, google maps, apple watches, fitbits, buzzing is used to get the user's attention. In google maps it buzzes when the user needs to change direction or in gaming the controller buzzes when something bad happens. Buzzing often has a negative association with an event. In this application, buzzing is used to let the user know they are on the right track and do not need to look at the device or correct there path. The idea that buzzing was linked to positive reinforcement and a symbol of not needing to pay attention to the device was pretty confusing to us.

2. **[H3 User Control and Freedom] (Severity 4) - 3 of us**
   There was no clear way to change the destination once you have already embarked on the journey. Only option was to exit out of the navigation system and use the built in Android back button (which was unclear to the iOS natives in the group) to go back to the main list of destination options.

3. **[H2 Match Between System and the Real World] (Severity 2) - 3 of us**
   There was no way to preview the next step, which might have been helpful for quicker direction changes and just overall getting their faster, especially for people who are more used to the space.

4. **[H2 Match Between System and the Real World] (Severity 2) - 3 of us**
   It is unclear how many flights of stairs to go up and the user is left dependent on the visual images. The elevator approach solves this by indicating which button to press.

5. **[H2 Match between system and the real world] (Severity 2) - 2 of us**
   Image framing issue: images were very specific to a particular angle and time point. For instance, in the step that reads “turn to head down the hallway” the user can’t see the stairs in the image so it’s confusing to understand where the user is coming from and going (a wider angle might show more context). Also, the image for “continue to first alcove” makes the user feel like they’re going to be walking for a long time because of that long hallway and arrow. See recommendations for an idea to fix this.

6. **[H5 Error Prevention] (Severity 3) - 1 of us**
   There was no clear error notification/user feedback when the user pressed on something that was not linked or went in the wrong direction. The buzzing was not intuitive and there was no explicit message telling the user that they were either no longer on the right path or was not using the app as intended.

7. **[H3 User Control and Freedom] (Severity 2) - 1 of us**
   Given that the target users for this app are people in a new environment, it seems counterintuitive to expect users to know the name of their destination. The only way to explore the list of possible destinations was through the drop down menu that would appear with suggested locations as you started typing. This can be daunting for users who are unfamiliar with where they were and where they are going.

8. **[H7 Flexibility and Efficiency of Use] (Severity 3) - 1 of us**
   There was no change to the system for new and experienced users. For experienced users there is too much repetitive information input necessary and the app appears to have no memory of previous user behaviour.

9. **[H10 Help and Documentation] (Severity 2) - 2 of us**
   Once a location set is it is unclear what setting vibration on or off will do as there is no documentation for it or suggestion as to how vibration will affect your route/experience. Even after using the app the vibration function had to be explained a bit.

10. **[H4 Consistency and standards] (Severity 1) - 1 of us**
    There is an inconsistency with what the red box highlights in the image. It is not as severe because it asks the user to notice the element. However, in some images, it means there is an action required, and others it is simply just a signpost.

11. **[H8 Aesthetics and minimalist design] (Severity 1) - 1 of us**
    Long form text may be hard to walk and read as instructions were written in sentence form.

12. **[H8 Aesthetics and minimalist design] (Severity 1) - 1 of us**
    Text on “Route Overview” screen is too small to read.

Summary Tables

Severity Rating	Number of Instances
0	0
1	3
2	5
3	2
4	2

Name of offense	Number of instances
[H1] Visibility of system status	x
[H2] Match between system and the real world	4
[H3] User control and freedom	2
[H4] Consistency and standards	1
[H5] Error prevention	1
[H6] Recognition rather than recall	x
[H7] Flexibility and efficiency of use	1
[H8] Aesthetic and minimalist design	2
[H9] Help users recognize, diagnose, and recover from errors	x
[H10] Help and documentation	1

Recommendations

1. Retake images to include more context of the surrounding space. If the user is at the top of the stairs and needs to make a left, include part of the stairs in the image and the wall on the left so the user knows where they are coming from and where they are going.
2. Google maps usually has some kind of route overview that can be checked at any time and it feels like a quick drop down like that would be helpful, especially with the visual imagery.
3. Provide a way to change the final destination within the guidance/navigation screen.
4. While the images do help, having a known flight of stairs or some floor indicator would be provide better information at no cost to visual clutter (since they already have a stair icon).
5. Make the arrow turn into the alcove so the user has a general hint as to what the next step is going to be so they do not have walk too far before hitting the “next step” button. Another way to solve this problem could be to change the way steps are divided (i.e. not isolating “continue to the first alcove” as its own step but rather including the turn as part of it) but editing the image seems like an easy fix instead.

Appendix: Individual Heuristics

April Chen:

1. **[H1 Visibility of system status] (severity 2)**
   Buzzing as an encouragement that the user is going the right direction is unintuitive. Though, it makes more sense that it buzzes a lot when the user is off track.

2. **[H3 User control and freedom] (severity 3)**
   Have to click stairs/elevator then Go elongates the process. User may expect that once they click stairs, the process will begin. Or the "Go" button should be differentiated from the stairs and elevator options. Somehow pop out more?

3. **[H4 Consistency and standards] (severity 1)**
   When two elements are highlighted in the image, or different types of elements are highlighted, the meaning is inconsistent. Is it a door that s/he has to walk through, a button to press or a signpost that indicates the room?

4. **[H5 Recovering from Error] (severity 3)**
   Does not properly diagnose the problem and propose a solution for the user when the user goes off course.

5. **[H8 Aesthetics and minimalist design] (severity 1)**
   Instructions written in sentence form. Screen can get cluttered when instructions are very long.

Gracey Wilson:

1. **[H2 Match between system and the real world] (Severity 4)**
   Vibrations weren't intuitive because of past experiences. Didn't know would I really put the phone in my pocket if I had no idea where I'm going? (This ties back into the "no overview" thing - there's no way for me to see in general whether I'm in the right direction because it's all step-by-step)

2. **[H2 Match between system and the real world] (Severity 3)**
   The "Route Overview" doesn't feel like it gives a general heuristic direction, like "you're going to go upstairs and to the left and the room you're going to will be on the right" which is what I wanted/expected, especially based on previous experiences with mapping software. (i.e. google maps' "route overview" would should the general directions. I can see that was the effort, and it's certainly harder indoors, but it didn't really jive with my intuitive expectation of what an overview would look like.

3. **[H8 Aesthetics and minimalist design] (Severity 1)**

Text on “Route Overview” screen is too small to read.

4. **[H2 Match between system and the real world] (Severity 2)**
   Especially for “turn to head down the hallway” after reaching the top of the stairs, since I can’t see the stairs in the image, it’s confusing to understand where I’m coming from and going. Also the image for “continue to first alcove”: it would be helpful to make the arrow turn into the alcove so I have a general hint as to what the next step is going to be.

Samantha Young

1. **[H4 Match between system and the real world] (Severity 3)**
   The vibration used to show that I was on and off the right track seemed confusing for me. Normally something buzzing or beeping signifies I am doing something wrong rather than doing something right and buzzing often symbolizes requiring the attention of the user. This mismatch between the normal convention and the convention of the app was difficult for me to navigate and contributed to me having a difficult time using the app efficiently.

2. **[H9 Help Users Recognize, Diagnose and Recover from Errors] (Severity 2)** When a user goes off the path there is a different buzzing vibration. As of current, there is no way for you to figure out how to get back to the right path seeing as you got off the path other than it changing in buzzing. Direct instructions on rerouting would allow the user to easily recover from these kinds of mistakes. A sort of direct instruction on how to recover from an error would ease the stress of the user.

3. **[H10 Help and documentation] (Severity 3)**
   I had no idea how to use the application when I was using it. I did not know when to start or how to start or that I should put it in my pocket. Some instructional or help piece would be useful in this kind of scenario with descriptions of what the different buzzing means and the different operating modes of the application.

4. **[User Control and Freedom] (Severity 2)**
   It is difficult to change the location preference options if you decided you no longer wanted to go to the room you are navigating to. This restricts the user’s freedom. The option to change locations would give the user the freedom to not be locked in to one experience.
5. **[Visibility of System Status] (Severity 2)**
   At the start of the navigation it seems as though you are currently navigating because there are two images that show red boxes as to where I should go. However I did not actually start the navigation. I didn’t even notice the “go” button. Some kind of indicator that I am not navigating or navigating would be useful in figuring out where to go this kind of scenario.

Philipa Yu

1. **[Visibility of system status] (severity 2)**
   The app had no display option for taking a look at the most macro scale of the path selected. For users who are new to the space, it would be more helpful to have this view as it would allow the user to have greater understanding of their position within the larger environment.

2. **[Match between system and the real world] (severity 1)**
   The perspective of the images did not change when the user reached a different point in the navigation process. Moreover, in a couple of the steps, the photo indication did not include significant markers that could help the user orient himself/herself.

3. **[Match between system and the real world] (severity 4)**
   The way the vibrations and haptic feedback worked was very confusing. When the phone buzzed I thought it was demanding my attention rather than reassuring me that I was on the right path. Also if the device were in my pocket, I would have a really hard time distinguishing between the different vibration patterns, much less feeling it to begin with.

4. **[User control and freedom] (severity 3)**
   There was no clear way to change the destination once you have already embarked on the journey. Only option was to exit out of the navigation system and use the built in Android back button (which was unclear to the iOS natives in the group) to go back to the main list of destination options.

5. **[User control and freedom] (severity 2)**
   Given that the target users for this app are people in a new environment, it seems counterintuitive to expect users to know the name of their destination. The only way to explore the list of possible destinations was through the drop down menu that would appear with suggested locations as you started typing. This can be daunting for users who are unfamiliar with where they were and where they are going.

6. **[Error prevention] (severity 2)**
   There was no clear error notification/user feedback when the user pressed on something that was not linked or went in the wrong direction. The buzzing was not intuitive and there was no explicit message telling the user that they were either no longer on the right path or was not using the app as intended.

7. **[Flexibility and efficiency of use] (severity 2)**

There was no change to the system for new and experienced users. For experienced users there is too much repetitive information input necessary and the app appears to have no memory of previous user behaviour.

8. **[Aesthetic and minimalist design] (severity 3)**
   The images used to navigate the user had unnecessary information and lacked important markers at the same time. There were important anchors that were necessary to help the user orient themselves that were missing. There were also lighting and visual clarity issues with the images. A few changes to the image treatment could make the directions more clear and consistent across different steps.

9. **[Help and documentation] (severity 4)**
   There was no option for a help button or anyway for the user to orient themselves within the app. The user would be completely on their own if they had questions or there were bugs in the system.

Benjamin Ziemann

1. **[Consistency and Standards] (Severity 4)**
   The vibration function of a phone or controller is typically used to signify a user to something they need to be immediately aware of. In this implementation, the vibration is constant except for when you go off track. While this can be seen as a hotter/colder mechanic, in the context of technology this feels backwards.

2. **[Documentation] (Severity 2)**
   Once a location set is it is unclear what setting vibration on or off will do as there is no documentation for it or suggestion as to how vibration will affect your route/experience. Even after using the app the vibration function had to be explained a bit.

3. **[Consistency and Standards] (Severity 1)**
   Buttons to move forward in the process are generally not located in relation to the previous step which can be a bit disconcerting having to search / not knowing what to search for.

4. **[Match Between System and the Real World] (Severity 2)**
   It is unclear how many flights of stairs to go up. While the images do help, having a known flight of stairs or some floor indicator would be provide better information at no cost to visual clutter (since they already have a stair icon). The elevator approach solves this by indicating which button to press.

5. **[Match Between System and the Real World] (Severity 1)**
   There was no way to preview the next step, which might have been helpful for quicker direction changes and just overall getting their faster, especially for people who are more

used to the space. Google maps usually has some kind of route overview that can be checked at any time and it feels like a quick drop down like that would be helpful, especially with the visual imagery.

6. **[Visibility of System Status] (Severity 2)**
   The entry to set location is at the top of the screen and upon entering the list of steps you will be taking to get to your destination is shown in the middle. I assumed the navigation had started and completely missed the “Go” button tucked in the bottom corner. Part of this I think was the coloring and size of it being the same as the stairs and elevator options despite it arguably being more important as well as it being in a very different location than the buttons to progress in the steps leading up to it.

7. **[User Control and Feedback] (Severity 1)**
   No apparent way to redo location without backing out of the entire process. It would be nice to be able to change location mid way through, especially if you are unfamiliar with the space and realize you had put in the wrong destination.