

# **A8: Usability Study Report**

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Team Rocket

Sho Conte

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# Summary

We began our research with the question, “How can we make dining out a more enjoyable and efficient process?” We defined dining out to be anywhere a person goes to eat besides cooking at their own home. To find our answers, we conducted a series of interviews, questionnaires, and observational studies to better understand our question and to see if it’s indeed a problem for our target group (see Participant Demographics Summary).

Ultimately, we found that the most common problem people encounter during their dining out experience is during the search and discovery of restaurants. In other words, the people in our target group have trouble finding and deciding on a suitable restaurant to dine at.

Through our research, we found that this problem is due to a variety of reasons. For instance, some people don’t want to think about what to order when they arrive at a new restaurant and others worry about the food quality at unfamiliar restaurants. People in our target group usually go to restaurants they are already familiar with however, many say they are open to try new places. The group that we researched on also expressed how information such as price, restaurant ratings & reviews, location, menu, dietary needs, and pictures can all have an influence on where they go dine at. Location and customer reviews & ratings were examined to be factors of the largest importance when it came to deciding on a place to eat. Most research participants indicated that they preferred to eat in groups of at least two people when dining out. The total mean, in terms of how long it took the interviewees to decide on a place to eat, was approximately 20 minutes. The lowest average decision time being 7.5 minutes and the highest being 45 minutes. When a participant dined with a larger group consisting of more than 4 people, it took a greater amount of time for them to plan and choose a restaurant. This was due to vast differences in taste, budget, and location.

From our research results, we narrowed down our problem to focus on improving the search and discovery aspects of dining out. From our questionnaires, we found that a majority of participants relied on technology to help with restaurant search and discovery so, we decided to create an app called Foodsy. The approach we decided to take was to help users find the perfect restaurant that will satisfy their current cravings quickly and easily. Even if the user has no specific cravings, Foodsy will help the user reveal a craving or suggest a great restaurant for them. We hoped that this will in turn, reduce decision making times and make this process more enjoyable and efficient. Our marketing tagline was: Foodsy is a food discovery and search app that will reveal your inner cravings.

We were aware of the competition of existing services such as Yelp and Google however, we've created and identified gaps that even those well established services were missing. For example, both popular services are not concentrated on the space of dining as Yelp and Google Maps also list local shops, salons, and other local services. This gives our service an edge as we can tailor our experience to focus on **restaurant** search and discovery. Another advantage we found was that our app focused on displaying pictures of a restaurant's dish one at a time, each picture taking up 75% of the screen instead of displaying a general low quality restaurant picture like Yelp and Google Maps.

Our team tested 5 paper prototypes, then combined the features and UI based on which implementations worked well to create our high-fidelity prototype version 1. Then we tested our high-fidelity prototype version 1 on a few users and made changes accordingly to create our high-fidelity prototype version 2. Our version 2 prototype underwent another round of testing, this time with HCI professionals and classmates.

For our prototype testing, it was difficult to replicate a real life use case for our app due to prototyping software limitations. For instance, our app suggests you dishes from certain restaurants based on your dietary preferences and preferences for category of food (Chinese take out, pizza, pasta, etc) and curates a carousel for you based on those preferences to browse through. Since each user in our testing would have different preferences it would have been unrealistic to make screens for each combination of preferences in our prototype. Instead, we went with the scenario and task approach to testing where we would give participants a scenario and a list of tasks to accomplish.

From these tests, we found that users navigated the app with minimal effort and understood most of the app's features. A couple confusing features were the "choose 3 dishes" cart page. The intention behind this feature was to limit users to only choose three dishes that they liked in order to avoid endlessly browsing for food. This feature could be improved on in the future by allowing users to turn it on/off or set their own limit. Other minor confusions happened at the instruction pages and food browsing screens (see Findings and Design Implications) which we addressed in our High-Fidelity Prototype V2. Overall, participants described the app as simple, straightforward, and many complimented it for its pretty interface design. Furthermore, many users valued the allergy and dietary restriction options and the option to allow guests to use the app without signing up. In terms of efficiency and decision making speed, it was difficult to test thoroughly however, in post-test interviews, participants reported that they could see the app aid them in making restaurant decisions.

Throughout the design process, our team has identified a common problem, found a gap in existing services, and set out to improve the experience for users in our target area. Before implementing any feature we ask ourselves, "How does the user

benefit?” and “Does this feature help us achieve our main goal of making dining out more enjoyable and more efficient for the user?” To get a better understanding of these questions we used cognitive walkthroughs, tests within our team, and background research. Finally, to answer these questions, we conducted user tests. This is the process we iterated through that resulted in the Foodsy app.

## Research Method

Recruitment of participants for usability testing was something that none of us had done before. Therefore, we decided to focus on the resources that were closest to us. The tests were performed on our fellow classmates, experts that were called in, as well as friends and family. Luckily, we were able to gather results from a wide range of people in terms of age, gender, career, etc.

Prior to conducting usability tests on our prototype, we began our research with observations, one-on-one interviews, and online questionnaires to gain a better understanding as to how people decide where and what to eat, what the most problematic steps are, and what makes the decision making process quicker or slower.

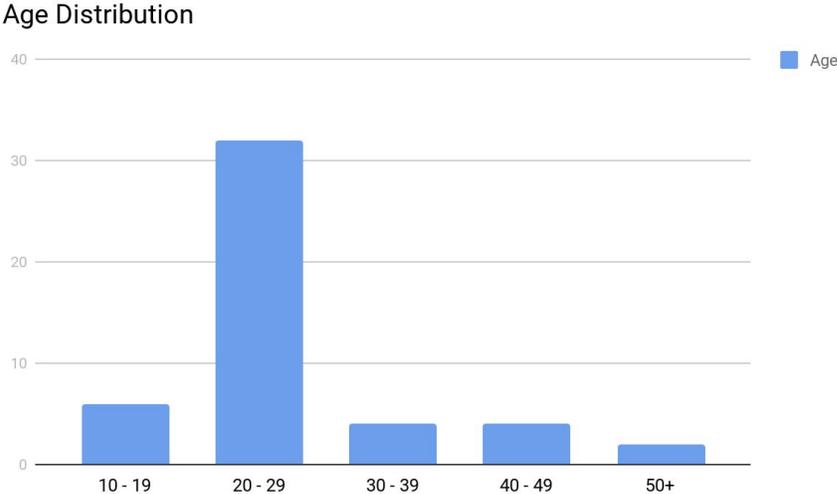
The observational research was convenient because we were able to see how people did certain tasks without prompts and without knowledge that they were being observed until after the observation, so as to not bias their actions. The observations revealed that groups took twice as long to make a decision as to where to eat compared to individuals that went out to eat alone or in pairs. Further, it was discovered that the primary cause of the extra time spent on deciding where to eat was due to groups or individuals who wanted to try something new. This resulted in extra time spent during the *search and discovery* of new restaurants. The one-on-one interviews resulted in more in-depth answers and revealed that people are often more likely to be satisfied with having less to choose from rather than an array of items to select from. The effect that this revelation had on our app was that the like/dislike portion of the app was limited to 3 likes from which the person had to then choose from, or hit the random button for the choice to be made for them. This creates a more efficient process for the user.

Once we had completed the first prototype of our application, we continued on with usability tests. Some of the tasks completed by the participants included finding a new restaurant or food they would like to try, or saving an item they tried from the application for later. During the usability tests, we collected data such as: how long it took them to do a specific task, what questions or observations they had (We encouraged them to think aloud in order to get as much information as possible) as well as what screens they spent more time on. These usability tests were conducted in both classroom settings, on a university campus, as well as at the homes of the

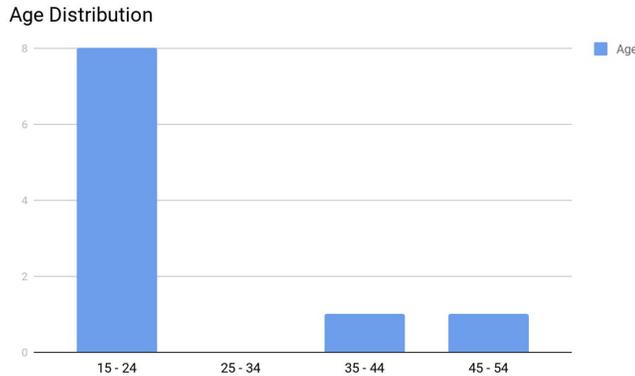
participants. These usability tests were imperative in helping us discover the pain points in the decision-making process as well as in our app, which ultimately lead to the next design iteration.

## Participant Demographics Summary

We started with formative study, researching and getting to know more about the target audience. For the overall study audience, we had a total of 58 participants to collect data and study from. The sample population ranged in many factors. In our sample population, we had good balance of male and female participants. The sample included family members, students, workers ranging between the ages 18-40 with the average of 20. Majority of the populations were undergraduate students in their 20s. They all had easy and quick access to technologies and were literate with the technology, such as smartphones. All of the candidates lived in the city or suburbs and dined out every other day of the week.



Then, we had the opportunity to test our low-fidelity and high-fidelity with more participants. These participants were also students, family, and industry professionals. All participants were familiar with technologies; owned personal smartphones. The age distribution was the following graph below. The participants were also good balance of males and females and most of the participants were between the ages 15 to 24. Participants in that group of the sample population were also, all undergraduates with one highschool student. All of the sample populations reported to also live in city and suburbs.



## Findings and Design Implications

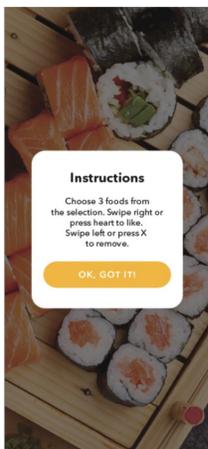
Throughout the usability tests, we received a lot of positive feedback regarding our design. In particular, the overall design in terms of aesthetics (i.e. colours, layout, theme, etc.) was perceived to be well thought out, pleasing, and very polished (said by almost all participants). To be more specific, the most enjoyed pages were the login and registration pages with their orange and white theme, and the food selection page where the participants had to choose if they liked what image showed up or not. Additionally, the high contrast page designs, legible font sizes, and the rounded components theme were all very well received in almost all of our usability tests. The participants also enjoyed that we had a mascot egg and felt that it offered some nice flair to our app. In terms of actual functionality, many users were pleased that we offered allergy and dietary restriction preferences since no app currently on the market implements those features. In particular, a participant said that “I really like the value that this app offers from the preferences like allergies and dietary restrictions. It’s something that no other app has implemented yet as far as I know.” (Expert 3).

Although there were many positive comments, some components were definitely problematic and challenging for participants to understand how we designed it to be used. In the end, they are the ones who are potentially using our app and as developers we must respect that and iteratively update our design to be more user friendly. While all of our participants successfully completed the tasks asked of them, the following design implications resulted in some tasks taking longer than expected to complete. Unfortunately due to technical difficulties we were unable to recover some data regarding the length of time it took to complete certain tasks. In the following paragraphs we will go in detail about some of the drawbacks and implications our design ran into when performing the usability tests with our high-fidelity prototypes.

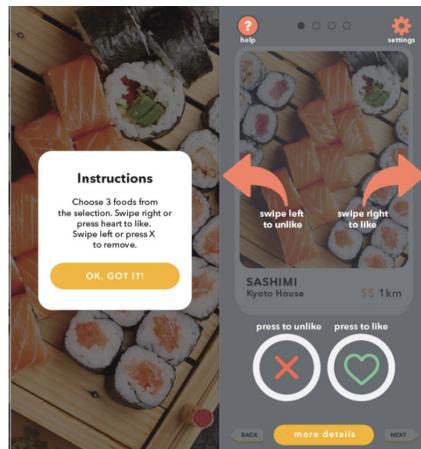
One of the main concerns we saw during our high-fidelity usability testing was our implementation of the instructional overlay for the food browsing page. We intended for users to read this page to gain insight on how to navigate through the food selection part of our app.

However, many participants were confused upon viewing this screen and only briefly skimmed over the content on the page before moving on. Participants have said that they are “confused by [our] instructions screen, it really needs a label like ‘instructions’” (Expert 1). After being informed of what the purpose of it was, a most of the participants recommended we add some sort of text that clearly displays its purpose. An example would be an “Instructions” title and maybe a small “tap to dismiss” under it. In the end, we assigned this a usability severity scale of medium-high, because although it was not extremely necessary to understand as the next part was relatively straightforward, it offered some important insight into what is expected of the user in the coming steps and played a big part in the overall user experience. In particular, we included in the screen that they were to choose three food items that they were interested in. However, we did not explicitly explain that only after choosing three “liked” food choices that they would move onto the next part. A participant said that “the instructions for the carousel is very unclear” (Expert 3). Below contains a comparison of the iterations we went through for this page.

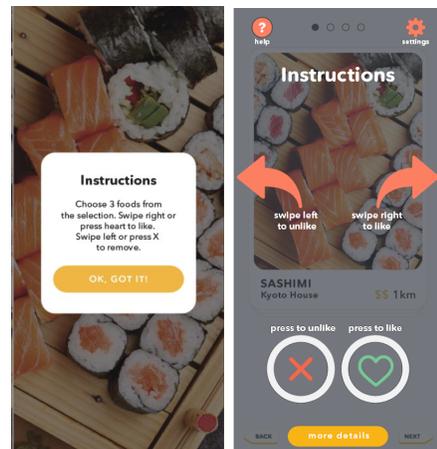
First Iteration



Second Iteration

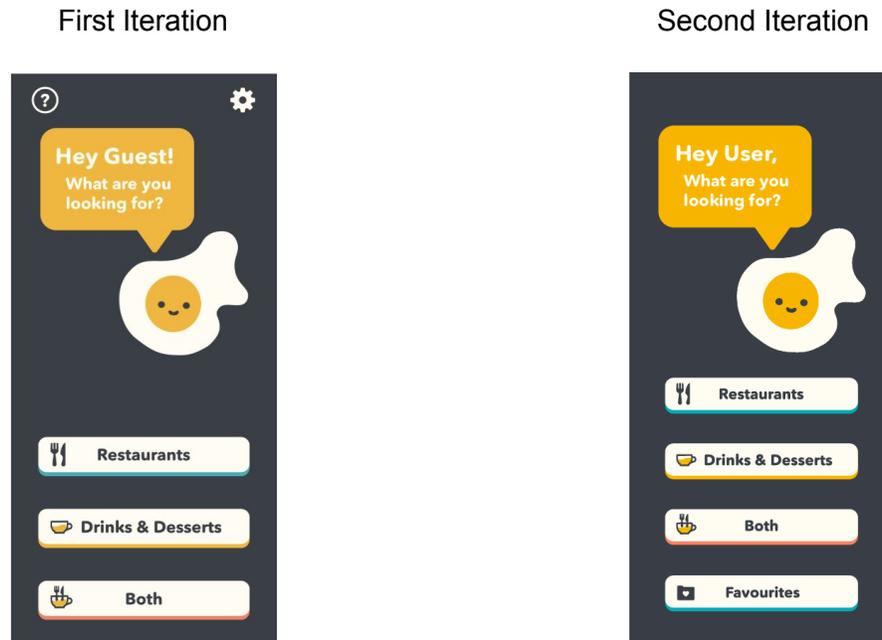


Third Iteration



Another task that many participants struggled with was finding the favorited restaurants. In our prototype, the favourites page was located in the settings page, however, that was clearly problematic seeing as how all participants took much longer than expected to find the favourites page. A participant said that “trying to find favourites is very hard actually and not what I was expecting at all” (Sho Conte). We expected them to return to the home page and intuitively think that it would be under settings since they did not see a way to get there from the previous walkthrough of the app, but that was not the case. Many participants tried going through the process again of choosing categories until they realized this was not the right approach (i.e. “I only found it because I exhausted all of the other options. I even tried clicking the egg!” (Sho Conte). Overall, the feedback we received from the task asking the participant to find their favourites was negative due to the fact it was so hidden away. The most feasible suggestion we received was to add “favourites” as a category (Sho Conte). This way, it would be easier to access, be really obvious to the user, and most importantly go really well with the existing

design. We decided to give this problem a severity rating of medium, since it did not prevent the user from using the app for its intended purpose, but it still is a very important detail that would massively improve the usability of our app. Below contains a comparison of the iterations we went through for this page.

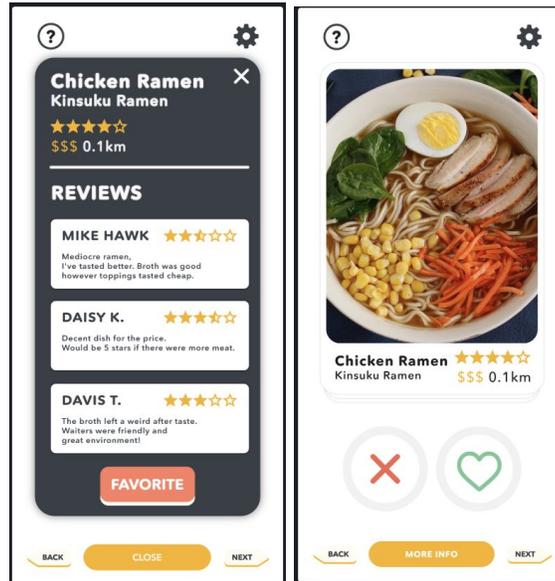


Similarly, many users struggled to find the reviews of restaurants when tasked with it. In the prototype we used for usability tests, you could only access reviews through settings similar to favourites. A participant has said that they were “a little confused about the review process” (Expert 1) and that it took them awhile to figure out. This was an oversight on our part since we missed the fact that the most common use case for checking reviews, especially on food based apps like Foodsy, is that they want to see reviews for one specific restaurant. Many users tried to navigate to a restaurant’s info page and looked for a way to find reviews that way and some even tried clicking on the star rating to see if it would bring up more info. After these observations, we decided to add a way to show reviews for a restaurant which can be seen in the iteration comparisons below. In the final prototype, clicking “More Info” will take you to a page where you can read reviews. Previously, we had that button redirect to the restaurant’s website. Similar to the favourites issue, we rated this a medium on the severity scale since while its a very nice functionality to have, and possibly even almost essential, it does not significantly hinder the users’ progress through our app.

First Iteration



Second Iteration



A final addition to what was previously discussed, another small issue is the registration process. A participant suggested that we should have a password validity checker or some sort of tooltip that lets the user know what characters were valid in a password because “I should know what the password requirements are, like am I allowed to use special characters?” (Expert 2). Their suggestion was to add a small “?” button beside the password field that would display a popup with the necessary information. We classified this as low priority since it is not too big of a problem.

Note that additional information regarding the full quotes can be found in the “Curated Expert Quotes” located in the “Links” section of this report.

## Discussion of Research Limitations

Due to the research limitation, couple of the features of the prototypes were ignored or hard to find. For example, the swiping motion of the selecting food screen has confused many participants in the prototype testing. If we had researched more about the motions that were familiar to all participants, we could have implemented those familiar motions. We should have also researched if participants are more comfortable and prefer either Android or Apple phones. This would have a lot of affect on the familiarity of motions on smartphones. Overall, due to the research limitations, we had to make lots of modification from high-fidelity version 1 to version 2.

As the test execution were not perfected, we have to make couple modification to the testing for each participants we had. The biggest lesson we learned from the industry professional while we were executing the test was to ask the participant to think out loud and ask them to take us through the thinking process while performing the actions. If we did our part in our research of test execution, our testing would have been a lot smoother.

Most of the participants that were researched, all reported that they lived in city or suburbs. Also, most participants were in their 20s. Since most of our data had very specific specifications (in 20s and lived in city or suburbs), this limited our target audience to be suitable for only participants that are in their 20s that also live in city or suburbs. This limitation of our research will affect the usability tests for participants that do not hit the specific specifications.

Most of the participants researched were in their 20s and lived in city or suburbs. Due to these very specific population, our data limits our project to be more user friendly by a larger population of users. The current data we have which the demographics were mostly people in their 20s and lived in city or suburbs, can't represent the whole population. We need variations in the participant's demographics as well. With more variety of participants and more data, we can analyze the data and create a more user friendly application for all users.

## Reflections

To create the most optimal user experience, we iterated both low-fidelity (low-fi) and high-fidelity (high-fi) prototypes to refine based on user feedback.

Before iterating the first low-fi prototype, we felt that there weren't any elements that were difficult to understand. We assumed that our overall user interface was immediately usable for users without prior experimentation or assistance. Another premature assumption that we made was that we forecasted all risks. We assumed that our interfaces predicted and accounted for all possible user constraints or errors in user input (e.g. texts, clicks, swipes). After conducting the first low-fi usability testing, we learned that our design implementation was generally straightforward to use, and users could identify the efficiency of the application – how efficient it makes one's restaurant decision-making process. Users were able to understand the purpose of the application and differentiate its functions from that of other food/restaurant discovery and review applications. For instance, three filters were used throughout the application to narrow down the user's food/restaurant results. Users found the number of filters used in the application prototype (Food Category, Types of Cuisine, Dietary Restrictions) necessary and not trivial. This ensured that all filters used were necessary, and not overbearing, to incorporate to ensure an efficient user experience with selecting a restaurant. Nevertheless, there were shortcomings that were not considered while designing the prototype that were suggested by study participants. For instance, users had no way of returning to the previous screen, as back-buttons were not incorporated. This was a critical mistake that we had overlooked. We assumed that there would be a back button located somewhere on the phone. Users preferred the application to have its own incorporated back button, rather than using the phone's integrated back button.

Taking suggestions and criticism from users allowed us to have another perspective on making the application more efficient and user-friendly and led us to create a high-fidelity prototype. We created more screens like the "Settings" screen, where users can customize accessibility settings and personalize their search results based on dietary restriction, distance, price, and preferred cuisine. We also created a "Favourites" screen and a "Reviews" screen for users to access their favourite restaurants and go over previously written reviews and ratings that they made. On top of user feedback, we also conducted a heuristic evaluation report that was assessed based on Nielsen's Jakob Heuristics and Ben Schneiderman's Golden Rules to discover and usability issues. For instance, our "Allergies" screen violated both the Flexibility and Efficiency of User and Visibility of System Status rule, as it limited users to select only from the given allergy options and no instructions were given on what action to perform on the screen, therefore we added a "+" button to input custom allergies as well as added text instructions to direct users to select applicable allergies.

Even after creating the high-fidelity prototype, we still had some improvements to make. To further refine our high-fidelity prototype, we also had expert reviews during another usability test, where we would analyze user experience and receive feedback on design and functionality features from industry professionals. A problem participants experienced when using our Foodsy app was that they were given no indication that the instructional overlay screen was the instructional overlay. Users would try performing swiping gestures on the overlay screen, when it was just meant to be an instructions page. Prior to the refined version of our hi-fi prototype, we

assumed that users would understand that it was just an instructions page that could be removed by a single touch or tap; however, this was not the case. We analyzed that older audiences had difficulty understanding it was just instructions. A solution to this was to simply add the title/text “Instructions” on the screen. Another problem they experienced was that the “Favourites” button was difficult to navigate to. Users can only access Favourites from the Settings page. A solution to this was to add a “Favourites” button to the landing page screen. Last, but not least, the existence of the carousel feature was a problem. They found that the carousel was confusing and out-of-context, as they are usually meant to represent chronologic and instructional steps or screens. Our solution to this was to simply remove to eliminate confusion.

Overall, Team Rocket has truly learned a lot from this semester-long project. For us, the main takeaway from this project was that iterative design is key. Iterative design is the repetitive procedure of rapidly implementing designs/prototypes and receiving critical feedback. Designer needs and user needs are not always the same and can differ, thus we always need to test and revise to create a better user experience. In the past, we had made assumptions about features and buttons, thinking they were self-explanatory and comprehensive, but in fact were not for some users. We learned to iterate designs from initial concepts to real, immediate solutions by gathering feedback and conducting rapid usability testing prototypes with users throughout the sprints of a design project. In the future, if we were to ever launch this app publicly, we will conduct a detailed competitive analysis, such as implementing a SWOT analysis for each competing food discovery and search app like Yelp. This way, we can try to come up with more ideas or features to get ahead of the curve. Moreover, we will focus on ensuring a universal design. Technologies enable different communities of lifestyle, of interest, of practice to share experiences. Team Rocket hopes to create a strong attempt at making each and every individual's experience worthwhile by offering widely accessible services and user interfaces. To make our services accessible, we will continue to focus on design principles such as: design error, intuitive design, ease of use (usability), text and symbols, and visual contrast.

## Links

### **Kevin's Paper Prototype Video:**

<https://www.youtube.com/watch?v=3tpJTlffuu0&t=4s>

### **Expert Testing Audio Recordings:**

<https://drive.google.com/file/d/17rmgZ-jzcSlj1xc4QpZeHEIRE-5ANGjb/view?usp=sharing>

### **High-Fidelity Prototype V2:**

<https://invis.io/RCQY80PP8MX>

### **Powerpoint:**

[https://drive.google.com/file/d/1r173YR\\_usE4Fn\\_KUKuz0RzZ0CQOFdchP/view?usp=sharing](https://drive.google.com/file/d/1r173YR_usE4Fn_KUKuz0RzZ0CQOFdchP/view?usp=sharing)

### **Curated Expert Quotes:**

[https://docs.google.com/document/d/1r6vpTKvYS5pTb6VQjRmk8S87XA327bBgBfc4XniPj\\_Q/e/dit?usp=sharing](https://docs.google.com/document/d/1r6vpTKvYS5pTb6VQjRmk8S87XA327bBgBfc4XniPj_Q/e/dit?usp=sharing)

## **Appendix: Supplementary Materials**

See the following link for supplementary materials.

<https://docs.google.com/document/d/1zleq5XeifLX6lajG5kQHvJ5yl4BVfeWxQRFhKQsrBo/edit?usp=sharing>

## **Appendix: Assignment Work Attribution**

Summary: Kevin

Research Method: Aamnah

Participant Demographics Summary: Hyun Jung Shin

Findings and Design Implications: Ryan Gu

Discussion of Research Limitations: Hyun Jung Shin

Reflections: Jamie Kim