

DECO2500

INDIVIDUAL REPORT

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June 19, 2020



Contents

| | | |
|----------|--|-----------|
| 1 | Introduction | 5 |
| 2 | Iteration 1 - Low Fidelity Prototype | 6 |
| 2.1 | Requirements/Conception Design | 6 |
| 2.1.1 | System Concept Statement | 6 |
| 2.1.2 | Design Principles | 6 |
| 2.1.3 | System Requirements | 6 |
| 2.2 | Low Fidelity Prototype | 7 |
| 2.3 | Low Fidelity Prototype Evaluation | 7 |
| 2.3.1 | Evaluation Methods | 7 |
| 2.3.2 | Evaluation Protocol | 8 |
| 2.3.3 | Evaluation Results | 9 |
| 2.3.4 | Evaluation Analysis | 10 |
| 3 | Iteration 2 - Medium Fidelity Prototype | 12 |
| 3.1 | Revised Requirements/Conception Design | 12 |
| 3.1.1 | System Concept Statement | 12 |
| 3.1.2 | Design Principles | 12 |
| 3.1.3 | System Requirements | 15 |
| 3.1.4 | Personas | 16 |
| 3.1.5 | Interaction Scenarios | 17 |
| 3.1.6 | UX Goals | 17 |
| 3.2 | Medium Fidelity Prototype | 18 |
| 3.2.1 | Interface Design | 18 |
| 3.2.2 | Interface Functionality | 19 |
| 3.3 | Medium Fidelity Prototype Evaluation | 20 |
| 3.3.1 | Evaluation Methods | 20 |
| 3.3.2 | Evaluation Protocol | 21 |
| 3.3.3 | Evaluation Results | 21 |

| | | |
|-------------------|--|-----------|
| 3.3.4 | Evaluation Analysis | 22 |
| 4 | Iteration 3 - High Fidelity Prototype | 24 |
| 4.1 | Revised Requirements/Conception Design | 24 |
| 4.1.1 | System Concept Statement | 24 |
| 4.1.2 | Design Principles | 24 |
| 4.1.3 | System Requirements | 25 |
| 4.1.4 | Informed Models | 25 |
| 4.1.5 | UX Goals | 25 |
| 4.2 | High Fidelity Prototype | 26 |
| 4.2.1 | Interface Design | 26 |
| 4.2.2 | Interface Functionality | 28 |
| 4.3 | High Fidelity Prototype Evaluation | 28 |
| 4.3.1 | Evaluation Methods | 28 |
| 4.3.2 | Evaluation Protocol | 30 |
| 4.3.3 | Evaluation Results | 31 |
| 4.3.4 | Evaluation Analysis | 32 |
| 5 | Summary (Release 2) | 34 |
| 6 | Conclusion | 35 |
| 7 | References | 36 |
| Appendices | | 38 |
| A | Low Fidelity Prototype | 38 |
| A.1 | Evaluation Protocol | 39 |
| A.2 | Google Forms | 42 |
| A.3 | Presentation | 44 |
| A.4 | Questionnaire Results | 46 |
| A.5 | Interview Notes | 48 |

| | |
|---|-----------|
| B Medium Fidelity Prototype | 49 |
| B.1 Personas | 50 |
| B.2 Interaction Scenarios | 51 |
| B.3 UX Goals | 55 |
| B.4 Evaluation Protocol | 56 |
| B.5 Evaluation - Google Forms | 59 |
| B.6 Evaluation - Presentation | 61 |
| B.7 Evaluation - SUS Results | 62 |
| B.8 Evaluation - Notes | 63 |
| C High Fidelity Prototype | 64 |
| C.1 Evaluation Protocol | 65 |
| C.2 Evaluation - Google Forms | 67 |
| C.3 Evaluation - Presentation | 70 |
| C.4 Evaluation - Notes Template | 72 |
| C.5 Evaluation - Expert Notes | 73 |
| D Summary | 74 |
| D.1 Conceptual Design | 75 |
| D.2 Prototype Progression | 76 |

1 Introduction

In the domain of discovering, deciding where to dine out is an important topic that impacts almost everyone's lives, and most of the time it is time-consuming and frustrating. Based on research, at least once per week, everyone wants to try somewhere new from lots of different options to have a shared experience with others. However the problem arises with the gap between what users want and need, and how they are supported in fulfilling these.

There are 8 factors that are important to almost every user when deciding where to dine out. A user wants to be able to choose what they are craving from a nearby location with easy access to basic information. These factors are all beautifully handled by existing applications, however they focus heavily on reviews when research shows that word-of-mouth recommendations have a greater influence. Additionally, those with dietary requirements (about 20%) and those with a budget (almost everyone) must search using niche apps or be directed to a menu that they must filter themselves. What results is an average of 15 minutes searching every single time, with budget, dietary requirements and friend recommendations ignored.

This report details the process and feedback of three iterations of the interaction decision process to design an application to support all of the factors that are important to a user when deciding where to dine out.

2 Iteration 1 - Low Fidelity Prototype

The initial research and conceptual design of the low-fidelity prototype were previously presented as a mind map and [presentation](#). In review, there are six main features that have been incorporated into the design of the low-fidelity prototype to address users needs. All of these features will be brought to the attention of the user during this first evaluation to determine they align with user needs and whether they should be carried into the next iteration.

2.1 Requirements/Conception Design

All of these elements of the conceptual design are clearly outlined by the mind map. All important information has been repeated here for easier reference and any recommended revisions from the provided feedback have been applied.

2.1.1 System Concept Statement

The interaction paradigm is **mobile** and the interaction mode is **instructing** only (nudging is simply used as an additional tool for recommendation but is not a mode). As per the feedback, the metaphors used for this application should refer directly to the symbol/real-world representation being used rather than the information they are representing.

- search --> magnifying glass
- arrows
- bookmark
- addition --> plus sign
- thumbs up/down
- tick/cross/question mark
- filter/settings --> tuning sliders
- menu
- information --> lower case i
- account --> person outline
- map
- favourite --> heart
- coupon
- edit --> pencil
- phone
- website --> world
- clock
- address --> Google Maps pin
- navigation --> road sign with arrow

2.1.2 Design Principles

- Give clear direction and guidance
- Be familiar
- Simplify decision process
- Encourage collaboration
- Maximise customisation opportunities
- Open to change
- Manageable steps

2.1.3 System Requirements

1. Promote existing deals - Users are informed of whether an option is in their budget.
2. Interactive Map - Interface needs a way to search for options.

3. Editable and shareable list - User needs a way to review their options.
4. Filter menu and map view - Users only want to view what is relevant to their individual needs.
5. Recommend to a friend - Keep track of user history, remove focus from user reviews.
6. Restaurant information - Information to make an informed decision.

2.2 Low Fidelity Prototype

Below is the proposed low fidelity prototype as submitted with the mind map.

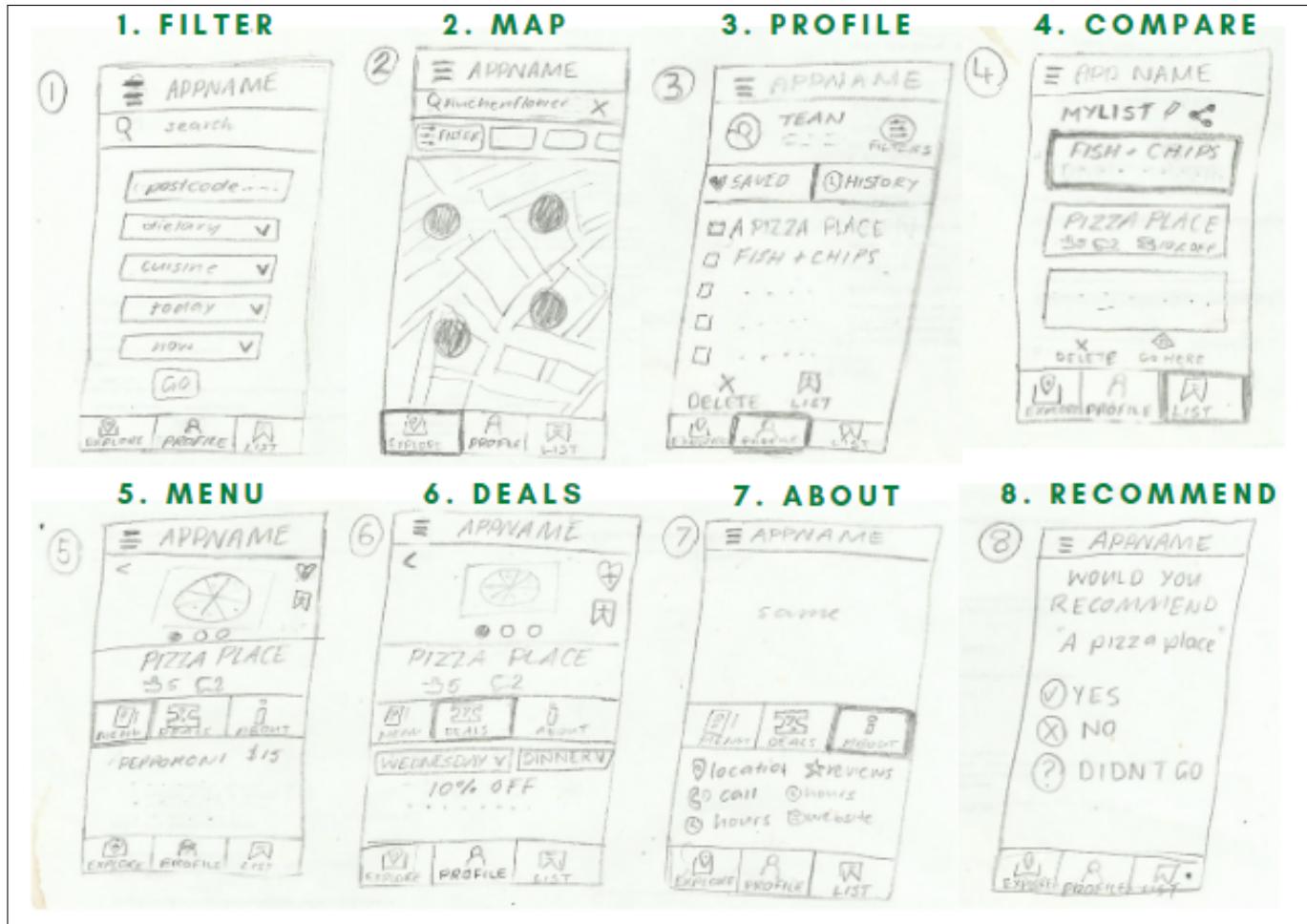


Figure 1: Low Prototype

2.3 Low Fidelity Prototype Evaluation

2.3.1 Evaluation Methods

The purpose of these evaluations is to learn more about the users' needs, confirm that the conceptual model is appropriate for the users, and to provide feedback about design and flow. It is imperative that any misalignment of values or expectations are identified at this early stage before further time is spent on interaction design. Users must be able to understand how the system works and it must align with their expectations to be a worthwhile project [Studio 4 Week 5]. The evaluation method chosen for the Low Fidelity Prototype is a combination of Design Walkthrough, Co-design and Technology Acceptance Model (TAM).

A design walkthrough involves giving the user a task and, without guidance, ask them to complete the task. By observing and documenting how they interact with the system, feedback on how users expect the system to operate and what they expect the system can be obtained [32]. This feedback provides clearly whether the conceptual model chosen is appropriate to the users mental model [31, 37]. This method was chosen as the steps involved in using the application are almost the same for every instance, and so it is imperative that users are able to easily complete these steps (i.e the task) without cognitive overload at this early stage of design [30, 38].

The co-design process generally involves explaining to the user how the system works and asking for their opinion how they would design the features of the application (Evaluation Guide). For this evaluation, at points during the design walkthrough when a user gets stuck, in addition to asking them what the issues are and what they are experiencing, additional co-design practices will be adopted. This includes asking the user what they think should be happening and how they would design this part to be more intuitive [31]. Since the user is in control of instructing the system it is important that they are able to achieve their goal of choosing a place to dine out the way they want to and expect, especially since it is a process that will be repeated on average twice a week for them [50].

TAM consists of a set of questions based on perceived usefulness, perceived ease of use, attitude and intention to use the system. These questions are scaled from 1 (strongly disagree) to 4 (strongly agree). For this evaluation, eight of the questions were selected (at least one from each category). These questions were identified as most relatable to the purpose of the application, without being repetitive. The questions provide quantitative analysis that can assist with identifying problem areas of user acceptance, however by themselves they don't provide the reasoning behind the response [32]. So in addition to these questions, follow up questions will be asked when a response less than strongly agree is selected to gain further insight into the users experience to understand why there is a gap between mental models [31, 37]. This method was incorporated as an extension to the design walkthrough/co-design process to determine whether users could not only use the system but whether they accept it and believe the design and the features assist them with mitigating the problem of deciding where to dine out [39].

Together these evaluation methods provide a succinct overview of whether at this stage of design that application gives the user what they want, what gaps may exist in the conceptual model and the overall acceptance of the design and flow of the prototype.

2.3.2 Evaluation Protocol

This protocol was created to provide structure and consistency amongst evaluation of participants. The protocol outlines the flow of the evaluation including scripts, instructions and details of notes to be taken [31, 32]. The protocol can be viewed as [Appendix A.1](#). Due to current measures relating to COVID-19 all evaluations were performed online, unless part of the family unit. Users are invited to a Google Form where they are asked to sign in with their Google Account. From here they can navigate themselves through all aspects of the evaluation. The form can be viewed in [Appendix A.2](#).

Firstly, the user is introduced to the evaluation process and asked to complete a consent form online. The consent form is then uploaded in the provided section on the form. Secondly, the user is given instructions for the Design Walkthrough and directed, via a link, to a Google Slides presentation. Here they are given the task and access to navigate through slides depicting different pages of the paper prototype. The task is fairly vague to provide feedback on whether it is clear to the users what features are available without being told. The presentation is designed so that when users select areas of the paper prototype that are 'clickable' they are directed to the appropriate slide with the corresponding page. The presentation can be viewed in [Appendix A.3](#).

Thirdly, whilst completing the task any time they are stuck for a period of time they are asked to stop and follow up questions are asked, including contribution of design as part of the co-design process. Finally, once the user has completed the task they select a link on the presentation that takes them back to the Google Form where they will complete the TAM evaluation. On the form, users will select their answer between 1 and 4 (strongly agree) which will be stored as quantitative results and follow up questions will be asked for further clarification. The results can be viewed in [Appendix A.4](#). Throughout all sections of this process, notes were taken of observations and feedback. These notes can be seen in [Appendix A.5](#).

2.3.3 Evaluation Results

The following provides an overview of the results and feedback from the evaluations and is separated by the key features of the application.

1. Filter by preferences (including both craving and dietary requirements) - this filtering extends to the map results and menu display
 - Users liked that they had the option to filter by dietary and cuisine.
 - Some confusion about the difference between cuisine and dietary which would be clear when the dropdowns are clickable.
 - It wasn't clear that the menu was filtered as well, users noted that if they had been able to filter they probably would have noticed that it was only showing specific meals.
 - A user wanted to be able to view other menu items as well and suggested that below the filtered items on the menu page there was also a way to access the full menu or change filters on this page.
2. Interactive map - replicate the familiar experience of exploring destinations
 - Users had no problem selecting a restaurant
 - About half of the users selected the filter icon before picking a restaurant. They either expected to be taken back to the preference page or bring up a more detailed version of the same list (with those previously chosen pre-selected).
3. Promote existing deals - have existing deals from restaurants separate from the menu and easily viewable based on date selection
 - Users liked that deals was easily accessible and was one of the main tabs on the restaurant page.
 - Was clear that it was filtered based on the day and that they could change that selection in this tab.
4. Editable and shareable list - provide support to be able to compare options and share these with others
 - For most users, when they reached the restaurant page it was not clear what the next step was. They looked at all the information and most got stuck.
 - Most users didn't notice the small list icons in the corner. Their attention was on the six main tabs. When asked whether this was a good position for these icons all but 1 users said yes if it was clearer what the list was.
 - Many of the users didn't recognise what the 'list' icon was. One of the suggestion was to add the text 'Add to list' and another was to change the icon to scales (the icon would also change on the main tab).
 - Many of the users mentioned that before getting to the list page they didn't know what

the 'list' icon on main tab meant. Once reaching the list page, for some it wasn't clear whether it was a list for them to compare or a list of places they have saved for later. One of the suggestions was a different name, such as 'Compare' since 'list' was vague. Also, a design suggestion was to use scales as the icon.

- Most of the users noticed the share button and knew exactly what it did, one of the users suggested adding the text 'share' as well like every other icon
- The delete, edit and go here icons were all clear. Users liked that you could just be directed straight there after deciding.
- Once on the list page, most users were happy to just select a restaurant and go there as currently designed. They were happy with just have the name, rating and deals information.

5. Recommend to a friend - focus on word-of-mouth recommendations instead of star ratings

- Users liked the idea reviews were friends only. In the TAM evaluation when asking if they would recommend, some commented that this would mean they had a better experience on the app.
- Users understood the thumbs up and down was ratings, but not that it was friends only until it was explained.
- None of the users had issues with the notification page, and understood it was related to friend recommendations (after being told earlier). Like the clear wording and only 3 options.
- Users liked that they would be nudged later without having to remember to go back and do it themselves later, especially since the more people that reviewed the better the ratings.
- One of the users wanted to be able to see other reviews too and raised the questions 'What if I don't have friends/know people who live in my area?'. They saw the star ratings on the information page, but wanted to see others thumbs up and down recommendation. They suggested that on the restaurant page where the icons are to have with the default as friends and swipe to be able to see all reviews from the app.

6. Restaurant information - ensure users are able to readily access general information about a restaurant without being overwhelmed

- Users understood all of the icons on the about page, liked that this was one of the tabs but not the first one.
- Users had no issues with finding the information about the restaurants.
- Once on the list page, some of the users expected to be able to select the restaurant and be taken back to the restaurant page or see more information. One suggestion was to incorporate right and left swiping for different actions. Another suggestion, from a user who wanted to be able to call the place, suggested when selecting a restaurant it overshadowed the name and you had the icons for delete, more information, call and directions.

2.3.4 Evaluation Analysis

From the process of this evaluation, there are a number of key factors that will influence the design of the medium prototype to ensure increased usability and acceptance of the application for the user. For users deciding where to dine out, this prototype has met their needs. From the walkthrough aspect of the evaluation, all users interacted with all of the features of the system, with the list feature the only aspect that needed guidance to reach. On the TAM evaluation, the overwhelming

result for the perceived usefulness of the app was strongly agree. Users said they felt all aspects of the application were important in assisting them and especially liked the simpler rating system from friends and the ease of deal access. Therefore, all features of the low fidelity prototype will be carried through to the next iteration.

From the evaluations it is evident that specific areas of the conceptual model didn't match the users mental models [29, 37]. The results of the TAM evaluation showed that the areas of concern were perceived ease of use and attitude. For all users there was only one area of the application in which they had concerns. For some, this was during the gulf of execution due to the misunderstanding of how to complete the task, that is not knowing how or that they could proceed from the restaurant page to the list page. For others, this was during the gulf of evaluation, as there was the misalignment of design expectation of selecting a restaurant on the list page before proceeding to the location [28, 36]. During the TAM follow up questions users said they would rate strongly agree in these categories if their suggestions from the co-design were adopted.

Overall, users had no feedback about the overall flow of the application. During the walkthrough, users appreciated the simple design and all commented on the three tabs used to break up the restaurant page as sleek, and easy to use and understand. Most of the icons were recognisable by users, who especially liked when there was text accompanying them. For the next iteration, using the suggestions from the co-design the metaphor used for the list will instead be scales, accompanied by the new name of 'compare'. Additionally, on the list page, when selecting a restaurant an overshadow of icons with text will appear showing the existing delete and go here icons as well as more info and call. Not only does this make it clear what selecting the restaurant does and allow them to instruct the system as they want, but also saves screen real estate and uses Fitts Law to reduce cognitive load [40, 53].

3 Iteration 2 - Medium Fidelity Prototype

The medium fidelity prototype is the first digital version of the application. It follows the research and initial conceptual design of the low fidelity prototype, while revising these concepts using the analysis of the first round of evaluations. The main sections of misunderstanding are from restaurant to comparison list, and comparison list to restaurant. To better understand the users and the usability of the app, this section additionally includes personas, scenarios and UX Goals.

3.1 Revised Requirements/Conception Design

From the low fidelity evaluations the initial requirements and conceptual designs will be revised accordingly. This includes more detail to the design principles and system requirements.

3.1.1 System Concept Statement

The problem statement and high-level description of the outlined in the low fidelity prototype are still accurate for the next iteration, as well as the definition of mobile paradigm and instructing mode. However, whilst most of the metaphors were accurately chosen, there were several that either didn't align with the user's mental models or the defined design principles. The following updated metaphors will be applied to this next iteration, as per the evaluation analysis of the low fidelity prototype.

- bookmark --> scales: Did not match the mental model of users for 'Editable and shareable list' feature.
- map with location marker --> compass: Not consistent with industry standards for 'EXPLORING' action, violating design principle 'Be Familiar'.
- coupon --> offer: Not consistent with industry standards for 'DEALS' representation, violating design principle 'Be Familiar'.
- clock --> clock with arrow: Not consistent with industry standards for 'HISTORY' representation, violating design principle 'Be Familiar'.

3.1.2 Design Principles

From the evaluation analysis of the low fidelity prototype, it was evident that only two of the design principles identified in the first conceptual design were followed satisfactorily.

- Open to change - All users stated that their attitude towards the app (during the TAM evaluation) would improve if their suggestions from the co-design were implemented, all of which will be in this following iteration.
- Manageable steps - There was no issue with the flow of the application and users appreciated the use of tabs.

The remaining design principles were not implemented well enough causing issues for the users which particularly affected their perceived ease of use and attitude towards the application.

- Simplify decision process - All users encountered at least one issue, either during the gulf of execution or evaluation, that prevented them from moving forwards without assistance. During

this next iteration, these issues will be resolved and more attention will be made to preventing this serious errors.

- Give clear direction and guidance - Most users were unable or unsure of how to move from finding a restaurant to going there. In this next iteration there needs to be more focus by providing large actionable buttons.
- Be familiar - One of biggest confusions was with the word and icon choice for list. In this iteration this will be changed to scales and compare.
- Encourage collaboration - Users weren't aware that the recommendation system was based on word-of-mouth only, and so in this iteration the word friends will be added to be clear.
- Maximise customisation opportunities - Users weren't aware that their filtering of preferences also extended to the menu. The same filtering element as the interactive map will be applied on the map page to ensure users are aware of the extent of their customisation abilities.

Additionally, two new design principles were identified following the low fidelity evaluations and will be introduced in this iteration to contribute to these guidelines.

- Fluid navigation - Users weren't able to move smoothly back and forth between pages which added steps to their process.
- Immediate access to actions - Once reaching the comparison page, users wanted access to more action options than just directions. In this iteration they will be given additional options readily available on the same page.

In order to satisfy these principles and those previously stated, the below will be taken into consideration for the prototype. Many of these design elements respect existing platform guidelines to ensure both visual and functional consistency across the application to reduce confusion for the users [5]. The well documented industry standards outlined by material design will be followed. These standards are not only thoroughly researched to ensure the optimal user experience, but their popularity creates a sense of familiarity for users which greatly reduces cognitive load (especially in terms of memory, learning, and pattern and recognition) [5, 30, 38].

- Colour
 - Consistent colour throughout: The primary colour, used for a majority of the application, is 'medium violet red'. This colour was selected as pink is calming, joyful and encourages creativity [7], which aligns with the aim of wanting to users to enjoy the experience of choosing where to dine out.
 - Follow recognizable colour schemes: Variants of the primary colour are used in contrast to distinguish different elements [60]. They were chosen using the material design palette generator [58]. The light variant is 'lavender blush' and is used to fill buttons when they are selected. This follows a monochromatic scheme which produces a soothing effect and is easy on the eyes [1, 2]. By using specific colours this also assists with reducing cognitive overload using the Gestalt principle of similarity [40, 65].

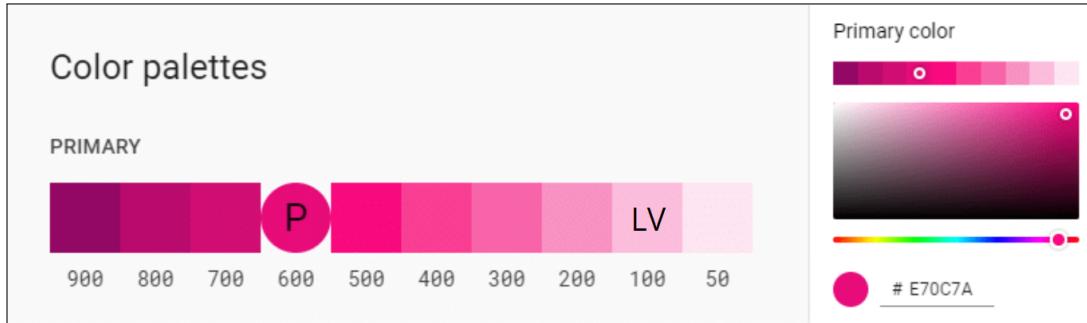


Figure 2: Colour Palette - Medium Violet Red

- Typography

- Use popular font: The only font used throughout the app is 'roboto'. It is the default font for Android and many Google services [55]. The colour of the font is either the primary, white or grey depending on the background.

Figure 3: Font - Roboto

- Iconography

- Use industry standards metaphors: The appearance of the icons is in-line with material design where possible [59]. Some of these icons take advantage of closure in Gestalt's theory (users complete borders themselves) [40, 51]. The only icon that had to be sourced elsewhere was the scales for the compare feature.

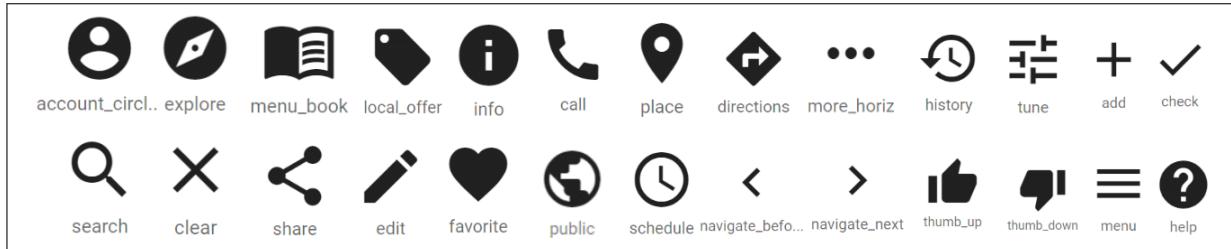


Figure 4: Icons - Material Design

- States

- Hierarchical visuals (colour, text) - Titles and buttons should be large and primary coloured, to contrast against other elements to allow quick access [3].
- Highlight active interfaces - Ensures tabs are coloured when selected to make it clear to users the current page they are on.

- Navigation

- Bottom navigation bar - Provides access to 3-5 top-level destinations. This allows quick movement between screens [4]
- Navigation tabs - Used within the restaurant hierarchy to replicate the bottom bar to enable later navigation but for peer related content [4]. Also supports users mental models of tabs [45].
- Elements are consistent and locked - Follows the Gestalt principle of continuity [40, 51].
- Access to desired buttons - Offer clear affordances, less movement between pages [36].
- Large buttons lose to action - Reduced errors and wasted time as per Fitts law [40, 53].

- Communication
 - Icons accompanied by small text - Although selected icons should be popular metaphors, added text helps to reduce the cognitive load and assist first-time users [4].
 - Avoid jargon - Everyone should be able to understand any text used throughout the application. For example LIST was not clear and has been amended to COMPARE [5].
- Space
 - Dropdown/hidden menus - The Gestalt principle of proximity to show the options are related to one another. This promotes customisation and reduced cognitive load by allowing user to only see what is relevant to them [40, 64].
 - Keep interface elements to a minimum - Reduces the amount of space taken on the screen so overcrowding doesn't occur. White space is a friend [47].
 - Overlays - When elements are selected use an overlay with action buttons as proximity indicates these action are related to the selected according to Gestalt principle of proximity [39, 51]. This also takes advantage of the technique of progressive disclosure by keeping screen elements to a minimum and hidden until needed [5].
- Time
 - Minimise user input - Stepping through should be quick and since on mobile typing only increases frustration and so should only be when absolutely required.
 - Don't overload with options - Hicks law makes it clear that users only want a select number of options to choose from [40].

3.1.3 System Requirements

From the initial research there were six system requirements identified that were implemented in the low fidelity prototype. For this next iteration, several of the requirements will remain the same:

1. Promote existing deals - Users are informed of whether an option is in their budget.
2. Editable and shareable list - User needs a way to review their options.
3. Restaurant information - Information to make an informed decision.

The requirements 'Filter map and menu view' will be split into two separate requirements as the functionality and purpose were identified to be actually slightly different. The map view provides an overview of options that match the user's need, and while the menu also performs this action it is a narrower and more customised view of the particular restaurant. This not only requires the categorisation of the restaurant as a whole but also the individual factors of the menu; price, ingredients, etc. Therefore, additionally the requirement 'Interactive Map' will be updated to include this preference filtering and a new requirement added to describe the menu filtering.

4. Interactive map filtered by preferences - All relevant information is available within application.
This is supported by previous research and the evaluations confirmed that this is expected behaviour of an interactive map.
5. Filter embedded restaurant menu by preferences - Make decisions without navigating to another graphic/page.
Users weren't aware in the low fidelity prototype that the menu was filtered and embedded but supported the idea as per the initial research that users almost always look at the menu beforehand and use apps to avoid navigating between different websites for information.

The 'Recommend to a friend' requirement will also be split into two, as there are actually two separate requirements being compartmentalised into one; word of mouth recommendations and user tracking.

6. Recommend to a friend - Remove focus from reviews and encourage user interaction.

As per the initial research, users rarely leave reviews. From the evaluations, most users commented that they would this word-of-mouth recommendation system as it is simple and it improves their experience.

7. Track user history - Remember preferences and customise experience.

Users expected that they had access to their history and that they would be able to save their preferences for later use, especially since the application would be used weekly.

3.1.4 Personas

To summarise and empathize with the users of the system, four personas have been developed. Each of these personas represent a different type of user to provide an overview of each group's expectations, use cases and highlight the most important functionality they need [67, 72]. There is a typical user as well as one at each end of the extremes (low and high use) and a user who requires the use of less required elements (dietary and planning). Each persona has a name, photo, life goal, blurb, quote relating to the system and an overview of their characteristics (employment, demographic, relationship status, income, interests, use of the system, restrictions, favourite food, age) [33]. The full breakdown of each persona can be viewed in [Appendix B.1](#).



Figure 5: Personas Overview

These personas were developed by reviewing the initial research of the application (both desk research and interviews) with the participants of the low fidelity evaluations to refine 'Who is the user?' and 'What is important to the user?' [24]. First looking at the characteristics identified to describe the behaviour of the users:

- Who? Everyone eats out so personas are all in different age demographics, relationships, employment and income brackets.
- What? From the interviews, all 'sometimes' try new places so the personas are mixed.
- When? Users range from eating out at least once per week up to four times per week so each user falls under a different number.
- Where? Anywhere, all like options
- Why? To share experience with others, so 3/4 of the personas always eat with others.

Also as identified in the initial research and confirmed by the low fidelity evaluations, there are six factors that are important to the user. Each of these factors are covered by the features of the application. Each persona encompasses three of these factors in their decision process and eating out behaviours.

| Factor | David | Jessica | Sophie | Matt |
|---|-------|---------|--------|------|
| Matches dietary (<i>2/12 participants had dietary concerns</i>) | | | Yes | |
| Choose by craving (<i>'Taste' is most important factor</i>) | | Yes | | Yes |
| Word-of-mouth (<i>91% based on recommendation</i>) | | | Yes | Yes |
| Located nearby (<i>1/3 mentioned as part of decision</i>) | Yes | | | Yes |
| Menu online (<i>50% always, 50% sometimes look before</i>) | Yes | Yes | Yes | |
| Deal or low cost (<i>3rd most important factor</i>) | Yes | Yes | | |

3.1.5 Interaction Scenarios

For each of the created persona's a storyboard of their typical interaction with the system was sketched. These scenarios communicate the subsets of user behaviour of the system to assist with ensuring all users needs are met and that the design of the system supports these expectations [33]. Each scenario has 11 slides and uses the template supplied by NNGroup with rough sketches and simple explanations. There are four scenarios, all of which can be found in [Appendix B.2](#).

1. David - Student Deals: David wants to eat out with friends but wants to find the cheapest option. He uses Google Maps to look nearby but has to go to each restaurant's website to view the deals. He struggles to remember all the deals and places he has looked at and the text conversation with his friends is just a mess of links and names. It takes over 20 minutes to find somewhere.
2. Jessica - Hump Day: Jessica doesn't feel like cooking and so she wants to send some good value options to her partner. She regularly uses the Foodie app and has a list of favourites. She checks which one has a good deal and matches her craving to add to her comparison list. She sends these options to her partner, who in turn remembers somewhere he has been wanting to try and edits the list to send back to her. This place looks great so they decide to go here and Jessica saves it for next time too.
3. Sophie - Busy Planner: Sophie has a busy day on the road tomorrow so she needs to plan what she is going to have for lunch. This is her least favourite task of planning as she has to look through lots of images of menus on the Zomato app to find what matches her diet. Then she reads through long reviews to get a sense of the place before writing it down in her diary for tomorrow. When tomorrow comes she will decide and have to get directions on Google Maps.
4. Matt - Lunch at work: Matt is at work and is craving pizza for lunch. He wants to pick somewhere nearby that is preferably recommended by friends. He doesn't like to waste time deciding so he uses the Foodie app since he can filter by pizza and location on the first page and get a quick glance of what his friends think.

3.1.6 UX Goals

When determining the 'success' of the user experience it is important to 'focus on outcomes not the features' [46]. Rather than focus on the service the application is offering, focus on the problem that this application is solving. The problem is that no existing solutions that give users what they actually want (the benefits); options to dine out with others based on personal preference (craving, dietary), nearby location and word-of-mouth recommendations.

These UX Goals were developed by identifying the main user needs, from previous evaluations and research, and then selecting content and functionality requirements to meet them. The goals use SMART principles and together cover all systems requirements ([41]. Each goal is a real-world end state that users want to reach [71]. The full details of the UX goals can be found in [Appendix B.3](#),

including their source, measures and link to requirements.

1. I want to dine out at places that match my dietary requirement.
2. I want to eat what I am craving.
3. I want to choose where to eat based on my location.
4. I want to view the menu of the restaurant as it relates to me before going there.
5. I want to learn about the relevant deals of a restaurant.
6. I want access to the basic information of a restaurant.
7. I want to compare a variety of restaurants at once.
8. I want to share the experience of dining out with friends.
9. I want to dine out at restaurants that have been recommended by word-of-mouth.
10. I want to re-visit restaurants that I enjoyed.
11. I want to find new places to eat out.
12. I want to dine out in my budget.
13. I want to decide where to dine out in less than 20 minutes.
14. I want support restaurants without having to leave long reviews.

3.2 Medium Fidelity Prototype

Taking into consideration the revised requirements as outlined from the results of the low fidelity prototype evaluations a medium fidelity prototype was created. Figma was chosen due to its browser-based interface, easy-to-use design, prototype functionality and popularity in the UX world [74]. Colour, icons and basic functionality has been implemented. The icons were created using logomkr [75] and any images are sources from the open-source photo collection on canva [73].

3.2.1 Interface Design

Overall the updates ensure user's have clear understanding and awareness that:

- the shareable comparison list is a main feature with clear guidance to get there and understanding of its purpose. --> Change LIST to COMPARE and update 'bookmark' metaphor to 'scales'. For the 'add to compare' icon, enlarge it, add this text and move it to the main area on restaurant page.
This will help David with finding options that he can share with his friends instead of having to remember them separately.
- both the map and menu are filtered by their personal preferences with the ability to expand or minimise these options as needed. --> Add filter bar to MENU page, add shading to selected filters
This will solve Sophie's frustration of wanting to look through multiple menus for her diet without navigating between websites.
- recommendations are by word of mouth, with the option to view all responses as well. --> Add text 'friends' next to recommendations, add option to view all reviews.
This will save Matt time as he highly values the opinions of friends and wants to make a quick decision.

- they have access to basic information of a restaurant on every relevant page. --> Add overlay with more action icons when select from compare list

This will assist Jessica with wanting to use her list of saved restaurants as her method of search to send to her partner to view.

Also, to align with the design principles any metaphors that didn't previously match the material design icons will be updated (Google Maps pin, compass, menu, coupon).

The below is the interface of the medium fidelity prototype, with any relevant updates outlined. Also note, the application now has a name; foodie. It is simple and fun. It will replace APPNAME in the top navigation bar.

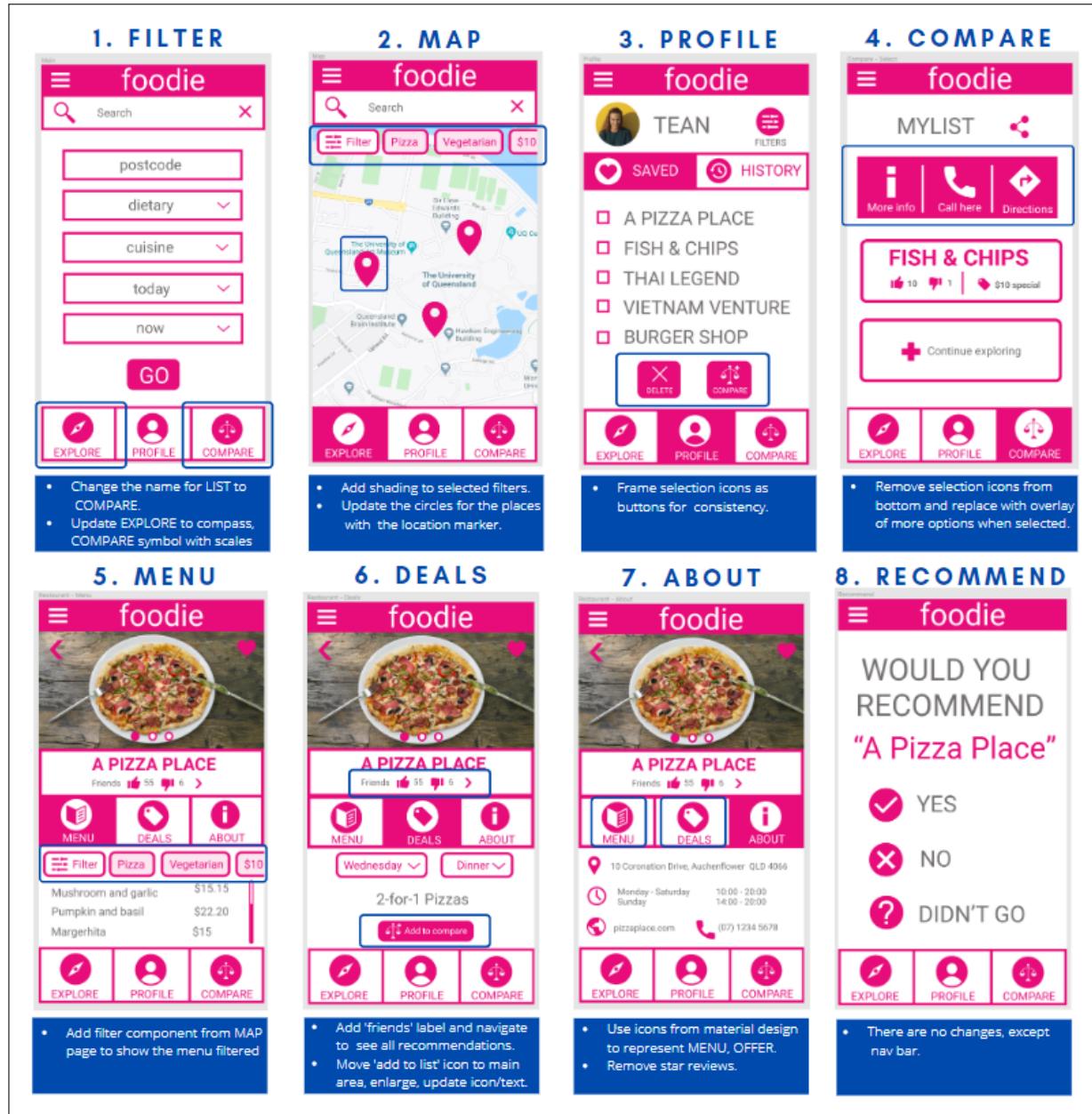


Figure 6: Medium Prototype - Interface Modifications

3.2.2 Interface Functionality

Since this is the first digital version of the prototype, the same interaction as the low fidelity prototype was implemented (only one end option for each feature). The functionality at this time mainly includes the navigation between tabs. For the buttons, the 'GO', back arrow and 'continue exploring'

navigates to the map, while 'Add to compare' to the compare list. There is also the ability to scroll through the menu once.

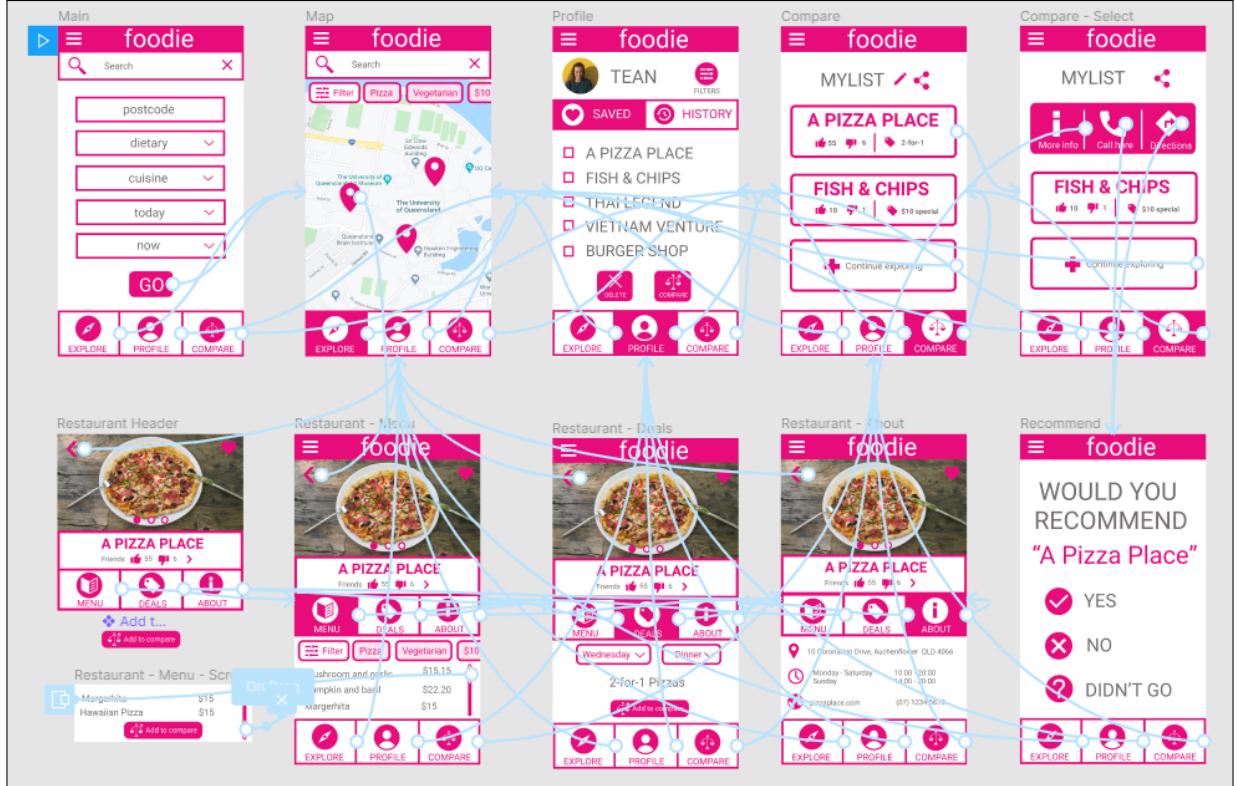


Figure 7: Medium Prototype - Interface Functionality

3.3 Medium Fidelity Prototype Evaluation

3.3.1 Evaluation Methods

Instead of evaluating whether the application assists users with solving a problem the purpose of the evaluations of the medium fidelity is to determine the usability of the application which in contributes to shaping the user experience [57]. Any gaps between mental models in the low fidelity prototype have been amended for the medium fidelity prototype and it has been determined that this application is something users want, so now it is a matter of whether they can use it.

The think aloud evaluation method requires users to either complete a specific task or walk through all aspects of the application, whilst saying out loud everything they are thinking [42]. This method was chosen as it provides substantial qualitative feedback on the user's experience as it is happening in regards to their expectations of the system. Since the end goal for this application is the same for every user, deciding where to dine out, the process of deciding is different for every user with a wide range of approaches that can be taken with the system.

The System Usability Scale (SUS) is a set of 10 questions, with both positive and negative responses, that provides a grade for the usability of the system. These questions are a popular staple of evaluation in the user experience industry as they are cheap and quick process [66]. Since the user is only required to respond with a numerical value, the full picture of why and how users feel about a system may be missing. This is used to supplement the think aloud evaluation as it provides an overall quantitative picture of the user experience after an overload of qualitative feedback [66].

After all evaluations have been completed, the raw data collected from the results of the SUS questionnaire will go through the following steps to effectively analyse the data and get a better under-

standing of users overall opinion of the systems usability. These steps will provide a SUS Score for each participant, as well as an average, which can be compared against the standard percentile ranks. Also, since the average of results can be skewed by outliers, a distribution of responses is generated which instead shows the median and interquartile range which is not affected by these outliers [35, 26].

1. Convert Raw Data: ODD = Response - 1, EVEN = 5 - Response
2. Calculate SUS Scores: Total * 2.5 for each participant
3. Average for each question: Total / number of participants for each question
4. Distribution of responses: Boxplot to show distribution of each question

3.3.2 Evaluation Protocol

The purpose of this protocol, structure and consistency, is the same as the low fidelity prototype. The protocol can be viewed in [Appendix B.4](#). Also similarly, users are invited to a Google Form where all instructions, links and surveys are available to them. The form can be viewed in [Appendix B.5](#). After providing consent the user will be directed to an interactive prototype. Each page of the prototype in presentation mode is outlined by a typical android smartphone frame. The slides can be viewed in [Appendix B.6](#).

Users are asked to use the app as if they were a first time user interested in the app. They are given no specific task and to speak all thoughts out loud with no interruptions from the evaluator. This is in-line with the Think Aloud evaluation method. In addition to taking note of their use and understanding of components of the prototype, the 'click' measures for the UX goals will also be taken simultaneously. After the user has finished explaining each step of the system as they understand, users will be directed back to the Google Forms to answer the 'Survey Questions' to further measure the UX Goals. Each questions is rated out of 3 (don't agree, neutral, agree). Following these questions, the users will also complete the SUS questionnaire. This is simply the collection of raw data which will be analysed once all evaluations have been completed.

For this evaluation, there are six participants in total. Three of the users will be brand new to the system, whilst the other three took part in the evaluation of the low fidelity prototype. This provides a balance of fresh eyes with no preconceived ideas who can comment on the basic flow of the application, and also those who already have a basic understanding who were able to evaluate if the changes made were appropriate and look at the application in more detail. The raw notes are in [Appendix B.7](#).

3.3.3 Evaluation Results

The following provides an overview of the results and feedback from the evaluations and is separated by each persona's ability to complete their scenario.

1. David - Student Deals
 - Today/now confusing, didn't understand the difference between the two --> 2/5 user's mentioned.
 - Wants to be able to filter by price before getting to the map view --> The poorest survey responses were to UX Goal 'I want to dine out in my budget'.
 - Liked that there was a dedicated page for deals, though wanted to be able to view this

tab first (before menu).

2. Jessica - Hump Day

- Went to the saved restaurant but couldn't go to the restaurant information page without adding to the compare list first --> Poor response to 'I could easily access information when needed'
- Tried to find an option to view all deals.
- Wanted to be able to follow partner's saved places instead of just in the list.

3. Sophie - Busy Planner

- Was able to filter by location, cuisine, dietary and tomorrow which she felt made the search very custom.
- Wanted to be able to save her preferences for later but couldn't find how to without assistance.
- Still had difficulty finding how to add a restaurant to compare list though was quicker than previously --> Poor responses to both time and survey results for UX Goal 'I want to compare a variety of restaurants at once.'
- After finding places , wasn't sure if compare list was going to be able to save for the next day and wanted to be able to save for future trips.

4. Matt - Lunchtime at work

- Selected to filter by cuisine for the map, but wanted to be able tell which places were popular before having to click into each one
- Once at the restaurant looked at the recommendations and could tell they were friends
- Wanted to be able to go straight here without going to compare list, wanted a 'go here now' option --> Poor response to 'I could easily access information when needed'
- After going to the restaurant wanted to be able to recommend without having to open the app.

3.3.4 Evaluation Analysis

The overall interaction of the app was much improved from the low fidelity prototype as users could now progress from the restaurant page to the compare list, and move from compare list to their next desired page (back or forward) without issues. The first step in understanding the data was to complete the data analysis steps of the raw data collected from the SUS questionnaire to calculate the scores and view the distribution. The data and graphs associated with the analysis of this raw data can be viewed in [Appendix B.8](#).

In terms of usability, as per the SUS analysis the grading of the system overall was a low A with an above average score in the 82nd percentile. However, the scoring was as low as 62.5% (C - below average) to 95% (A - above average).

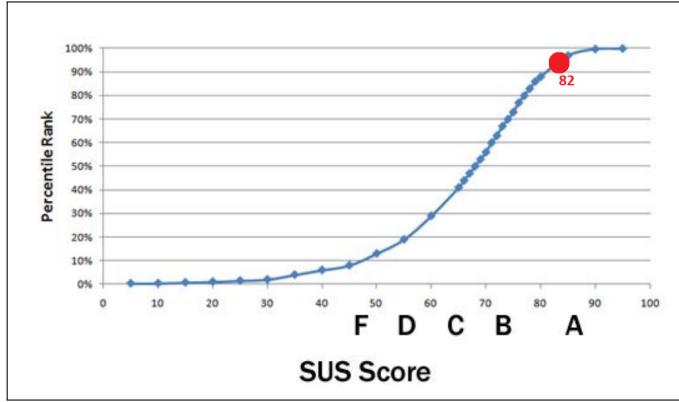


Figure 8: SUS Grade

The lowest scoring questions was 'I thought there was too much inconsistency in this system' with an average of 2.8. The highest scoring question was (reverse) 'I think that I would need the support of a technical person to be able to use this system' with 3.66, closely followed with 'I found the system unnecessarily complex' with 3.5. All other questions were either rated overall 3.16 or 3.33. This suggests that the system is easy to use in terms of technical complexity, however there is still too much thought process involved with moving through the system.

The think aloud evaluations identified that the main issue contributing to this inconsistency in this iteration was the availability of options for different actions. This also aligned with three UX goals not being met. The first UX goal not achieved is 'I want to dine out in my budget' which had to poorest response to survey questions. Users want to be able to filter by budget on the first page, and agreed the now option is redundant. The second UX goal is 'I want to compare a variety of restaurants at once', which caused the highest number of errors when moving from restaurant to compare. Users want a broader view of the places on the map view with differentiation of restaurants based on popularity before selecting an irrelevant restaurant (different colour or icons with legends). Also, although the time from restaurant page to compare list was greatly reduced, many of the users still had difficult finding the 'add to compare' button as it was often hidden.

The third UX goal that users was 'I could easily access information when needed' which was only met sometimes. Users want the ability to be assisted with going to a restaurant straight from the restaurant page without proceeding to the compare screen (more buttons). On the restaurant page no-one used the bottom tab and so instead this will be replaced by the popular action buttons. Additionally, users wanted to be able to access more information on the places recorded in their profile without having to add them to the compare list first. Most users commented they usually wouldn't select more than one restaurant at a time, so instead of checkboxes the same overlay as the compare page will be used (more info, add to compare and delete as the options).

4 Iteration 3 - High Fidelity Prototype

4.1 Revised Requirements/Conception Design

4.1.1 System Concept Statement

The following metaphors will be applied/added to this next iteration.

- cross --> rubbish bin: Update to be consistent with industry standard.
- tuning --> cog: The 'tune' metaphor did not match the users' mental models for setting default preferences. Tune metaphor remains for filtering.
- home: User's considered the filter page the main page and consistently wanted to return here. (*Participant 2: "looking for home button in the top bar to go back" [20]*)
- floppy disk: Need a familiar metaphor for added 'saving' functionality
- arrow arched to the left: Undo
- rubbish bin with three lines: For remove all functionality on default preferences.



Figure 9: High Prototype Metaphors

4.1.2 Design Principles

A couple of the design principles that were not being met in the previous iteration are not being handled according to users.

- Encourage collaboration - Users had no issues this iteration with viewing recommendations, recommending a visited place and sharing the compare list.
- Be familiar - There was no gap in mental models of any of the metaphors in this iteration.

The following design principles have still not been adhered to in a satisfactory manner, causing continued issues for users.

- Customisation opportunities - Users had difficulty finding how they could set default preferences. This will be made clearer this iteration by updating the metaphor to a cog and the name to 'default preferences'. Users also wanted to be able to use their saved list to search and so an overlay will be introduced with more actions [68].
- Immediate access to actions - While users now had more action options on the compare page they also expected this overlay on other lists (saved/history). A similar overlay of actions will be added here. Also users wanted to be able to go straight to a place from the restaurant page so an action bar will replace the main bottom bar as it was not used. This position at the bottom of the screen ensures the easiest and quickest access for the users on mobile [4].
- Fluid navigation - There were still too many steps between pages, particularly for users who wanted to be directed straight to a restaurant without using the compare feature. A directions and call action will be added to the new action bar on the restaurant page.

- Clear direction & guidance - The 'add to compare' button and favourites button were still hidden for many users. Both of these actions will be included in the action bar.

Two new design principles will be introduced to assist with resolving issues identified in the medium fidelity prototype.

- Purposeful movement - Users noted that were a number of times where they had to navigate through various pages to complete a simple task. For example, to go to a restaurant users need to arbitrarily choose a place on the map, add this restaurant to the compare list, select the compare tab, choose the restaurant from this list then select directions/call. To assist with meeting this design guideline an overview of restaurants using icons will be added to the maps as well as a bar on the action page to allow users to go straight to a restaurant.
- Consistency - The colours of icons was not consistent which caused confusion and errors from the users. For this iteration, a focus on consistency across the application will be applied, including both visual (colours) and functional (interactive elements) consistency [5]. To achieve this, dark pink fill will represent active states, fark pink outline will represent clickable buttons and the light pink fill will be when an action/button has been selected.

4.1.3 System Requirements

As per the evaluations, it is evident that all system features are important to the range of users and all will be carried forward into this next iteration. However, for the requirement 'Track user history - Remember preferences and customise experience' this will be now split into three parts as the customisation of the application has more expectations from the user than originally anticipated.

- Track user history - Easily re-visit restaurants.
This feature now specifically focuses on user's desire to be able to re-visit restaurants they have been too before as demonstrated by the interest in this feature during the medium evaluations. Additionally, the initial research states that while users eat out at least twice a week, they try new places sometimes leaving potentially have that time for places they love.
- Remember preferences - Shortcuts for expert users.
During the medium evaluations the ability to set preferences was not made obvious, despite user's enquiring if there was a feature to be able to save for later
- Favourite restaurants - Alternative way to search for options.
The capabilities of this feature are essential to Jessica and the clear definition provides expert users with more functionality. Also, in general users spend over 15 minutes searching through various options and don't want to repeat this process each time if avoidable.

4.1.4 Informed Models

There are no changes to the personas or interaction scenarios.

4.1.5 UX Goals

From the initial research and medium fidelity analysis, a number of the UX goals were not met adequately in the previous iteration.

- I want to re-visit restaurants that I enjoyed: User's did not have access to view more information

about places in their history.

- *Participant 2 & 3: "I expected to be able to filter by history and use this to search options too." [9, 10]*
- I want to dine out in my budget: The option to filter by budget was hidden and user's could not find it without assistance.
 - *Participant 1 & 2: "Want to be able to filter by price here but cant see that option.. was looking for it first" [19,20]*
- I want to decide where to dine out in less than 20 minutes: There is no information about a restaurant before selecting on a map increasing the time to decide.
 - *Participant 4: "Looking for what is most popular, wondering for a way to see where I been before quickly" [22]*
- I want to compare a variety of restaurants at once: The 'add to compare' button was hidden on the restaurant page, so users weren't aware this goal could be met or it was difficult to find.
 - *Participant 2 & 5: "can't find the add to compare option" [20, 23]*

Also, from the medium prototype evaluations and interaction scenario analysis, there are three desires/expectations from users that did not match any of the existing UX goals.

- I want to use my favourites to choose a restaurant.
 - *Participant 2 & 3: "I expected to be able to filter saved and use this to search options too." [20,21]*
 - *Jessica (scenario): Wants to be able to use her saved list as primary search feature*
- I want to visit a place without comparing options.
 - *Participant 3: "want to go straight to a restaurant without adding to compare" [21]*
 - *Matt (scenario): Wants to go to first best place.*
- I want to save my preferences for next time.
 - *Participant 2: "not clear that can set defaults, but I would use this" [20]*
 - *Sophia (scenario): Her diet doesn't change and setting her preferences would save her a lot of time.*

4.2 High Fidelity Prototype

Using the medium fidelity prototype as a strong foundation and the updated conceptual design, further steps to improve the usability, and therefore user experience, of the application were applied to a high fidelity prototype [57].

4.2.1 Interface Design

These were the main issues from the medium prototype and how they will be resolved::

- Filter by budget hidden --> Add price to main filter page
 - *David now has clear option to filter by what is most important to him*
- Difficulty setting default preferences --> Replaced the icon with settings metaphor and added text, setting preferences is same as default filter page.

- Sophie can now save her diet for next time
- No overview on map --> Add classification icons to markers on interactive map
- Can't go to restaurant without using compare feature --> Add icon options to be able to get the information to go directly to a restaurant without adding to compare list.
 - Matt can now choose in less time as desired with just one option.
- Expected to be able to filter saved/history lists --> Added filter bar to these page similar to the map and menu pages.
- Can't use saved list to access restaurant information --> Added option to go to restaurant page from saved list using overlay.
 - Jessica can now utilise her saved list better.

This is an overview of the updated prototype, with the important aspect changes outlined and explained visually.

1. FILTER

2. MAP

3. PROFILE

4. COMPARE

5. MENU

6. DEALS

7. ABOUT

8. RECOMMEND

Changes Summary:

- 1. FILTER:**
 - Light colouring when an option has been selected
 - Add functionality for dropdown (select arrow to open/close)
 - Add background
- 2. MAP:**
 - Add symbols to 'marker' to provide overview of restaurant before click
 - Add colours to differentiate 'marker'
 - Add functionality for 'filter' to go back to main page with saved options
- 3. PROFILE:**
 - Include overlay for more actions
 - Rename 'filter' to 'default preference'
 - Update metaphor for preferences, delete
 - Add filter bar to saved/history tab
 - Add 'about' icon, update colours
- 4. COMPARE:**
 - Update overlay so the name/details of restaurant are still visible
 - Remove dark pink fill from icons to show they are selectable but not active
- 5. MENU:**
 - Remove main bottom tab as not needed
 - Remove 'add to compare'
 - Add bar instead of important actions
 - Move favourites to this action bar
 - Add buttons to go straight to restaurant
- 6. DEALS:**
 - Add functionality to view 'Everyone' recommendations
 - Add functionality to filter the deals
 - Update colouring to reflect when option selected/active
- 7. ABOUT:**
 - Add functionality to select all actions
 - Update colour of icons - pink outline shows clickable, light pink is selected
 - Add home button to first page saved
- 8. RECOMMEND:**
 - Update metaphors to be thumbs
 - Add 'saved' message overlay when select
 - Change to light pink when selected
 - Add background

Figure 10: High Prototype - Interface Modifications

4.2.2 Interface Functionality

Additional functionality has also been added to give the experts a more realistic experience of how the interface should behave.

- At least one option for each dropdown on main filter page.
- Basic preview of pages when adding default preferences.
- Change of state colour when adding a restaurant to compare or favourites.
- Preview of application status messages when saving a selection.



Figure 11: High Prototype - Interface Functionality

4.3 High Fidelity Prototype Evaluation

4.3.1 Evaluation Methods

To effectively evaluate the high fidelity prototype, a heuristic evaluation will be undertaken. This method requires UI/UX experts to critically assess the interface of the application against a set of criteria to determine whether it meets a minimum standard of usability [42]. This criteria will be a list of 10 heuristics which have been specifically selected for this application. By using experts there are fewer ethical and practical issues, and their knowledge can provide key insights into the general expectations of usability the domain and identify potential issues when all functionality is properly implemented. However, it is important to keep in mind that there is an increased possibility of trivial issues being identified and some larger issues overlooked as they are not evaluating through the eyes of the user [43].

There are two preparation steps before starting the heuristic evaluation [34]. The first is to determine the features of the application. These have been outlined and updated continuously in the system

requirements sections of the reports. The second step is the choose the set of heuristics with these features in mind. By looking at the SMART [56] and Nielson 2001 [44, 61, 70]and HOMERUN heuristics [48], 10 heuristics were chosen as criteria to determine their usability [43].

1. **Provide immediate notification of application status:** This is a refinement of *Visibility of system status*, which states 'The system should always keep users informed about what is going on, through appropriate feedback within reasonable time.' However, as this is a mobile application, the status must be immediate and due to screen size should be done non-intrusively where appropriate.
2. **Use a theme and consistent terms, as well as conventions and standards familiar to user:** This is a combination of *Consistency and standards (use platform conventions)* and *Match between system and the real world (for user)*. Essentially, users should know exactly what words and actions mean, and these phrases should be familiar to the user with information appearing in a logical order. Additionally, as this is a mobile application a theme should be used 'to ensure different screens look alike' and that the 'standards that users have come to expect in a mobile application' are used.
3. **Prevent problems where possible; assist users should an error occur:** This is a combination of *Help users recognize, diagnose and recover from errors* and *Error prevention*. Error message should be clear and concise with solution suggestions, and even better 'prevents a problem from occurring in the first place'. It is essential that a mobile application 'is error-proofed as much as possible'.
4. **User control and freedom:** 'Users often choose system functions by mistake and will need a clearly marked "emergency exit" to leave the unwanted state without having to go through an extended dialogue. Support undo and redo.'
5. **Each interface should focus on one task:** Due to the of mobile application, This heuristic is unique to mobile application as a result of their use cases (frequent interruptions) and screen space (less cluttering). This means 'only having the absolute necessary elements onscreen to complete that task'.
6. **Aesthetic and minimalist design:** The original is *High quality content* which is mainly for websites but highlights the important of providing functionality users want. The mobile equivalent is *A visually pleasing interface* and focus on the forgiveness of users if the interface is attractive. The 'attractiveness' of an application is a qualitative measure with different opinions. Instead this heuristic focuses on the aesthetic of the app by assessing whether it is minimalist, which is the preferred design of today's mobile Users [47].
7. **Recognition rather than recall:** The HOMERUN equivalent is *Ease of use* which states that 'users need to be able to find the information they need quickly and easily. This is similar to *Intuitive interfaces make for easier learning*, which says similar for mobile interfaces in that they 'should be easy-to-learn whereby next steps are obvious'. Neither of these heuristics are clear about how the application should be achieving intuitiveness. Instead this heuristic focuses on minimises cognitive load by 'making objects, actions, and options visible' so that users dont need to remember each part of the process.
8. **Design a clear navigable path to task completion:** A more refined heuristic compared to *Relevant to users' needs* which measures whether the users are able to perform the task they want. This heuristic measures whether users are 'able to see right away how they can interact with the application and navigate their way to task completion'.
9. **Allow configuration options and shortcuts:** A reworded revision of *Flexibility and efficiency of use*, it more appropriately identifies that the system should provide expert users with ability to tailor frequent actions.
10. **Facilitate easier input:** This heuristic is unique to mobile applications in that it focuses on

making it easy to input content from the perspective of a mobile device.

These were not chosen for this application:

- **Display an overlay pointing out main features when appropriate or requested to help first-time users.**: This is similar to *Help and documentation*, however there are no difficult elements of the application that need explaining and so no documentation is included for its use to be assessed by an expert
- **Use camera, microphone and sensors to lessen user's workload**: The only sensors used in this application is GPS which is adopted from other applications and so there is no unique factors to assess for this application. According to research and existing solution no other sensors would be appropriate.
- **Cater for diverse mobile environments (lighting, ambient noise, gloves, etc)**: At this stage there have been no accommodations made for different use case environments and so there is nothing for users to assess against this heuristic.
- **Often updated, Minimal download time, Unique to the online medium, Net-centric corporate culture supporting site**: None of these heuristics are relevant to the mobile application or available to be assessed at this stage of prototyping.

There are three stages of a heuristic evaluation; briefing session, evaluation period and debriefing session. During the evaluation period, experts go through the features of the application individually twice [43]. The first time is to get a feel and understanding of the interface, and the second time through is to focus on the specific features and make notes [62]. During this second pass, according to chapter 13.4.2 of The UX Book, each expert 'individually browses through each part of the interaction design, asking the heuristic questions about that part'. The expert takes note of where and how the heuristic has been violated, how this would cause usability issues for the user and the probable effect on the user. They also rate the severity of the usability issue choosing between two options for three factors; occurrence (common, rare), impact (low, high) and perseverance (very, not). The combination of these factors provide a severity rating (0 to 4), and the mean of at least three evaluators ratings is satisfactory to determine the seriousness of the usability issue [63]. The debriefing session is an extension that could be used to brainstorm ideas to resolve the violations [62].

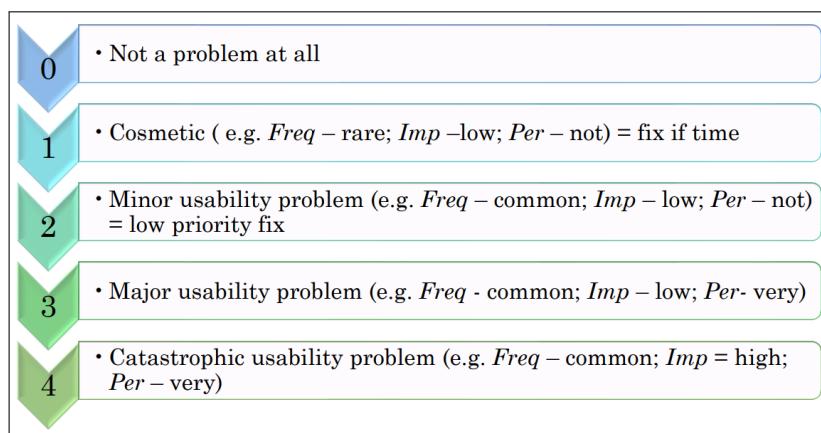


Figure 12: Heuristic Severity Ratings

4.3.2 Evaluation Protocol

The purpose of the protocol is the same as previous prototype evaluations. The protocol can be viewed in [Appendix C.1](#). To guide the experts through the three stages of the heuristic evaluation, after commencing the online call, the experts are provided with a link to a Google Forms. The form

can be viewed in [Appendix C.2](#). This form The first step is the briefing session where the expert is given an overview of the task and expectations, and asked to complete a consent form. The second stage is completing the heuristic evaluation. The expert is given a list of 13 tasks, each of which pass through every page and feature of the application. The expert is asked to complete each task at their own speed with guidance when/if an error occurs. They are provided with a link to the high fidelity prototype on figma. The slides can be viewed in [Appendix C.3](#).

After the user has completed all of the tasks and expresses they feel confident with the system they are directed back to the Google Forms to prepare for the second pass. During the second pass of the application, the expert is again asked to complete each of the tasks however this time they are to specifically evaluate the usability of the system against the chosen heuristics. There are ten heuristics that were identified as part of the preparation for the evaluation. On the Google Forms, the experts are provided a link to a Google Sheets where there is a tab called HEURISTICS which lists and describes each of the heuristics. In the sheet is a second tab for the expert to fill out their notes with the appropriate headings, including the severity rating factors. The tabs of the sheet can be viewed [Appendix C.4](#). The expert uses the same link to the prototype to evaluate each task against these heuristics. After they are satisfied they have identified all the current issues they are debriefed.

This evaluation included 5 experts as this would identify at least 75% of the evaluations [43]. One of the evaluators also took part in the low fidelity evaluation and another has participated in all three evaluations. This range of familiarity with the application may provide the identification of some unique issues and ensures that all previous issue were addressed. The raw notes are in [Appendix C.5](#).

4.3.3 Evaluation Results

From the heuristic evaluation there were a range of issues identified. Where more than one evaluator has noted the issue the mean of the severity factor responses has been taken. Also in this case, the heuristic that was consistent amongst all answers was chosen or a judgment call was made for the most appropriate.

| Issue | #Experts | Heuristic | Factors | Severity |
|--|----------|-----------|------------------|--------------|
| DROPDOWN | | | | |
| want to select whole box not just arrow | 4 | 10 | common,low,very | major |
| want to select text not just box | 3 | 10 | common,low,very | major |
| want to select anywhere to save option | 3 | 3, 8 | common,low,very | major |
| SAVED MESSAGE | | | | |
| save doesn't take user away from edit screen | 1 | 8 | common,low,very | major |
| saved message has to be clicked out of and then back | 1 | 8, 4 | common,low,very | major |
| MAIN | | | | |
| reset option | 2 | 3 | rare,low,very | cosmetic |
| not clear what home icon refers to | 2 | 3 | rare,low,very | Cosmetic |
| COMPARE | | | | |
| too many steps to delete, edit page redundant | 4 | 8,3 | common,low,very | major |
| RESTAURANT | | | | |
| no shortcut to compare/favourite | 2 | 9 | rare,low,not | cosmetic |
| want to see more detail about reviews | 2 | 2 | common,low,not | minor |
| menu text area is small, lots scrolling | 1 | 7 | common,low,not | minor |
| PROFILE | | | | |
| not clear need to save defaults | 2 | 1,6 | common,high,very | catastrophic |
| can't add to favourite from history | 2 | 9 | rare,low,very | cosmetic |
| can't undo delete for saved | 1 | 4 | rare,low,not | cosmetic |
| not able to delete/modify history | 1 | 4 | rare,low,not | cosmetic |

4.3.4 Evaluation Analysis

All of the heuristic violation results identified according to this sample of experts, so while approximately 75% may have been collected there is potential that another set of the same evaluations with different experts could yield different results. Additionally, many of the issues identified were only identified by 1 or 2 experts which provides unreliable results. A further step that could be taken would be to recontact the experts with the entire list of issues and ask them to rate each one. This was not available at this time.

From the results there are four issues where their severity rating can be considered reliable (more than 3 experts), all of which have been identified as having a major market impact. This means they are 'important to fix, should be given high priority' [63]. The first two of these issues relate to the small area of selectability of the dropdown boxes and their content. These violate **heuristic 10** and do not align with Fitts law as larger buttons/selection area and proximity between selections is better for the user. The following two issues both violate **heuristic 3** and **heuristic 8** as they require unnecessary steps from the users and increase the chance of unresolved errors occurring. When selecting an option on a dropdown menu users have to be careful about how they choose to exit the overlay or their option will not be saved, and when deleted an option from the compare list users have to carefully complete at least four steps without warning if the sequence is not correct.

These issues cause frustration and confusion for the user. All of these four issues will definitely need to be rectified in the next iteration due to their agreed consensus from experts as major issues.

The remaining issues were only identified by one or two experts and so that severity rating is not entirely reliable. Looking at those rated by at least two experts, there are four cosmetic issues, one minor, and one catastrophic. Reviewing these violations objectively, these issues will be considered for the next iteration with lower priority than the major issues identified previously. The first issue has been labelled as catastrophic in violation **heuristic 1** and **heuristic 6**, which occurs on both the default preferences and edit compare list page. Experts noted that it was not clear that on these edit pages the changes needed to be saved as not only was there no response from the application when the pages weren't saved but this was not required for similar behaviour in other areas of the application. The minor issue violates **heuristic 2** and relates to the inability to view more information about reviews on the restaurant page when selecting the icons, despite this being an expected behaviour and functionality from other rating systems. The next two issues violate **heuristic 9**, firstly by not allowing users to add a visited restaurant to favourites easily and secondly by not providing accelerators to the favourite and compare list from the restaurant page for expert users [49]. The final two cosmetic issues relate to the violation of **heuristic 3** on the main page due to the absence of a reset button and the confusing presence of the home icon.

The final issues have only been identified by one expert and include two cosmetic, one minor, one major and one catastrophic. These will need further evaluation to determine their actual severity rating. At this time the two cosmetic issues violate **heuristic 4** and both relate to the profile page in that restaurants in the history cannot be delete/modified and there is no option to confirm or undo a deletion from the saved list. The minor issue is that the text of the menu is too small which may cause lots of scrolling and violates **heuristic 7**. The major and catastrophic issue are both identified by the same expert whom stated that the saved messages violate **heuristic 8**. The major issue is that when the saved message pop-up appears users must click outside of it and then the back arrow to go back, and the catastrophic issue is that after selecting saved the user isn't taken directly back to the previous screen. This is an example of the rating of one expert is unreliable as these appear to be less serious issues than presented given the impact of other issues.

The reliable major usability problems will be adjusted with high priority. This will resolve all of the violations of **heuristic 10**. For the unreliable issues from two experts the catastrophic issue will be given next priority followed by the minor problems. This will resolve all violations of **heuristic 1,2,6**. The cosmetic issues in this list will be handled if there is time, which will handle **heuristic 3,9**. The issues identified by only one expert will be rated further by at least one other expert before deciding, to determine the actual violation of **heuristics 4,7,8**. According to the results there is no violation of **heuristic 5**.

5 Summary (Release 2)

In summary, there have been three iterations of the human interaction cycle. The outcome of these cycles have been compiled and summarised for reference of progression. User research should be done at all stages so this is no way a complete list [46]. The final conceptual design (metaphors, system requirements, design principles, UX Goals) from these cycles can be viewed in [Appendix D.1](#). The progression of the prototype interface can be viewed in [Appendix D.2](#). Each iteration is denoted by a different colour; **low**, **medium** and **high**.

The next step would be to complete another iteration cycle. This would include updating the conceptual design (metaphors, system requirements, design principles), UX goals and prototype. Without going into full detail of these changes, the new metaphors to be introduced would be related to a refresh/reload action as well as repurposing the cross metaphor as the cancel option when checking user's navigation. A new design guideline would be introduced 'minimal effort' to ensure user's don't have issues with the selectability (particularly of dropdowns) again. There are a few system requirements that were previously mentioned by users and research that were beyond the scope of release 1. These include the ability to follow other users, save lists for future self use or or for others to view, and a voting system with the comparison list.

In order of severity ratings as outlined in the high fidelity evaluation analysis, these are ideas for changes that could be applied to the next prototype iteration only focusing on what can be improved with the conceptual design from release 1.

1. The whole box of a dropdown needs to be made selectable. --> Fitts Law
2. The text of options in the dropdown should be selectable. --> Fitts Law
3. Once an option has been selected in a dropdown users should not to worry about how they exit the overlay and should be saved no matter their next click. --> Fitts Law
4. Remove the edit action icon on the compare page. Instead a delete option, using the bin metaphor, will be added to the existing list of actions in the overlay when selecting an option on this page. This reduces the number of steps from 4 to 2 and replicates the same behaviour as the saved page. --> Consistency
5. Prompt user to save defaults if they haven't selected before exiting page.
6. Support the display of more information when selecting the recommendations/reviews on restaurant page i.e. which friends voted.
7. Remove the home button from the main page.
8. Have a reset option as an icon the main page (less obvious than the GO button as it is less used) and when select prompt the user to confirm they want to reset.
9. Add favourite action icon to overlay on history page.
10. Add accelerator to favourite and compare buttons, long press to be directed straight there.

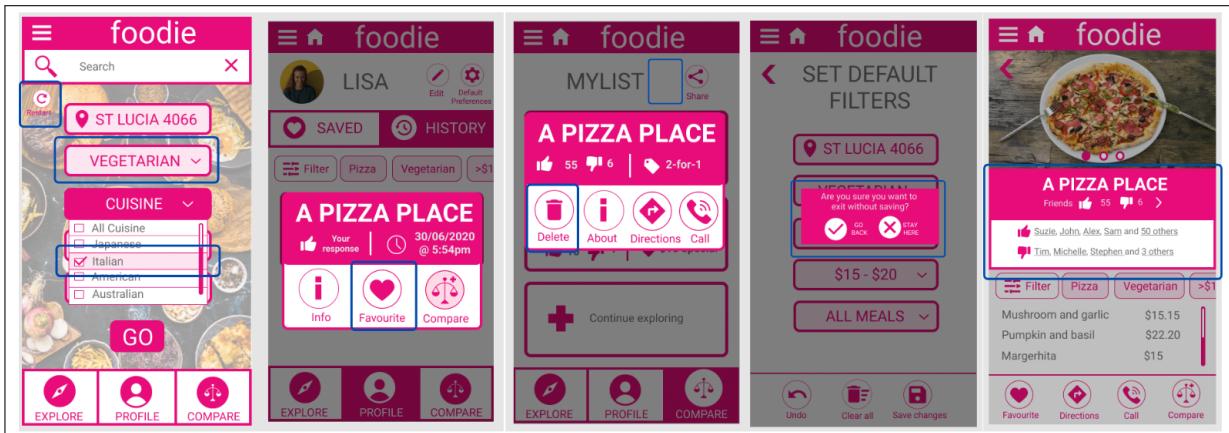


Figure 13: Release 2 Prototype

6 Conclusion

The foundation of this application came to fruition through the initial research (both desk and interviews) performed during the development of the mind map. From this research, *Foodie* has been developed and refined through three iterations of the design process. Each step involved the creation/modification of the conceptual design which in turn was applied to the prototype and then tested through various evaluation methods (both user and expert based). In each iteration the gap between the gulf of execution and evaluation continued to close, mental models were better aligned, consistency throughout the system achieved, UX goals met and cognitive overload reduced using various techniques. Overall, while there are still improvements to be made to release 2, as briefly mentioned, the project started with identifying an issue and ended with a useable and accepted application. Users can now happily make the decision of where to dine out.

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Appendices

A Low Fidelity Prototype

A.1 Evaluation Protocol

EVALUATION PROTOCOL

Low Fidelity Prototype

Tean-louise Cunningham (42637460)

Complete a design walkthrough with co-design and TAM questionnaire of a low-fidelity prototype to identify gaps between conceptual and mental models.

PREPARATION

Since this is an individual evaluation only myself and the participant will be involved. Therefore, I will be fulfilling the role of facilitation, observation, recording and interaction flow. The following materials will be prepared for the user prior to the evaluation.

1. Electronic Consent form
2. Paper Prototype
3. Walkthrough Presentation Slides
4. Questionnaire
5. Google Forms
6. Zoom software

INTRODUCTION

Opening Statement

User has been sent a link with survey and instructions on Google Forms. User's screen is being shared over an online conference call. *Thank you for taking the time today to provide some feedback on the early stages of a mobile application. The purpose of this app is to assist you with deciding where to dine out using an interactive map, filtered preferences and comparison feature.*

Today, I will be showing you the basic prototype to observe how you interact with it , to determine any functionality or design that is not intuitive, and whether it is achieving its purpose effectively for you as the user.

Consent

Before we get started, please read carefully through this consent form. It reiterates the purpose for today and how your data will be used. Your personal details will not be used directly in any way and all observations are of your interaction with the software only. If you like to proceed with contributing please fill out this form and upload with the given link. User reads through and fills out consent electronically with provided link and uploads.

Thanks for filling that out, please save it on your computer for the time being. If at any time you don't wish to continue just let me know and we will stop, and none of your feedback will be used. A reminder that I am only testing the software and not evaluating you.

DESIGN WALKTHROUGH

Instructions

To get your feedback, I will be asking you to complete a specific task using the prototype. At any point you get stuck or are confused I may pause you for a moment to ask you some questions. I won't be explaining or showing you how to use the system. The point of this exercise is to see what you, as a first time user, expect of the system and how you think it should flow.

In a moment you will be able to view the paper prototype and move through the pages. Please interact with the application as if it was reactive. This means pressing everything that you normally would to complete the task. The more realistic your interaction with the prototype the better the feedback to know where to improve.

You will have 10 minutes to complete the following task. Any questions?

Please click on the link to the presentation. The task is to choose two places and decide between them where you would like to eat dinner tonight, takeaway of course. You can start.

The user confirmed they have no questions and is starting the task. Record, observe and take detailed notes of their process.

Task Notes

These are the steps that the user should be going through to complete the task, and observations relating to each one that need to be taken note of.

1. Filter preferences: This is the default page and so all users will start here.

- Do they know how to filter?
- Did they fill all of the filters out before proceeding?
- Did they know how to get to the next page?
- How long did it take to complete this page?

2. Interactive Map: This is the page that follows the preferences page.

- Were they able to select a restaurant?
- Did they know the map was interactive?
- Did they try to press any other buttons on the page?
- How long did it take them to select a restaurant?

3. Restaurant Information

- After selecting a 'dot' on the interactive map they will be brought here.
- How many of the cards did they select?
- Did they understand the menu was filtered?
- Did they know what all the icons meant?
- Were they able to add a place to a list?
- What information did they want to look at?
- How long did it take them to move to another step?

4. List page: If a user selects the 'List' icon they will be brought here to compare.

- Did they get to this page?
- Do they know how to select a decision?
- Do they understand what to do next?
- How long did it take the user to find out their was a list page?

5. Repeat: Since the task is to select 2 places, users will need to repeat 2-5

- Were they able to find out how to get back to previous steps?
- Did they want to choose a second place?
- How long did it take to figure out how to get back to the map?

6. Recommendation Page: After they have chosen a place and completed the task they will be nudged here.

- Did they understand what was happening?
- Did they know what they were suppose to do?

CO-DESIGN

Instructions

While completing the task the user encounters a problem and is obviously stuck trying to move to the next step, or they took an action expecting different functionality. Prompt them to speak out loud during this time.

Please just pause for a moment:

- Do you understand what the next step is?
- What are you having trouble finding or understanding?
- Where/what do you think you should be able to find?
- How would you design this part?

Show them the next step to continue the evaluation of the whole task.

Problem Notes

For each roadblock, in addition to noting the responses to the above questions:

1. The issue
 - Do they understand what the next step is?
 - What didn't they understand or couldn't find?
 - Did they get stuck because they didn't understand the task?
 - Did they get stuck because of the design?
 - Was the flow confusing?
 - After being showed the next step were they still confused?
2. Design Suggestions
 - What do they think they should be able to find?
 - What were their suggestions to redesign?
 - How was the experience prior to this point?
 - What elements of the existing design did they like?

TAM EVALUATION

Instructions

The user has completed the task.

Thank you for completing the task. Now select to go back to the form. Finally, I have some questions to rate your experience and your acceptance of this application. The purpose is to determine the perceived usefulness and ease of use, your attitude towards the app and intention to use.

For each question choose a number between 1 and 4, with 1 being strongly disagree and 4 being strongly agree. Please answer honestly. I may follow up with additional questions where necessary.

Questionnaire

1. I can accomplish deciding where to dine out more quickly using this application (PU1)
2. This application enables me to make better decisions about where to dine out. (PU5)
3. Overall I find this application useful (PU6)
4. It is easy to use this application to decide where to dine out (PEOU2)
5. Overall I believe this application is easy to use (PEOU3)
6. Overall my attitude towards this application I favourable (ATT3)
7. I will use this application on a regular basis in the future (ITO1)
8. I will strongly recommend others to use this application (ITO3)

Questionnaire notes

The quantitative answers from the users will be saved on Google Forms which automatically calculates and graphs collected data. Additionally, any score that is not 4 (strongly agree) will be followed up with the following questions.

- Why did you give this score?
- What stopped you from scoring higher?

Conclusion

All done. Thank you so much for your time today. Just a reminder that if you would like to withdraw at any time, let me know and your data will not be used. Thank you for your time, it is greatly appreciated and your data is very valuable.

A.2 Google Forms

Dining Out - Low Fidelity

Thank you for taking the time today to provide some feedback on the early stages of a mobile application. The purpose of this app is to assist you with deciding where to dine out using an interactive map, filtered preferences and comparison feature.

Today, I will be showing you the basic prototype to observe how you interact with it, to determine any functionality or design that is not intuitive, and whether it is achieving its purpose effectively for you as the user.

*Required

Consent

Before we get started, please read carefully through this consent form. It reiterates the purpose for today and how your data will be used. Your personal details will not be used directly in any way and all observations are of your interaction with the software only. If you like to proceed with contributing please fill out this form and then we will get started.

<https://deco7250-wfixrenkka-uc.a.run.apn/index.cfm>

1. Please upload your consent form here.

Files submitted:

Design
Walkthrough

To get your feedback, I will be asking you to complete a specific task using the prototype. At any point you get stuck or are confused I may pause you for a moment to ask you some questions. I won't be explaining or showing you how to use the system. The point of this exercise is to see what you, as a first time user, expect of the system and how you think it should flow.

PAPER PROTOTYPE

<https://docs.google.com/presentation/d/e/2PACX-1vRp-XVOiwPddbw5wp-AI2ygoOTJgQkY-D8aeRK1Gcven4r3RGuu5s3ovjfEP2nfOA/pub?start=true&loop=false&delayms=30000>

TAM
Evaluation

These questions are about your acceptance of this application. The purpose is to determine the perceived usefulness and ease of use, your attitude towards the app and intention to use.

Please answer honestly. I may follow up with additional questions where necessary.

2. I can accomplish deciding where to dine out more quickly using this application. *

Mark only one oval.

1 2 3 4

Strong Disagree Strongly Agree

3. This application enables me to make better decisions about where to dine out. *

Mark only one oval.

1 2 3 4

Strong Disagree Strongly Agree

4. Overall I find this application useful. *

Mark only one oval.

1 2 3 4

Strong Disagree Strongly Agree

5. It is easy to use this application to decide where to dine out. *

Mark only one oval.

1 2 3 4

Strong Disagree Strongly Agree

6. Overall I believe this application is easy to use.*

Mark only one oval.

1 2 3 4

Strong Disagree Strongly Agree

7. Overall my attitude towards this application I favourable.*

Mark only one oval.

1 2 3 4

Strong Disagree Strongly Agree

8. I will use this application on a regular basis in the future.*

Mark only one oval.

1 2 3 4

Strong Disagree Strongly Agree

9. I will strongly recommend others to use this application.*

Mark only one oval.

1 2 3 4

Strong Disagree Strongly Agree

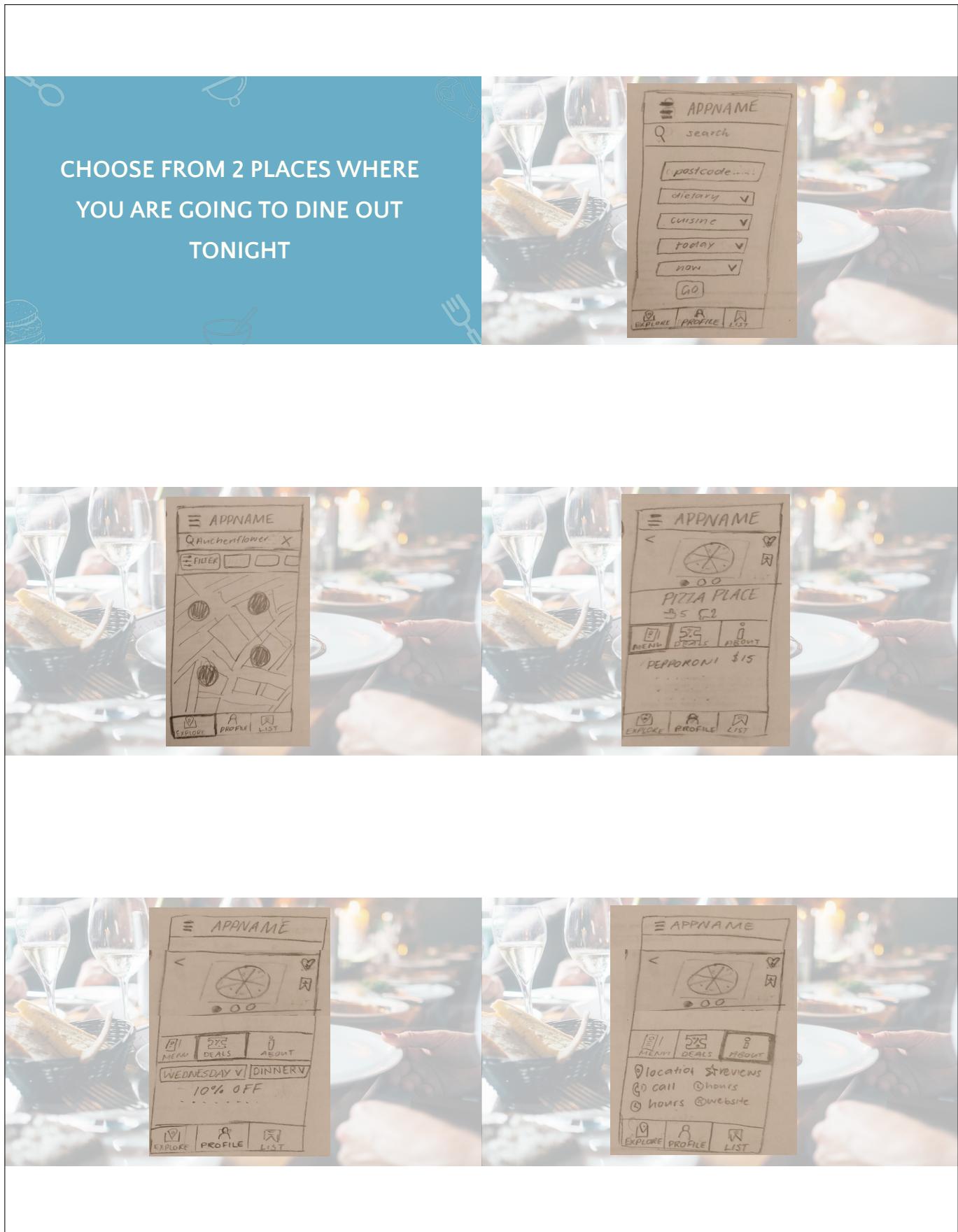
THANK YOU!!

A reminder that you can withdraw your consent at any time and your data will not be used.

This content is neither created nor endorsed by Google.

Google Forms

A.3 Presentation

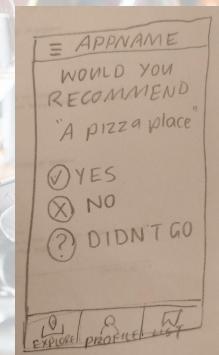




YOU ARE GIVEN DIRECTIONS!

2 hours later

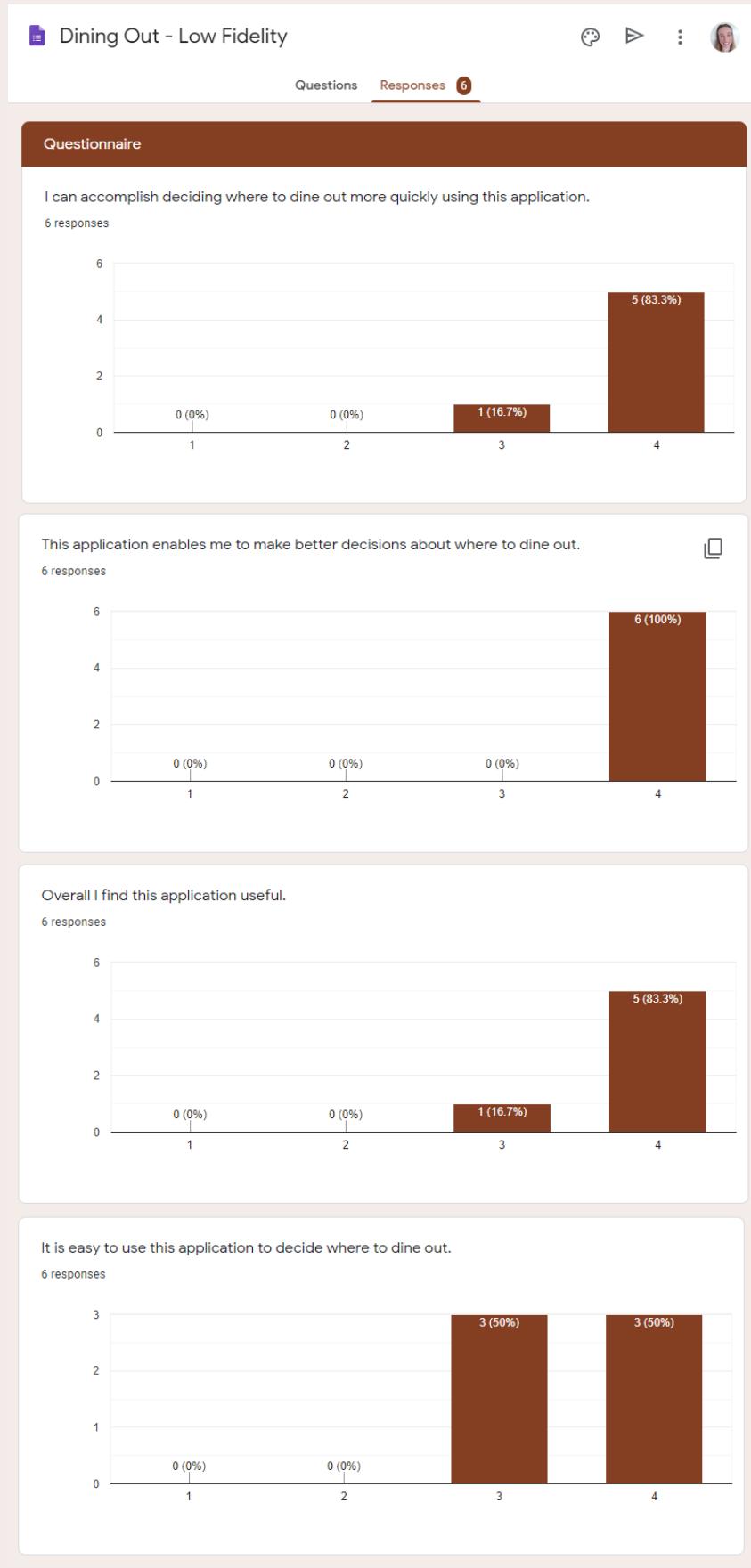
...you get a notification



DONE!

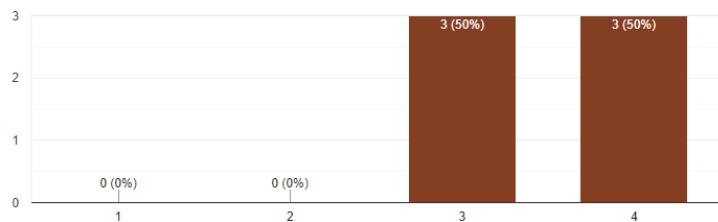
[Back to Google Forms](#)

A.4 Questionnaire Results



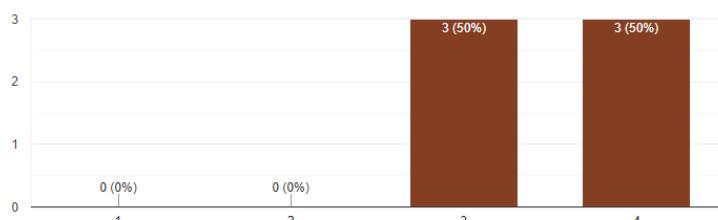
Overall I believe this application is easy to use.

6 responses



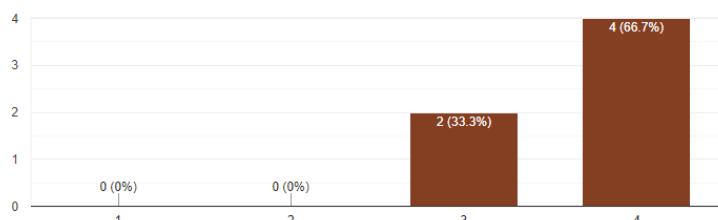
Overall my attitude towards this application I favourable.

6 responses



I will use this application on a regular basis in the future.

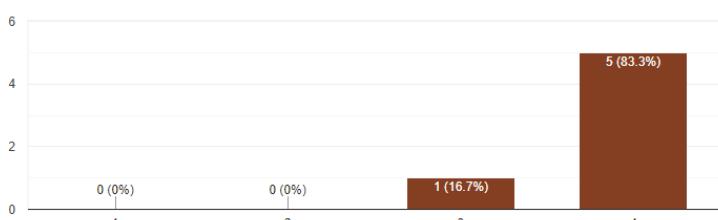
6 responses



I will strongly recommend others to use this application.



6 responses



THANK YOU!!

A.5 Interview Notes

| | | Participant 1 | Participant 2 | Participant 3 | Participant 4 | Participant 5 | Participant 6 |
|----------------------------------|--|---|--|--|---|---|---|
| WALKTHROUGH | | | | | | | |
| 1. Filter preferences | Do they know how to filter? Did they fill all of the filters out before proceeding? Did they know how to get to the next page? How long did it take to complete this page? | Yes - no problems All except date and time | No problems here They selected postcode and dietary before go | Yes - labels were click Selected all of them | Yes Dietary and assumed location was current Got stuck for a couple of seconds before noticing the go | Yes - dropdowns Postcode, cuisine | Yes Assumed current location, cuisine |
| 2. Interactive Map | Were they able to select a restaurant? Did they know the map was interactive? Did they try to press any other buttons on the page? How long did it take them to select a restaurant? | Yes - no problems Yes - no problems Selected filters - expected to go back to preferences page | No problems - 'go' was clear Filters to go back to the preferences page | No problems - liked the big go | No problem No just selected place | about 3 seconds about 3 seconds | Yes Yes |
| 3. Restaurant Information | How many of the cards did they select? Did they know the menu was filtered? | Looked at menu and deals No - had to explain | Looked at all of the 3 tabs No had to tell them | Looked at all 3 of the cards No - had to tell them | All of them No - had to tell them | All of them briefly No - had to tell them | All of them briefly No - had to tell them |
| | Were they able to add a place to a list? Did they know what all the icons meant? What did they look at the most? | Yes | No the heart & list icons were too small, main focus was on the 6 large tabs, | No had to explain where the icon was, still didn't know what the 'list' really meant Understood the heart but not familiar with the bookmark icon | No - didnt see the list icon and didnt know what it was when pointed it out Knew the heart but not the bookmark | Saw the list and heart icon, and noticed bookmark in the list tab but didnt know the difference knew all the symbols but not the difference | Yes - added to favourites and list and kind of hoped one of them would do something, then saw the list icon |
| | The deals How long to move to another step? | about 8 seconds | Mainly the menu and deals They got stuck at this point | Look at all of the information They stuck stuck at this point | The menu They got stuck at this point | All of them They got stuck at this point | Yes - super clear about the heart and list at first About 10 seconds |
| | Did they understand what the recommendations meant? | Thought it was just ratings, had to explain its friends only | Thought it was a rating system, had to explain they were friends only - liked the idea | Yes they liked it was simple thumbs up and down but had to explain it was friends only | Thumbs up and down but not that they were friends | Yes, but not that it was friends only, wanted to see others ratings too | Yes, but not that it was friends only, wanted to see others ratings too |
| 4. List Page | Did they get to this page? | Yes | Werent able to get here | Werent able to get here | Werent able to get here | Got here but didnt add a place | Yes |
| | Do they know how to select a decision? | No - expected selecting to go back to the restaurant page | Yes | Yes - understood if it was highlighted then it was selected as their decision | Yes - at first thought about going back but decided didnt need to | Yes - just select and go here (liked that it gave directions) | Got stuck here - wanted to get the phone number of place |
| | Do they understand what to do next? How long did it take to get here? Did they understand the purpose of this page? | Yes About 10 seconds Yes - and that could share | Yes - select go here was easy to understand Couldnt get here At first didn't know what the tab 'list' was until they got there | Yes Couldnt get here Yes | Yes Couldnt get here Yes | Yes Couldnt get here properly Yes - to see quick view | Yes about 15 seconds Didnt know the difference between here and profile |
| 5. Repeat | Were they able to start again? Did they choose a second place? How long to go back to map? | Select explore to go back Yes 2 seconds | No problem - select explore Was happy to choose the first one 2 seconds | Selected explore Up to this point was clear but was confused what they should be able to do | Yes Yes 2 seconds | Yes Yes 2 seconds | Yes Yes 2 seconds |
| 6. Push | Did they know what they were suppose to do? | No problems | No problems - understood this connected with the friend recommendation | No problems - liked that it was simple yes or no | No problems | Yes | Yes |
| CO-DESIGN | | | | | | | |
| The Issue | What and when did they get stuck? | Got to the list page - wanted to go back to the restaurant information | Got to the restaurant page - didn't know what to do next or how to move forward with selection | Got to the restaurant page - didnt know what to do next | Got to the restaurant page and wasnt sure what the next step was | Got to the list page without adding and didnt know how to add | Got to the list page but wanted to be able to get their phone number |
| | Do they understand what the next step is? What didn't they understand or couldn't find? | Yes - but want to be able to go back a step before making a choice Different expectation for selecting the restaurant name | No they don't know how to interact with the restaurant except the menu, deals and about tabs Don't know what to do next, the next step wasn't intuitive | No - not sure what to do | No Didnt know they could go to a list to compare | knew they wanted to be able to compare, tried both heart and bookmark | Yes but wanted more information before going forward |
| | Did they get stuck because they didn't understand the task? | No | Yes - they didnt know that they could add items to a list to compare with others | Yes - they didnt know that list couldnt see the list icon and didnt know what it did | No - thought comparison was just looking at 2 places | the difference between bookmark and favourite | Couldn't find a way to get back to the restaurant page |
| | Did they get stuck because of the design? | Yes - design wasnt as expected | No - even after getting stuck, if it had been clearer on how to get to the list they said they wouldn't change the order | Yes - couldnt find the list icon or know that there was another step | Yes - wasnt clear that there was anything else they could do | yes - the icons were clear and confused about what 'list' meant | No - just wanted more before completing |
| | Was the flow confusing? | No | No - After explaining how to get to the list page, it made sense from there and they could continue with no issues | Up to this point was clear but was confused what they should be able to do | No - but didnt know there was a next step | No | No |
| | After being showed the next step were they still confused? | No | No it was clear after explaining what was suppose to be done | No | No | No | No |
| | What do they think they should be able to find? | Wanted selection to take them back to previous and have a different way to choose this option to move forward with | Something to let them 'go here or move on' | Didnt know what they should be looking for | Guidance that there is another step forward | Distinction between the heart and bookmark icon | Selecting the restaurant would take them back to the restaurant page or if they selected go here they would get more info |
| Design Suggestions | What were their suggestions to redesign? What was their experience prior to this point? | Swipe left to delete, swipe right to get directions and selection to go to restaurant page (remove 'go here' and 'delete') OR have tick box next to the options to mark which ones should be deleted or go here No problems - overall reached here in about 10 seconds | add to 'list' as text button near the name of the restaurant for more attention, change the name of list to 'compare' | change the icon for list both here and on the main tab as the 'bookmark' isn't clear, add text to the icon as well | leave the list icon where it is but have text instead that says add to list with a notepad icon, and do the same for the list tab | Change the bookmark icon to a scale and leave it where it is, remove the plus from the heart, have the map coloured based on if it is a favourite, change name to 'compare' | when you select a restaurant you are given the option to get more information, a number, delete or directions - suggested an overshadowing effect with icons and text |
| | What elements of the existing design did they like? | Like the bottom 3 tabs and the 3 tabs on the restaurant page, was very intuitive up till this point | Had no problems, had all been very smooth | No problems up to this point | No problems up to this point | No problems up to this point | Except for the list icon at first was smooth |
| | | | liked the overall layout of the page and especially the 3 main tabs on this page, and the 3 bottom tabs | liked the tabs and was intuitive they could be selected, very clean and simple, liked when there was text included with the icons | liked the tabs and the filtered menu after I told them about it | Liked the tabs, the menu and tabs page easily accessible, liked all the icons other than bookmark | the highlighting of the tabs and that there were 3 main tabs, liked being able to easily move through the tabs on the restaurant as well. |
| TAM EVALUATION | | | | | | | |
| PU | I can accomplish deciding where to dine out more quickly using this application (1) This application enables me to make better decisions about where to dine out. (5) Overall I find this application useful (6) | 4 | 3 - Would strongly agree if clearer how to compare | 4 | 4 | 4 | 4 |
| PFOU | It is easy to use this application to decide where to dine out. (2) Overall I believe this application is easy to use. (3) | 4 | 4 | 4 | 4 | 4 | 4 |
| ATT | Overall my attitude towards this application I favourable (3) | 4 | 3 - Having the menu and deals at the forefront was great 3 - Vague of journey to endpoint | 3 - liked the simple design, but the icons could sometimes be confusing 3 - up till understanding that places could be compared with a list | 4 | 4 | 3 - the list icon wasnt very intuitive 3 - except for the end when wasnt able to go back |
| IIO | I will use this application on a regular basis in the future (1) I will strongly recommend others to use this application (3) | 4 | 3 - Like the app, but didn't like getting stuck 3 - Due to COVID won't be able to use it much now, plus normally only eats out about once a week 3 - Agree because having more people you know using the apps the better the ratings | 3 - smooth process but wants more clarity from restaurant to list page 3 - doesnt eat out often | 4 | 4 | 3 - although got stuck, doesn't stop me from being able to use the app 4 |

Appendices

B Medium Fidelity Prototype

B.1 Personas

| | | |
|--|--|---|
|  <p>HIGH USE</p> | <p>MATT</p> <p>GOAL: FOSTER RELATIONSHIPS</p> | <p>Matt works at an accounting firm in the city. He doesn't enjoy cooking so eats out at least 4 times a week with others (co-workers or family). He is open to eating anything, but doesn't like to spend much time looking. He will choose based on craving and will always visit a place if it is recommended by a friend.</p> |
|  <p>RESTRICTIVE</p> | <p>SOPHIE</p> <p>GOAL: BE HEALTH CONSCIOUS</p> | <p>Sophie works for the city council and is vegan. She is very conscious about what she eats and with her schedule she will generally eat out twice a week. She likes to plan and spends a lot of time deciding on where to eat as it needs to matches her dietary. She reads lots of reviews as she likes to support reputable local businesses.</p> |
|  <p>TYPICAL</p> | <p>JESSICA</p> <p>GOAL: TRAVEL WITH PARTNER</p> | <p>Jessica works in retail and is in a relationship. She enjoys travelling and trying different cuisines. They generally eat out twice a week together (once at a new place), and once at work. When deciding where to eat she focuses on value (low cost and good reviews), as she wants to save to money but also wants to eat good food.</p> |
|  <p>LOW USE</p> | <p>DAVID</p> <p>GOAL: COMPLETE UNIVERSITY DEGREE</p> | <p>David is a university student with a casual job at the grocery store. He enjoys spending time with his friends but doesn't have much income. Once a week he will take a break from instant noodles and eat out with friends. He is happy to spend the time to search through options, as long as he can find the cheapest place.</p> |

B.2 Interaction Scenarios

PERSONA: DAVID

USER STORY/SCENARIO: STUDENT DEALS

1 David and his friends have had long day at uni.

2 They decide to eat out for cheap tuesday

3 Opens up Google Maps

4 Only cares about options that are cheap AND

5 Wants somewhere near campus, walking distance

6 Wants to filter by price but no option....

PAGE # 1 PROJECT/TEAM: FOODIE DATE: STORYBOARD NNGROUP.COM

PERSONA: DAVID

USER STORY/SCENARIO: STUDENT DEALS

7 Selects place then directed to external website to see deals

8 Back to maps, select another, sent to website, repeat

9 Tries to remember which places and what deals

10 Sends list of links for friends to look through

11 Finally choose an option and go there

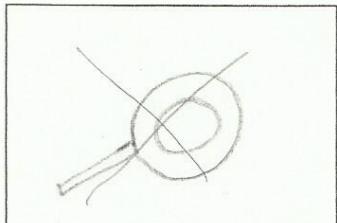
PAGE # 2 PROJECT/TEAM: FOODIE DATE: STORYBOARD NNGROUP.COM

PERSONA: JESSICA

USER STORY/SCENARIO:

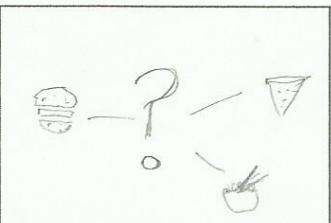
HUMP DAY

1



It's wednesday
and Jessica doesn't
want to cook

2



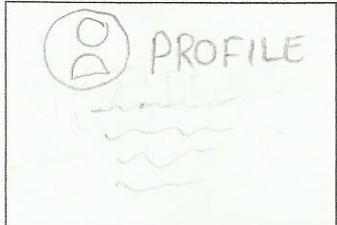
Not sure what
she feels like

3



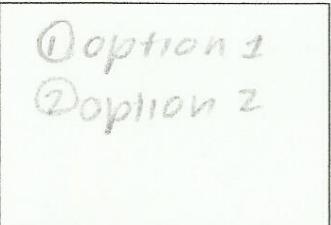
Wants to see
wednesday deals
of favourites.

4



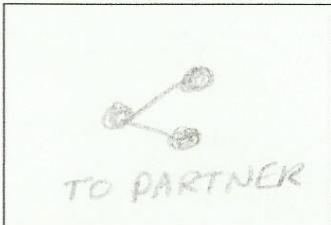
Looks at list
of favourites on
profile

5



Adds places
with wednesday
deals to list

6



sends list
to partner

PAGE # 1 PROJECT/TEAM: FOODIE

DATE:

STORYBOARD NNGROUP.COM

PERSONA: JESSICA

USER STORY/SCENARIO:

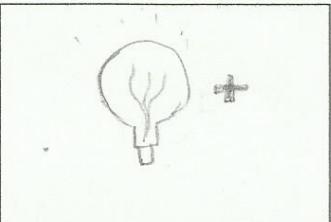
HUMP DAY

7



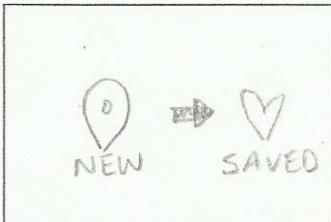
Partner looks
at list on app

8



Reminded of
new place and
adds to list

9



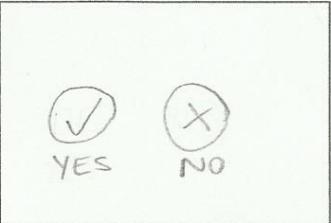
Jessica likes look
of new place and
saves for later

10



Go to new place
together

11



Recommends
afterwards

PAGE # 2 PROJECT/TEAM: FOODIE

DATE:

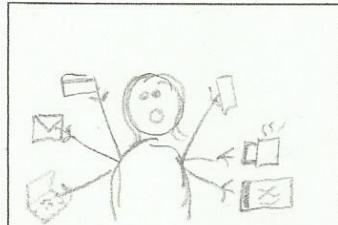
STORYBOARD NNGROUP.COM

PERSONA: SOPHIE

USER STORY/SCENARIO:

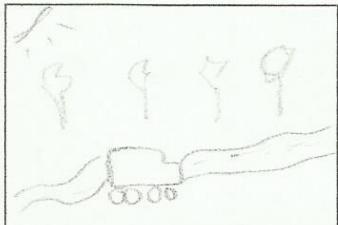
BUSY PLANNER

1



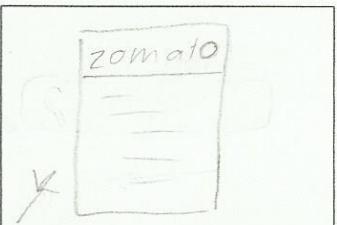
Sophie has a
busy day
tomorrow.

2



She will be
travelling so
needs to eat out.

3



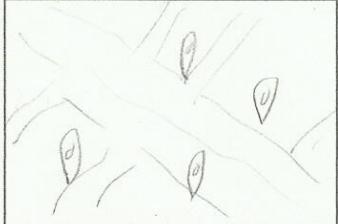
Opens zomato
app.
(has menus)

4



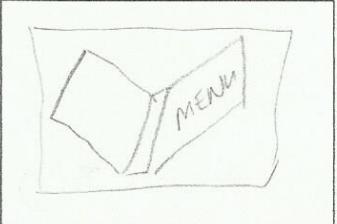
Search for
restaurants
labelled vegan.

5



Looks at area
she will be
for lunch.

6



Selects an option
and looks at
image of whole menu.

PAGE # 1

PROJECT/TEAM: FOODIE

DATE:

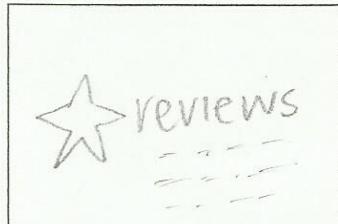
STORYBOARD NNGROUP.COM

PERSONA: SOPHIE

USER STORY/SCENARIO:

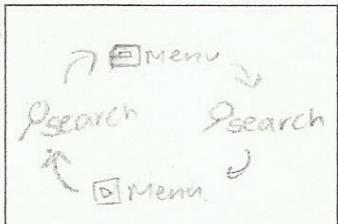
BUSY PLANNER

7



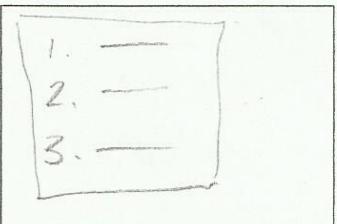
Looks at reviews
from everyone
(lots to read)

8



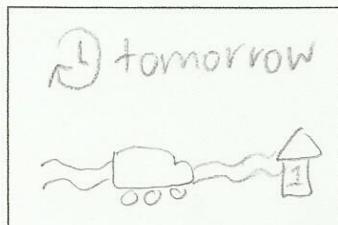
Goes through
list looking at
options, again.

9



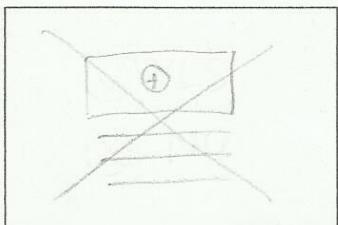
Needs to write
list of options
in diary.

10



It's tomorrow
and she is
close to option 1

11



Too busy to
leave review
later.

PAGE # 2

PROJECT/TEAM: FOODIE

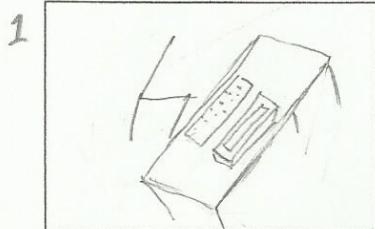
DATE:

STORYBOARD NNGROUP.COM

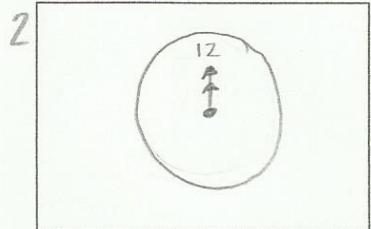
PERSONA: MATT

USER STORY/SCENARIO:

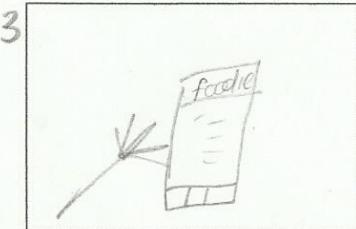
LUNCHTIME AT WORK



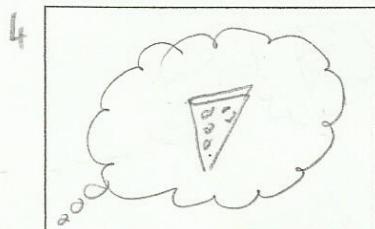
Matt is at work



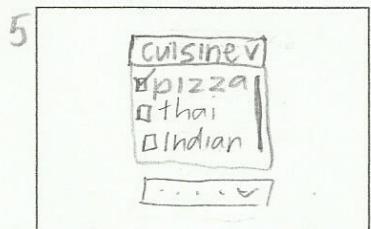
It's lunch time



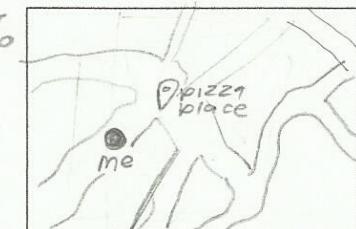
Opens the app



Matt is craving
pizza



Filters by pizza
on first page
only



Chooses somewhere
nearby

PAGE # 1 PROJECT/TEAM: FOODIE

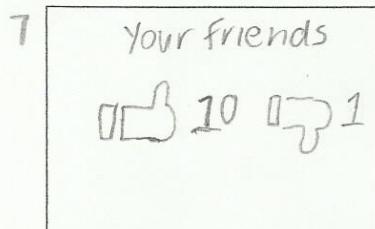
DATE:

STORYBOARD NNGROUP.COM

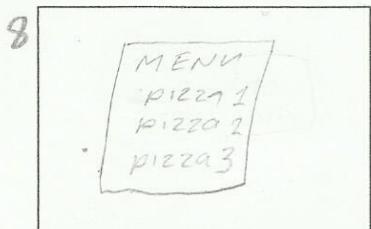
PERSONA: MATT

USER STORY/SCENARIO:

LUNCHTIME AT WORK



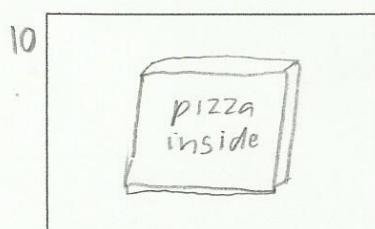
Looks at friend
recommendations



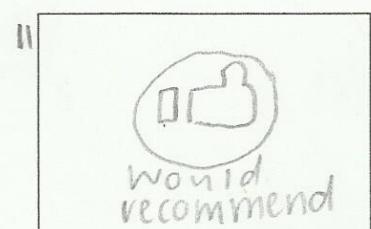
Checks place
has pizza on
menu.



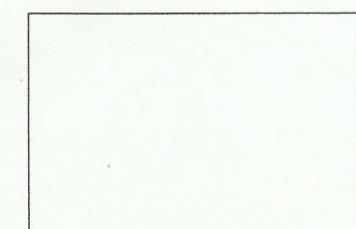
Happy with
this option



Buys pizza
with friends



Rates afterwards
when reminded



PAGE # 2 PROJECT/TEAM: FOODIE

DATE:

STORYBOARD NNGROUP.COM

B.3 UX Goals

| SOURCE | UX GOAL | MEASURES | REQUIREMENTS |
|--|--|---|---|
| Initial Research Interviews <ul style="list-style-type: none"> Participant 11: "My partner is vegan so that usually greatly reduces the scope of choice. Happy Cow removes the necessity to manually filter out non-vegan places." 2 of 12 of the participants were restricted by dietary when deciding where to dine out | I want to dine out at places that match my dietary requirement. | Survey Questions: <ul style="list-style-type: none"> I was able to choose based on my diet. I was clear the map was filtered by my preference for 'dietary' I was clear the menu was filtered by preference for 'dietary' Clicks: <ul style="list-style-type: none"> User chose a dietary | <ul style="list-style-type: none"> Start with page of filters to make it obvious Separate options for dietary and cuisine Add/remove filters after initial search Set dietary preferences in profile Predefined list of dietary |
| Initial Research Interview <ul style="list-style-type: none"> Participant 7: "I think about what I feel like and jump on Uber Eats to search. I don't actually order from the app because I want to go there but it helps me decide what places have what I'm craving by categorising by cuisine." 5 mentioned 'Craving' as part of decision process | I want to eat what I am craving. | Survey Questions: <ul style="list-style-type: none"> I was able to choose based on my craving. It was clear the map was filtered by preference for 'cuisine' I was clear the menu was filtered by preference for 'cuisine' Clicks: <ul style="list-style-type: none"> User chose a cuisine Time: <ul style="list-style-type: none"> From filter to restaurant page. | <ul style="list-style-type: none"> Start with page of filters to make it obvious Separate options for dietary and cuisine Add/remove cuisines after initial search Predefined list of cuisines (not over the top) |
| Low Fidelity Evaluations <ul style="list-style-type: none"> Participant 1: "I assume the postcode will be filled with my current location or I will enter it. This is the only thing I would change on this page as I only care if the place is nearby, then I'll decide from whatever options come up on the map." Initial Research Interviews <ul style="list-style-type: none"> 4 mentioned 'location' as part of decision process | I want to choose where to eat based on my location. | Survey Questions: <ul style="list-style-type: none"> I was able to filter places based on my location. I was able to search in my area of interest. I was able to use my current location. Clicks: <ul style="list-style-type: none"> User entered a postcode Errors: <ul style="list-style-type: none"> From filters to restaurant page. | <ul style="list-style-type: none"> Have option to filter by location on first page Set location preferences in profile |
| Initial Research Interviews <ul style="list-style-type: none"> Participant 2: "I choose based on whether there are options on the menu that suit everyone in the family." 5 mentioned 'menu' as part of decision process Half of respondents said they always look at the menu before, and the other half said sometimes | I want to view the menu of the restaurant as it relates to me before I go there. | Survey Questions: <ul style="list-style-type: none"> I had no trouble finding the menu of the selected restaurant. I was happy the menu was filtered based on preference. I was happy the menu is embedded in the app. Clicks: <ul style="list-style-type: none"> User selected menu User selected filters | <ul style="list-style-type: none"> Menu is filtered for each user Menu is the tab open after selecting an option Menu is embedded in application so not external link |
| Low Fidelity Evaluations <ul style="list-style-type: none"> Participant 2: "I like that the deals have a dedicated space. Normally you have to go to a million different links just to find their menu or find them on social media and scroll through posts." Initial Research Interviews <ul style="list-style-type: none"> 75% of respondents said they sometimes order a deal, and the remaining 25% responded always | I want to learn about the relevant deals of a restaurant. | Survey Questions: <ul style="list-style-type: none"> I had no trouble finding the deals of the place. It was clear the deals were filtered based on day. I was happy I was only shown the deals relevant to my day. Clicks: <ul style="list-style-type: none"> User selected deals tab User chose a day/time User added on this page | <ul style="list-style-type: none"> Deals have their own tab Pre-select day of deals on the first page Deals are visible when comparing options |
| Low Fidelity Evaluations <ul style="list-style-type: none"> Participant 1: "After selecting somewhere in my area, I expect to see all the basic stuff – phone, address, hours etc." Initial Research Interviews <ul style="list-style-type: none"> Participant 10: "I use Google Maps because I can see photos of food or menu, reviews, general information about opening hours or peak busy periods" | I want access to the basic information of a restaurant. | Survey Questions: <ul style="list-style-type: none"> I had no trouble finding the basic information of the restaurant. I had access to everything I wanted to know. I could easily access information when needed. Clicks: <ul style="list-style-type: none"> User selected about tab User added on this page User selection option in compare list | <ul style="list-style-type: none"> Information about the restaurant has its own tab Access back to about when comparing options Directions and call are readily available when deciding on place |
| Low Fidelity Evaluations <ul style="list-style-type: none"> Participant 5: "Normally I would search, pick a place, look at it then go back to the map and do it again... I just try to remember what I saw before but it's very time consuming." Initial Research Interviews <ul style="list-style-type: none"> Participant 4: "Maps makes it easy to view wide variety at once." | I want to compare a variety of restaurants at once. | Survey Questions: <ul style="list-style-type: none"> I was able to compare options in one glance. I was able to add places to compare. I liked having the ability to compare options. I wanted to be able to compare more options. Clicks: <ul style="list-style-type: none"> User added to compare User looked at compare | <ul style="list-style-type: none"> Dedicated page for comparing options, one of the main tabs Ability to add options to a list for comparison when viewing the restaurant |
| Low Fidelity Evaluations <ul style="list-style-type: none"> Participant 6: "I like that I can share this list with my friends. Deciding where to eat is always a team effort and coordinating the different options is normally a nightmare." | I want to share the experience of dining out with friends. | Survey Questions: <ul style="list-style-type: none"> I could easily share options with friends. I would recommend this app to friends. Clicks: <ul style="list-style-type: none"> User selected share. | <ul style="list-style-type: none"> Share comparison list with friends Follow other people View friends recommendation on |
| Low Fidelity Evaluations <ul style="list-style-type: none"> Participant 4: "I try and remember what places people at work told me about and show my husband. I would say 8/10 times we go there." Initial Research Interviews <ul style="list-style-type: none"> 4 mentioned 'word-of-mouth' as part of decision process | I want to dine out at restaurants that have been recommended by word-of-mouth. | Survey Questions: <ul style="list-style-type: none"> It was clear friend's recommendations were available. It was clear how the recommendation system worked. Clicks: <ul style="list-style-type: none"> User looked at friends recommendations. Errors: <ul style="list-style-type: none"> Understanding the recommendation system. | <ul style="list-style-type: none"> Thumbs up and down system instead of star reviews. Friend recommendations are visible first, then others After visiting restaurant, nudged for recommendation |
| Low Fidelity Evaluations <ul style="list-style-type: none"> Participant 3: "I'm a creature of habit and like to go back to places I liked when travelling for work, can I see where I've been before?" | I want to re-visit restaurants that I enjoyed. | Survey Questions: <ul style="list-style-type: none"> I had no trouble finding places I had visited before. Clicks: <ul style="list-style-type: none"> User selects profile User selects history | <ul style="list-style-type: none"> History of visited locations and recommendations in profile Save restaurants as to be viewed later |
| Low Fidelity Evaluations <ul style="list-style-type: none"> Participant 1: "I probably try new places at least once a week. I like to mix it up to find new favourites." Initial Research Interviews <ul style="list-style-type: none"> All respondents said they sometimes try new places. | I want to find new places to eat out. | Survey Questions: <ul style="list-style-type: none"> I could easily find new places. Clicks: <ul style="list-style-type: none"> Number of places clicked Errors: <ul style="list-style-type: none"> From restaurant page to compare list. | <ul style="list-style-type: none"> History of visited places in profile Interactive map for exploration View saved restaurants on profile Main tabs |
| Initial Research Interviews: <ul style="list-style-type: none"> Cost was the third most important factor when deciding where to dine out 75% spend less than \$20 per meal | I want to dine out in my budget. | Survey Questions: <ul style="list-style-type: none"> I was able to choose a place based on my budget. I had no trouble finding the prices on menu. Clicks: <ul style="list-style-type: none"> User clicked on filter to change price | <ul style="list-style-type: none"> Option to filter by budget on menu and map pages Dropdown list of predefined budgets Menu has clear prices Easy access to deals Ability to change budget |
| Initial Research Interviews <ul style="list-style-type: none"> Participant 7: "It takes way too long to decide where to eat out. Half the time I give up and make something at home." Over 65% said it took at 20 minutes to make a decision and most said they wanted to spend less time. | I want to decide where to dine out in less than 20 minutes. | Survey Questions: <ul style="list-style-type: none"> I was able to choose a place quicker than usual. Time: <ul style="list-style-type: none"> Total time from opening the app to choosing a restaurant to visit Errors: <ul style="list-style-type: none"> Total number from start to finish | <ul style="list-style-type: none"> Process is broken down into manageable steps Flow of steps is clear Large actionable buttons Top and bottom navigation bars Max of 3 tabs per page |
| Initial Research Interviews <ul style="list-style-type: none"> Participant 5: "I always read reviews I just never leave them. Sometimes I think about leaving a review, because the place was good, but then I put it off and forget... It takes too long – rate, write and photo." Reviews were the 5th most important and ratings the 8th when making decision. 67% of respondents said they never leave reviews, 25% sometimes and only 8% always | I want support restaurants without having to leave long reviews. | Survey Questions: <ul style="list-style-type: none"> I could easily recommend a place after visiting. I would use this recommendation system. I would be happy to be nudged with the notification to recommend. Clicks: <ul style="list-style-type: none"> User chose yes or no Time: <ul style="list-style-type: none"> How long to select a recommendation | <ul style="list-style-type: none"> Star and commented reviews are obsolete. Thumbs up and down system is used Users are asked to recommend after visiting place using nudging. Large buttons to make it easy to select Only 3 options to choose from |

B.4 Evaluation Protocol

EVALUATION PROTOCOL

Medium Fidelity Prototype

Tean-louise Cunningham (42637460)

Complete a think aloud evaluation accompanied by SUS Questionnaire of a medium fidelity prototype to identify gaps between conceptual and mental models.

PREPARATION

Since this is an individual evaluation only myself and the participant will be involved. Therefore, I will be fulfilling the role of facilitation, observation, recording and interaction flow. The following materials will be prepared for the user prior to the evaluation.

1. Electronic consent form
2. Digital medium fidelity prototype
3. Figma prototype presentation
4. SUS questionnaire
5. Google forms
6. Zoom software

INTRODUCTION

Opening Statement

User has been sent a link with survey and instructions on Google Forms. User's screen is being shared over an online conference call.

Thank you for taking the time today to provide some feedback on the early stages of a mobile application. The purpose of this app is to assist you with deciding where to dine out using an interactive map, filtered preferences and comparison feature.

Today, I will be showing you the first digital prototype of this application to observe your interaction with it and evaluate its usability.

Consent

Before we get started, please read carefully through this consent form. It reiterates the purpose for today and how your data will be used. Your personal details will not be used directly in any way and all observations are of your interaction with the software only. If you like to proceed with contributing please fill out this form and upload with the given link.

User reads through and fills out consent electronically with provided link and uploads.

Thanks for filling that out, please save it on your computer for the time being. If at any time you don't wish to continue just let me know and we will stop, and none of your feedback will be used. A reminder that I am only testing the software and not evaluating you.

THINK ALOUD

Instructions

Now its time to look at the prototype. Click next and you will be taken to the next section of the form where you will find a link. This link will take you to the prototype.

Pretend that you have just downloaded this app and you want to see what you can do with it. Say everything out loud that you are thinking. For example, "I think this button does this", "When I click this button I think I am going to go here", "Now I am looking for how to do this". As it is still in the design stage not every button will work, however, the important part of this exercise is for me to understand how you think you should be able to use it and what you expect each part of the app to do.

As you go move to each new page on the the app I will also be asking you some questions to help me rate how whether the app is providing you the best user experience. For each question please give an answer between 1 and 5, with 5 being strongly agree and 1 strongly disagree. Do you have any questions?

User is able to find the link and has no questions.

You can start. Remember to talk about anything big or small.

Observations

As the user talks out loud while walking through the application it is important that notes of all factors are recorded. The notes are separated by page and components.

- Text
 - Did the user understand the text?
 - Did the user think there was too much text?
 - Could the user read the text?
- Button
 - Did the user know what each button did?
 - Did each button take the user where they expected?
 - Did the user select all the buttons?
 - Was the user able to easily select the buttons?
 - Were there enough buttons for the user?
- Icons
 - Did the user understand all the icons?
 - Were the icons what they expected?
 - Were the icons familiar?
- Tabs
 - Did the user like the number of tabs?
 - Did the user use all the tabs?
 - Did the tabs take them where they expected?

UX Measures

There are two measures for the UX goals outlined in Appendix B.3; survey questions and clicks. These have been separated to the appropriate pages. Firstly, as the user is using the app, note the number of clicks for each of the basic functionality actions (white squares). Secondly, after the user has moved forward to a new page, the relevant UX survey questions for the previous page will be asked. These questions are rated between 1 and 5, with 5 being strongly agree (they are noted with black square). The results are recorded quantitatively by the interviewer to reduce the load of the user. Any additional clarification can be asked at the same time.

1. Filter
 - I was able to choose based on my diet.
 - I was able to choose based on my craving.
 - I was able to choose based on my budget.
 - I was able to search in my area of interest.
 - User chose a dietary
 - User chose a cuisine
 - User chose a day/time
 - User entered a postcode
 2. Map
 - It was clear the map was filtered by preference for 'dietary'
 - It was clear the map was filtered by preference for 'cuisine'
 - I had no trouble finding places near my location.
 - I could easily find new places.
 - Number of places clicked
 - User clicked on filter to change price
 3. Menu
 - I had no trouble finding the menu of the selected restaurant.
 - I had no trouble finding the prices on menu.
 - I was happy the menu was filtered based on preference.
 - I was happy the menu was embedded in the app.
 - It was clear the menu was filtered by preference for 'dietary'
- 'dietary'
- It was clear the menu was filtered by preference for 'cuisine'
 - User selected filters
 - User selected menu
4. Deals
 - I had no trouble finding the deals of the restaurant.
 - It was clear the deals were filtered based on my day.
 - I was happy I was only shown the deal relevant to my day.
 - User selected deals tab
 - User added to compare from this page
 5. About
 - I had no trouble finding the information of the restaurant.
 - I could easily access restaurant's information when needed.
 - I had access to everything I wanted to know about it.
 - User selected about tab
 - User added on this page
 6. Compare
 - I was happy with the number of options I could compare.
 - I could easily compare options in one glance.
 - I could easily share my options with friends.
 - I could easily add places to compare.

- User looked at compare
- User selected option in list
- User selected share.

7. Profile

- I had no trouble finding places I had visited before.
- User selects profile
- User selects history

8. Recommend

- I could easily recommend a place after visiting.
- It was clear how the recommendation system worked.
- I would recommend this app to friends.
- I would be happy to be nudged with the notification.

- I would use this recommendation system.
- It was clear friend's recommendations were available.
- User chose yes or no
- User looked at friends recommendations.

9. Overall:

- I was able to choose quicker than usual.
- Number of errors from filter to restaurant
- Number of errors from restaurant to compare
- Errors understanding the recommendation system
- Time from filter to restaurant
- Time from restaurant to compare
- Time to select a restaurant
- Time to make a recommendation

SYSTEM USABILITY SCALE (SUS)

Instructions

The user has completed the task.

Thank you for completing the task. Now select to go back to the form. Finally, I have some questions to rate your experience and your opinion of the usability of this application.

For each question choose a number between 1 and 5, with 1 being strongly disagree and 5 being strongly agree. Please answer honestly. I may follow up with additional questions where necessary. Please take note that the questions alternate in terms of positive and negative responses.

Questionnaire

1. I think that I would like to use this system frequently.
2. I found the system unnecessarily complex.
3. I thought the system was easy to use.
4. I think that I would need the support of a technical person to be able to use this system.
5. I found the various functions in this system were well integrated.
6. I thought there was too much inconsistency in this system.
7. I would imagine that most people would learn to use this system very quickly.
8. I found the system very cumbersome to use.
9. I felt very confident using the system.
10. I needed to learn a lot of things before I could get going with this system.

Questionnaire Notes

The quantitative answers from the users will be analysed according to the guidelines for SUS data to calculate a score and view the distribution of the participants answers. At this time for further qualitative understanding, any score that is not the highest choice (not 1 or 5 as appropriate) will be followed up with the following questions.

- Why did you give this score?
- What stopped you from agreeing/disagreeing strongly?

Conclusion

All done. Thank you so much for your time today. Just a reminder that if you would like to withdraw at any time, let me know and your data will not be used. Thank you for your time, it is greatly appreciated and your data is very valuable.

B.5 Evaluation - Google Forms

Dining out - Medium Fidelity

Thank you for taking the time today to provide some feedback on the early stages of a mobile application. The purpose of this app is to assist you with deciding where to dine out using an interactive map, filtered preferences and comparison feature.

Today, I will be showing you the first digital version of this prototype to observe how you interact with it and determine the overall usability of the application.
***Required**

Consent

Before we get started, please read carefully through this consent form. It reiterates the purpose for today and how your data will be used. Your personal details will not be used directly in any way and all observations are of your interaction with the software only. If you like to proceed with contributing please fill out this form and then we will get started.

<https://deco7250-wfixrepkka-uc.a.run.app/index.cfm>

1. Please upload your consent form here.

Files submitted:

Think
Aloud

The below link will take you to the prototype. Pretend that you have just downloaded this app and you want to see what you can do with it. Think out loud about everything you are seeing. "I think this button does"; "When I click this button I think I am going to go ..."; "Now I am looking for how to". As it is still in the design stage not every button will work, however, the important part of this exercise is for me to understand how you think you should be able to use it, what you expect each part of the app to do.

Prototype

<https://www.figma.com/proto/0WYtAGvFm8a0hxSIDqGJ4R/Medium-Fidelity?node-id=4%3A3&scaling=scale-down>

System Usability
Questionnaire

Please answer the following questions truthfully. They are all about the usability of the prototype. The more honest the better the feedback. Reminder, this is only about using the prototype itself.

2. I think that I would like to use this system frequently. *

Mark only one oval.

1 2 3 4 5

Strongly disagree Strongly agree

3. I found the system unnecessarily complex. *

Mark only one oval.

1 2 3 4 5

Strongly disagree Strongly agree

4. I thought the system was easy to use.

Mark only one oval.

1 2 3 4 5

5. I think that I would need the support of a technical person to be able to use this system. *

Mark only one oval.

1 2 3 4 5

Strongly disagree Strongly agree

6. I found the various functions in this system were well integrated. *

Mark only one oval.

1 2 3 4 5

Strongly disagree Strongly agree

7. I thought there was too much inconsistency in this system. *

Mark only one oval.

1 2 3 4 5

Strongly disagree Strongly agree

8. I would imagine that most people would learn to use this system very quickly. *

Mark only one oval.

1 2 3 4 5

Strongly disagree Strongly agree

9. I found the system very cumbersome to use. *

Mark only one oval.

1 2 3 4 5

Strongly disagree Strongly agree

10. I felt very confident using the system. *

Mark only one oval.

1 2 3 4 5

Strongly disagree Strongly agree

11. I needed to learn a lot of things before I could get going with this system. *

Mark only one oval.

1 2 3 4 5

Strongly disagree Strongly agree

This content is neither created nor endorsed by Google.

Google Forms

B.6 Evaluation - Presentation



B.7 Evaluation - SUS Results

Raw Data

| SUS QUESTIONS | | P1 | P2 | P3 | P4 | P5 | P6 |
|---------------|--|----|----|----|----|----|----|
| 1 | I think that I would like to use this system frequently. | 4 | 3 | 5 | 4 | 4 | 5 |
| 2 | I found the system unnecessarily complex. | 1 | 3 | 1 | 1 | 2 | 1 |
| 3 | I thought the system was easy to use. | 5 | 3 | 4 | 5 | 4 | 4 |
| 4 | I think that I would need the support of a technical person to be able to use this system. | 1 | 2 | 1 | 1 | 2 | 1 |
| 5 | I found the various functions in this system were well integrated. | 5 | 4 | 4 | 5 | 4 | 4 |
| 6 | I thought there was too much inconsistency in this system. | 2 | 3 | 2 | 2 | 2 | 2 |
| 7 | I would imagine that most people would learn to use this system very quickly. | 5 | 4 | 4 | 5 | 4 | 4 |
| 8 | I found the system very cumbersome to use. | 1 | 3 | 2 | 1 | 2 | 2 |
| 9 | I felt very confident using the system. | 5 | 4 | 4 | 5 | 4 | 4 |
| 10 | I needed to learn a lot of things before I could get going with this system. | 1 | 2 | 2 | 1 | 2 | 2 |

Figure 14: SUS Raw Data

SUS Scores (Steps 1-3)

| SUS QUESTIONS | | P1 | P2 | P3 | P4 | P5 | P6 | AVERAGE |
|---------------|--|-----------|-------------|-------------|-----------|-----------|-------------|---------|
| 1 | I think that I would like to use this system frequently. | 3 | 2 | 4 | 3 | 3 | 4 | 3.17 |
| 2 | I found the system unnecessarily complex. | 4 | 2 | 4 | 4 | 3 | 4 | 3.50 |
| 3 | I thought the system was easy to use. | 4 | 2 | 3 | 4 | 3 | 3 | 3.17 |
| 4 | I think that I would need the support of a technical person to be able to use this system. | 4 | 3 | 4 | 4 | 3 | 4 | 3.67 |
| 5 | I found the various functions in this system were well integrated. | 4 | 3 | 3 | 4 | 3 | 3 | 3.33 |
| 6 | I thought there was too much inconsistency in this system. | 3 | 2 | 3 | 3 | 3 | 3 | 2.83 |
| 7 | I would imagine that most people would learn to use this system very quickly. | 4 | 3 | 3 | 4 | 3 | 3 | 3.33 |
| 8 | I found the system very cumbersome to use. | 4 | 2 | 3 | 4 | 3 | 3 | 3.17 |
| 9 | I felt very confident using the system. | 4 | 3 | 3 | 4 | 3 | 3 | 3.33 |
| 10 | I needed to learn a lot of things before I could get going with this system. | 4 | 3 | 3 | 4 | 3 | 3 | 3.33 |
| TOTAL | | 95 | 62.5 | 82.5 | 95 | 75 | 82.5 | |

Figure 15: SUS Scores

SUS Distribution (Step 4)

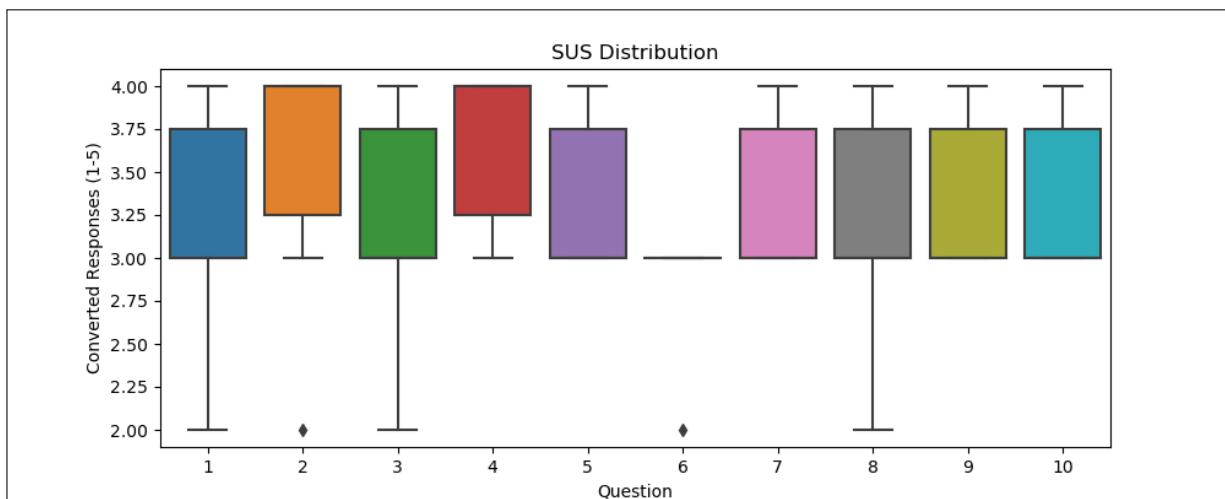


Figure 16: SUS Distribution

B.8 Evaluation - Notes

| | | Participant 1 | Participant 2 | Participant 3 | Participant 4 | Participant 5 |
|-----------------|--|---|--|--|--|--|
| 1 - PREFERENCES | Text | Today/now confusing, not sure what is difference | today/now not clear what the difference is, when? - calendar | wanted to get back to this page on multiple occasions | Wanted to be able to view by price, what first looking for | price is coming up as search filter, but dont know where it came from |
| | Button | Want to be able to filter by price here but can't see that option | looking for home button in the top bar to come back | | | |
| | Icons | | not sure where EXPLORE is going to go, what to expect | expect this filters to save while open and reset when open app again | | |
| | User changed at least one of the filters. | Y | Y | N | Y | Y |
| | User chose a dietary | N | Y | N | N | N |
| | User chose a cuisine | Y | Y | Y | Y | Y |
| | User chose a day/time | N | N | N | Y | N |
| | User entered a postcode | Y | Y | Y | Y | Y |
| | I was able to choose a restaurant based on my diet. | 3 | 3 | 3 | 3 | 3 |
| | I was able to choose a restaurant based on my craving. | 3 | 3 | 3 | 3 | 3 |
| | I was able to choose a restaurant based on my budget. | 1 | 1 | 2 | 1 | 1 |
| | I was able to search in my area of interest. | 3 | 3 | 3 | 3 | 3 |
| 2 - MAP | Text | | | | | |
| | Button | | expected filter to go back to the first page | expect filter to go back to first page | looking for what is most popular, wondering for a way to see where I been before | expect filter to go back to first page |
| | Icons | | not sure what search does | | | |
| | Number of places clicked | 3 | 2 | 1 | 4 | 2 |
| | User clicked on filter to change price | N | Y | Y | N | Y |
| | I was able to use my current location. | | | | | |
| | It was clear the map was filtered by preference for 'dietary' | 3 | 3 | 3 | 3 | 3 |
| | It was clear the map was filtered by preference for 'cuisine' | 3 | 3 | 3 | 3 | 3 |
| | I could easily find new places. | 3 | 2 | 3 | 2 | 3 |
| | I had no trouble finding places near my location. | 3 | 3 | 3 | 3 | 3 |
| 3 - MENU | Number of errors from filter to compare | 2 | 5 | 3 | 2 | 3 |
| | Time from filter to compare | 5sec | 12sec | 10sec | 8sec | 6sec |
| | Text | | | | | |
| | Button | | expected 'add to compare' to be unmovable button | | wanted to be able to order from here | cant find how to add, dont like that I had to scroll to find |
| | Icons | | | | | |
| | Tabs | | | | | |
| | User selected filters | N | Y | Y | N | N |
| | User selected menu | Y | Y | Y | Y | Y |
| | I had no trouble finding the menu of the selected restaurant. | 3 | 3 | 3 | 3 | 3 |
| | I had no trouble finding the prices on menu. | 3 | 3 | 3 | 3 | 3 |
| 4 - DEALS | I was happy the menu was filtered based on preference. | 3 | 3 | 3 | 3 | 3 |
| | I was happy the menu was embedded in the app. | 3 | 3 | 3 | 3 | 3 |
| | It was clear the menu was filtered by preference for 'dietary' | 3 | 3 | 3 | 2 | 3 |
| | It was clear the menu was filtered by preference for 'cuisine' | 3 | 3 | 3 | 2 | 3 |
| | Text | want to be able to view all deals | | | Expected to see deals page first | |
| | Button | | | | | |
| | Icons | | add to compare was much clearer | | | |
| | User selected deals tab | Y | Y | Y | Y | Y |
| | User added to compare from this page | N | Y | N | Y | Y |
| 5 - ABOUT | I had no trouble finding the deals of the restaurant. | 2 | 3 | 3 | 1 | 3 |
| | It was clear the deals were filtered based on my day. | 2 | 2 | 3 | 2 | 3 |
| | I was happy I was only shown the deal relevant to me. | 2 | 3 | 3 | 2 | 3 |
| | Text | | | | | |
| | Button | | colours for clickability is not consistent, add to compare is dark pink without being selected | want to go straight to a restaurant without adding to compare | | |
| | Icons | | | | | dont always want to look at more than one option, cant find option to get directions on page |
| | User selected about tab | Y | Y | Y | Y | Y |
| | User added on this page | N | N | N | N | N |
| | I could easily access restaurant's information when needed. | 3 | 3 | 1 | 3 | 1 |
| | I had access to everything I wanted to know about it. | 3 | 2 | 2 | 3 | 1 |
| 6 - PROFILE | I had no trouble finding the information of the restaurant. | 3 | 3 | 3 | 3 | 3 |
| | Text | | | | | |
| | Button | | not sure what to expect here | | | |
| | Icons | | not clear that can set defaults but I would use this | | | |
| | User selects profile | Y | Y | Y | Y | Y |
| | User selects history | Y | Y | N | N | Y |
| | I had no trouble finding places I had visited before. | 3 | 3 | 3 | 3 | 3 |
| | Number of errors from restaurant to compare | 3 | 4 | 2 | 1 | 3 |
| | Time from restaurant to compare | 15sec | 30sec | 22sec | 18sec | 16sec |
| | Text | | | | | |
| 7 - COMPARE | Text | | when select an option not clear which option I have selected | | | |
| | Button | | can't find the add to compare option | couldn't find add to compare until scrolled, not expecting that | | |
| | Icons | | | | | when select add to compare expect to go to compare page or msg to say it saved |
| | User added to compare | Y | N | N | Y | Y |
| | User looked at compare | Y | Y | Y | Y | Y |
| | User selected option in list | Y | Y | Y | Y | Y |
| | User selected share. | Y | N | Y | Y | N |
| | I was happy with the number of options I could compare. | 3 | 3 | 3 | 3 | 3 |
| | I could easily compare options in one glance. | 3 | 3 | 3 | 3 | 3 |
| | I could easily share my options with friends. | 3 | 3 | 3 | 3 | 3 |
| 8 - RECOMMEND | I could easily add places to compare. | 3 | 1 | 1 | 1 | 1 |
| | Text | | | | | wasn't expecting this to be in the app |
| | Button | | | | | |
| | Icons | | | expected the yes and no to be thumbs up and down to match | | |
| | User looked at friends recommendations. | N | N | Y | Y | N |
| | User chose yes or no | Y | Y | Y | Y | Y |
| | I could easily recommend a place after visiting. | 3 | 3 | 2 | 3 | 3 |
| | It was clear how the recommendation system worked. | 3 | 3 | 3 | 3 | 3 |
| | I would recommend this app to friends. | 3 | 3 | 3 | 3 | 3 |
| | I would be happy to be nudged with the notification. | 3 | 2 | 3 | 2 | 3 |
| | I would use this recommendation system. | 3 | 3 | 3 | 3 | 3 |
| | It was clear friend's recommendations were available. | 3 | 3 | 3 | 3 | 3 |
| | Understanding the recommendation system | 0 | 1 | 1 | 0 | 0 |
| | Select a recommendation | 2sec | 5sec | 3sec | 2sec | 3sec |

THINK ALOUD **SURVEY** **CLICKS** **ERRORS** **TIME**

Appendices

C High Fidelity Prototype

C.1 Evaluation Protocol

EVALUATION PROTOCOL

High Fidelity Prototype

Tean-louise Cunningham (42637460)

HCI Experts individually perform a Heuristic evaluation of the high fidelity prototype to determine as a non-use if it meets a standard of usability.

PREPARATION

Since this is an individual evaluation only myself and the participant will be involved. Therefore, I will be fulfilling the role of facilitation, observation, recording and interaction flow. The following materials will be prepared for the user prior to the evaluation.

- 1. Electronic consent form
- 2. Digital high fidelity prototype
- 3. figma prototype presentation
- 4. Google forms with instructions
- 5. Google sheets for heuristic
- 6. Zoom software

INTRODUCTION

Opening Statement

User has been sent a link with survey and instructions on Google Forms. User's screen is being shared over an online conference call.

Thank you for taking the time today to provide some feedback on the early stages of a mobile application. The purpose of this app is to assist you with deciding where to dine out using an interactive map, filtered preferences and comparison feature.

Today, you as a HCI expert, will complete a heuristic evaluation with a provided set of criteria to determine if the application meets a minimum standard of usability. There are two phases. The first is a basic walkthrough to get a feel for the application and the second phase is your analysis of usability based on the given heuristics.

Consent

Before we get started, please read carefully through this consent form. It reiterates the purpose for today and how your data will be used. Your personal details will not be used directly in any way and all observations are of your interaction with the software only. If you like to proceed with contributing please fill out this form and upload with the given link.

User reads through and fills out consent electronically with provided link and uploads.

Thanks for filling that out, please save it on your computer for the time being. If at any time you don't wish to continue just let me know and we will stop, and none of your feedback will be used. A reminder that I am only testing the software and not evaluating you.

HEURISTIC EVALUATION

Instructions - Phase 1

Let's get started with Phase 1. This step is to simply get a feel for the application. Select NEXT on the Google Form. On this page you will see a list of tasks to complete using the application (based on user needs) and a link to the prototype.

Keep this page open to refer back to. Please follow the link to open the prototype. Take your time to explore the application by performing the provided tasks which will access every feature of the application. When you feel comfortable we will move on to phase two.

User is able to find the link and has no questions.

You can start. Please ask any questions you may have.

The user has expressed that they feel comfortable with the application at this time.

Instructions - Phase 2

Now that you are more familiar with the application, it is time to look at the specific features of the application and determine their usability according to the chosen heuristics. Just as before you will complete each task while identifying issues. For each issue you are asked to describe the issue, assign it to one or more heuristic category and rate its severity.

There are ten heuristics which you will use in your analysis. Select NEXT on the Google Form to view a link that will take you to a list of these heuristics and what they mean. On the second sheet of this link is where you will be able to fill out all relevant issues and associated information.

User is able to find the link and has no questions.

You can start. Add as many issues as you like and feel free to discuss your process.

Walkthrough Tasks

When exploring the application, the expert will follow the steps during both phases to ensure every feature of this application is viewed and understood for analysis.

- Interactive map filtered by preference
 - 1. Select LOCATION, VEGETARIAN, ITALIAN, Italian, Vegetarian, \$15 - \$20, ALL MEALS.
 - 2. Search the map and choose a restaurant.
- Filter embedded restaurant menu by preference
 - 3. Scroll through the menu
- Promote Existing Deals
 - 4. Look at the deals
- Restaurant Info
 - 5. Check the opening hours of A PIZZA PLACE and go there
- Recommend to a friend
 - 6. Make a recommendation.
- View all reviews of PIZZA PLACE
- Favourite Restaurants
 - 8. Favourite A PIZZA PLACE
 - 9. Remove THAI LEGEND from your favourites.
- Track User History
 - 10. View A PIZZA PLACE in your history
- Remember preferences
 - 11. Set your default preferences
- Editable and Shareable List
 - 12. Add BURGER SHACK to compare.
 - 13. Remove FISH & CHIPS from compare.
 - 14. Share list.

Heuristics

- 1. Provide immediate notification of application status.
- 2. Use a theme and consistent terms, as well as conventions and standards familiar to user.
- 3. Prevent problems where possible; assist users should an error occur.
- 4. User control and freedom.
- 5. Each interface should focus on one task.
- 6. Recognition rather than recall
- 7. Aesthetic and minimalist design
- 8. Design a clear navigable path to task completion
- 9. Allow configuration options and shortcuts.
- 10. Facilitate easier input

Observations

For each issue the following will be recorded (as outlined on the form) as a part of stage two:

- Screen/element description
- Usability issue
- Heuristic Category
- Probable effect on user
- Severity rating
 - Frequency - of encountering problem: rare, common
 - Impact - of problem: low, high
 - Persistence - how easy to overcome: not, very

Conclusion

All done. Thank you so much for your time today. Just a reminder that if you would like to withdraw at any time, let me know and your data will not be used. Thank you for your time, it is greatly appreciated and your data is very valuable.

C.2 Evaluation - Google Forms

Dining out - High Fidelity

Thank you for taking the time today to provide some feedback on the early stages of a mobile application. The purpose of this app is to assist you with deciding where to dine out using an interactive map, filtered preferences and comparison feature.

Today, you as a HCI expert, will complete a heuristic evaluation with a provided set of criteria to determine if the application meets a minimum standard of usability. There are two phases. The first is a basic walkthrough to get a feel for the application and the second phase is your analysis of usability based on the given heuristics.

Consent

Before we get started, please read carefully through this consent form. It reiterates the purpose for today and how your data will be used. Your personal details will not be used directly in any way and all observations are of your interaction with the software only. If you like to proceed with contributing please fill out this form and then we will get started.

<https://deco7250-wfixrepkka-uc.a.run.app/index.cfm>

1. Please upload your consent form here.

Files submitted:

Heuristic
Evaluation -
Phase 1

Keep this page open to refer back to. Please follow the link to open the prototype.
<https://www.figma.com/proto/rCw4aKBYhtVva2xiZRhB9c/High-Fidelity?node-id=188%3A29697&scaling=min-zoom>

Take your time to explore the application by performing the provided tasks which will access every feature of the application.
When you feel comfortable we will move on to phase two.

2. Interactive map filtered by preference

Tick all that apply.

- 1. Select LOCATION, VEGETARIAN, ITALIAN,\$15 - \$20, ALL MEALS.
- 2. Search the map and choose a restaurant.

3. Filter embedded restaurant menu by preference

Tick all that apply.

- 3. Scroll through the menu

4. Promote Existing Deals

Tick all that apply.

- 4. Look at the deals

5. Restaurant Info

Tick all that apply.

- 5. Check the opening hours of A PIZZA PLACE and go there

6. Recommend to a friend

Tick all that apply.

- 6. Make a recommendation
- 7. View the reviews of PIZZA PLACE

7. Favourite Restaurants

Tick all that apply.

- 8. Favourite A PIZZA PLACE
- 9. Remove THAI LEGEND from your favourites.

8. Track User History

Tick all that apply.

- 10. View A PIZZA PLACE in your history

9. Customizable experience

Tick all that apply.

- 11. Set your default preferences

10. Editable and Shareable List

Tick all that apply.

- 12. Add BURGER SHACK to compare.
- 13. Remove FISH & CHIPS from compare
- 14. Share list.

Heuristic
Evaluation -
Phase 2

Look at the specific features of the application and determine their usability according to the chosen heuristics. For each issue you are asked to describe the issue, assign it to one or more categories and rate its severity.

Your responses will be recorded at the following link:

https://docs.google.com/spreadsheets/d/1G1VMep2cwNQ3Azcs21e_qMVXmbPxIVfm_fTDU1PFdB0/edit?usp=sharing

11. Interactive map filtered by preference

Tick all that apply.

- 1. Select LOCATION, VEGETARIAN, ITALIAN,\$15 - \$20, ALL MEALS.
- 2. Search the map and choose a location.

12. Filter embedded restaurant menu by preference

Tick all that apply.

- 3. Scroll through the menu

13. Promote Existing Deals

Tick all that apply.

- 4. Look at the deals

14. Restaurant Info

Tick all that apply.

- 5. Check the opening hours of A PIZZA PLACE and go there

15. Recommend to a friend

Tick all that apply.

- 6. Make a recommendation
- 7. View the reviews of PIZZA PLACE

16. Favourite Restaurants

Tick all that apply.

- 8. Favourite A PIZZA PLACE
- 9. Remove THAI LEGEND from your favourites.

17. Track User History

Tick all that apply.

- 10. View A PIZZA PLACE in your history

18. Custom default preferences

Tick all that apply.

- 11. Set your default preferences

19. Editable and Shareable List

Tick all that apply.

- 12. Add BURGER SHACK (saved) to compare.
- 13. Remove FISH & CHIPS from compare
- 14. Share list.

This content is neither created nor endorsed by Google.

Google Forms

C.3 Evaluation - Presentation

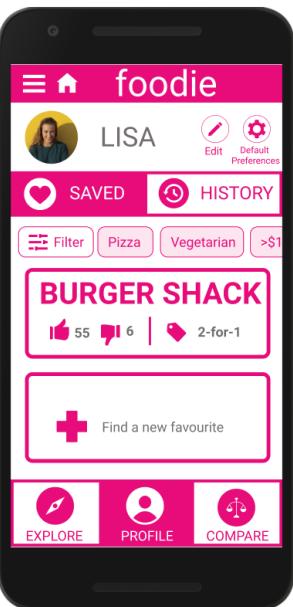
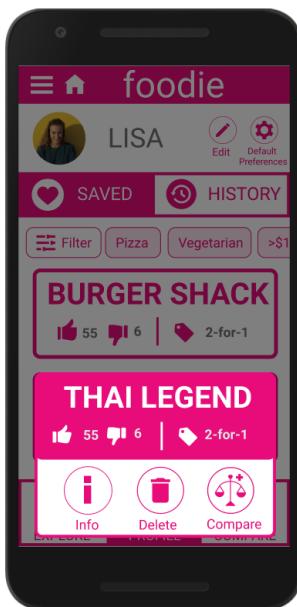
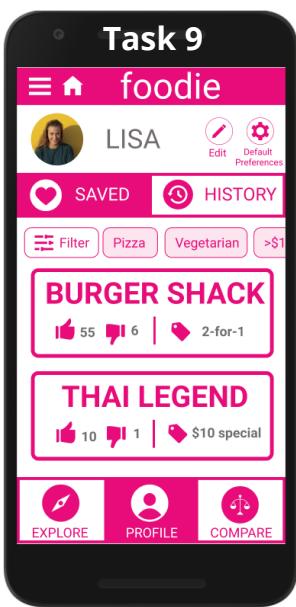
The figure displays a 4x2 grid of smartphone screens, each showing a different task or state of the 'foodie' mobile application. The app has a pink header with the word 'foodie' and a navigation bar below it.

- Task 1:** Shows the initial search screen with filters for LOCATION, DIETARY, CUISINE, PRICE, and MEAL. The 'VEGETARIAN' option is selected. Buttons include 'GO', 'EXPLORE', 'PROFILE', and 'COMPARE'.
- Task 2:** Shows the results of the search for 'ST LUCIA 4066'. It includes a map of the area with several location markers. Buttons include 'Filter', 'Pizza', 'Vegetarian', and '\$>\$10'.
- Task 3:** Shows a detailed view of a pizza place. The top shows a large image of a pizza. Below it is a card for 'A PIZZA PLACE' with social metrics: Friends (100), Likes (55), Dislikes (6). Buttons include 'MENU', 'DEALS', 'ABOUT', 'Filter', 'Pizza', 'Vegetarian', and '\$>\$10'. Below the card is a menu list:

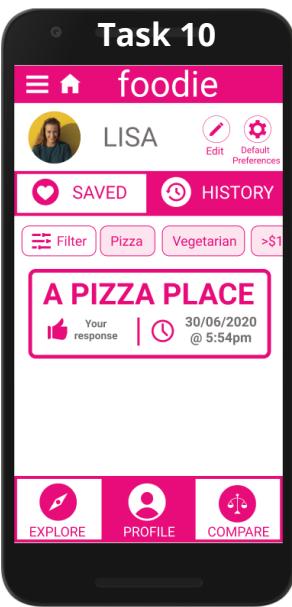
| | |
|---------------------|---------|
| Mushroom and garlic | \$15.15 |
| Pumpkin and basil | \$22.20 |
| Margerhita | \$15 |

 Action buttons at the bottom are 'Favorite', 'Directions', 'Call', and 'Compare'.
- Task 4:** Similar to Task 3, but with a dropdown menu for 'WEDNESDAY' and 'MEAL' (Lunch, Dinner) and additional details like '2-for-1 all day' and '4-6pm \$10 off v'. Action buttons are 'Favorite', 'Directions', 'Call', and 'Compare'.
- Task 5:** Similar to Task 3, but with more detailed information including address ('10 Coronation Drive, Auchenflower QLD 4066'), operating hours ('Monday - Saturday 10:00 - 20:00 Sunday 14:00 - 20:00'), and contact info ('pizzaplace.com (07) 1234 5678'). Action buttons are 'Favorite', 'Directions', 'Call', and 'Compare'.
- Task 6:** A survey screen asking 'WOULD YOU RECOMMEND 'A PIZZA PLACE'' with options: 'YES', 'NO', and 'DIDN'T GO'. A message says 'Your response has been saved.' Action buttons are 'EXPLORE', 'PROFILE', and 'COMPARE'.
- Task 7:** Similar to Task 3, showing the 'A PIZZA PLACE' card with social metrics and a menu. Action buttons are 'Favorite', 'Directions', 'Call', and 'Compare'.
- Task 8:** Similar to Task 3, showing the 'A PIZZA PLACE' card with social metrics and a menu. Action buttons are 'Favorite', 'Directions', 'Call', and 'Compare'.

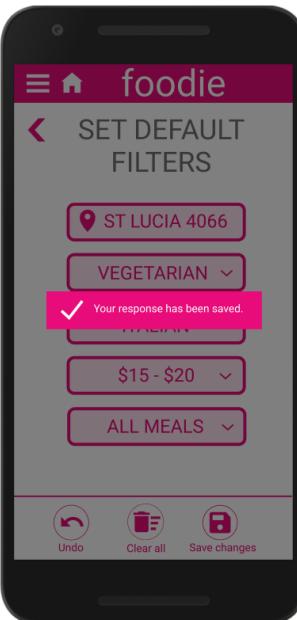
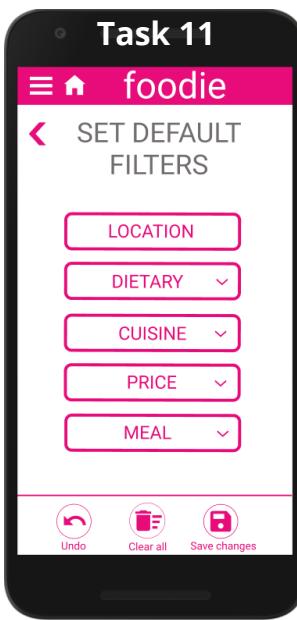
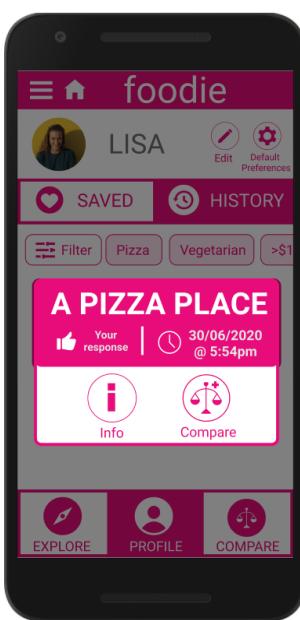
Task 9



Task 10



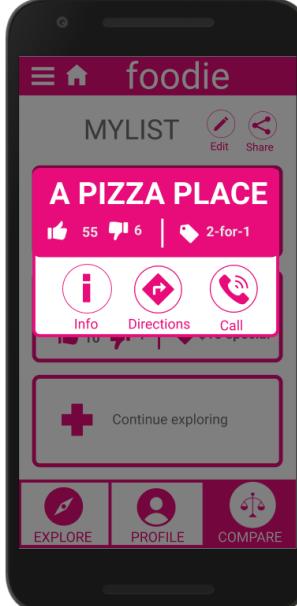
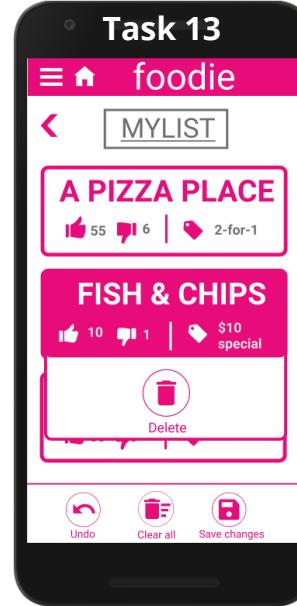
Task 11



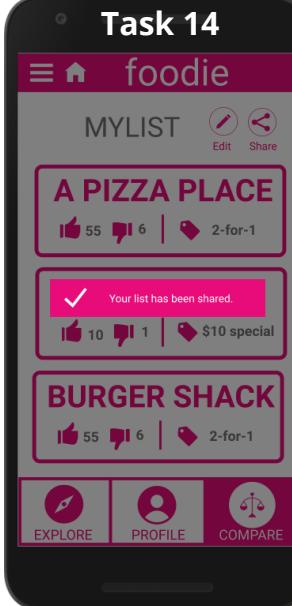
Task 12



Task 13



Task 14



C.4 Evaluation - Notes Template

Heuristics (Tab 1)

| HEURISTICS | |
|---|--|
| 1. Provide immediate notification of application status. | <i>Ensure the mobile application user is informed of the application status immediately and as long as is necessary. Where appropriate do this non-intrusively, such as displaying notifications within the status bar.</i> |
| 2. Use a theme and consistent terms, as well as conventions and standards familiar to user. | <i>Use a theme for the mobile application to ensure different screens look alike. Also create a style guide from which words, phrases and concepts familiar to the user will be applied consistently throughout the interface, using a natural and logical order. Use platform conventions and standards that users have come to expect in a mobile application such as the same effects when gestures are used.</i> |
| 3. Prevent problems where possible; assist users should an error occur. | <i>Ensure the mobile application is error-proofed as much as is possible. Should an error occur, let the user know what the error is in a way they will understand, and offer advice in how they might fix the error or otherwise proceed.</i> |
| 4. User control and freedom. | <i>Users often choose system functions by mistake and will need a clearly marked "emergency exit" to leave the unwanted state without having to go through an extended dialogue. Support undo and redo.</i> |
| 5. Each interface should focus on one task. | <i>Being focusing on one task ensures that mobile interfaces are less cluttered and simple to the point of only having the absolute necessary elements onscreen to complete that task. This also allows the interface to be glanceable to users that are interrupted frequently.</i> |
| 6. Recognition rather than recall | <i>Minimize the user's memory load by making objects, actions, and options visible. The user should not have to remember information from one part of the dialogue to another. Instructions for use of the system should be visible or easily retrievable whenever appropriate.</i> |
| 7. Aesthetic and minimalist design | <i>Dialogues should not contain information which is irrelevant or rarely needed. Every extra unit of information in a dialogue competes with the relevant units of information and diminishes their relative visibility.</i> |
| 8. Design a clear navigable path to task completion | <i>Users should be able to see right away how they can interact with the application and navigate their way to task completion.</i> |
| 9. Allow configuration options and shortcuts. | <i>Depending on the target user, the mobile application might allow configuration options and shortcuts to the most important information and frequent tasks, including the ability to configure according to contextual needs.</i> |
| 10. Facilitate easier input | <i>Mobile devices are difficult to use from a content input perspective. Ensure users can input content more easily and accurately by, for instance displaying keyboard buttons that are as large as possible, as well as allowing multimodal input and by keeping form fields to a minimum.</i> |

Expert Notes Template (Tab 2)

| EXPERT # | | | | | | | |
|----------|-----------------------------|----------------------------|---------------------------|-------------------------------|------------------------------|------------------------------|--------------------------|
| | Screen/ element description | Usability issue | Heuristic Category | Probable effect on user | Severity rating | | |
| | | | | | Frequency (Rare Common) | Impact (Low High) | Persistence (Very Not) |
| EXAMPLE | eg. main filter screen | eg. font too small to read | eg. 4 - control & freedom | eg. annoyance, can't continue | eg. rarely encounter problem | eg. impact of problem is low | eg. not easy to overcome |
| ISSUE 1 | | | | | | | |
| ISSUE 2 | | | | | | | |
| ISSUE 3 | | | | | | | |
| ISSUE 4 | | | | | | | |
| ISSUE 5 | | | | | | | |
| ISSUE 6 | | | | | | | |
| ISSUE 7 | | | | | | | |
| ISSUE 8 | | | | | | | |
| ISSUE 9 | | | | | | | |
| ISSUE 10 | | | | | | | |
| ISSUE 11 | | | | | | | |
| ISSUE 12 | | | | | | | |
| ISSUE 13 | | | | | | | |
| ISSUE 14 | | | | | | | |
| ISSUE 15 | | | | | | | |

C.5 Evaluation - Expert Notes

| Screen/ element description | Usability issue | Heuristic Category | Probable effect on user | Severity rating | | |
|-----------------------------|---|--------------------|--|------------------------------|------------------------|-----------------------------|
| | | | | Frequency (Rare Common) | Impact (Low High) | Persistence (Very Not) |
| EXPERT 1 | | | | | | |
| main filter screen | box doesn't tick when clicking text | 3, 10 | harder to tick box | common | low | very |
| main filter screen | whole button doesn't open dropdown | 8, 10 | harder to open menu | common | high | very |
| restuarant info page | cannot view detailed reviews | 2 | cannot read reviews | common | high | very |
| default preferences | not easy to see save button | 6 | dont save preferences | common | high | not |
| compare list | cannot easily remove item | 4 | too many steps to delete an item | common | low | not |
| various screens | clicking non-arrow button area does not open menu | 3 | need to click the same button multiple times | common | high | very |
| EXPERT 2 | | | | | | |
| Home, restaurant | Expected I could click anywhere on page to save selection and close dropdown | 4 | Would not have known choice wasn't saved | rare | low | very |
| Home/ search | How to clear selections? Currently Home button does this. | 3, 4 | Might help in changed mind during process | rare | low | not |
| Home / search | If home button wasn't meant to clear selection, should there be a home button on the page? Suggests this isn't the me page. | 3 | None really unless lost / new user | rare | low | not |
| Profile / restaurant | back button on restaurant page taking back to map | 4 | Get lost, need to find way back | rare | low | not |
| Compare/ mylist | Would like to have delete option when click on restaurant | 4 | would be a bonus | rare | low | not |
| Mylist / edit | Edit page possibly redundant | 9 | 2 less steps, going to edit page and then back after | rare | low | not |
| EXPERT 3 | | | | | | |
| main page | have to click down button icon | 10 | annoyance | common | low | very |
| main page | have to click down button to save selection | 10 | annoyance, get results that you don't want | common | low | very |
| pizza page | have to click deals word rather than the whole tab | 10 | annoyance | rare | low | not |
| all | the colour pink, orange sparks hunger and thirst | 7 | the colour pink does not make me feel hungry but rather distracts the user from food | common | high | very |
| restaurant page | short cut to compare page, you have to go back to map to go to the compare | 9 | user gets lost having to return to the map and then moving into compare | rare | high | not |
| restaurant page | short cut to favourites page, you have to go back to map to go to the favourites | 9 | user gets lost having to return to the map and then moving into favourites | rare | high | not |
| history | should be able to save from here | 9 | have to go and try and search for it again | rare | high | very |
| my list | have to go to edit and then click and remove before the restaurant and then go back and refreshes the list page | 7,8 | this could be a delete button when the user clicks on the restaurant | rare | high | not |
| EXPERT 4 | | | | | | |
| Main | Want to touch anywhere on the box, not on the down arrow as it is small | 10 | annoyance | common | low | not |
| Main | maybe have a reset button next to GO | 3 | annoyance | rare | low | not |
| Restaurant | There are a number of different sections of this page | 5 | slow the user down, or send in wrong direction | common | low | very |
| Restaurant | menu is quite small | 7 | lots of scrolling if menu is long, annoyance | common | low | not |
| Recommendation | Small pause before the saved pop-up and then it stays on screen until user clicks again | 1 | User might try to click twice | rare | low | not |
| Recommendation | Clicking on the saved pop-up doesn't make it disappear | 4 | May not be able to navigate away as expected | rare | low | not |
| Restaurant | Can not click on the thumbs, other apps have this functionality | 2 & 10 | May confuse user when they cannot enter a review here | common | high | very |
| Profile | Edit button is not for changing the saved places | 8 | Delete button is obscured, but edit is visible. However edit is for a different task | rare | low | not |
| History | Not able to delete | 4 | Evidence on marital infidelity | rare | low | very |
| Default | Unclear what the undo button is for | 8 | Users may not access this feature | common | low | not |
| My List | The cards here are not expandable with options like in the other pages | 2 | Users may not realise they need to use the edit button, frustration | common | low | not |
| My List | Save does not take the user away from the edit screen | 8 & 10 | Users may not know they are still editing, may expect to be back at the final list | common | high | not |
| EXPERT 5 | | | | | | |
| main page | have to click exactly on dropdown arrow to open | 10 | frustration, difficult to select | common | low | very |
| main page | can only select the box not the whole word for options | 10 | frustration, difficult to select | common | low | very |
| main page | must select arrow to close and save selection | 3,8 | doesn't save, can't continue | common | high | not |
| list page | have to go through too many options to delete an option | 3 | can't delete, frustration | rare | low | very |
| history | can't save an option from here | 9 | more steps | rare | low | very |
| deals | same issue with dropdowns as main | 3,8,10 | frustration, difficult to select | rare | low | very |
| default | not clear that need to select save | 1 | won't save, user won't know what to do | rare | high | not |
| restaurant | can't go directly to compare or favourites, have to go back to map first | 9 | more steps | rare | low | not |
| recommend | after choosing option, saved message has to be clicked out of and then back, | 8 | more steps, | common | low | very |
| saved | can't undo delete | 4 | mistakes can't be undone | common | low | not |

Appendices

D Summary

D.1 Conceptual Design

CONCEPTUAL DESIGN

SYSTEM CONCEPT STATEMENT

PROBLEM STATEMENT: Design and develop a mobile application that assists the user with finding a trusted place to eat out that matches their custom requirements and preferred habits conveniently.

INTERACTION PARAGIM: Mobile

INTERACTION MODE: Instructing

KEY METAPHORS



SYSTEM REQUIREMENTS

- 1 PROMOTE EXISTING DEALS**
Users are informed whether an option is in their budget.
- 2 EDITABLE AND SHAREABLE LIST**
User needs a way to review their options.
- 3 RESTAURANT INFO**
Information to make an informed decision.
- 4 INTERACTIVE MAP FILTERED**
Search for options relevant to user needs.
- 5 EMBEDDED MENU FILTERED**
All relevant information is available.
- 6 RECOMMEND TO A FRIEND**
Remove focus from reviews, encourage user interaction
- 7 TRACK USER HISTORY**
Easily re-visit restaurants
- 8 DEFAULT PREFERENCES**
Shortcuts for expert users
- 9 FAVOURITE RESTAURANTS**
Alternative way to search for options.

DESIGN PRINCIPLES

- OPEN TO CHANGE**
- MANAGEABLE STEPS**
- SIMPLIFY DECISION PROCESS**
- CLEAR DIRECTION & GUIDANCE**
- BE FAMILIAR**
- ENCOURAGE COLLABORATION**
- CUSTOMISATION OPPORTUNITIES**
- IMMEDIATE ACCESS TO ACTIONS**
- FLUID NAVIGATION**
- MINIMAL EFFORT**
- PURPOSEFUL MOVEMENT**
- CONSISTENCY**

UX GOALS

I want to...

- | | |
|---|---|
| <input type="checkbox"/> dine out at places that match my diet | <input type="checkbox"/> dine out at restaurants that have been recommended by word-of-mouth. |
| <input type="checkbox"/> eat what I am craving. | <input type="checkbox"/> re-visit restaurants that I enjoyed. |
| <input type="checkbox"/> choose where to eat based on my location | <input type="checkbox"/> dine out in my budget. |
| <input type="checkbox"/> view the menu of the place as it relates to me before going there. | <input type="checkbox"/> decide where in less than 20 minutes |
| <input type="checkbox"/> learn about the relevant deals of a place. | <input type="checkbox"/> support places without long reviews. |
| <input type="checkbox"/> access the basic information of a place. | <input type="checkbox"/> use my favourites to choose a place. |
| <input type="checkbox"/> compare a variety of restaurants at once | <input type="checkbox"/> visit a place without comparing options. |
| <input type="checkbox"/> share the experience of with friends | <input type="checkbox"/> save my preferences for next time. |
| <input type="checkbox"/> find new places to eat out. | |

D.2 Prototype Progression

LOW - MEDIUM - HIGH

Prototype Progression

The following section illustrates the progression of a mobile application prototype through eight stages, from low-fidelity wireframes to high-fidelity designs.

1. FILTER

2. MAP

3. MENU

4. DEALS

5. ABOUT

6. COMPARE

7. PROFILE

8. RECOMMEND