



simplify dining—just for you.



**Carina L.**

Product  
& Design



**Audrey S.**

Product  
& Development



**Ellie Y.**

Development  
& Design



**Hillary T.**

Design

## Value Proposition

simplify dining—just for you.

## Mission Statement

Our goal is to simplify the decision-making process for people dining out, based on their unique dietary profiles and logistic constraints.

## Problem & Solution Overview

We discovered that a lack of detailed information about full dining experiences makes it difficult for people to eat out. While general information and high-level reviews about food quality are now easily accessible, customers are typically unable to learn specifics about potential allergens, parking availability, COVID safety measures, and other factors. This poses a particular challenge for consumers with food restrictions, strong dietary preferences, or strict logistic constraints. Our solution, noms, provides granular information about dining experiences to customers based on the unique factors that they prioritize over others.

## Needfinding

To scope out potential problems in this space, we interviewed a mix of consumers, such as people who typically eat on a budget or have time constraints, and creators, including individuals who actively follow food trends and heavily rely on the internet to explore restaurants. After interviewing eight individuals from diverse backgrounds, we found the following insights & needs:

- People want to know more details about potential dining experiences, ranging from service quality to food ingredients
- Time is often the biggest inconvenience and constraint for full-time workers
- People want value from their meals, whether it's from eating out or cooking
- Food is a huge part of people's lives because it is associated with both feelings of frustration and satisfaction—a good or bad meal affects one's mood



*Screenshot from a needfinding interview. Majority were conducted over Zoom.*



## Kiara

- **POV:**
  - We met Kiara, a Stanford student who has many restrictive food allergies. We were surprised to notice that she avoids asking about ingredients and just risks allergic reactions. We wonder if this means she's nervous about inconveniencing restaurant staff or her dining partners. It would be game-changing to provide her better certainty of restaurants' food options and dietary accommodations before entering.
- **HMW:**
  - How might we personalize dish recommendations based on each customer's dietary needs and preferences?
  - How might we help people feel proud & open about dietary needs, like a badge to show off?
  - How might we make dietary accommodations & customizations the norm for any dish?

## Generous

- **POV:**
  - We met Generous, a Yelp Elite reviewer who enjoys trying new restaurants. We were surprised to notice that he was previously hesitant to try new cuisines and used to only eat at the same buffet restaurant. We wonder if this means he's worried about dealing with more negative dining experiences and service issues. It would be game-changing to provide him with transparency about the "full" dining experience ahead of time, including service and hospitality.
- **HMW:**
  - How might we make the dining experience at restaurants as clear as shopping & ordering online?
  - How might we give a personalized recommendation (from someone you trust) for any restaurant?
  - How might we make unknown foods & cuisines more approachable?
  - How might we make every server at a restaurant feel like a friend?

## Terry

- **POV:**
  - We met Terry, an executive chef with 16 years of culinary experience. We were surprised to notice that he finds it a challenge to accommodate everyone's dietary needs, but still thinks "less" food options are better than "more". We wonder if this means he is afraid customers will get overwhelmed with too many options and thinks too many customizations are inefficient. It would be game-changing to give him the creative freedom to cook what he wants while still meeting everyone's dietary needs.
  
- **HMW:**
  - How might we make it easier for chefs to get an accurate sense of their customers' pre-existing preferences?
  
  - How might we make the task of accommodating everyone's needs less stressful?
  
  - How might we make selecting from restaurants' multiple food options feel as straightforward as ordering at In-n-Out?

## **Top 3 Solutions**

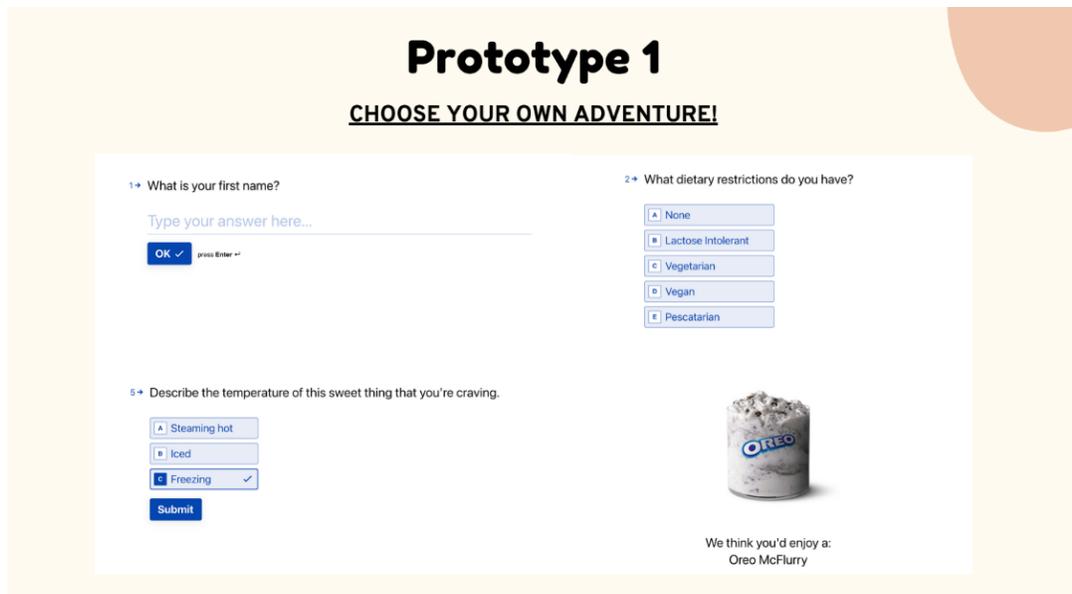
After brainstorming solutions for each of our top HMW questions, we selected the three approaches that best addressed each interviewee's key needs.

1. Gamify the dish selection process, so customers can easily get personalized recommendations based on their food preferences & needs.
  
2. Filter menus by dietary restrictions, food allergies, main ingredients + Sort menus by price, popularity, recently "arrived" (e.g. new items on the menu).
  
3. Show chefs customer analytics of all the dishes they serve.

# Experience Prototypes

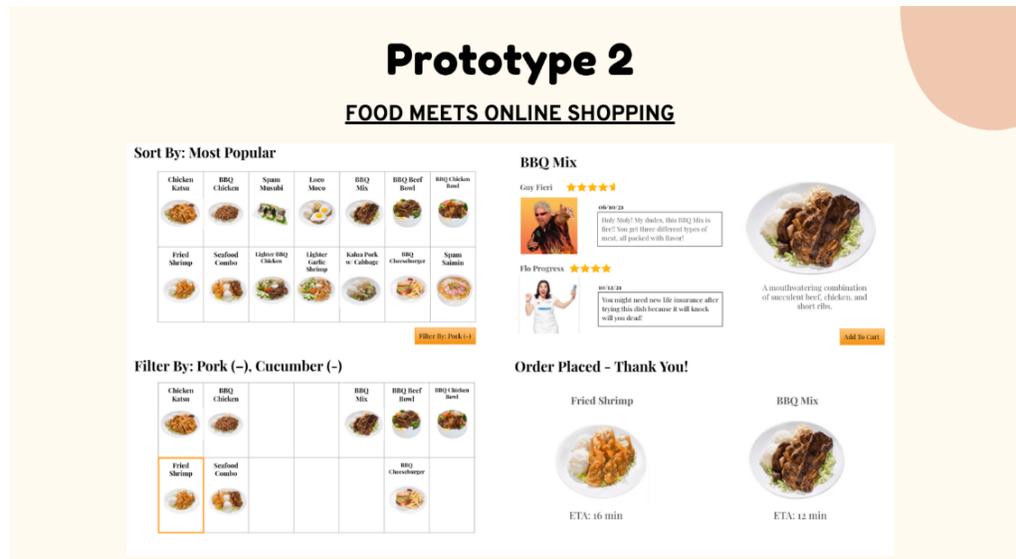
For each of our top three solutions, we created an experience prototype that we tested on new participants of differing backgrounds.

- **Prototype 1: Choose Your Own Adventure** → a gamified dish selection process where users answer a set of questions leading to a personalized recommendation
  - **Assumption:** Customers typically consider recommendations that fit their wants and needs, especially if it reduces time and effort.
  - Prototype:



What Worked Well	What Didn't Work
<ul style="list-style-type: none"> <li>● Personalized aspects (entering name, questions about dietary needs and cravings)</li> <li>● Recommended food met user's expectations</li> </ul>	<ul style="list-style-type: none"> <li>● Form could not remember previous answers (user has to fill out questions for multiple recommendations)</li> <li>● No consideration of time, budget, etc.</li> </ul>

- **Prototype 2: Food Meets Online Shopping** → a refined food ordering platform that filters restaurant menus according to user’s dietary preferences and restrictions, provides detailed reviews about a dish, and order status details
  - Assumption: Customers want to remove options that do not fit their criteria while viewing as much relevant information as possible.
  - Prototype:

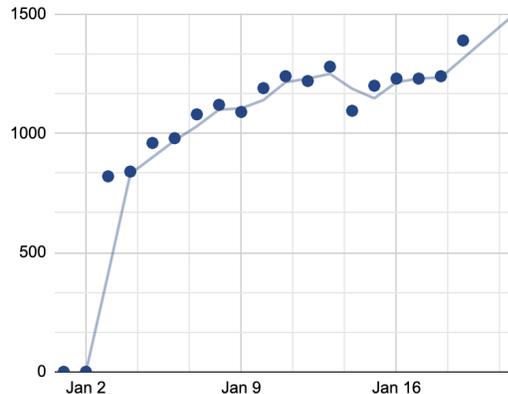


What Worked Well	What Didn't Work
<ul style="list-style-type: none"> <li>● Option to choose and layer on multiple preferences</li> <li>● Intuitive functions</li> <li>● Menu sorting by popularity and reviews</li> </ul>	<ul style="list-style-type: none"> <li>● Can be unnecessarily restrictive (dishes can be made with certain ingredients vs removing an entire option)</li> <li>● Previous reviews can bias user’s decisions</li> </ul>

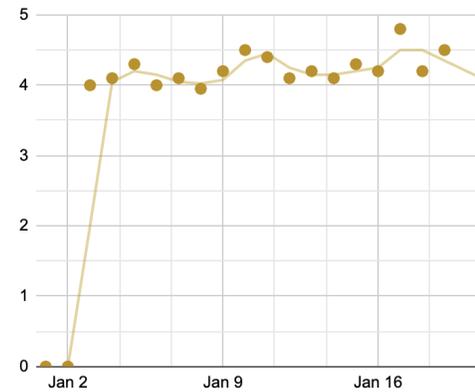
- **Prototype 3: Customer Data Analytics** → daily statistical reports on customer ratings and comments on a per-dish level along with monthly data trends
  - **Assumption:** Chefs want to get insightful feedback from customers to learn about and adapt to their needs and wants.
  - Prototype:

## MONTHLY DASHBOARD

### Daily Visitors



### Daily Rating



## DAILY REPORT

**DATE** Jan 19, 2022  
**TIME** Dinner  
**TOTAL VISITORS** 520

	# of Views	# of Servings Consumed	% of All Visitors	Conversion Rate	Ave Satisfaction Rating	# of Comments
Tonkatsu	510	440	84.6%	86.3%	4.5	82
Chicken Inasal	450	320	61.5%	71.1%	4.0	30
Soy Sesame "Chick'n" Stir-Fry	450	300	57.7%	66.7%	3.6	18
Garlic Rice	350	280	53.8%	80.0%	4.1	4
Roasted Eggplant	400	230	44.2%	57.5%	4.3	23
Chicken Posole Soup	250	80	15.4%	32.0%	3.8	5
Miso Soup	250	120	23.1%	48.0%	3.9	12
Performance Bar	500	450	86.5%	90.0%	4.0	5
Pasta Bolognese	450	300	57.7%	66.7%	3.5	6

What Worked Well	What Didn't Work
<ul style="list-style-type: none"> <li>● Daily reports with dish breakdown allows chef to make changes quickly</li> <li>● The data gives chef better idea of what kind and what amount of ingredients they should order</li> </ul>	<ul style="list-style-type: none"> <li>● Current dining system already shows student data (# of swipes, reported dietary restrictions)</li> <li>● Chefs want to hear more student thoughts rather than viewing numbers</li> </ul>

# Design Evolution

## Final Solution

Based on our interviews, users shared a common need for more detailed and digestible dining information when eating out. Specifically from Prototype 1, we validated that a quiz-type questionnaire was an engaging way for users to narrow down their food choices based on their own needs and/or preferences. From Prototype 2, we reasoned that the ease and flexibility of filtering out unwanted ingredients and sorting of prioritized aspects (i.e. price, wait time) made for helpful and unique features. While Prototype 3 helped us consider dining issues from a chef's perspective, their specific need for customer feedback did not strongly align with the other user needs and fell beyond the feasible scope of our project.

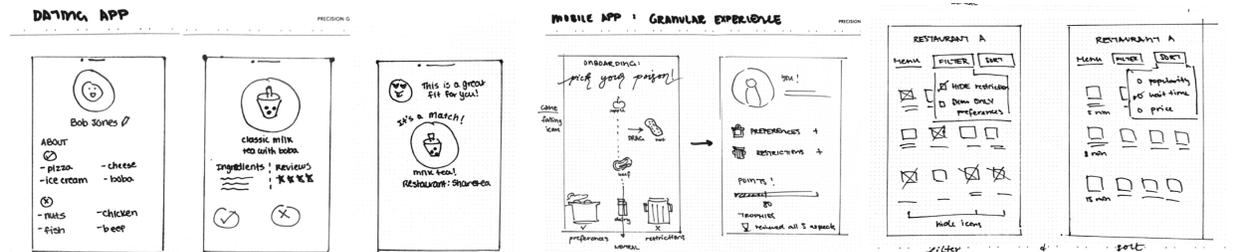
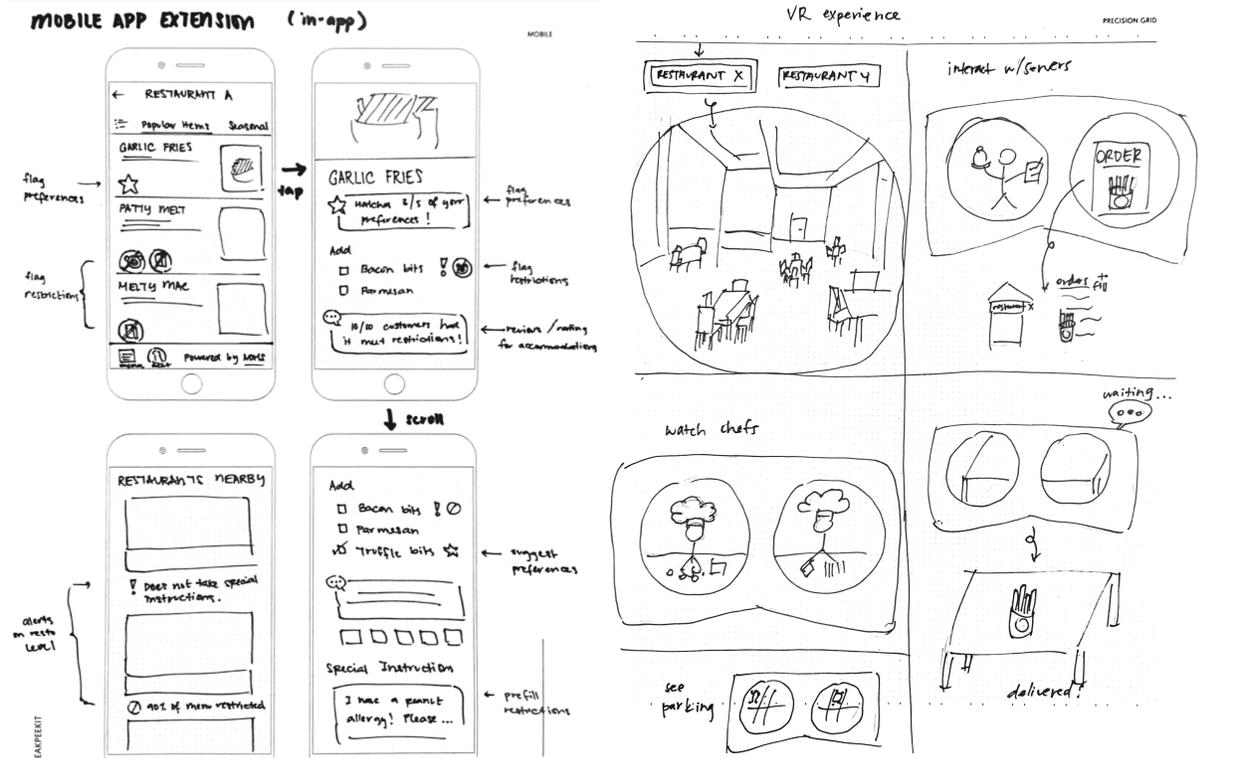
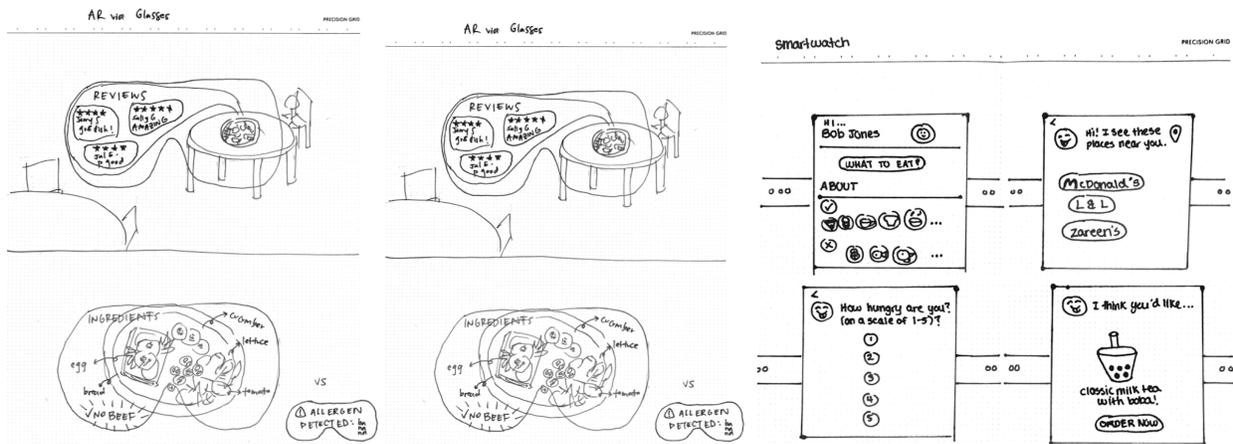
For our final solution, we designed a mobile app that provides granular information about the entire dining experience through a simple and customizable decision-making process that recognizes their dietary profiles and additional restrictions.

## Tasks

- **Task 1** (*Simple*): Get details on the full dining experience through a video walkthrough
  - This task allows users to be able to get a step-by-step overview of potential restaurants before they walk into it, helping them learn about details such as parking, which is typically overlooked on existing review platforms.
- **Task 2** (*Moderate*): Filter and sort restaurant menus
  - This task personalizes information discovery for users. Using the filters, dishes that do not fit a user's dietary profile are omitted so they can focus on their available options. Sorting allows users to prioritize items of greater relevance.
- **Task 3** (*Complex*): Get personalized dish recommendations through a quiz
  - This feature focuses on simplifying the selection process as it keeps in mind both the user's dietary needs and preferences. This helps users cut down on intensive searching to accommodate multiple restrictions.

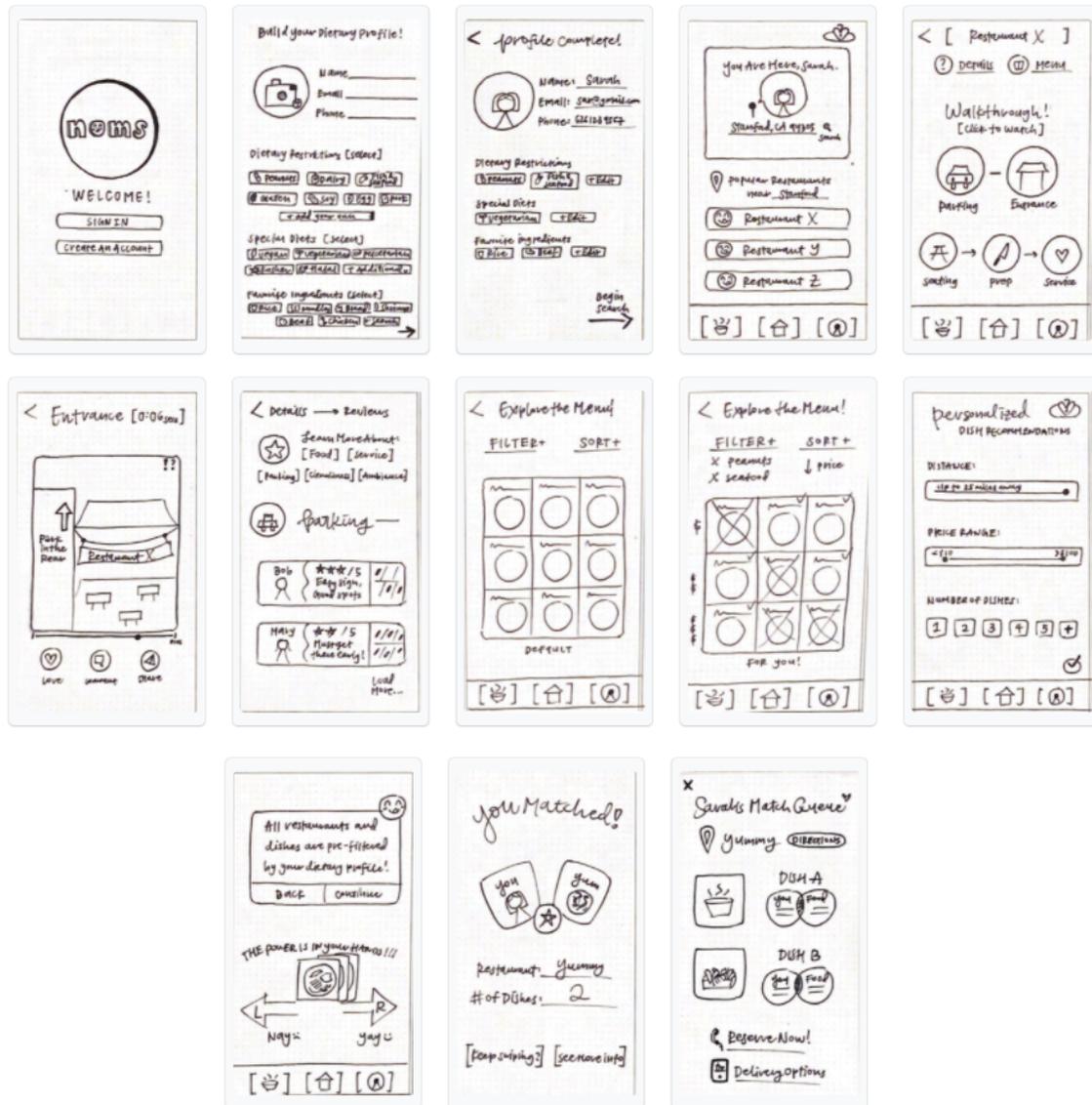
After solidifying our final solution and three tasks, we explored various design approaches for our platform. Through concept sketches, we considered a wide range of possibilities including immersive augmented reality and virtual reality experiences, smartwatch apps, and mobile apps and games.

# Concept Sketches



From these concept sketches, we developed storyboards for our top designs, which were the AR Glasses and Mobile App with swipe-based matching. After weighing the pros and cons of each design, we decided that the mobile app interface design would best encompass our solution and tasks. A mobile app is convenient, allows for location-based suggestions, and is intuitive and familiar to most users with smartphones. After sketching and storyboarding our three tasks for a mobile app interface, we created an interactive low-fi prototype using Marvel POP.

## Low-Fi Prototype



Storyboards of Task 1 (top), Task 2 (middle), Task 3 (bottom).

## Med-Fi Prototype

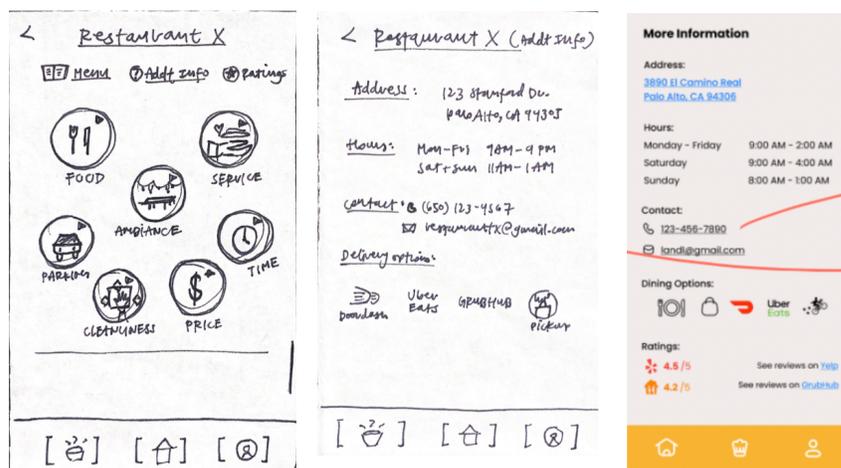
To test our initial prototype, we recruited individuals with diverse dietary profiles, restrictions, and dining priorities. Each participant was asked to complete tasks on the interactive Figma prototype while freely navigating and verbalizing their thought process. The users were positive about the customizable profile-building and the filtering/sorting of menus, since they could easily envision personal use cases. The dish recommendations feature garnered the most positive and negative feedback. Participants found it to be fun and the most unique feature, but also pointed out how the swiping did not match the style of our other task flows and that they preferred seeing a larger variety of suitable dishes versus only the ones they swiped on. Lastly, users suggested that we find ways to make dietary selections editable to account for temporary (day-to-day food preferences) and permanent (allergies) restrictions.

Based on this feedback, we made the following major changes for our med-fi prototype:

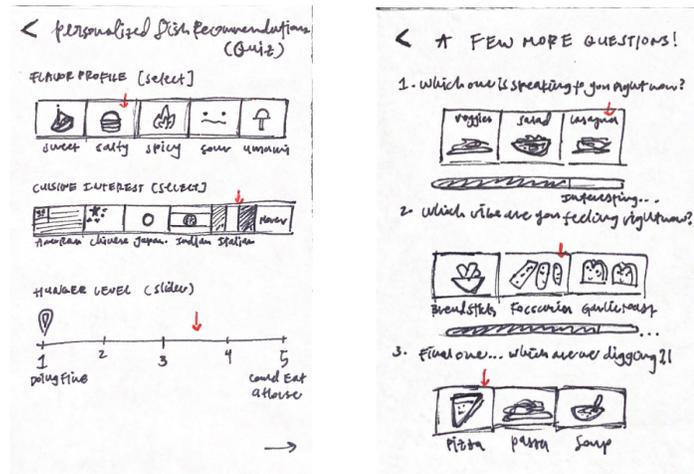
1. Making restaurant information more immediately accessible
2. Basing recommendations on dish features quizzes, rather than specific dish swipes
3. Additional user control before beginning the dish recommendation process
4. Removing in-app reviews; focusing on videos as part of the restaurant walkthrough

## Lo-fi to Med-fi Revisions

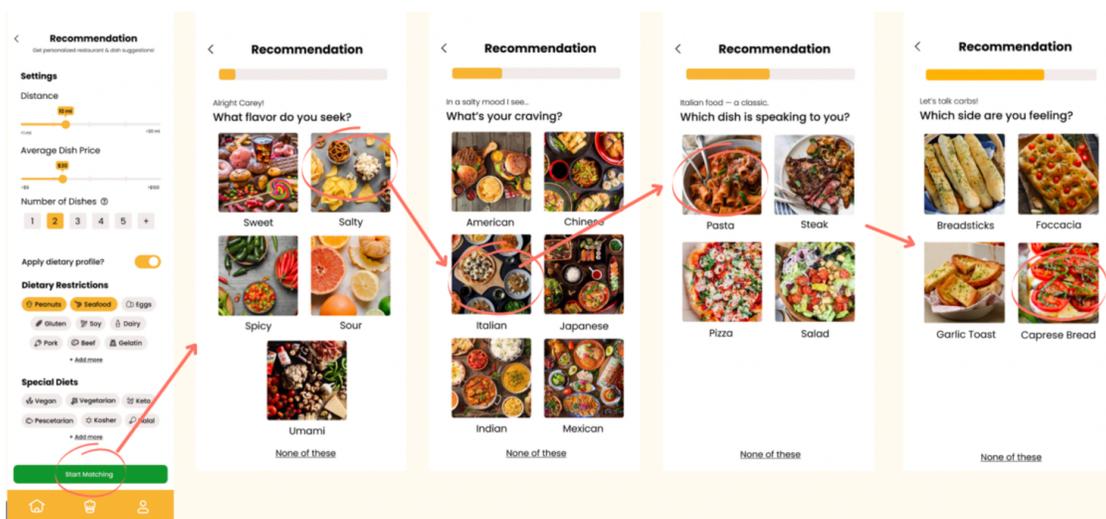
In our low-fi prototype, we had general restaurant information hidden at the end of a series of 2-3 clicks from the home page. For our redesigned model, we changed the format of our restaurant page to be scrollable with the general restaurant information right underneath the walkthrough videos.



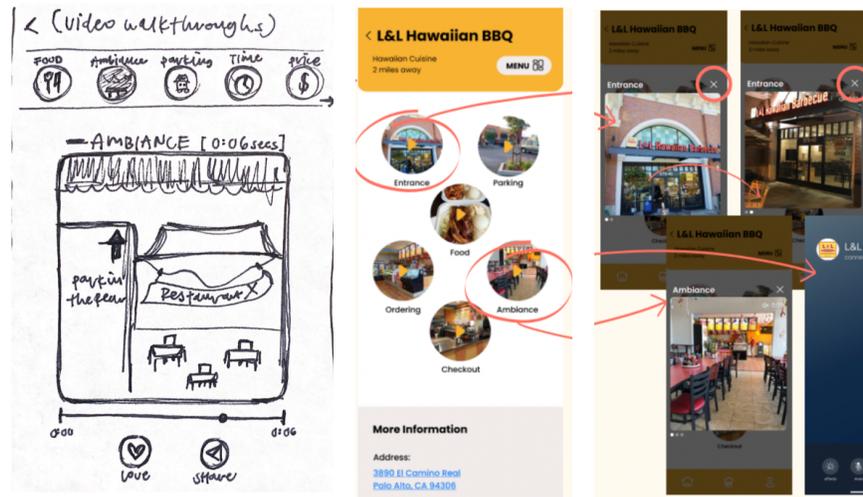
In our low-fi prototype, our dish recommendation feature gave users a list of dishes to swipe through, and eventually matched them to a menu that best met their needs. Our testers found that getting matched took long, especially for the few dishes they would receive. Also, the swiping limited their range of options.



In our redesigned model, we adapted a simple quiz-type questionnaire that asked the user open-ended questions about food profiles and items they wanted. Each answer they selected per question was considered in their final dish recommendation. We also included more preference settings for the user to edit before diving into the quiz.



In our low-fi prototype, we included a ratings/reviews section on our main page but realized that users found the step-by-step video walkthrough to be more valuable and unique. Since reviews were not part of our key value proposition, we decided to replace the reviews section with external links to other platform reviews, such as Yelp. We also redesigned the stories with more visible play icons and included examples of what it would look like to view each one.



### Med-fi to High-fi Revisions

From our heuristic evaluation we received a total of 22 major violations, 4 of which were severity four and 18 were severity three. Our most violated heuristics included User Control (5), Efficiency of Use (4), Value Alignment (4), and Fairness & Inclusion (4).

Some violations were caused by the med-fi tool limitations, and were already intended to be addressed in the high-fi prototype. Listed below are the violations grouped by section:

#### Onboarding Screens

1. Profile screen is information heavy; input fields are too small
2. Name field doesn't specify first or full name
3. Verification only via phone number
4. Lacking initial clarity on "unique" tasks for new users

Based on this feedback, we split registration & dietary profile input sections into two screens. We also specified full name, changed to registration via email address, and added an onboarding swiper with key tasks to give first-time users an idea of the purpose of our app.



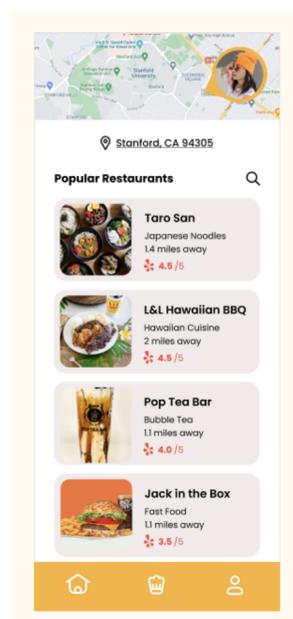
before

after

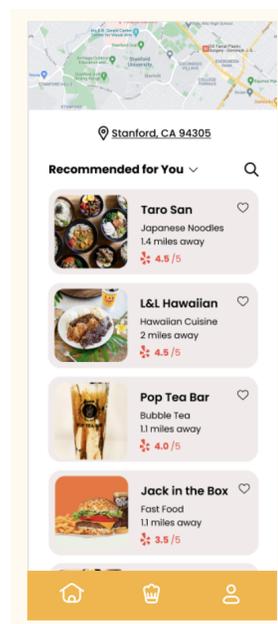
## Home Screen

5. Only able to set current location
6. Can't save restaurants or dishes for future reference
7. No filters or categorization beyond "Popular Restaurants"

From this feedback, we planned to add a functional category dropdown for restaurants on the home page (Popular Restaurants, Recommended for You, Distance), and store "saved" restaurants in the profile page. However during development, we decided to focus on other features as these details were not the focus of our app. We also decided to hard-code the location to Stanford due to time constraints and feasibility.



before

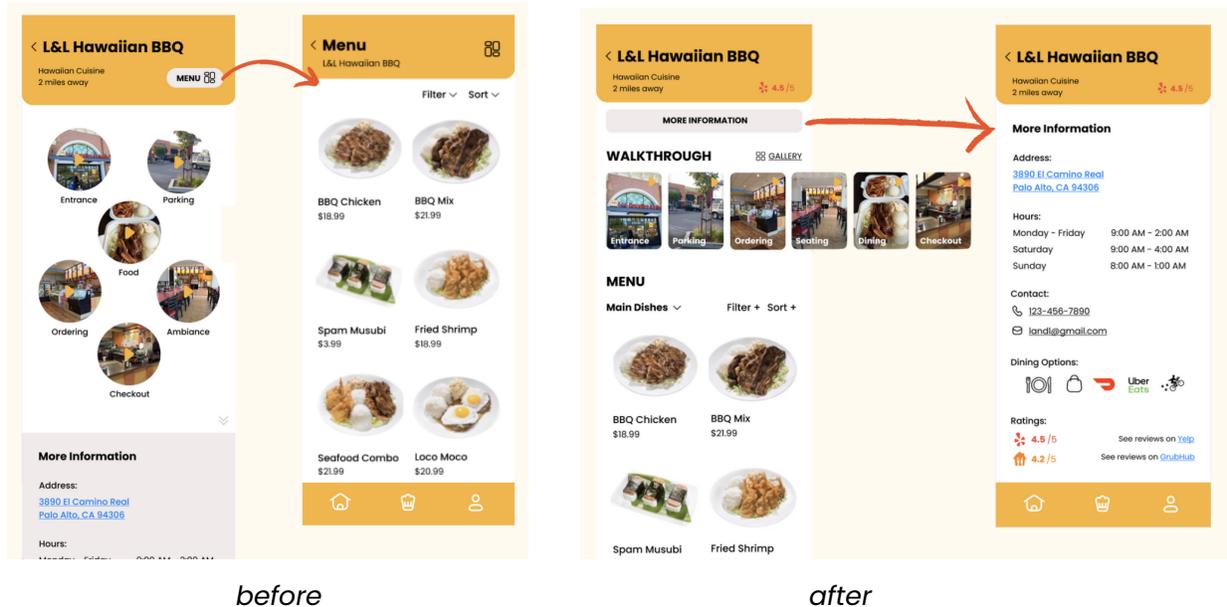


after

## Restaurant Screens

8. Videos take up too much real estate
9. Videos are not accessible for users with impaired sight or hearing
10. Labels for “Food” and “Menu” button are confusing
11. Menu is too hidden; should be displayed more prominently

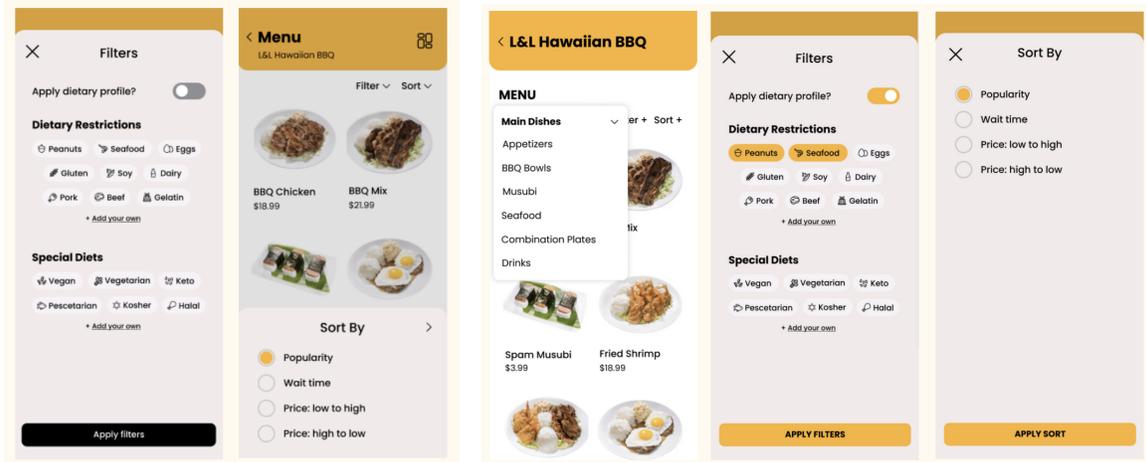
To make the menu more accessible to users, we embedded it in the main restaurant page so users would not have to click additional buttons. We also changed our walkthroughs to slide in a horizontal carousel so they would take up less space, updated the style to match the look of our app, and updated the label of “Food” to “Dining” to reduce confusion. Due to complexity, we were unable to add accessibility options for the videos/images, but this is something we would certainly explore in the future to make our app more accessible.



## Menu Screens

12. Can't close the sort pop-up without a selection
13. Sort pop-up appears at the bottom of the screen instead of the top
14. Unable to order food directly

Based on this feedback, we added a close button to the sort pop-up and moved the pop-up to cover the entire screen. Since ordering food directly is not part of the key value proposition for noms, we did not implement changes based on this feedback. We also added menu categories (Appetizers, Main, All Dishes) based on studio feedback to make it easier for users to narrow their searches.



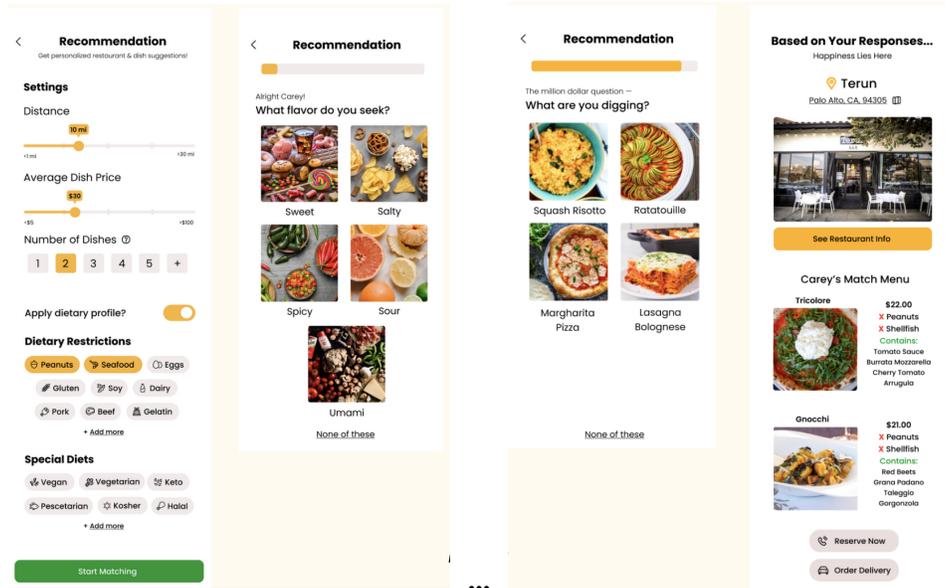
*before*

*after*

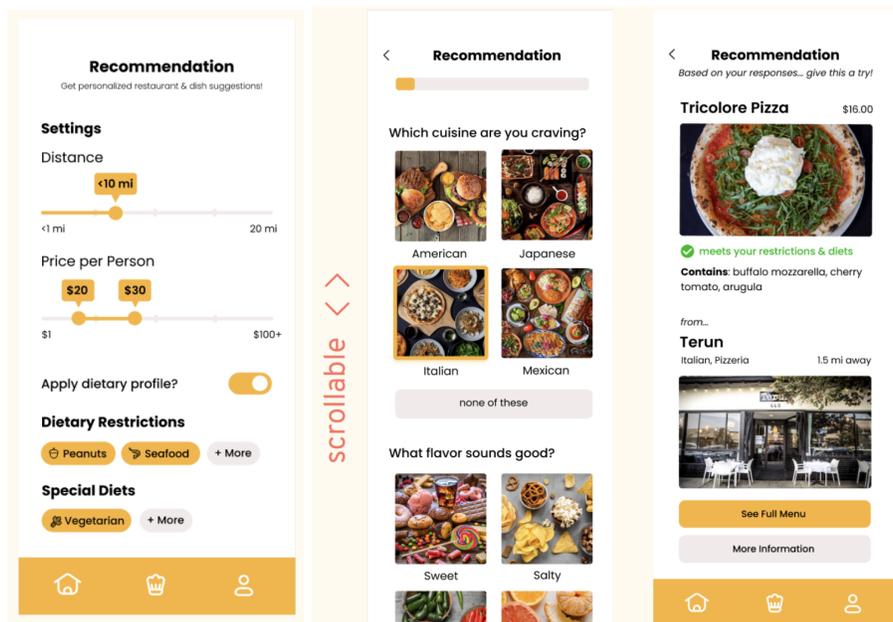
### Recommendation Screens

15. Only able to navigate question flow via back buttons (difficult to edit previous answers or exit)
16. Sliders are too small; hard to see the exact value
17. Price slider doesn't specify if it takes the average/less than value
18. Match results are not relevant or personalized enough
19. Can't load more dishes from the suggested restaurant
20. Unable to select multiple choices for recommendation questions

We made the question flow a scrollable screen instead of multiple screens, so that users could more easily go back and see or edit their selections. Additionally, we added lower and upper limits for the price slider, hard-coded recommendation paths based on answers, and added a button to go to the menu/restaurant page on the result page. We also reduced the number of questions from 5 to 3 and ultimately did not allow multiple-choice selections to reduce complexity.



before

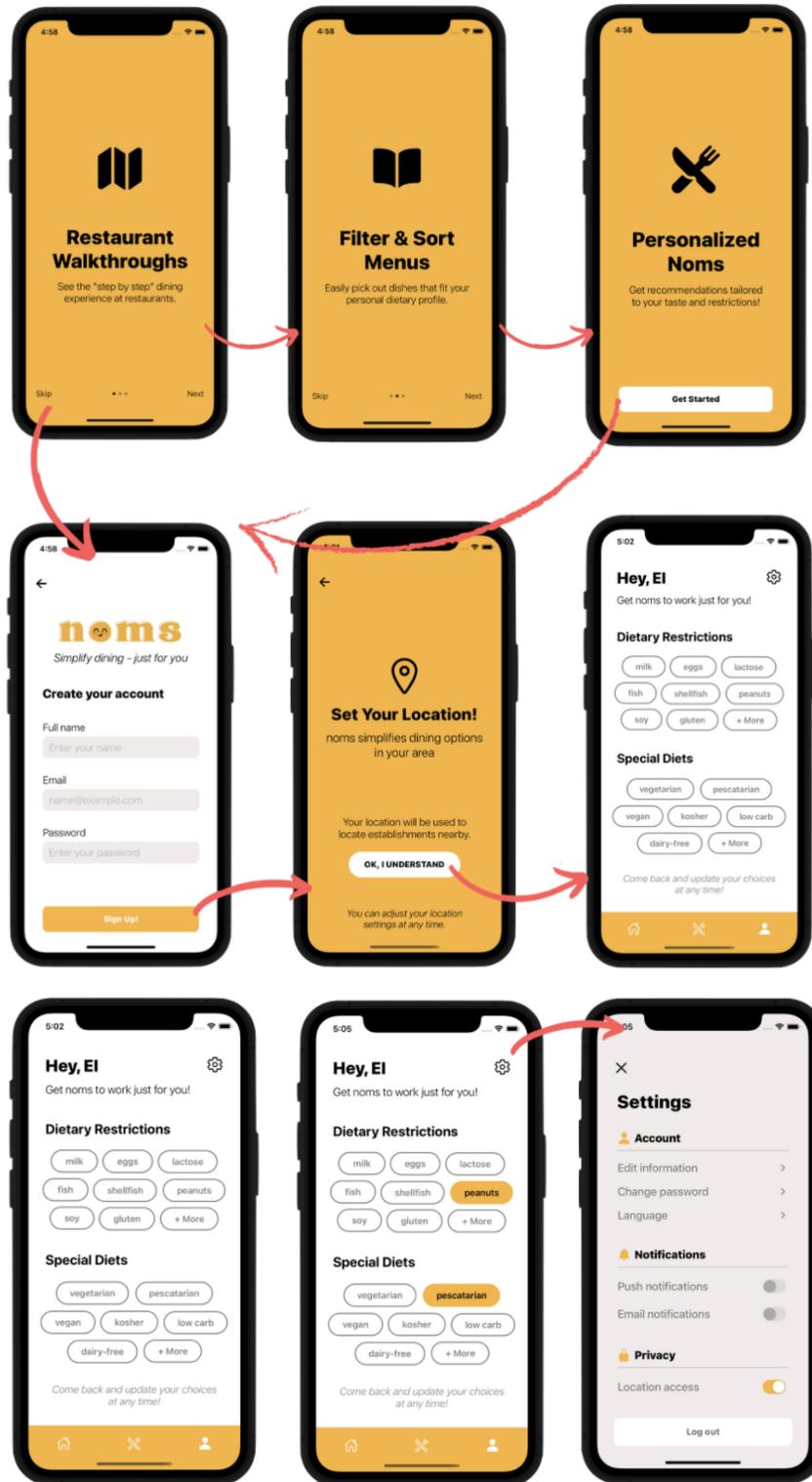


after

In summary, we had 22 violations of severity 3 and 4, and we addressed all of them. We had a few exceptions, where one violation was not directly related to our value proposition, and 3 fixes were not immediately implemented because of complexity and hard-coded constraints.

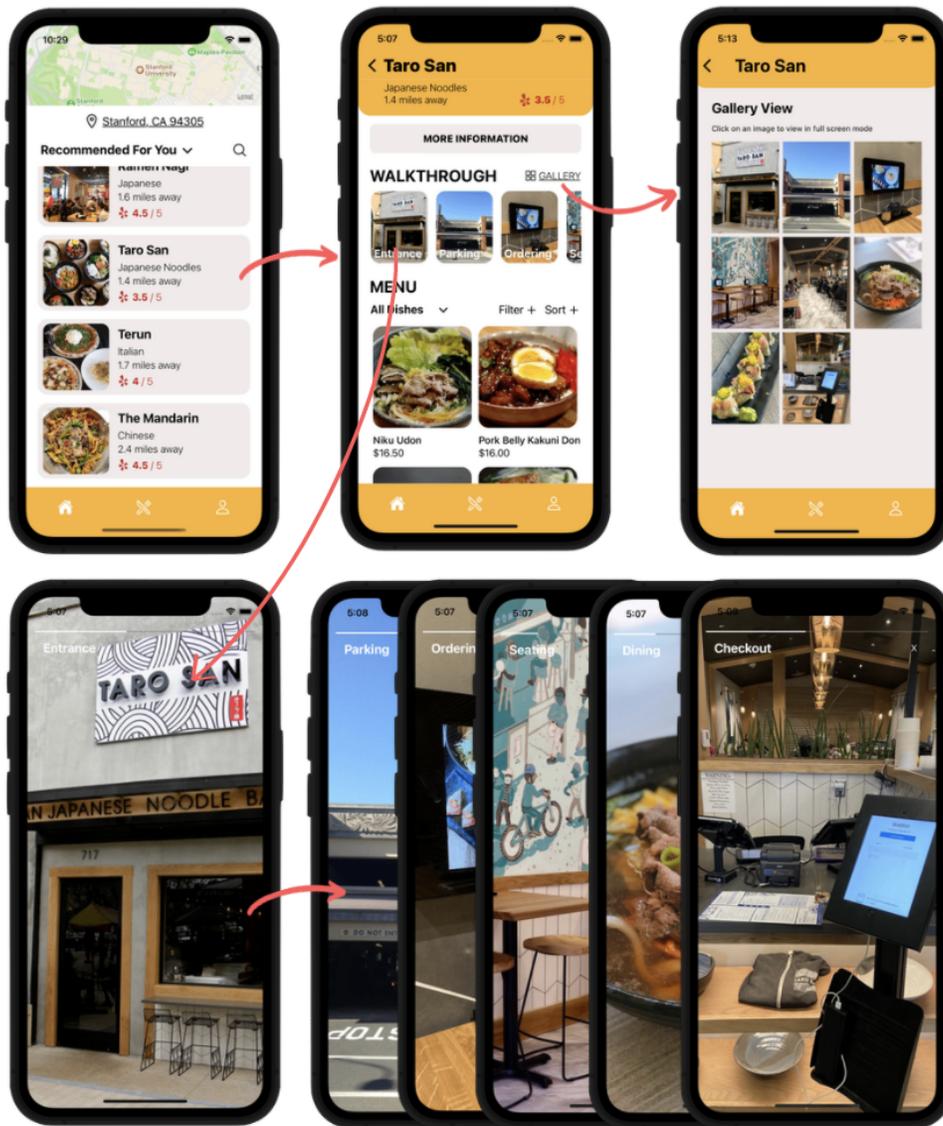
# High-Fi Task Flow Walkthrough

## Onboarding and Profile



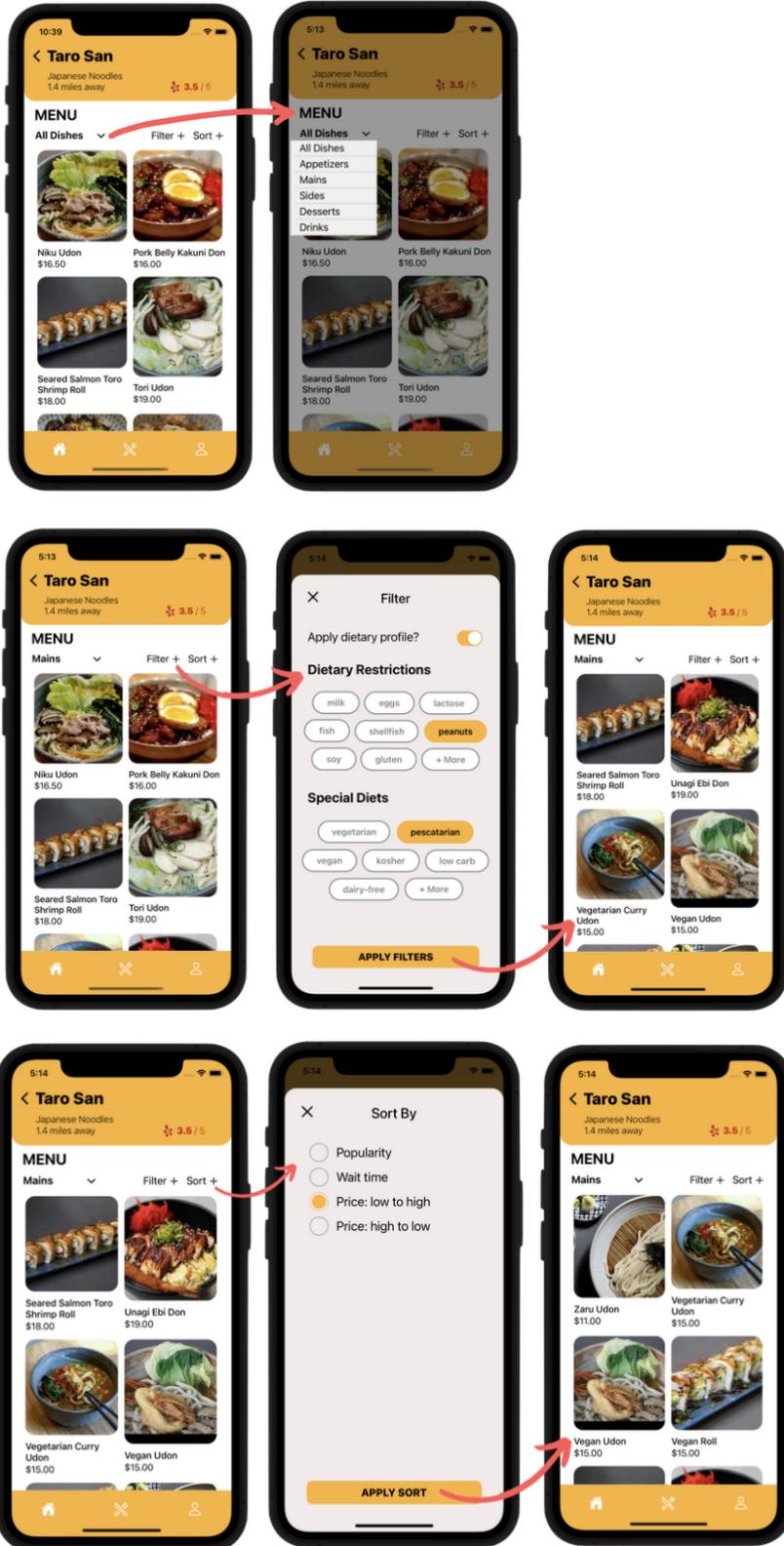
**Simple Task:**

See the “step by step” experience of dining at a restaurant



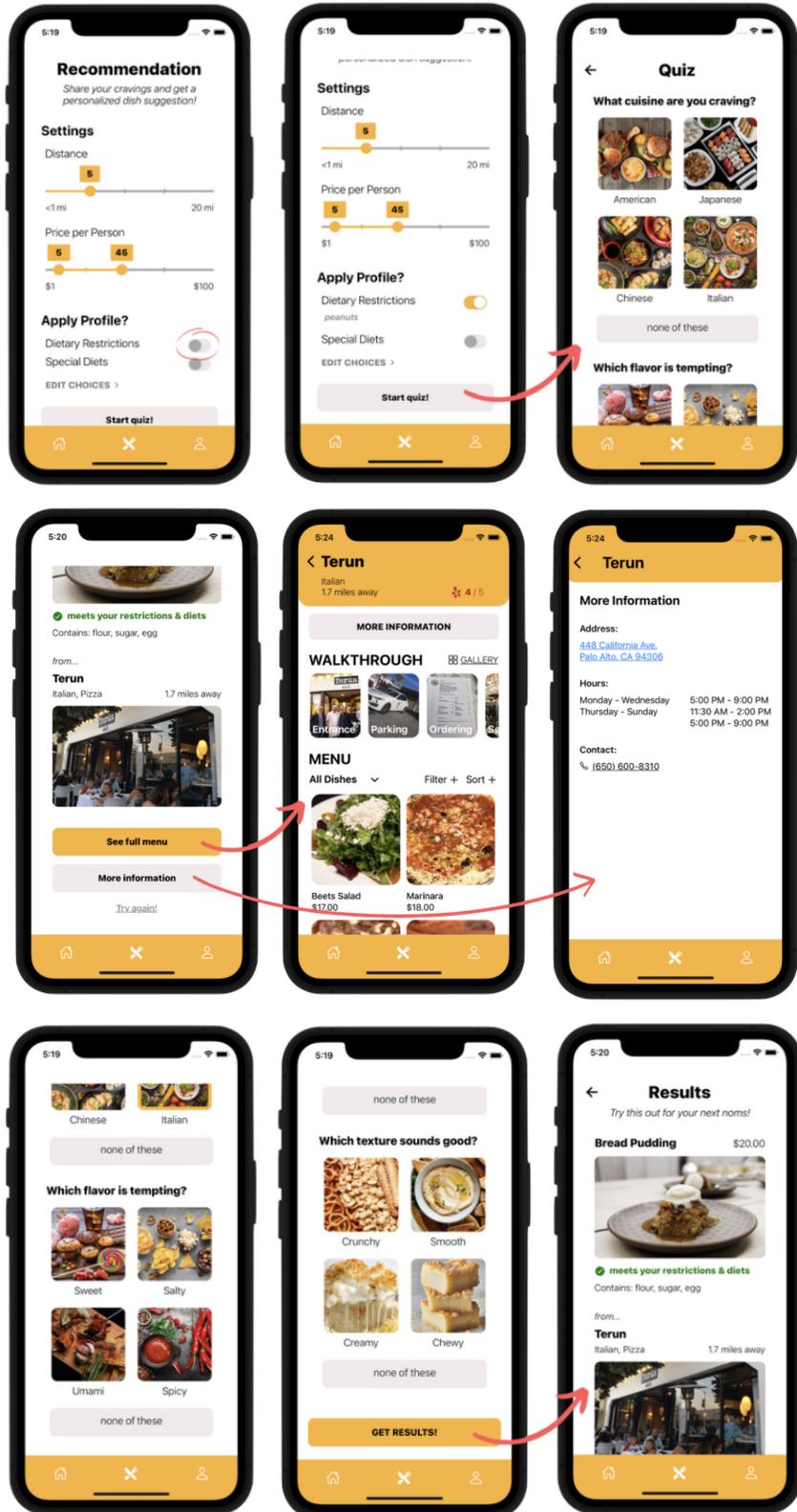
### Moderate Task:

Filter & sort specific restaurant menus



## Complex Task:

Get personalized dish & restaurant recommendations

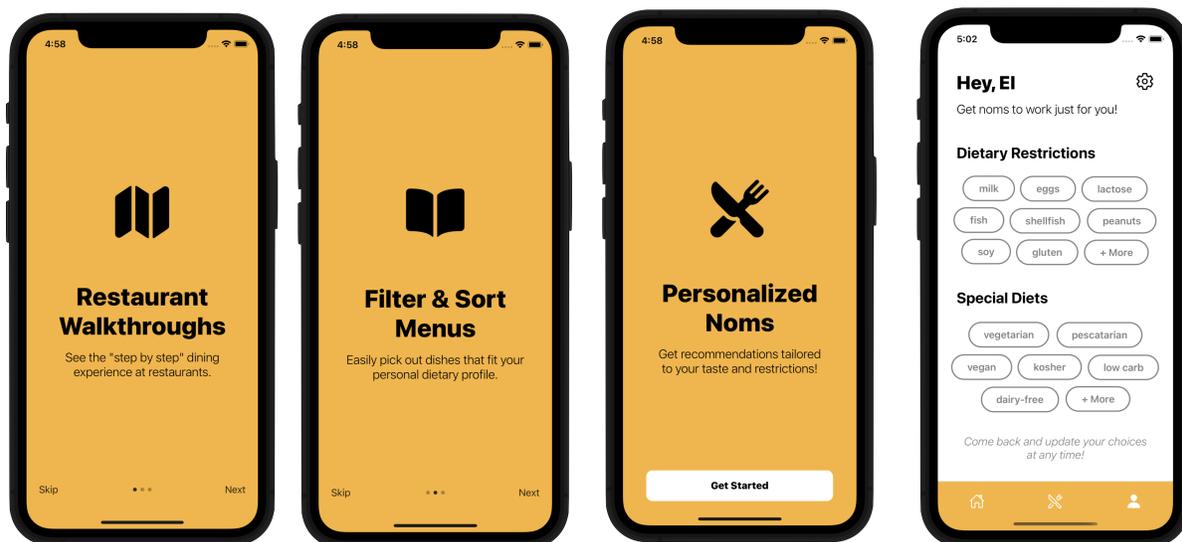


## Values in Design

After reviewing our feedback from our experience prototypes and interviewees, we focused on the following values that seemed the most important to the mission of our app:

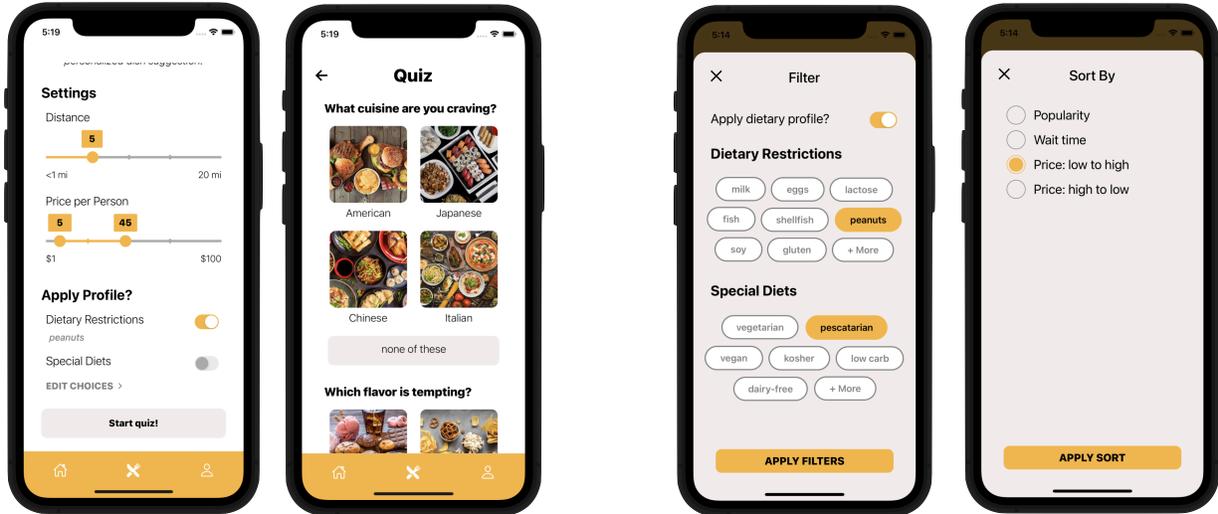
- Ease of Use
- Personalization
- Inclusivity
- Comprehensiveness

We reviewed our contribution to these at each stage of our design process to integrate into our final app design. To make the app easy to use, we included a swift onboarding process for new users. This includes a minimalist profile screen with spacious input fields and a page-by-page walkthrough that clarifies noms' unique tasks and features.



*Onboarding screens and dietary profile personalization*

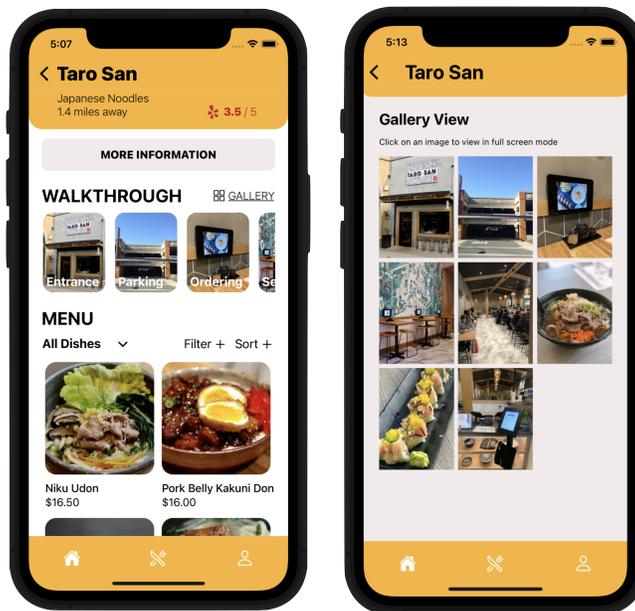
To personalize the user experience while being inclusive of unique dietary needs, when users are selecting dishes through filter/sorting menus and dish recommendations, they have the option to apply their dietary profile. This allows them to easily see dishes that fit their restrictions and immediate needs, such as wait time and price, without any of the hesitation or uncertainty that they might experience with live service interactions.



*Dish selection process*

*Filter and sort menu*

To make peoples' dining experiences as detailed and comprehensive as possible, our app includes a media walkthrough of a restaurant, from parking to checkout. With this feature, users can have a step-by-step experience and know what to expect at every stage.



*Comprehensive walkthrough of a restaurant*

While we felt that all of these values were important and positively contributed to our app design, we thought there was a potential conflict with trying to cater to *everyone's* tastes while meeting *individual* restrictions. However, we addressed this issue with a user-centered approach — we asked users for their specific dietary preferences and store them so that they can be applied throughout the app's features and tasks, such as filtering & sorting and the dish recommendation process.

## **Final Prototype Implementation**

### **Tools Used**

For our high-fidelity prototype, we used React Native as our application framework, Expo as a platform to build and simulate the app, and Google's Firebase to store our data. We also used Xcode and Apple's Simulator to test our app throughout the process and text editors including VSCode and Sublime Text to write our code. For both the initial medium-fi design and hi-fi revisions, we used Figma which was a huge help as it concretely defined both UI layout and task flows.

React Native allowed us to utilize existing public packages which we could import and customize for our purposes. This ranged from small details, such as the toggle/switch components and modal pop-ups, to larger components, including an onboarding swiper and image-viewing carousel similar to Facebook and Instagram stories. React Native also allowed us to take advantage of cross-platform development, so we could code the app to be both iOS and Android-compatible with one shared program. A challenge of working in React Native was having to continuously pass data across multiple files in long chains in order to access shared information in nested screens.

We addressed this by integrating the cloud-hosted Firebase database, so we could directly push and pull data from independent screens. Firebase has an intuitive user interface that allowed non-technical team members to support the app development and allowed us to minimize local storage space. However, Firebase does not support the changing of collection or document names, so we had to download other tools to push later edits.

### **Wizard of Oz**

In the recommendations tab, an AI algorithm would ideally produce a recommendation for the user based on their profile, logistic constraints, and answers to quiz questions. In our

prototype, we simulate this by providing 15 different hard-coded paths for user recommendations based on their answers alone.

### **Hard-Coded Data**

Due to complexity and time constraints, the location of our app is hard-coded to show 12 restaurants in the Stanford area. All of the restaurant information is hard-coded, including restaurant names, category, distance, rating, walkthrough videos/images, and menu items (including details about ingredients, restrictions, price, and more).

## **Summary & Next Steps**

Our team took a deep dive into the design thinking process within the space of arts & digital media. Though we decided to focus on food as a specific problem domain, we discovered a huge host of dining-related challenges to tackle. Through needfinding interviews and brainstorming sessions with potential users, we realized that while people now enjoy increased access to dining options via digital platforms, every individual's dining needs are unique and thus not always met by existing tools. Our app, noms, aims to connect users to personalized dining experiences that are tailored to their unique constraints.

If we had more time, we would ideally make hard-coded features in the prototype more responsive by allowing the user to change their location and see different restaurants. Additionally, we might add other features such as search and categories on the home page, and think about how to implement an actual algorithm for the recommendation flow.

Over the course of ten weeks, our team went through multiple iterations of the prototype-test-assess process to eventually create a high-fidelity prototype of noms. We learned that design thinking is a truly non-linear process that is both exhaustive and *exhausting*. At every stage, we had to continuously rethink designs based on user interviews, testing, and feedback, while also evaluating if we were staying “true” to our initial concept and meeting the key user needs we identified. There were moments we were forced to scrap ideas we were previously sold on and it felt like we took steps backward in the process. However, every piece of feedback and a new concept we incorporated only served to strengthen and improve our solution. Overall, working on noms was hugely valuable as a hands-on experience with the design thinking process.

## **Acknowledgements**

We would like to express our gratitude toward Professor Landay and our wonderful CA, Shana, as well as all members of the CS147 and CS47 teaching teams for their support and guidance throughout this quarter. Thank you for being a part of noms journey!