



CS 147 Fall 2023: Unintentional Good

Jeanette Han, Kevin Song, Maya Chandra, Megan Mou

12/8/2023

Table of Contents

[3] Project Name & Value Proposition

[4] Team Members

[5] Needfinding

Interviews

Synthesis

[10] POVs & Experience Prototypes

Final POV Statements & HMWs

Top 3 Solutions & Brainstorming

Experience Prototypes

[21] Design Evolution

Final Solution

Tasks

Design Evolution Visualizations & Rationale

Values in Design

[42] Final Prototype Implementation

Tools Used

Wizard of Oz Techniques

Hard-Coded Techniques

[44] Reflection & Next Steps

FoodDex | 3

Project Name & Value Proposition

Project Name

Value Proposition

Empower the average home cook to easily connect to new culinary techniques, cultures, and communities in one space — no previous experience required.

Tagline

Cooking. Culture. Community.

FoodDex | 4

Team Members



.....
Jeanette Han
User Researcher
Designer

.....
Kevin Song
User Researcher
Designer

.....
Maya Chandra
User Researcher
Developer

.....
Megan Mou
User Researcher
Developer

FoodDex | 5

Needfinding

Interviews

As a group, we immediately settled on food as a general area of interest because food is universally significant physically, culturally, and personally. However, food is such a broad domain. Thus, in line with our studio's focus on "unintentional

good,” we wanted to focus specifically on challenges related to cooking and meal planning.

To capture the diverse contexts of food, we recruited 7 interviewees with various backgrounds and opinions of cooking:

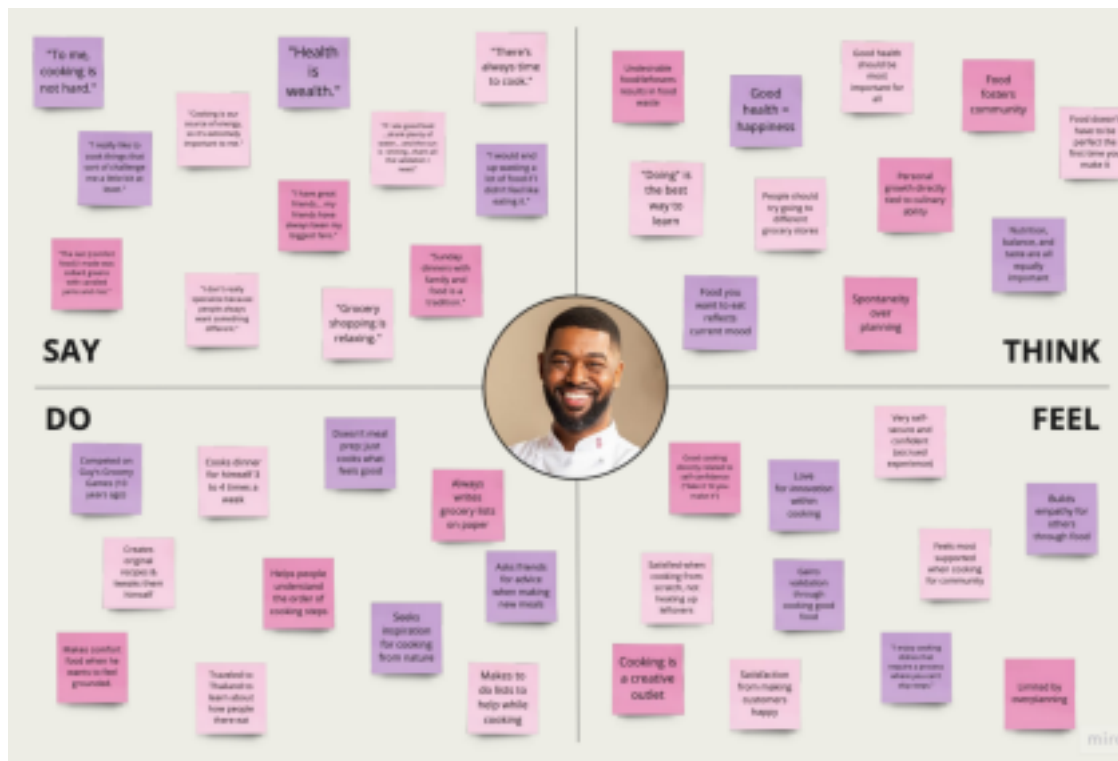
- **Derrick L.** — recent college graduate, living in NYC with his girlfriend ●
- Emma P.** — current college student athlete, intense dietary restrictions ●
- Richa G.** — working mom with 2 young children, home-cooks Indian food ●
- Terry B.** — professional chef with 18+ years of experience
- **Lisa P.** — mom with 2 adult children, works as local youth sports coach ●
- Phillip T.** — young financial analyst who is too busy to eat anything but takeout ●
- Stephen H.** — semi-retired classical musician, lives in SF with wife

With the exception of Terry (the professional chef), Phillip (who we felt could qualify as a potential extreme user), and Richa (who we felt could qualify as a non-user), participants were randomly recruited from public areas, as well as via circulated requests for relevant 3rd-degree connections, to keep our sample as representative as possible.

Interviewees were asked about their relationship with food and cooking, their attitudes towards different parts of the cooking process, and other aspects of their lives that interact with food such as dietary restrictions or partners.

FoodDex | 6

Interestingly, we found that interviewees who didn't cook (Derrick, Stephen) had a great desire to cook but didn't feel comfortable doing so for various reasons — Derrick felt that the final result wouldn't live up to his expectations, while Stephen's wife likes to be in sole control of the kitchen. On the flip side, interviewees who did cook (Emma, Richa, Lisa) did so out of necessity and, as a result, felt some level of detachment from cooking — Emma had to cook for herself to meet her specific dietary restrictions, while Richa and Lisa cooked for their families. Thus, a recurring tension was the amount of time it takes to cook against the payoff, whether that be because of



FoodDex | 9

In isolation, each interview revealed different individual needs, ranging from lack of motivation or time, to needing new ways to make cooking feel fun and innovative. However, analyzing all 7 interviews as a whole, we noticed that there was a general need for incentive to cook outside one's comfort zone. Those who didn't yet cook typically felt that the learning curve was too steep, and didn't feel that the food at the end was worth the tedious process; on the flip side, those who already cooked normally typically felt that there was nothing new or exciting. Thus, people didn't necessarily want to upset their cooking routines, but rather, wanted new and creative motivations to cook.

FoodDex | 10

POVs & Experience Prototypes

Through the statements and conclusions we drew from our interviews, we analyzed the most significant takeaways and pain points to form our POV statements. We ended up

creating POVs for three of our interviewees, Richa, Derrick, and Phillip because of the diversity in user needs and backgrounds they represented. Derrick represented an average beginner home cook while Richa and Phillip had unique considerations with their relationship to food such as having kids and an overwhelming work schedule that we wanted to dive deeper into.

From our three POVs we generated 34 HMW statements by rapidly popcorning ideas between the group. The focus of our HMWs was to encompass ideas as broadly as we could, even including farfetched statements that would probably be unrealistic to implement. We then chose 2-3 of the most cohesive and insightful HMWs for each of our three POVs to start brainstorming potential solutions that came to mind. We did a first pass to quickly jot down solutions that came to mind and ended up generating 45 initial solutions for our HMWs emphasizing creativity. We ended up narrowing down to our top three solutions – one for each of our POVs – that we decided to flesh out further through the experience prototypes.

Final POV Statements and HMWs

Richa's POV

- **We met** Richa, a working mom with 2 young kids, who juggles a busy schedule and is responsible for planning and cooking all of the meals in her multigenerational household.
- **We were surprised to notice** that she cooks every meal at home and shops at multiple different grocery stores — despite balancing work meetings, her children's extracurriculars, and personal commitments.
- **We wonder if this means** that she will go to whatever lengths necessary to

prioritize nutritional value and a variety of foods in her family's diet.

- **It would be game-changing** to centralize the grocery shopping and meal planning processes so she can spend less time and effort providing healthy, diverse meals for her family.

Richa's Most Insightful HMWs

1. HMW reduce the time needed to source different ingredients?
- 2. HMW satisfy the diverse nutritional needs and preferences of a multigenerational household?**
3. HMW keep track of all the dietary needs of growing children?
4. HMW make a busy schedule exciting instead of stressful?
- 5. HMW spread out cooking responsibilities in a family?**
6. HMW involve kids in the cooking process?
7. HMW make trying new foods fun for picky eaters?
- 8. HMW introduce flexibility and adaptability into the meal-planning process?**
9. HMW make cooking more fulfilling and less like a chore?
10. HMW build a schedule around cooking?
11. HMW connect a family through cooking and food?
12. HMW provide kids with a range of culinary experiences?

FoodDex | 12

Phillip's POV

- **We met** Phillip, a young financial banking analyst, who works 100+ hour weeks at his desk and eats 1 meal a day that is ordered on a delivery app using his \$30 work meal credit.
- **We were surprised to notice** that he still grocery shops and stocks his fridge with fresh produce that often goes bad, despite rarely having time to cook on

weekdays or weekends, since he used to cook frequently back in school.

- **We wonder if this means** that he still feels a deep desire to cook for himself, but is too overwhelmed by his current lifestyle to properly plan meals and use the ingredients he has in time.
- **It would be game-changing** to incentivize him to carve out time in his schedule for cooking and provide him with sufficient foresight so he can begin to plan out when to buy and use groceries.

Phillip's Most Insightful HMWs

- 1. HMW rediscover an enjoyment of cooking?**
2. HMW gently introduce cooking as a habit?
3. HMW make mealtime a relaxing break from work?
- 4. HMW introduce and instill long-term, sustainable healthy eating habits in busy professionals?**
5. HMW reduce food waste?
6. HMW evoke good memories and experiences through food?
7. HMW more evenly distribute meals and snacking throughout the day?
8. HMW create time to cook in a packed schedule?
9. HMW make eating a social bonding experience?
- 10. HMW reward busy people to make time in their day for cooking?**
11. HMW develop ownership and pride in home-cooked food?

FoodDex | 13

Derrick's POV

- **We met** Derrick, a Chinese-American software engineer who began cooking after recently graduating and moving in with his girlfriend in New York.

- **We were surprised to notice** that he wants to branch out from what his parents taught him and learn how to cook dishes that he tries at restaurants, but rarely does so due to his defeatist, self-critical attitude.
- **We wonder if this means** he has very high expectations for both his own cooking as well as the quality of cooking-related advice that he takes from others.
- **It would be game-changing** if he could receive guidance and feedback from people he trusts to develop his cooking skills, so that he can reach concrete cooking milestones and satisfy the very high expectations he sets for himself.

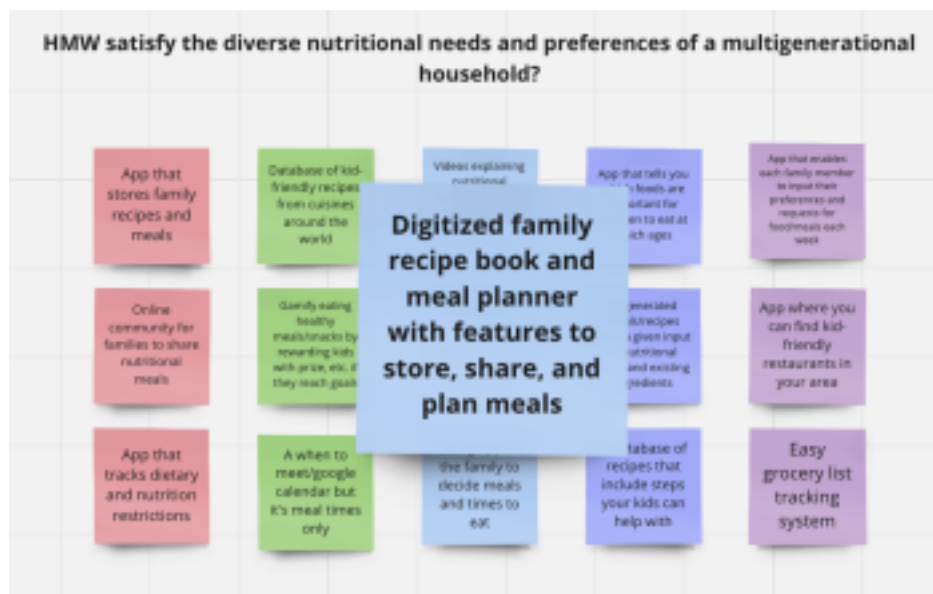
Derrick's Most Insightful HMWs

1. HMW empower home chefs to feel gourmet?
 - 2. HMW mitigate the anxiety that home chefs feel surrounding cooking new foods or trying new recipes?**
 3. HMW better combine cultural foods with healthy eating?
 - 4. HMW make buying fresh ingredients more cost-effective?**
 5. HMW make cooking a bonding experience between partners?
 6. HMW make replicating restaurant dishes exciting instead of intimidating?
 7. HMW affirm the reliability of new recipes?
- FoodDex | 14
8. HMW keep track of when food will expire?
 9. HMW plan meals so leftovers are sufficient for further use?
 10. HMW gamify taking culinary risks?
 - 11. HMW prioritize cooking during transitional periods?**

Top 3 Solutions & Brainstorming

We wanted our solutions to differ in how they addressed aspects of cooking users found difficult, with some more focused on family life and others geared more towards young professionals.

Solution 1 Brainstorm



Solution 1

Digitized family recipe book and meal planner with features to store, share, and plan meals.

Solution 2 Brainstorm



Solution 2

Cooking / eating habit tracker that rewards users for reaching milestones and maintaining streaks

Solution 3 Brainstorm



Solution 3

A platform with recipe packs organized into beginner, intermediate, and advanced levels for different cultures

Experience Prototypes

Following our determination of the top 3 solutions, we created very intuitive and basic mockups to test our assumptions and determine which final solution we should pursue. These prototypes ranged from a Google Form to showing a series of progressively harder recipes for a specific culture. We interviewed 8 participants and following each interview we asked them to share their sentiments on the value of the prototype as well as how it piqued personal interest. Similar to our needfinding, we wanted diverse testers but tailored our interviewees slightly based on the corresponding HMW and POV for the prototype.

Solution 1 Experience Prototype

Assumption: Busy families / parents would prefer saving and choosing from trusted recipes that they have already made before.

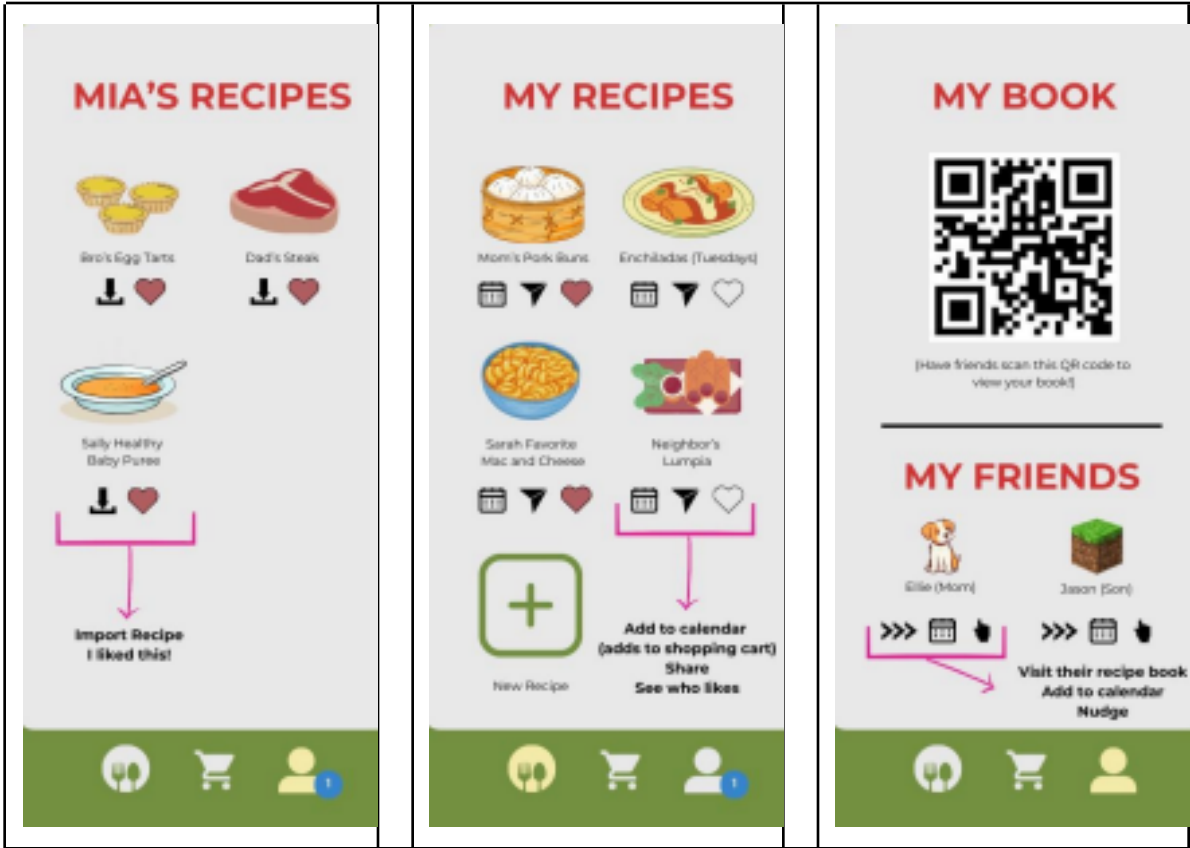
Key Aspects: The key aspect of our first experience prototype was using visual engagement as an incentive to engage with a digitized recipe book. Thus, we landed on mocking up 3 potential recipe book layouts for participants to comment their thoughts and feelings evoked from the screens. The three prototypes differed in terms of how they displayed recipes and social aspects ranging from a QR code to view recipe details to pictures detailing each dish. Additional functionality icons such as the ability to share with friends, favorite, and import external recipes were added to give

FoodDex | 17

the appearance of a cohesive, but still rudimentary prototype. We wanted to see if

people, particularly those who cook and live with family members, enjoy seeing their recipes displayed in a visually appealing format and if they feel the need to store their recipes in the first place.

Implications: Testers really appreciated the ability to share and import recipes to and from one another and noted that it is usually very challenging to remember the specific ingredients and steps if they are not stored somewhere convenient. They also enjoyed visualizing their recipes in one physical and aesthetic space, with one tester noting that although she might remember all her recipes, she ends up only rotating through a few when it comes time to cook. However, testers did want more ways to customize how they organize their recipes and suggested groupings based culture, ingredients, dietary restrictions etc. Our takeaway was that there is a common need to store and share recipes but we would have to prioritize visual design and allow for greater personalization for the user.

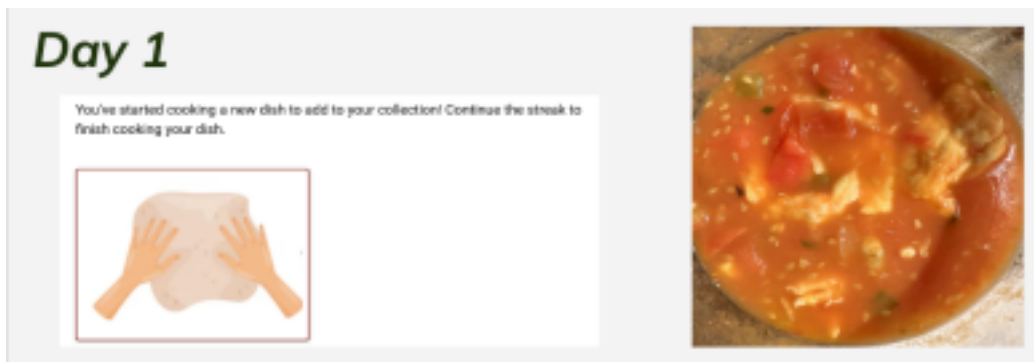


Solution 2 Experience Prototype

Assumption: People are incentivized to pursue progress by reward systems that concretely track and show behavior.

Key Aspects: The key aspect of our second solution was identifying how to properly simulate a reward system that can overcome the activation energy needed to build habits. Our prototype utilized specific wording and a rudimentary “badge collection” process to incentivize users. We used a form that started users on day 1, where they would have to upload a completed dish to partially unlock a reward. If they submitted a picture, they would be directed to a congratulations screen with the award and would progress to day 2. If users did not update their progress, we used friendly statements such as “Oh no! You broke your streak” in hopes that it would motivate them to get back on track. We tested this over the course of 2 days and asked participants “Did this reward make you feel motivated to cook more regularly and to unlock more recipe accomplishments?” to determine what type of incentives are most effective.

Implications: All of our testers noted that having some sort of reward, tangible or intangible (such as a badge or achievement page), made the tester feel inspired to cook. One participant in particular noted that they were interested in finding out the final rewards after unlocking the first image. One aspect that did not work as planned was the extent of the reward itself. Our testers noted that a picture was not the most effective way to get them motivated and suggested alternatives such as themed milestone badges (ex. Peloton), local restaurant discounts, etc. The implications we discovered were that generally all forms of rewards do translate into actions toward some habit or goal, however, different rewards are enticing to different groups of individuals.



Solution 3 Experience Prototype

Assumption: People feel empowered to cook more dishes of a different cultural background if they are gently introduced starting with a beginner recipe.

Key Aspects: The key aspect of our third prototype was seeing how incrementally increasing difficulty can affect confidence and willingness to explore. We realized that many home cooks often have difficulty exploring outside cultural dishes because of a lack of confidence unfamiliar recipes may cause. To boost their confidence, we first showed testers a very simple recipe from a culture of their interest and asked them to rate how they felt cooking that dish. We then incrementally increased the difficulty until it reached a challenging recipe they initially felt very unconfident with. We then asked them to rate their confidence level upon understanding how to cook the easier dishes. We hoped that through this prototype users were more open and up to the challenge rather than giving up.

Implications: Most testers, especially those with some prior cooking ability, felt more capable of attempting a difficult cultural dish after seeing beginner and intermediate recipes. On a five-point scale, the average confidence level increased from 2 to 3 for the most challenging dish. Additionally, testers really enjoyed that they could choose which foreign cuisine they interacted with as having some initial interest in the culture

made exploration more meaningful. One aspect that did not go as planned was when

testers noted they felt uncertain even when shown the simplest recipe due to unfamiliar cooking methods or ingredients. The implication we were able to conclude was that users generally are interested in exploration of different cultural dishes but limit themselves due to uncertainty. When given a soft introduction, however, they can gain the confidence necessary to pursue complex recipes.



FoodDex | 21

Design Evolution

Final Solution: FoodDex

FoodDex is a social-edutainment mobile app that promotes both broad and deep exploration of diverse world cuisines.

FoodDex comprises cultural recipes ranging in difficulty, diet, and familiarity. Users can “collect,” or cook, dishes to earn and level up badges representing their mastery of unique global cuisines. There are also social features to share progress with

friends via photos of cooked dishes and earned badges.

Our target audience is home cooks, especially amateur cooks. Because this may exclude children or the elderly,

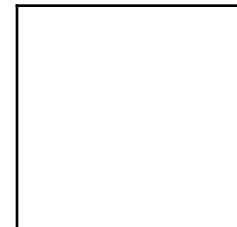
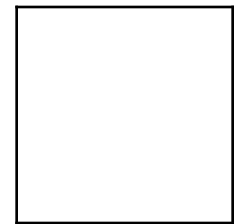
Choosing our Solution

The market is already heavily saturated with cooking and food-related apps and games; there were also quite a few previous CS147 projects in the food domain.

However, based on market research, we concluded that there was a lack of food apps that gamified the real-world cooking experience. Because one of our usability goals was robustness (specifically in exploration of new cuisines), we wanted to link the “game” aspect to cultural exploration.

This emphasis on worldly exploration reminded us of the Chess.com passport most notably Pokémon. Thus, we decided to give FoodDex an edutainment twist by incentivizing users to cook more dishes from different cultures and receive badges.

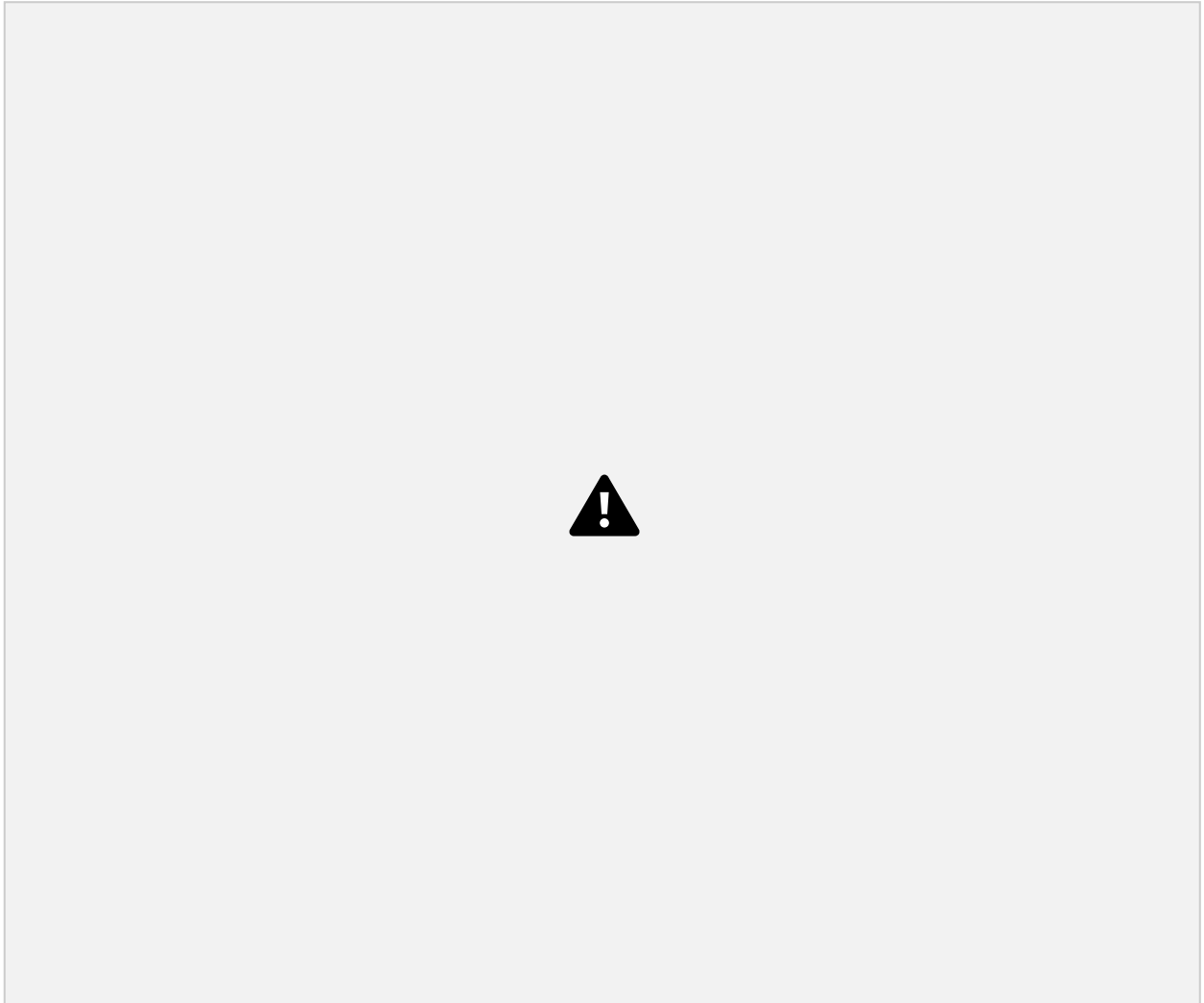
system, which incentivizes users to play more chess matches to face opponents living in different countries and receive stamps. The “collection game” is a staple of popular games,



Tasks

Simple: Discover a new recipe to cook from a specific culture FoodDex’s core functionality is a virtual “cookbook” with an emphasis on discovering recipes from diverse cultures/countries. Thus, this task will be the most fundamental and frequent use case for the app. Users can complete this task by (1) browsing recipes that are

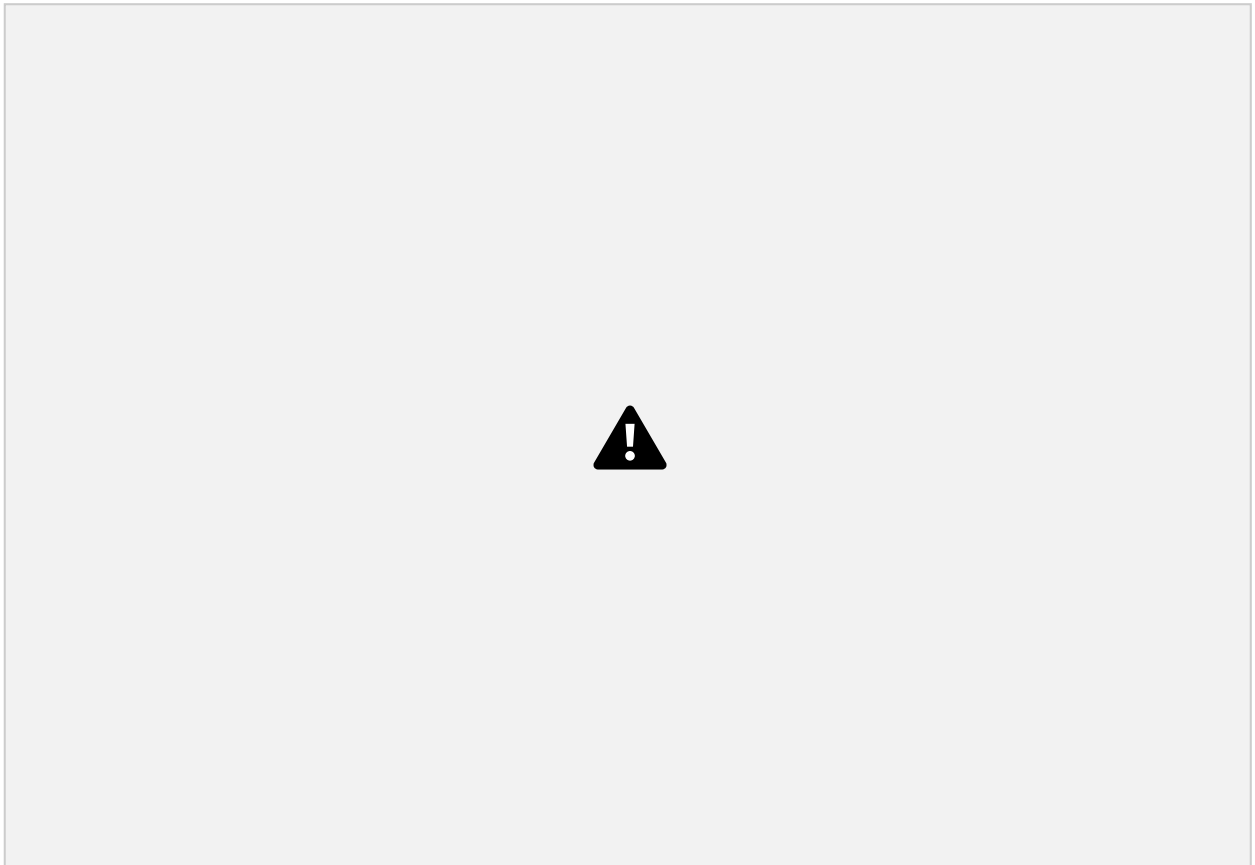
trending across all cuisines, or (2) visiting a specific cultural cuisine and picking a recipe from the list.



Moderate: Earn a reward for completing a cooking milestone (and be able to view it in your passport).

A key pain point among potential users (amateur home cooks) is a lack of intrinsic motivation to cook. Thus, FoodDex gamifies exploring new cuisines and taking culinary risks by harnessing the “collecting game” model. Users can complete this task by cooking from various cultures to collect badges in their food passport. Cooking more dishes from a cuisine will level up the corresponding badge.

Users who find new recipes (via the Simple Task) and cook them are rewarded; thus, this task is moderate as it naturally follows the simple task flow.

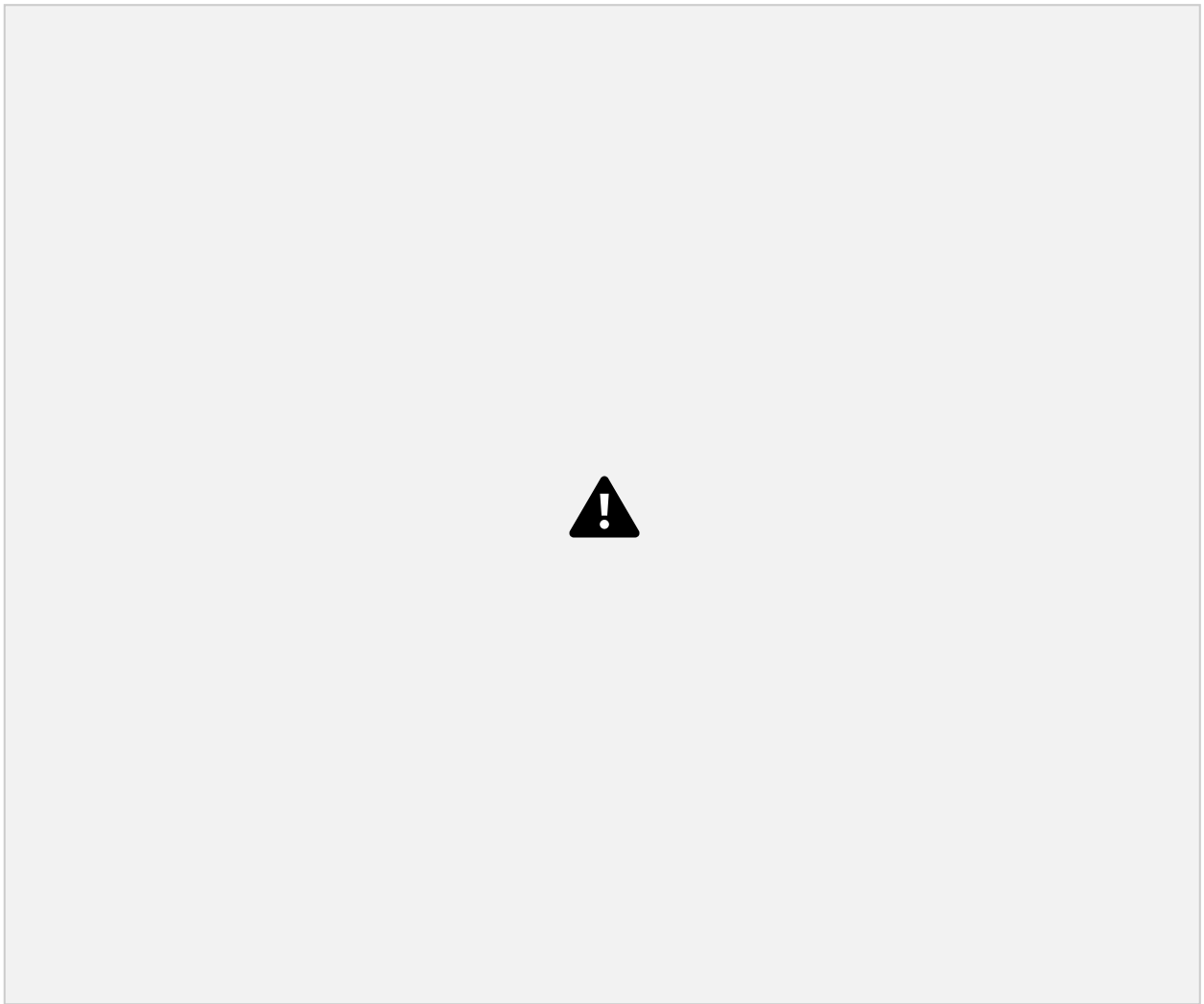


FoodDex | 24

Complex: Share cooking progress and interact with friends

Food is inextricably linked to community, and progress is sweetest when shared with others. Thus, we want users to be able to share photos of their food and badge progress with friends; this is also an added layer of motivation for users to cook through positive reinforcement and/or accountability.

Users can create a post after any progress they make (i.e. cooking a dish and/or earning a badge) or retroactively at any point via their profile.



Alternatively, users can browse through a feed of friends' shared posts and activities.



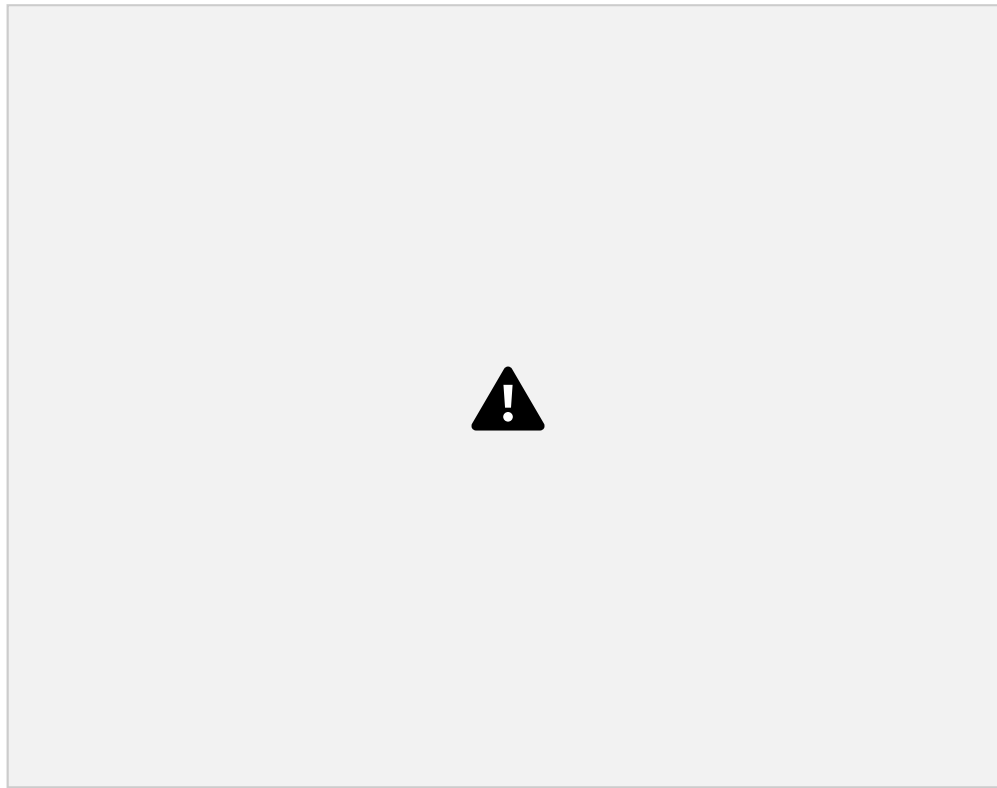
Design Evolution Visualization & Rationale

Choosing our Platform: Mobile App

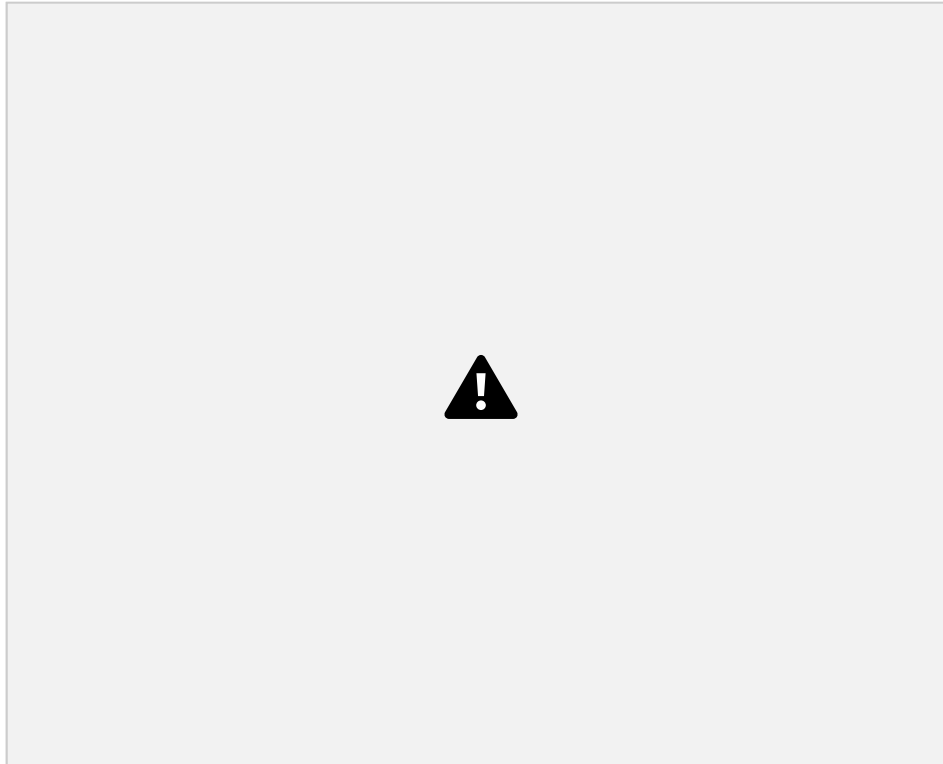
In the initial stages, we had several design directions available to us, including VR, AR, and a mobile app. After making pro-con lists for each, we quickly eliminated VR. There was some potential in using VR so that users could accrue cooking

experience in a virtual setting before transitioning to cooking in the real world; however, after identifying lack of progress or motivation as a pain point in our needfinding interviews, we felt that cooking real food would be a much more effective way for users to (1) derive more pleasure by reaching physical, tangible cooking benchmarks, (2) enjoy the fruits of their labor, (3) more effectively learn how to handle kitchen equipment, and (4) be able to share physical progress with friends.

Picking between AR and a mobile app was a bit more difficult; we created rough realizations to better visualize what the final product could look like in both cases.



Mobile App Realization



AR Realization

AR presented a convenient way to augment the real-world cooking experience that was both more innately intuitive and more engaging. However, because cooking is such a sensory experience, we felt that AR equipment would be too cumbersome and would limit a home cook's ability to smell, taste, or interact with their ingredients and food, leading to an ultimately more overwhelming or frustrating experience.

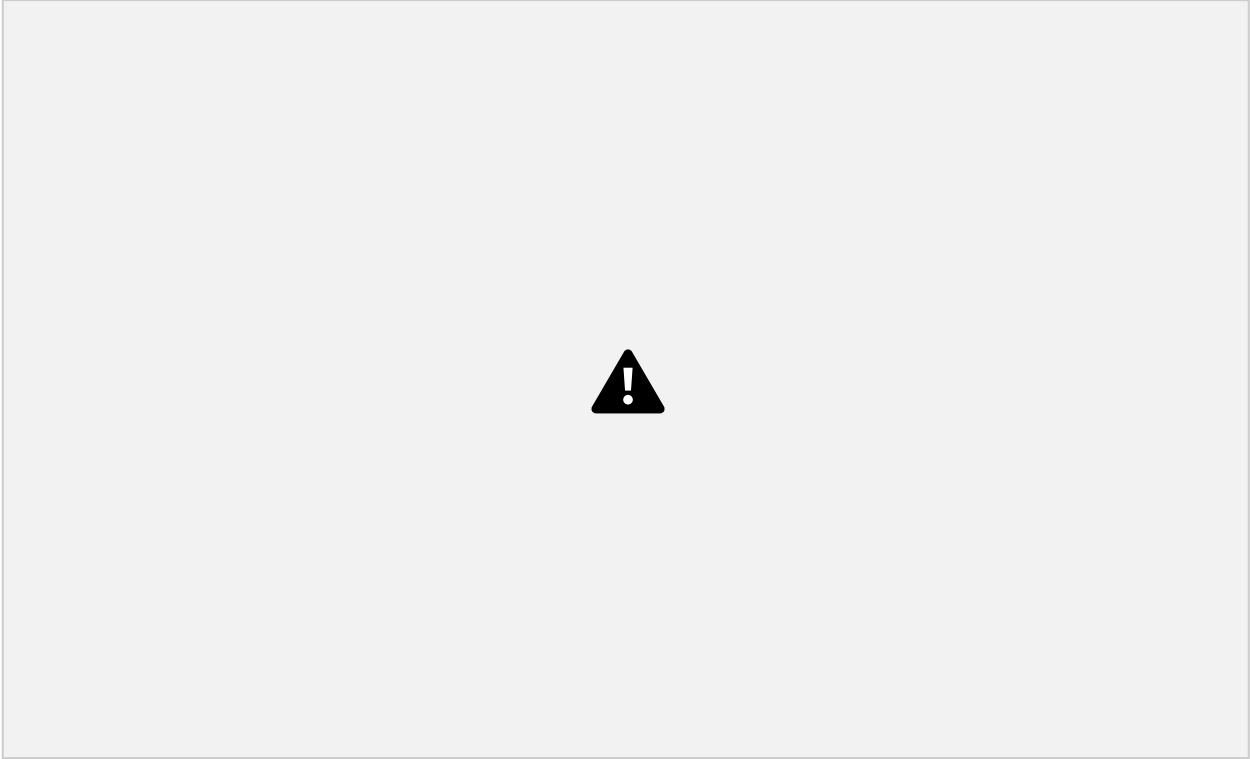
Additionally, we wanted FoodDex to be available to any home cook, and a mobile app would be much more accessible than tech that needs AR equipment. On the flip side, while a mobile app would be less immersive than AR, it is much more compact, allowing easy access to recipes, social functionalities, and personal cooking progress from any kitchen without interfering with the actual cooking process.

Thus, after weighing how effectively each platform would facilitate our user goals, as well as the technical feasibility of each, we settled on a mobile app.

Low-Fi Prototype

Our low-fi prototype consisted of digital sketches of key screens on Notability. Note that at this point in development, FoodDex was a food journaling app with a greater emphasis on logging food pictures with associated memories, with the badge system as a side feature. Thus, our moderate task centered looking for a journal of past cooked dishes.

Simple Task: Discover a new recipe to cook from a specific culture.

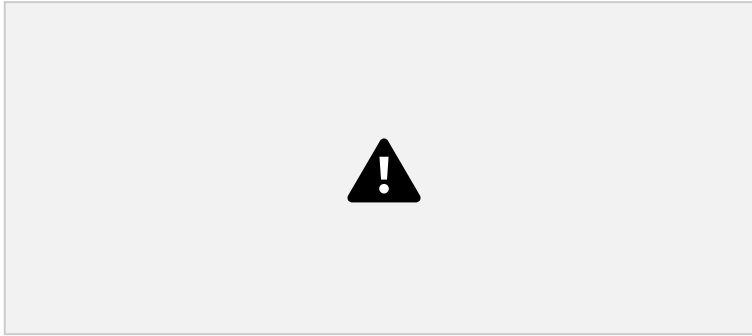


Moderate Task: Access the food journal to view tacos you previously made.

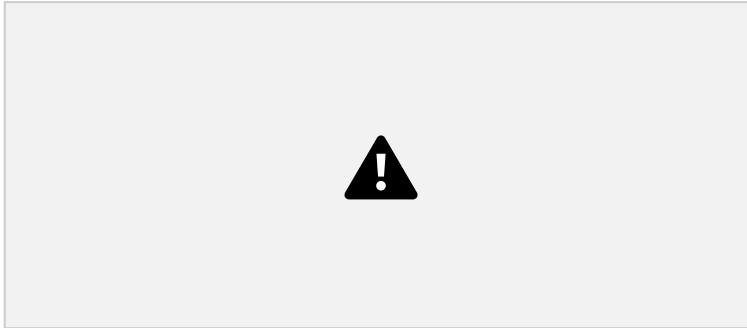


Complex Task: Share your progress and interact with friends.

Sharing Progress with Friends



Interacting with Feed Posts



Usability Testing

With these low-fi prototypes printed out, we approached 5 interviewees.

- **Hamdiya I.** — travels often for work, has a teenage daughter
- **Erik L.** — 20 y.o. student, loves cooking (would open his own restaurant) •
- **Morgan M.** — 50 y.o. software IT manager with 2 young children, rarely cooks •
- **Jackie** — local high school student, self-described foodie
- **Lauren S.** — 26 y.o. product manager, rarely cooks and lives alone

With the exception of Lauren, who we felt was a perfect match for our potential user base, all interviewees were recruited randomly from public spaces. When recruiting, there was a slight emphasis on diversity, since we were interested in the opinions of people with various ages and backgrounds.

FoodDex | 30

During testing, the interviewee was given a task, and the printout of the first screen in a task flow. While we did not provide any further guidance, the interview was encouraged to think out loud and voice their opinions. Depending on their actions and

how they interacted with each paper screen, we would continue to lay down the appropriate following screens.

To test our usability goals of **robustness** and **efficiency**, we counted errors for each task — noting common error trends — and timed how long each task took to complete, respectively. Some interesting observations from testing include: ● The app is fun. I'd download this myself. (4/5 interviewees)

- I'm encouraged to keep cooking by sharing food pics with friends.
- I want to see social content on the Home page.

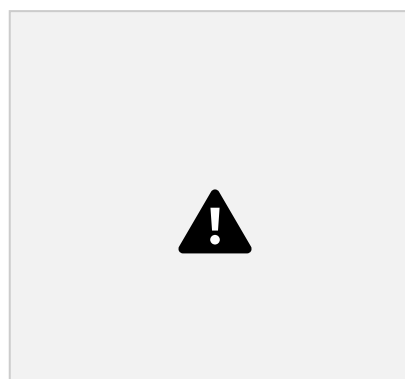
Our usability goal measurements for efficiency were as expected, with time scaling up from ~30 seconds for the simple task to 1 minute for the moderate and complex tasks. However, our measurements for robustness showed that, on average, interviewees made the most mistakes with the moderate task (1.8 errors), and no explicit errors with the simple task.

Low-Fi Prototype: Design Changes

Based on the feedback we received, as well as our usability goal measurements, we were able to draw conclusions and make design changes.

- **Our moderate task was not interesting.** Every interviewee was much more interested in the badge-earning reward aspect than the food journal. In fact, 4/5 interviewees expressed some form of visible confusion and/or frustration while interacting with the food journal. Thus, *we shifted our moderate task toward earning badges.*
- **What is the “map?”** In our low-fi prototype, we had a “map” tab with the intention of creating an interactive map that users could use to access country recipe pages. The biggest timing delay during simple task testing occurred when

users debated between picking “Mexico” directly



from the home screen or pressing “Map” (see right). However, nobody actually ended up using the map. Thus, *we honed in on our simple task of discovering recipes, removing the map and fully dedicating the home screen to direct links to new recipes/cultures.*

- **Starting task flows is confusing.** As an extension of the previous point, having multiple ways to initiate task flows was confusing, especially because our three tasks are related but can also be discrete use cases for FoodDex. This was particularly noticeable with our navigation bar, which featured 2 ways to initiate our simple task (Map & Home), no way to initiate our moderate task, and 1 way to initiate our complex task (Feed). Particularly with the complex task, interviewees often opted to press the profile icon in the top right as opposed to the “Feed” navigation tab. *Thus, we removed dual ways to access content, updating our navigation bar as clear initiators of our 3 tasks, and removing all other content from the home page that could be a source of confusion.*
- **Food icons are hard to read.** Especially when the goal is exploration and discovery, users are likely to encounter icons or pictures of food that they don’t recognize. 3/5 interviewees commented on the lack of visual clarity with icons and buttons. *Thus, we stripped away many of the confounding buttons competing for visual hierarchy and added labels to all food-related icons.*

With this feedback in mind, going into developing our medium-fi prototype, we prioritized **more linear task flows, clearer user interface, and a more intuitive navigation bar.**

Medium-Fi Prototype

Our medium-fi prototype was created on Figma, with design changes from our

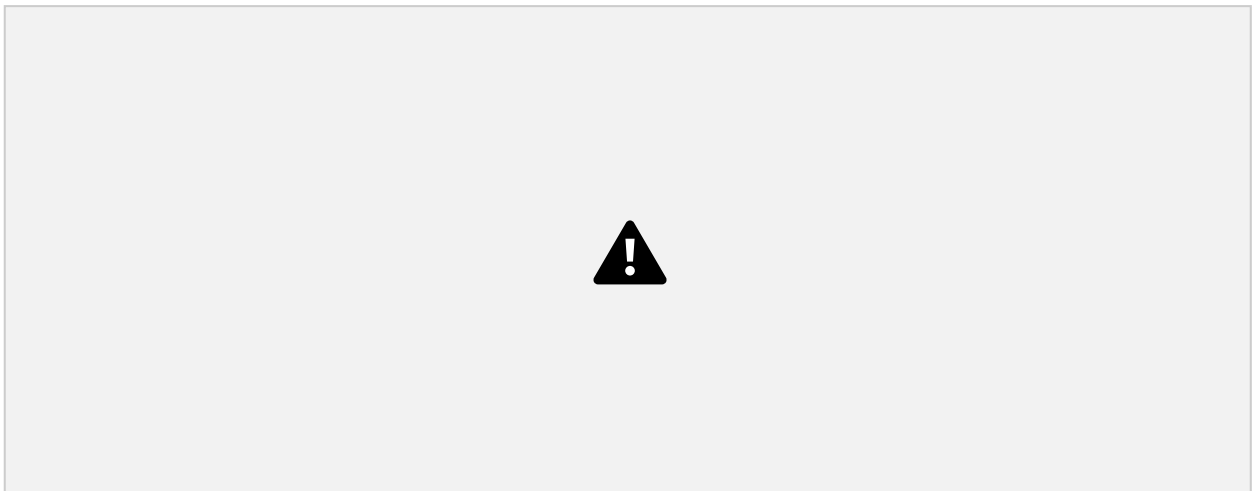
low-fi usability testing implemented.

Simple Task:

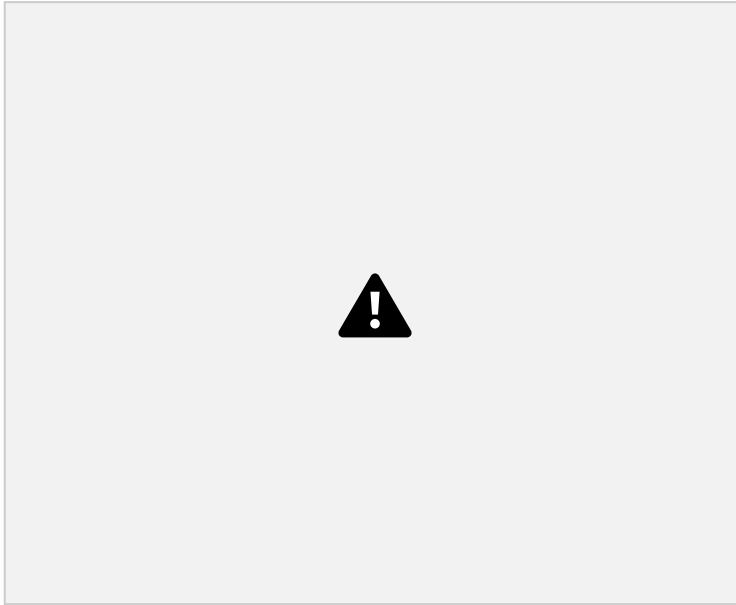


Moderate Task: Earn a badge for cooking progress.

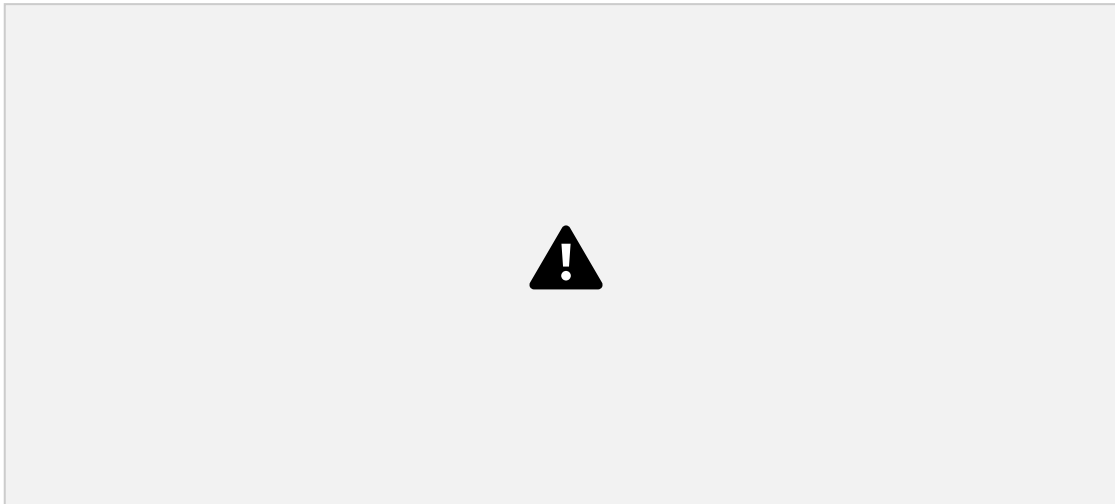
Earn a badge



Viewing the badge from your passport



Complex Task: Share your progress and interact with friends.



Medium-Fi Prototype Heuristic Evaluation

Within our CS147 studio, a group of peers conducted a heuristic evaluation of our medium-fi prototype. As a high-level summary, they identified **45 total heuristic violations**, with **H8** (Minimalist Design) and **H7** (Efficiency of Use) being by far the most frequent, **comprising 42% of all violations**. We received **17 violations of Severity 3-4** which led us to make 11 changes. When selecting which changes to implement, we

FoodDex | 34

considered impact on usability goals, complexity (i.e. is this change outside the scope of our three tasks?), and feasibility.

The complete list of Severity 3-4 violations is as follows.

Violations with an ✖ were not implemented, and an explanation is provided.

Violations with a ✔ were implemented and are visualized in the next section.

Violations highlighted in yellow resulted from limitations with Figma and were therefore already intended to be fixed with high-fi prototype implementation.

H1:

- ✖ Status of where you are in the recipe is not visible. (3)
 - While we heavily considered this change, a progress bar ended up being unutilized, since recipes aren't long enough to necessitate one. Additionally, the progress bar ended up taking up too much valuable screen space.
- ✔ The photo taken and the posted photo are different. (3)

H3:

- ✔ No way to view all your earned badges from your profile. (3)
- ✔ No way to comment multiple times on a post. (3)

H4:

● ✔ Confusing usage of gray to indicate unselected/unearned elements. (3) ● ✔ Kevin's profile page does not have a functioning comment button. (4) ● ✔ Depending on how you navigate to a page, certain pressables don't work. (4) **H7:**

- ✖ A photo is required to earn a badge. (3)
 - Requiring a photo upload is the only way we can keep home cooks accountable without making things overcomplicated or stressful. Furthermore, the spirit of FoodDex is to actually cook dishes, which means there should be a dish to take a photo of at the end.

FoodDex | 35

- ✔ Search bar to search recipes on Home screen does not work. (3)
- ✔ No way to retroactively upload old photos. (4)

H8:

- ✓ “Trending” and “New Cultures for You” on the Home screen are confusing. (3)
- ✓ Posts on social feed have too light of a font color. (3)
- ✗ Commenting on posts is unnecessary. (3)
 - Commenting is a vital part of social interaction, and we want to foster communities over food. While there was a suggested solution of using a timer instead, this could generate unnecessary stress, especially if amateur cooks struggle to finish in time.

H9:

- ✗ General lack of error messages throughout the app. (3)
 - While we also heavily considered this change, there ended up being no real application for an error message, or a place where it would be part of a task flow. Thus, it didn't end up being part of the final product.

H11:

- ✓ The complicated recipe has very small font. (3)

H12:

- ✗ Equating flags with cuisines could be problematic. (4)
 - We sympathize with and understand this stance. Countries, borders, and territories are inherently political. Our ideal solution would be to implement a custom system where users could upload country flags, information, and/or recipes that reflect their personal national identities. However, this is, regrettably, outside the scope of our work.
- ✗ No forum to share personal recipes. (4)
 - While a cool idea in theory, FoodDex already has three tasks that are moderately discrete. Adding a forum would likely overwhelm users with

too many tasks. Additionally, this change would add complexity that lies

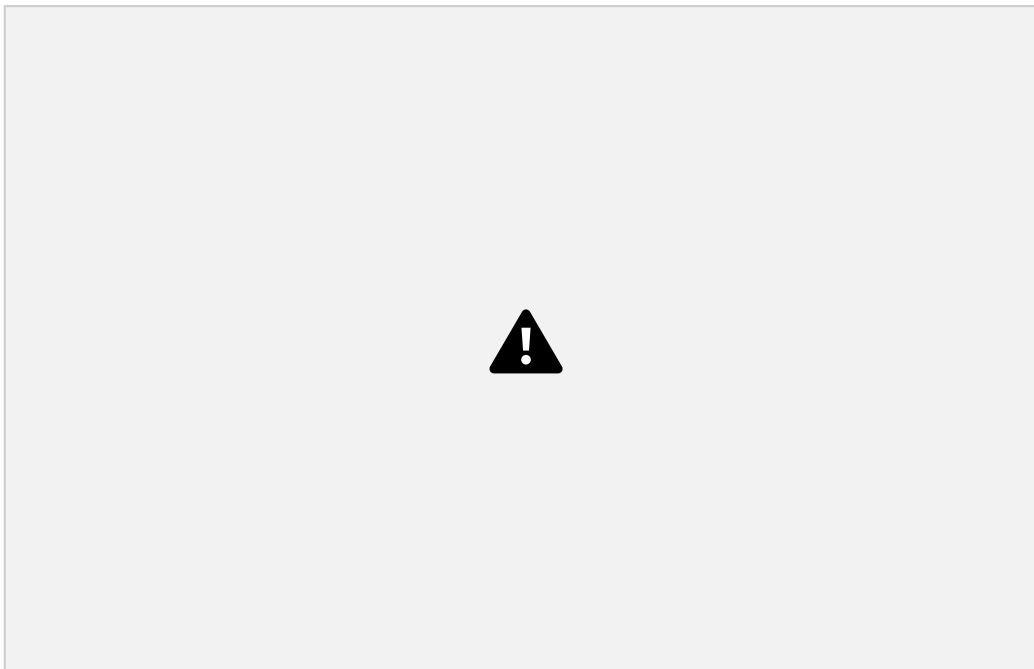
outside the scope of this project.

The high-fi prototype addresses these violations.

High-Fi Prototype

While the task flows of the high-fi prototype have already been shown above, key screens will be shown to illustrate the changes made based on the heuristic evaluation.

Home Screen

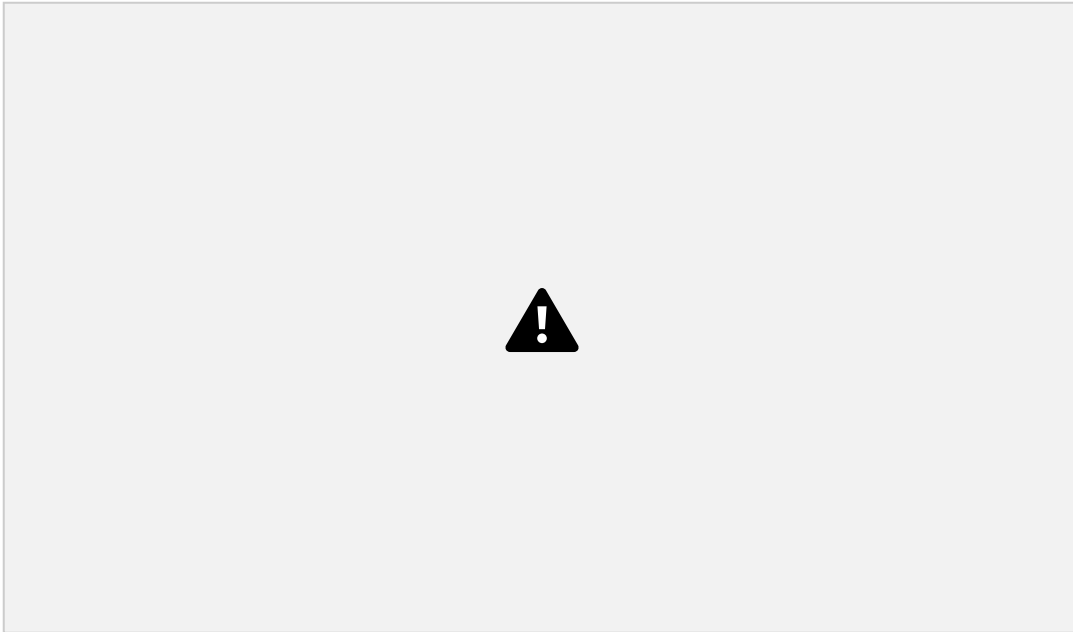


Although our goal from low-fi usability testing was to remove duplicate navigation/task flow paths, it seems that there are still some confusing elements on the Home screen. We especially want the home screen to be as intuitive as possible, since it's the springboard for recipe exploration, our simple task.

Recipe Screen

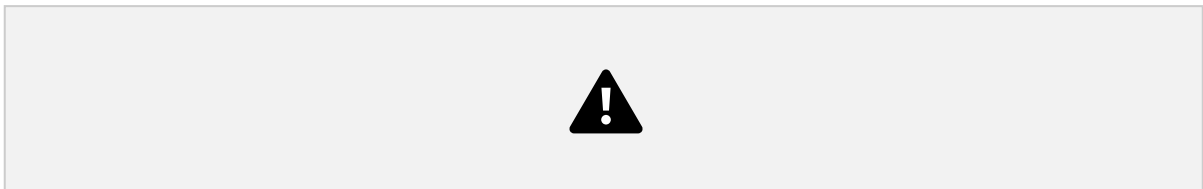


Recipe Filter



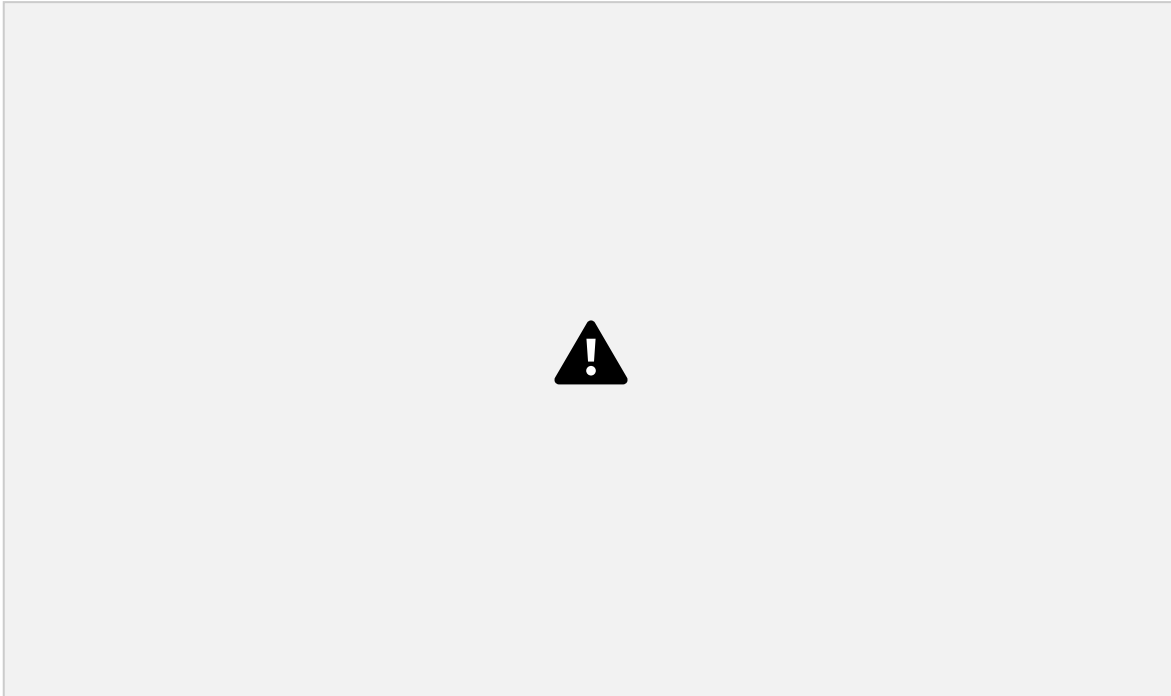
FoodDex | 38

Social Feed Post



The three preceding changes were all valid critiques that would positively boost UX and allow users to more easily achieve their usability goals. Also, these changes would enhance accessibility for users with visual impairments.

Profile



We want to centralize actions as much as possible for our usability goal of efficiency, especially the badge reward system that's so central to the app's identity. Having it linked to the personal profile makes complete sense since it's linked to one's identity on the app.

FoodDex | 39

Values in Design

Staying true to the theme of our studio, we wanted FoodDex to be a low stress and genuinely enjoyable way for users to discover new cuisines. From the very beginning of our needfinding to actually developing the app, we wanted to our values to be very clear both physically and implicitly. While we came in with a general sense of how we wanted to convey these values, through user interviews and especially lowfi

prototype testing, we were able to narrow them down more concretely. We also discovered that different demographics of users placed more emphasis on specific values than others and had to balance the tensions that rose from that as well.

What were the values you identified for your solution? How are these values embedded in specific design features? Are/were there any value tensions? Did you manage to address these tensions? If yes, how? If not, what were the inhibiting challenges?

The four final values we identified were:

1. Exploration. One of the most frequent comments during our interviews was that users wanted to gain more familiarity with other cultures but were not sure how to start. We hoped that FoodDex would ultimately empower people to choose unfamiliar cuisines they would like to pursue and eliminate the activation energy required to acclimate to different cooking styles and ingredients. This value is embedded in our home page, which explicitly promotes new dishes and cultures that a user has not yet attempted. Additionally the design of the passport and incentive to collect badges presents a visual representation of cultural exploration (and achievement!), which we hoped would genuinely excite users to step outside their comfort zone. A potential value tension that existed between exploration and flexibility was how structured we wanted the app to be. The more flexibility we gave users in choosing recipe difficulty, for example, actually hindered exploration as some people felt intimidated by the challenging cooking

FoodDex | 40

techniques and ingredients. To address this challenge, we developed a level progression format that defaulted to “easier”, less time intensive recipes for a soft introduction to explore unfamiliar cultures but still gave the flexibility for users to choose a complex recipe if they desired.

2. Community. Ultimately, we hoped that users would be able to celebrate and share their cultural discoveries and cooking journey with their social circles to

promote greater unity and learning. Just like how the world is composed of a global community, FoodDex also connects individuals with each other through their shared love of cooking and discovering new cultures. We encoded community through all the social features in our app like the feed, sharing post, and interactions such as liking/commenting. By fostering genuine connection and two way communication through their cooking experiences, we believe FoodDex is able to bring users closer together. Through our design process we did not experience this value coming into conflict with other values as the social aspects were more self contained in both the task flow and design.

3. Flexibility. Sticking to the theme of unintentional good, we did not want users to feel pressured or stressed to complete certain accomplishments/tasks while using our app. By allowing people to freely select and cook the dishes at their own pace, we hoped to accommodate a greater number of users to explore different cultural dishes. Some of our interviewees included a busy parent of two young children and a young professional who works 100+ hour weeks, and we did not want to exclude users based on how much time they were able to invest. The ways we encoded flexibility was through an open search bar function that allowed users to try any recipe they desired and also the ability to upload pictures and social updates after completing a recipe if there were time constraints in the moment. A tension that arose (in addition to the one identified earlier) was between flexibility and community. We realized through testing that users may feel pressure or competition when looking at their friends'

FoodDex | 41

accomplishments, preventing them from moving at their own pace. To resolve this we eliminated features that might cause unwanted stress such as automatic updates when your friends completed a badge so that the community would be a source of support rather than stress.

4. Fun. Lastly, we genuinely wanted FoodDex to transform cooking as an overwhelming chore to something users would look forward to! Cooking is so

inherent to nostalgic memories and identity and we wanted FoodDex to serve as a reminder that there is so much joy in the process and when you try new cuisines. We encoded colorful and interactive features such as the concept of badge progression that allowed users to have fun while also enjoying the satisfaction of cooking. Fun did not conflict with any of our other values as we tried to really base many of the features around user happiness and fulfillment.

FoodDex | 42

Final Prototype Implementation

We concluded our journey this quarter by developing the final high fidelity application which included task flows from the medium fidelity prototype and additional changes based on heuristic evaluations conducted by outside reviewers.

Tools used: pros and cons of these tools

We used a collection of tools to support development and manage various features embedded within our application. The main framework we utilized was React Native because a large advantage was that the language used, JavaScript, is compatible with both Android and IOS. Combined with the ability to access external libraries such as React Native Elements allowed for an efficient coding process. To build, we used Expo for its comparatively robust pre-built components and XCode to display and emulate the app. The greatest pro of Expo was the ease of access to common mobile features such as Image and Async storage – which we used repeatedly. A potential con we faced was that a team member's terminal was unable to run Expo, which led to a more difficult time developing as they could not asynchronously view updates to the app. Lastly, for more centralized data storage for user profiles and cuisines we used Supabase.

Wizard of Oz techniques

During the development process we realized that for users to fully experience all the features of our application and be able to access the task flows, we would have to use

Wizard of Oz techniques. Most of these features centered around the social components as interactions with other users would be impossible to develop naturally during a short demo timeframe. Below are our top 3 Wizard of Oz features:

1. Simulated badge collection progress and collection. The passport book comes pre loaded with a couple of badges already because we wanted to show the

FoodDex | 43

design without the need for extra steps (or real cooking) from the user's end.

Additionally, we encoded a simulated camera that uploads a completed recipe picture in order to collect a badge as we doubt users would actually have the food handy to submit.

2. Algorithm that powers homepage "For You" feature and recommendations for popular cuisines. It would be unfeasible to create a real algorithm to suggest trending or personalized recipes as it is impossible to collect that data without user history. But in order to achieve our usability goals and simulate exploration of new cultures, we decided to Wizard of Oz the recommendations.

3. All two sided social interactions. Our third task was to promote sharing posts with a user's circle of friends but we do not yet have other real people for necessary social interactions. To simulate them, we Wizard of Oz'ed and allowed users to interact with comments that were preselected.

Hard-coded techniques used

Similar to the Wizard of Oz features, we also hard coded aspects of our app in order to provide users with a more immersive experience.

1. Recipe lists and characteristics available for selection. There is a preset database with 15 recipes, 3 each from 5 different cuisines, in a Supabase database we made. The filters for each recipe such as difficulty, dietary restrictions, kid-friendly etc. were also predetermined.

2. Preexisting comments. While we Wizard of Oz'ed the interactions users experienced (for example comments), the actual profile posts and feed content were prewritten by us and hardcoded. This allowed for users to experience a robust social environment and understand the mechanics of our third task flow better.

Reflection & Next Steps

Main learnings from this quarter about the design thinking process, your studio theme, and your own project

We genuinely learned so many invaluable lessons about the design process and have grown our needfinding/prototyping skills immensely as a result. As a group we had so many takeaways ranging from how to maximize our individual strengths to the insights from our multitude of user interviews and heuristic evaluation results that we will undoubtedly take with us through the rest of our Stanford career and beyond.

1. Diversity in experience and needs between users

As a team of all college students, our group came into 147 with a good sense of what users our age and demographics wanted out of an app. But as we conducted user interviews we were genuinely so amazed by the different pain points and issues affecting different groups of people. We also quickly learned how important it was that we conduct deep analysis of the hidden needs of our interviewees. A moment that stood out to us was interviewing Stephen, the music teacher, who explained how the rise in apps and digital technology has really isolated the older generation. Through the empathy maps we were able to uncover unmet qualms/tensions that existed that were not outrightly mentioned and were able to make our idea more robust. As a result we very intentionally and carefully tried to design FoodDex as a truly universal platform that allowed all users to have a positive experience with cultural exploration.

2. Iterate, iterate, iterate with intentionality and purpose

The first half of the quarter was filled with various rounds of iteration from our experience prototypes to lowfi prototype designs. At times, it was hard for our team to really see the impact of purposeful iteration on the final design of our app. But now looking back, each time we discussed a potential change in response to a user error or

FoodDex | 45

redrew one of the lowfi prototype screens so that it provided more clarity, really added up towards our final product. We really made a strong effort to try and address every potential shortcoming of FoodDex in the given timeframe, and so every week for needfinding and experience prototype testing, we sought out more interviewees than required. Kind of like building a muscle, each time we iterated we grew more confident and efficient because we were able to take past learnings and apply them to our current issues. For example, the low fi screens initially took us many hours to design and plan out, but as we fine tuned each aspect of layout, color, size etc we were able to quickly reiterate and make progress towards our final app.

If you had more time, what might you add in the future?

Through both our heuristic evaluation results and what our group personally felt that we wanted to achieve with this project, there are many features we would want to add given the time. Mainly, we hope to further enhance our core usability goals of exploration and inclusive design by developing a more decentralized and user driven platform in the future. Below are some of the top features:

1. Forum for users to upload their own cultural recipes. This is absolutely the top feature we wish we had time to develop. Because our application is focused on cultural cuisines – and cultures are inherently political – we want to allow for the greatest possible inclusivity for recipe discovery. Currently, we hardcoded a small selection of cuisines, but adding the option for our diverse user population

to contribute from their own recipes would greatly increase the authenticity of FoodDex. Having this option would also largely eliminate the possibility of stereotyping or misrepresentation since users themselves would be able to assess the accuracy of their own culture dishes. Some additional safety measures if we were to implement an online forum would be content moderation to ensure respectful discourse and to prevent harassment of minority groups.

FoodDex | 46

2. Rotating collection of limited edition themed badges based on special events such as holidays. We recognize that food plays a pivotal role in many cultural celebrations and think that incorporating limited edition badges would further promote exploration. There are many dishes that are closely tied to a holiday (think Turkey for Thanksgiving!), and by adding such cuisines to FoodDex, it would serve as an added learning opportunity for users. The limited nature would also further incentivize users to actually participate and cook these dishes since they would be able to share special designs or banners with their network.

We wanted to sincerely thank Nancy our wonderful TA and James for their continuous and valuable support through the quarter. We would definitely not have been able to get to where we are without their help and have come out of CS 147 much, much stronger designers and developers.