

Hi-Fi Prototype Midway

Culture through Cuisine

Defne Genç, Janet Zhong,
Amrita Palaparthi, Kyla Guru

Meet Our Dishcover-ers

Defne



Dish of choice:



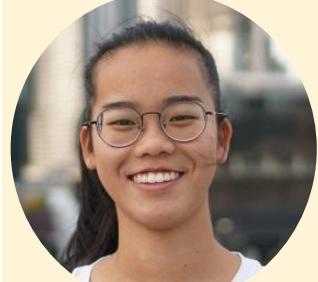
Kyla



Dish of choice:



Janet



Dish of choice:



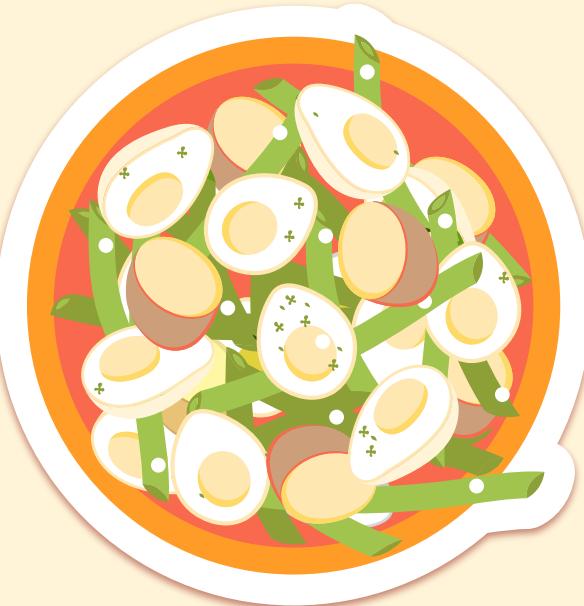
Amrita



Dish of choice:

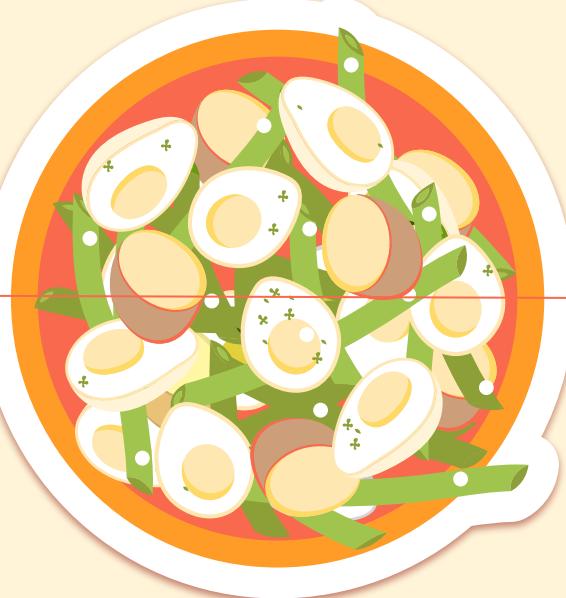


Problem Statement



Learning about and creating food with **ingredients** from other cultures can be an **intimidating experience**.

Our Solution



Dishcovery helps you recognize, learn about, and cook with foods from around the world. We use **image recognition** to identify new ingredients and enable you to delve into their **cultural context** and authentic recipes using them, providing a **cultural culinary companion** from the grocery store to your kitchen.

Table of Contents



Heuristic Evaluation Results

Summary of heuristic evaluation results.



Major UI & Product Revisions

Details and rationale on major changes, progress towards usability goals through revisions.



Prototype Implementation

Framework and features thus far, explanation of techniques, and plans for moving ahead.



Demo

Dish-cover Dishcovery in action (so far)!

Heuristic Evaluation Summary



6
Severity - 4

Our highest priority violations.



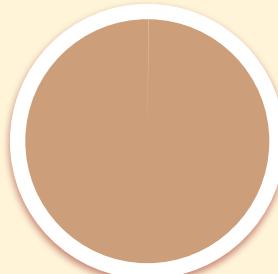
22
Severity - 3

Second priority violations.



31
Severity - 2

The most numerous amount
of violations – .



82

Violations Total

With the remaining Severity 1.



Heuristic Evaluation Summary

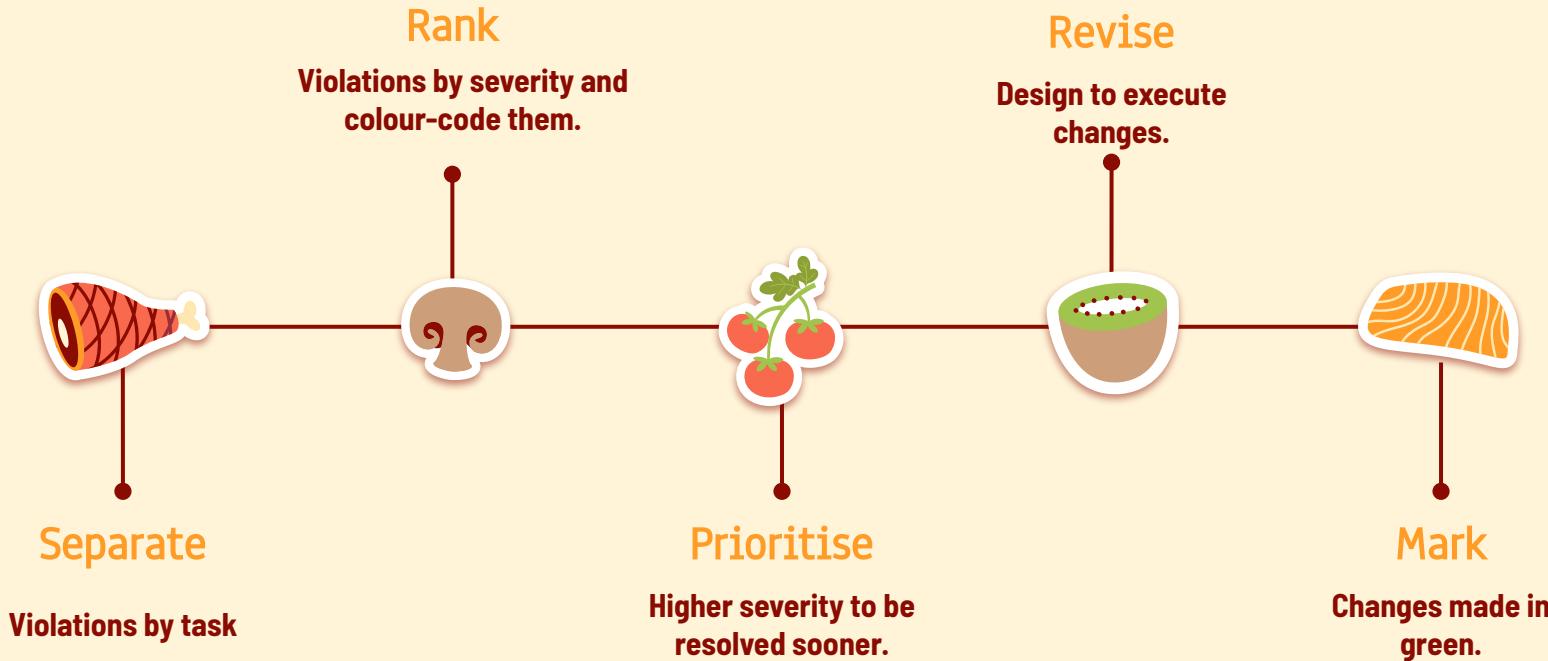
- **Consistency**
 - Consistent look and feel across pages
 - Layout, element placement within pages
- **Aesthetics and Minimalism**
 - Colors used in our app with meaning and intention
 - Only necessary animation between pages
 - Clear differentiation between different components in our UI
- **Signposting + Handling Failure Paths**
 - Notifications upon success and failure for tasks like scanning
 - Paths to re-scan an element when a scan fails
 - Clearer instructions for scanning and searching through dishes



Unaddressed Revisions

- Some qualitative recommendations and questions, i.e. **which cultures will be addressed**, where to get the data, and how to present foods that belong to multiple cultures
 - Will be left to decide for when we have real datasets, beyond implementation
- Some **button flows** that don't work aren't all resolved in the Figma (i.e. scan screens because of Figma limitations), more so left for the implementation prototype.
- **Mentioning cultural significance** in the context
 - Again, this depends on the datasets we plan on using, so it would be premature at this stage to try and reconcile what we will mention regarding the cultural significance of an ingredient
- We didn't **remove the match percentage (%90)**, but rather added a "match" text to clarify.

Heuristic Revision Methodology



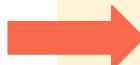
Encoding Violations to Prioritize

Red: Severity=4, Orange:Severity=3

Task 1: Search for an unfamiliar food item

Violations:

- There is no indication/confirmation on whether or not an item has been successfully scanned by the application.
- The interface's back button behaves differently based on the place in a task flow: sometimes it intuitively takes me back one screen, but sometimes it takes me back 2-3 screens (e.g. scanning bitter melon → more info → back)
- Description: navigation buttons do not work when I am about to scan an item / other parts of the app. [edit] - they work every other time for some reason.
- Description: After clicking on the Camera icon to start a scan (and before seeing the image recognition results), there isn't a way to go back to the previous screen.
- The image-recognition results of an ingredient doesn't have a mechanism for closing that tab.
- What happens if the user searches for an ingredient that doesn't exist?
- The Scan screen has instructional text saying "Place subject within focus!"
- You can check multiple user reviews for stars. Right now, you can click 5 star and up, 3 star and up, and exclude 4 stars.

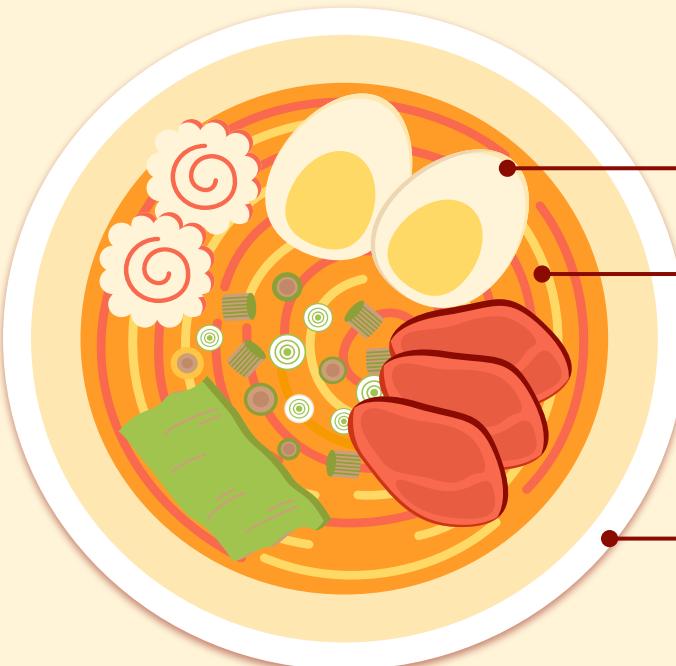


Task 1: Search for an unfamiliar food item

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- What happens if the user searches for an ingredient that doesn't exist?
- The Scan screen has instructional text saying "Place subject within focus!"
- You can check multiple user reviews for stars. Right now, you can click 5 star and up, 3 star and up, and exclude 4 stars.
- In the Scan screen, there is nothing indicating that the subject is correctly in focus.

Recap of our Task Flows



1

Search

For an unfamiliar food item through scanning.

2

Contextualise

Using the information provided in the app.

3

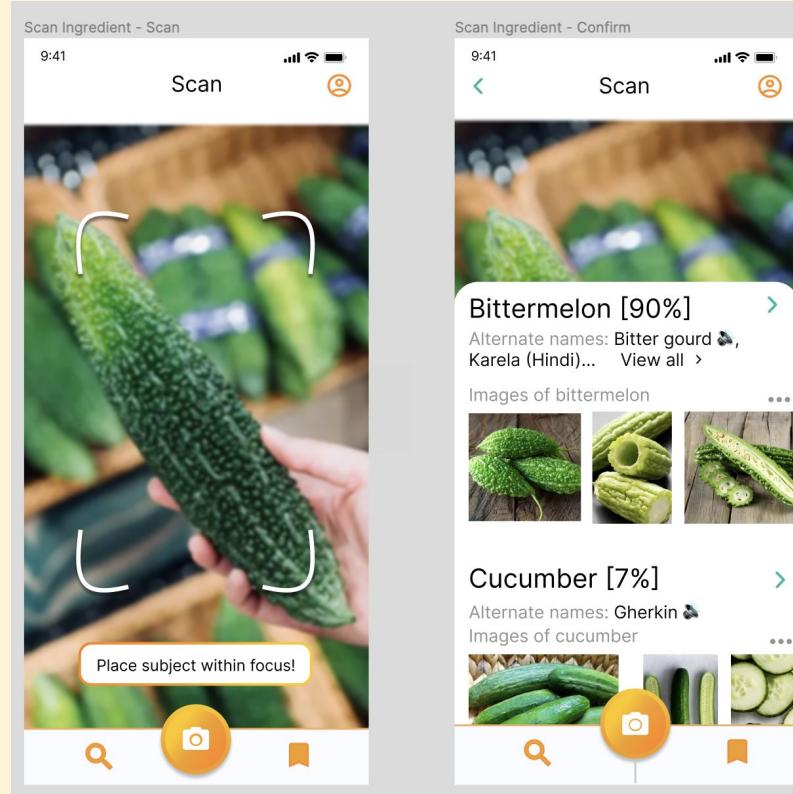
Authentic Cooking

Through recipes the user finds and/or saves.

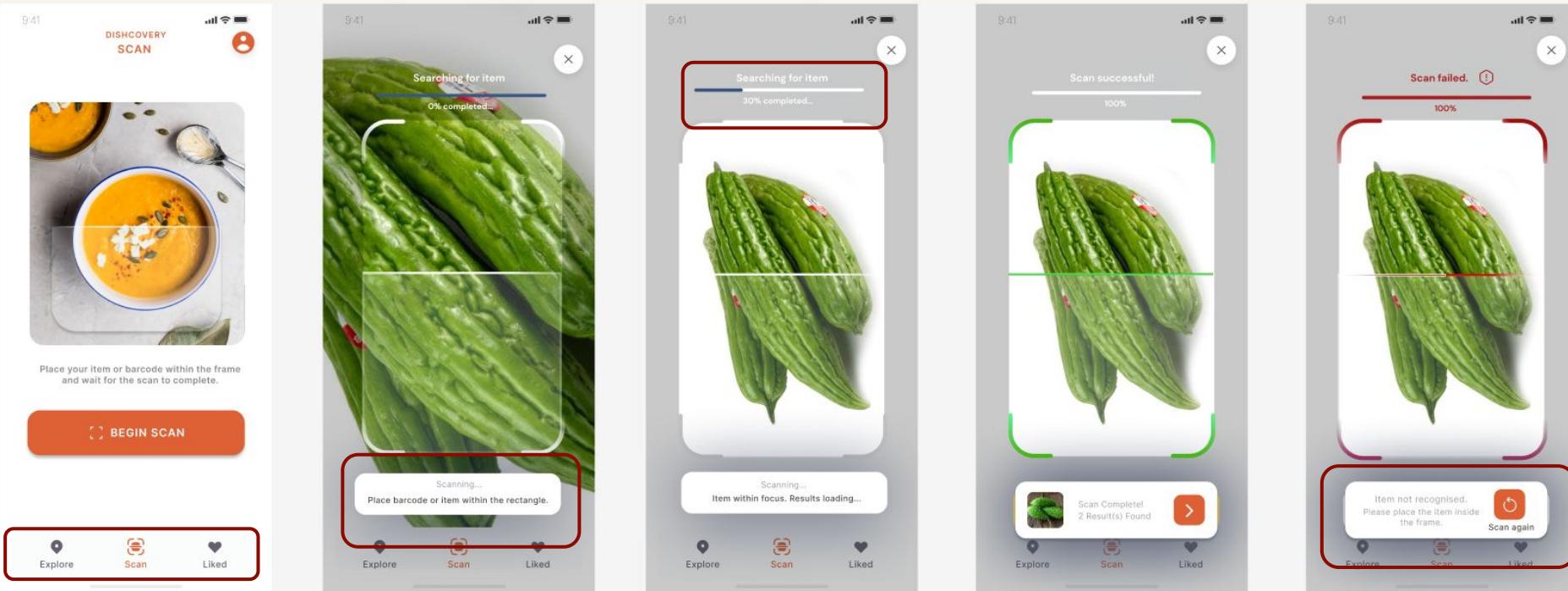
Task 1: Search for an unfamiliar food item

Severity	Description	Solution/Rationale
4	No confirmation when item scans or when the item isn't recognised.	<ul style="list-style-type: none">Use colours, confirmation, and warning as appropriate.
4	Some buttons not working properly in prototype.	<ul style="list-style-type: none">Addressed in implementation.
3	No warning for when subject isn't in focus.	<ul style="list-style-type: none">Added a warning to place subject in focus.
3	Colour scheme hard on the eyes.	<ul style="list-style-type: none">Changed to a single accent colour and removed gradients.

Task 1: Search for an unfamiliar food item (V1)



Task 1: Search for an unfamiliar food item (V2+Rationale)



S3: Removal of gradients to introduce a cleaner aesthetic.

S3: Clear instructions for placing item in focus and search in progress.

S4: Clear errors to guide user towards accurate scan results.

Task 2: Contextualization

Severity	Description	Solution
4	"View all" button not visible because it's in the same colour as the text.	<ul style="list-style-type: none">Changed to accent colour.
4	Need to re-scan to go back to the context from recipes.	<ul style="list-style-type: none">Added a back button.
3	Inconsistent tab names, spacing and punctuation.	<ul style="list-style-type: none">Standardised using components.
3	Which recipes and cultures to include?	<ul style="list-style-type: none">"Request recipe" option added for inclusivity.

Task 2: Contextualization (V1)

9:41 Ingredient Context

Explore Recipes →

Bitter Melon

Flavor Profile/Texture

Origins and Geography

Cultural Context and Tips

Health Benefits

Search Camera Bookmarks

9:41 Ingredient Context

Explore Recipes →

Bitter Melon

Flavor Profile/Texture

- Sharp, bitter flavour that is toned down through cooking
- Crunchy husk, similar to that of bell pepper
- Crunchy, watery inside similar to cucumber

Search Camera Bookmarks

9:41 Ingredient Context

Explore Recipes →

Bitter Melon

Flavor Profile/Texture

Origins and Geography

Bittermelon has a mixed origin, likely originating in Africa. Wild variants were spread in Asia and South-East Asia and it is also found in the Caribbean.

Search Camera Bookmarks

9:41 Ingredient Context

Explore Recipes →

Bitter Melon

Flavor Profile/Texture

Origins and Geography

Cultural Context and Tips

- **Chinese cooking:** stir fried with pork, used in soups and consumed as a tea.
- **Northern Indian Bitter Melon:** stuffed with spices, prepared or served with yogurt to offset the bitterness.
- **Southern India:** mixed with coconut and stir-fried with various spices.
- **Caribbean:** Bitter Melon is sautéed with onion, garlic until crisp.
- **Haiti:** herbal tea (asosi)

Search Camera Bookmarks

9:41 Ingredient Context

Explore Recipes →

Bitter Melon

Flavor Profile/Texture

Origins and Geography

Cultural Context and Tips

Health Information

One fresh bitter melon contains on average:

- **Calories:** 21
- **Protein:** 1 gram
- **Fat:** 0 grams
- **Carbohydrates:** 5 grams
- **Fiber:** 3 grams
- **Sugar:** 0 grams
- **Cholesterol:** 0 milligrams
- **Sodium:** 6 milligrams

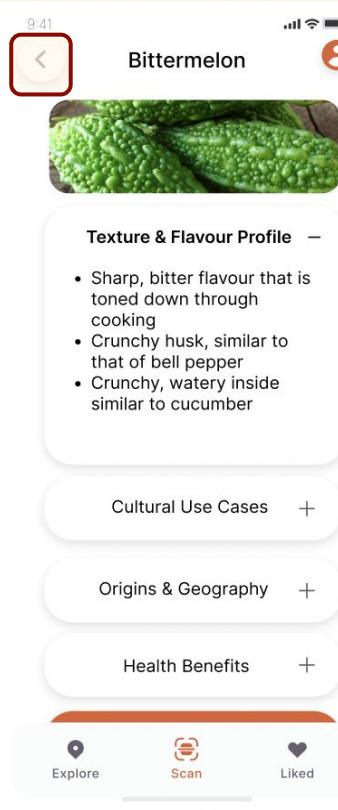
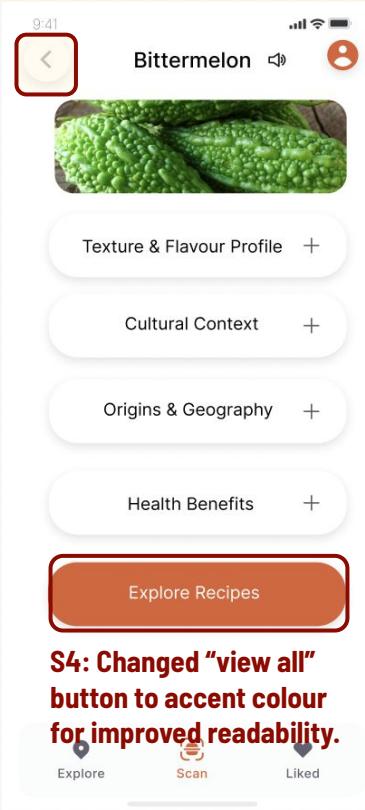
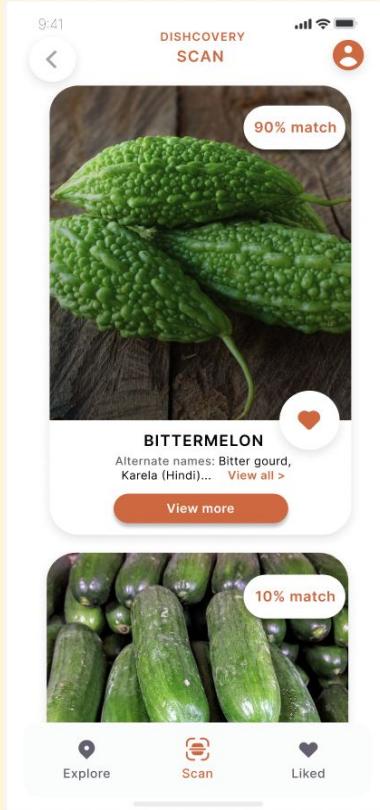
Bitter melon is rich in antioxidants. One cup of bitter melon contains about 43% of your recommended daily intake of vitamin C

Search Camera Bookmarks

Task 2: Contextualisation (V2+Rationale)

Usability goals: increasing learnability!

S4: Added a back button.



S3: Standardized styles to improve consistency.

Task 2: Contextualisation (V2+Rationale)

The figure consists of four screenshots of a mobile application interface for the food item "Bittermelon".

- Screenshot 1:** Shows the initial state with three main sections: "Texture & Flavour Profile", "Cultural Use Cases", and "Origins & Geography". Below these is a detailed "Health Benefits" section with nutritional information and a note about its antioxidant properties.
- Screenshot 2:** Similar to Screenshot 1, but includes a "REQUEST A RECIPE" button at the bottom of the "Health Benefits" section.
- Screenshot 3:** The "REQUEST A RECIPE" button has been moved to a prominent position at the bottom right of the screen, overlapping the "Health Benefits" section.
- Screenshot 4:** The "REQUEST A RECIPE" button is now highlighted with a red border, indicating it is the primary action point.

S3: "REQUEST A RECIPE" option added for inclusivity of currently under-represented cultural foods within our app.

Task 3: Authentic Cooking

Severity	Description	Solution
4	Some buttons and texts take user to wrong destination.	<ul style="list-style-type: none">• Addressed in prototype and implementation.
3	Inconsistent fonts and headers.	<ul style="list-style-type: none">• Addressed in prototype and implementation.
3	No confirmation before un-saving.	<ul style="list-style-type: none">• Confirmation added.
3	Filters buttons move when changed.	<ul style="list-style-type: none">• Used auto layout for filters.

Task 3: Authentic Cooking (V1)

The screenshots illustrate the Dishcovery app's user interface across five screens:

- Dishcovery Profile (Left):** Shows the user profile with the username "martinbikes123". It includes sections for Allergy Information (Peanuts, Green Bell Peppers, Oats), Nutritional Goals (Low-Fat, < 700 Calories), and Preferred Spice Levels (Low, Medium, High). Bottom icons include a magnifying glass, camera, and bookmark.
- Explore (Second from Left):** A search bar at the top allows users to search by ingredient. Below it, a section titled "Based on your scans" shows images of Lahmacun and Mixed Kebab. Another section, "Explore by ingredient", shows images of Bitter melon and Minced lamb.
- Dishes (Third from Left):** Displays a list of dishes with 52 results. A filter for "Bitter melon" is applied. The list includes Stir Fry, Narmul, Stuffed, Boiled, Crispy, and Ginisang Ampalaya. Each dish has a small image and a circular icon below it.
- Ginisang Ampalaya (Fourth from Left):** A detailed view of the Ginisang Ampalaya recipe. It features a large image of the dish, a "Share" button, and a "Cuisine: Filipino" label. The ingredients listed are Ampalaya (bittermelon thin slices), Garlic, Black Pepper, Eggs, and Onion. The recipe steps are: 1. Place the ampalaya in a large bowl. 2. Add salt and lukewarm water and leave for 5 minutes. 3. Heat the pan and place the cooking oil. 4. Sauté the garlic and onion. 5. Add the ampalaya.
- Filters (Right):** A screen showing various filtering options. It includes sections for Occasion (Breakfast, Lunch, Dessert, Snack), Difficulty (Easy, Medium, Hard), Dietary Preferences (Vegetarian, Gluten-free, Vegan), and Time (15 min, 10min, 30min, 1 hr, 1.5 hr, 2 hr+). Below these are "User Review" filters for star ratings (4 & up, 4.5 & up, 5 & up) and a "Show 3 results" button.
- Explore (Far Right):** A final explore screen showing results for "Dishes" with 3 results. It lists Narmul: Korea, Vepudu: India, and Ginisang Ampalaya: Philippines, each with a small image and a bookmark icon.

Task 3: Authentic Cooking (V2+Rationale)

S3: more consistent fonts and headers.

Usability goals: increasing efficiency of access to recipes!

Task 3: Authentic Cooking

S3: Auto-layout for filters to improve readability

The image displays four screenshots of the Dishcovery app illustrating design improvements related to filters and readability.

- Screenshot 1:** Shows the main interface with a search bar, ingredient suggestions ("Based on your scans"), and popular categories ("Popular Right Now"). A keyboard is visible at the bottom.
- Screenshot 2:** Shows the "Filters" modal with sections for Occasion (Breakfast, Lunch, Dinner, Snack), Difficulty (Easy, Medium, Hard), Dietary Preferences (Vegetarian, Vegan, Gluten-Free, Dairy-free), and Time (15 min, 10min, 30min, 1 hr, 1.5 hr, 2hr+). The "Dinner" filter is selected. A red box highlights the "Filters" modal.
- Screenshot 3:** Shows the "LIKED" screen displaying two recipe cards: "GINISANG" and "SPANAKOPITA". Each card includes a heart icon, difficulty level, preparation time, and origin.
- Screenshot 4:** Shows the "LIKED" screen displaying two recipe cards: "GINISANG" and "SPANAKOPITA". A red box highlights a confirmation dialog box at the bottom right asking "Unsave?" with "Confirm" and "Cancel" buttons.

S3: Auto-layout for filters to improve readability

S3: Unsave confirmation added for greater visibility of status

Progress Towards Usability Goals

Efficiency

Increasing the relevance of recipes

To help the user quickly find a recipe that suits their preferences, we improved the options provided in preferences and the filtering flow. The user can also calculate ingredients required depending on serving size.

Guiding the user's eyes quicker through design

Ease of use in navigating recipe with consistent fonts/coloring, added bar navigation inside the recipe itself.

Learnability

Scan results organization

Instead of having several options for what the ingredient may be, the prototype presents the most likely ingredient prominently and *feeds* the user consumable and well-formatted cultural content.

Easy access to cultural context

The user can access cultural context of a specific ingredient after scanning, as well as the cultural context of the selected dish after recipe selection.



Design Revisions Recap

H8 and H11: Accessible and Minimalist Design

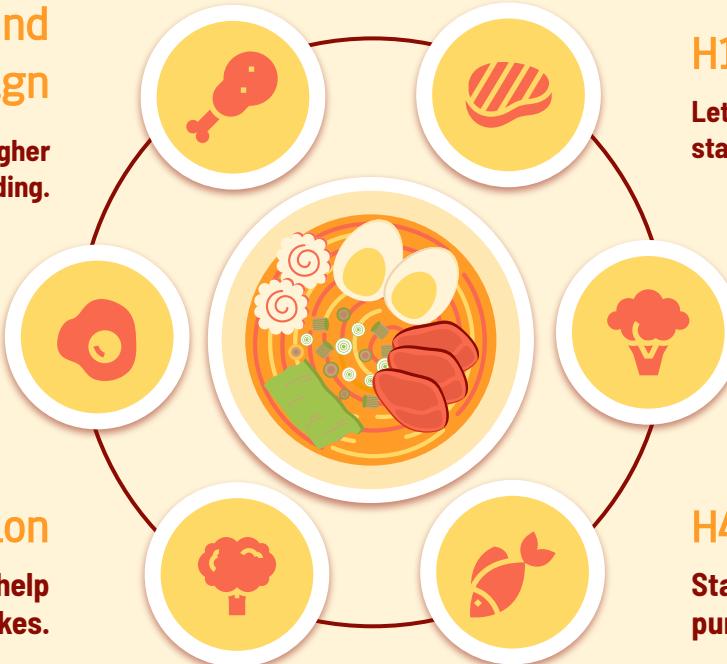
Fewer colours and higher contrast for ease of reading.

H12: Inclusion

More nutrition settings to be more inclusive of religious preferences.

H5: Error Prevention

Confirmations add to help users avoid mistakes.



H1: Visibility

Letting the user know the status and result of the scan.

H7: Efficiency

Making all buttons fully functional.

H4: Consistency

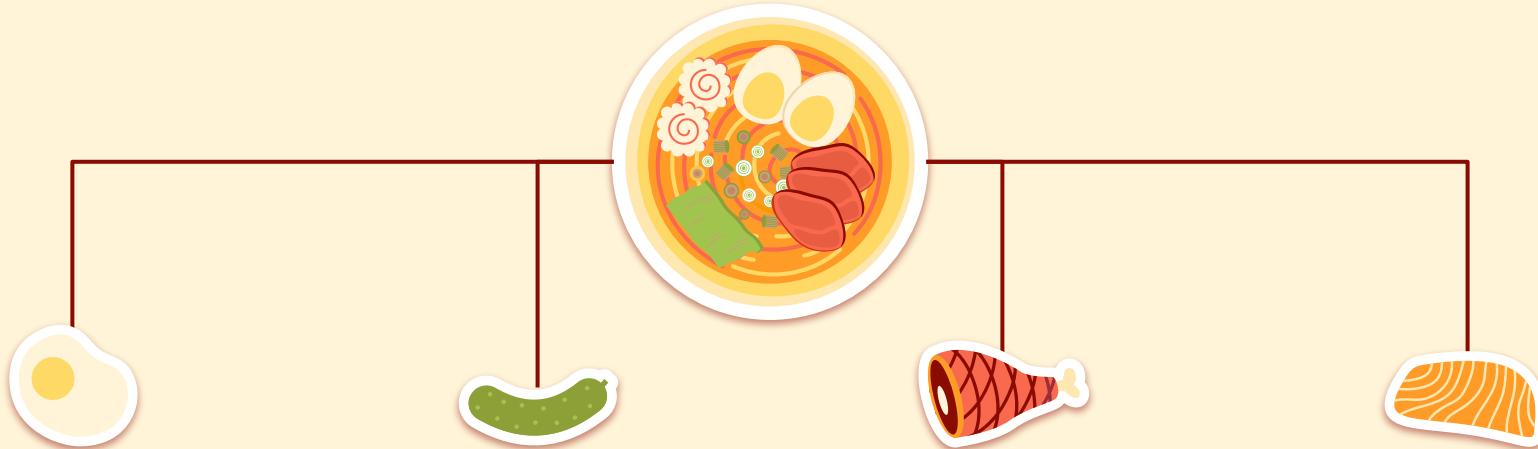
Standardising fonts, sizes, punctuation and names.

Prototyping

Converting design to code



Framework and Tools Used for Dev



GitHub

We have a central repo where we push updates to.

VSCode

VSCode allows us to produce code files and debug errors from Expo

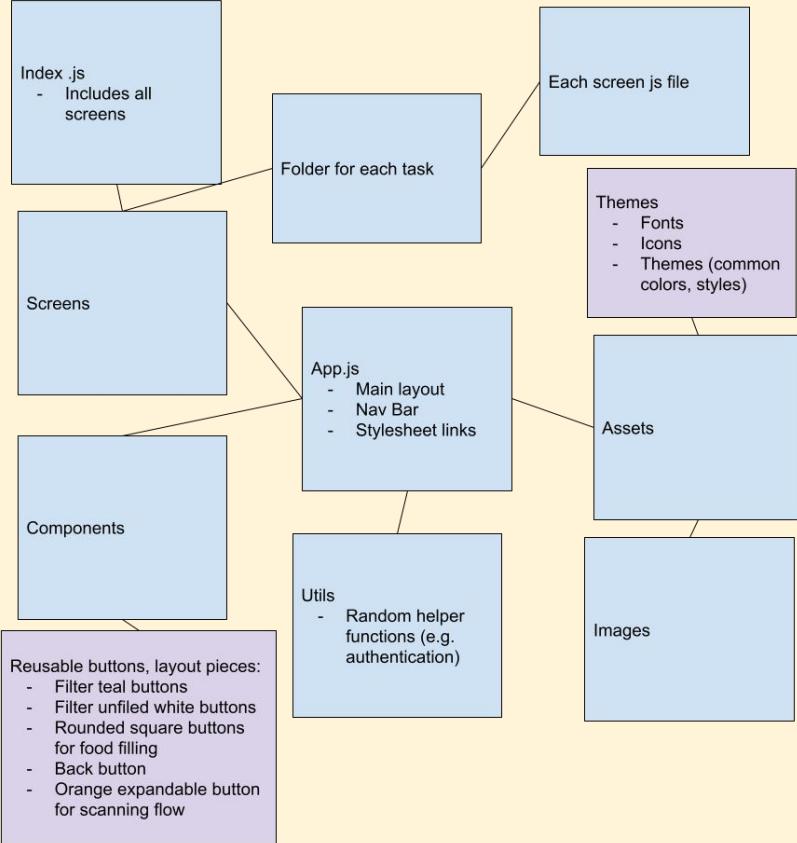
LiveShare

Especially when we are remote, LiveShare allows us to code collaboratively.

Expo

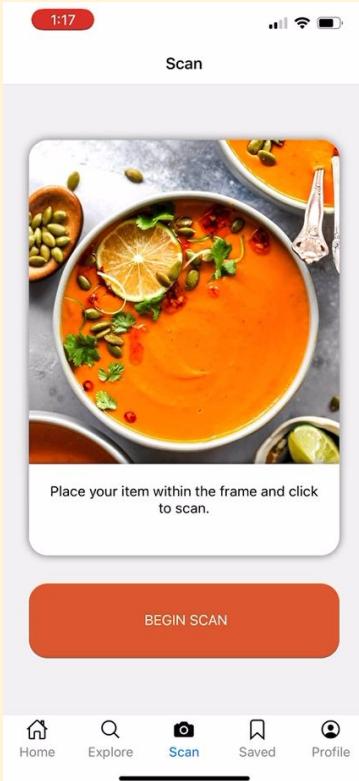
Expo lets us see our code changes (or code errors) come to life.

Code Organization



- Assets
 - Fonts, icons, images styles
- Constants (assets made into variables)
 - Fonts, icons, images, styles
- Screens (organized by task flow)
 - HomeScreen
 - Scan (**completed**)
 - ScanIntroScreen
 - ScanScreen
 - ScanCompleteScreen
 - Additional Context Screen
 - Explore
 - SavedScreen
 - ProfileScreen
- Components (reused in different screens)
 - DishCard

Implemented Features



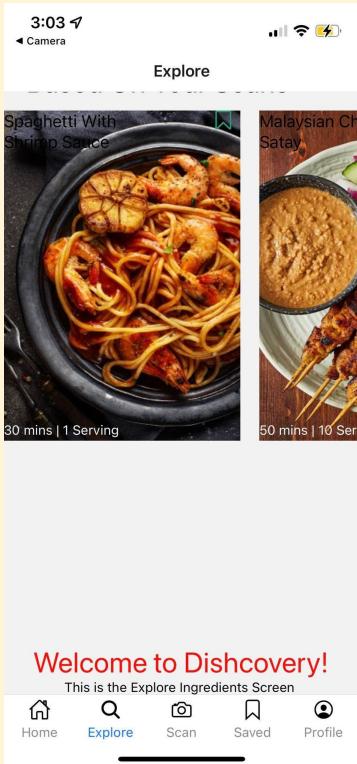
- ✓ Navigation for all main pages has been coded (Tab Navigator for Home, Explore, Scan, Saved, Profile and nested Stack Navigator for Scan Flow screen)
- ✓ **Functionality of Task 1:** Scan an Unfamiliar Ingredient has been completed
 - ✓ Connected to camera
 - ✓ Linked to Clarifai image recognition API
 - ✓ Created a library of cultural ingredients in the assets folder
 - ✓ Can recognize the items from the cultural ingredients (within some accuracy)
 - ✓ If ingredient is found, links to additional context page
 - ✓ If ingredient is not found, button to rescan
- ✓ **UI for Task 1:** Scan an Unfamiliar Ingredient has also been completed
 - ✓ Begin Scan UI
 - ✓ Animated white scanning aimer gif on top of camera
 - ✓ Progress bar as image recognition is searching
 - ✓ Scan box and progress bar turn red or green if image recognition is successful or not successful

Implemented Features

*UI is slightly different to Figma because in the code you have to click to scan, and it doesn't scan if you just hover like a QR code



Unimplemented Features and Plans to Finish



- **Task flow 2 and 3**
 - We have started the explore page!
 - Search by recipe function
 - Filter recipe function
 - Profile page
 - Pre-filtering of searching recipes using profile data
 - Connect app to Firebase/ Supabase to save user's data if they want to save recipes
 - Saved recipe page
 - (We no longer have a home page - it is now the explore page)
 - We also have to write the hard-coded cultural context information
 - Unify the UI (common fonts, button sizes, boxes etc)

We will have a weekend “hackathon” to finish!

Wizard of Oz or Hard-Coded Elements

Surprisingly, our image recognition is actually fully functional (woohoo!) and not wizard of oz'd. However, the perceived accuracy is a wizard of oz technique as it only recognizes three ingredients from a list that we create.

Wizard of Oz - Accuracy of Image Recognition

Image recognition only uses guesses that are in both the Clarifai API food-item library (around 500 generic ingredients) as well as our custom library of cultural food items. Currently we only have three items, bitter melon, cardamom and lemongrass. So if one scanned a cucumber, it would probably come up as bitter melon.

Hard-coded

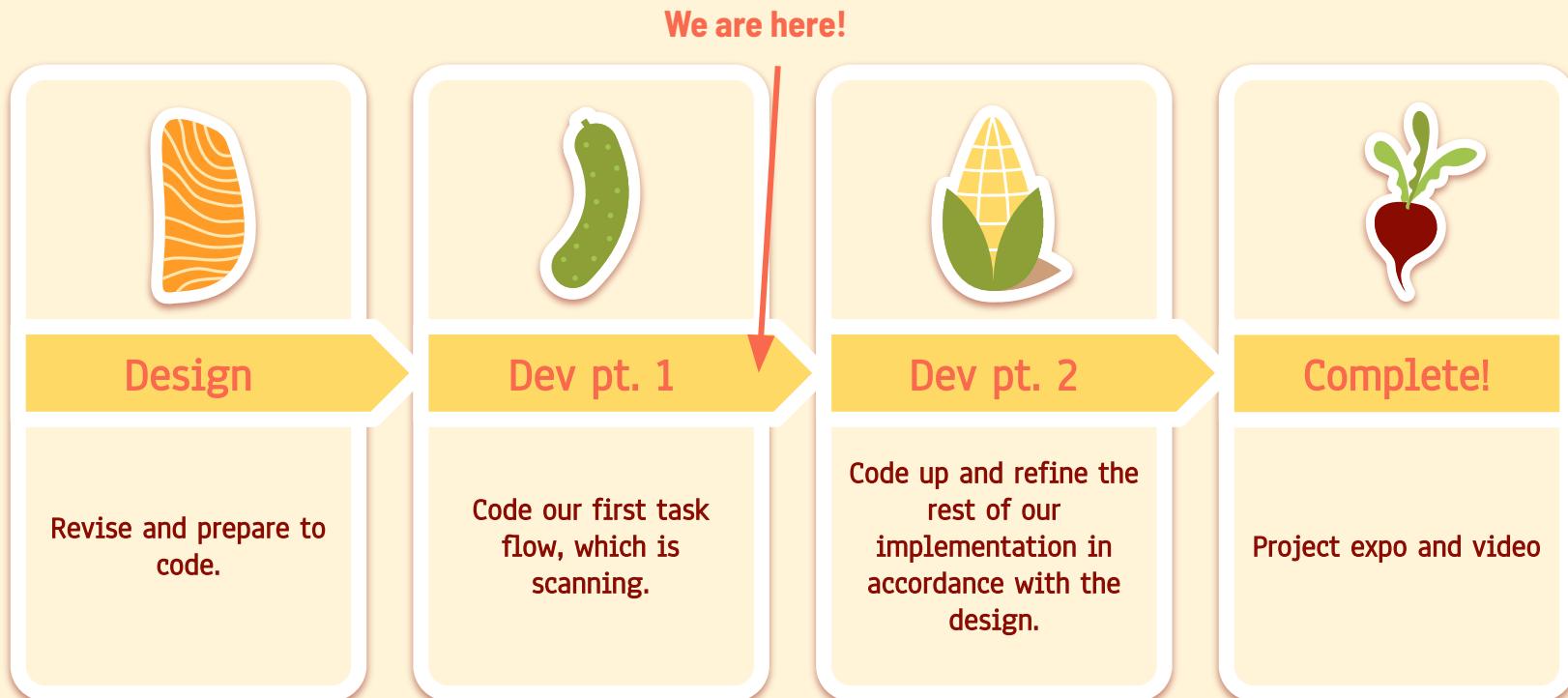
The cultural context of our selected items is currently hard-coded and stored locally on the app. In practice, this could potentially be sourced by searching the internet and interviewing individuals who prepare traditional cultural recipes

Issues/Questions

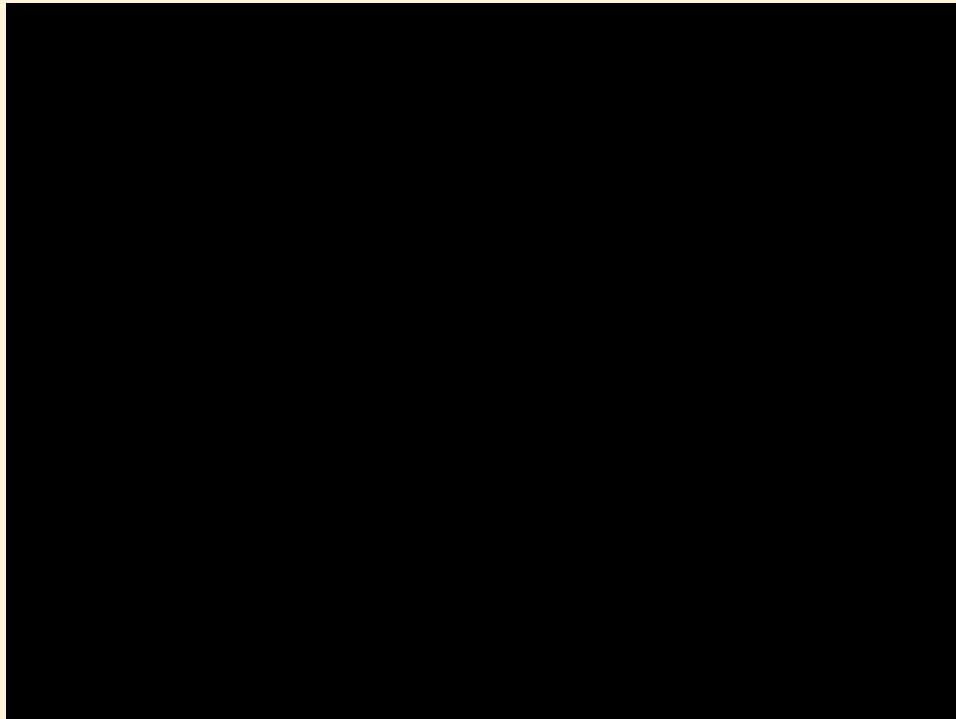
We haven't had significant roadblocks in our code so far but we do raise the following issues if this were to become a real app:

- **The Clarifai AI library only recognizes fairly generic food items.** If our aim is to recognize cultural / uncommon ingredients, then using Clarifai library is actually biased against this. One would need to create their own annotated data set of cultural ingredients and train their own computer vision model to truly achieve Discovery's aim. This is actually doable though - it could potentially be sourced by scraping/ downloading foreign food items from ethnic online grocery websites.
- In a real app, sourcing the cultural context and **making it very authentic is also a difficult** and hard to scale problem if this cultural context is manually sourced.

Progress and Trajectory



Demo Video!



Appen-dish