

Dishcovery

Your cultural culinary companion

Defne Genç, Sharon Wambu,
Abena Ofosu, Kayla Kelly

Meet Our Dishcover-ers

Defne



Dish of choice:



Sharon



Dish of choice:



Abena



Dish of choice:



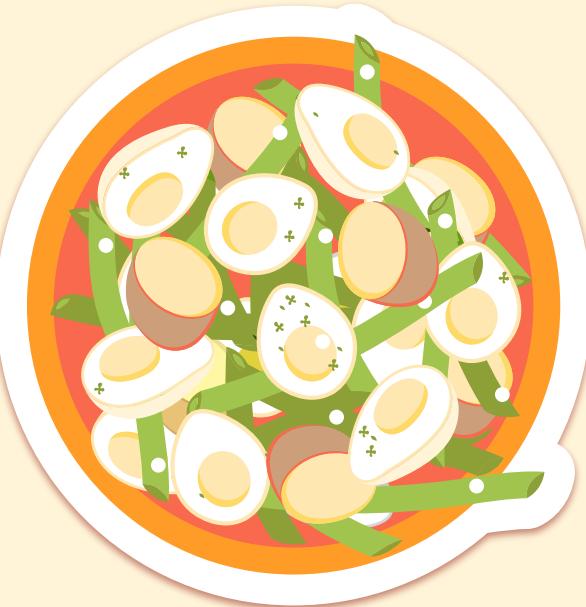
Kayla



Dish of choice:

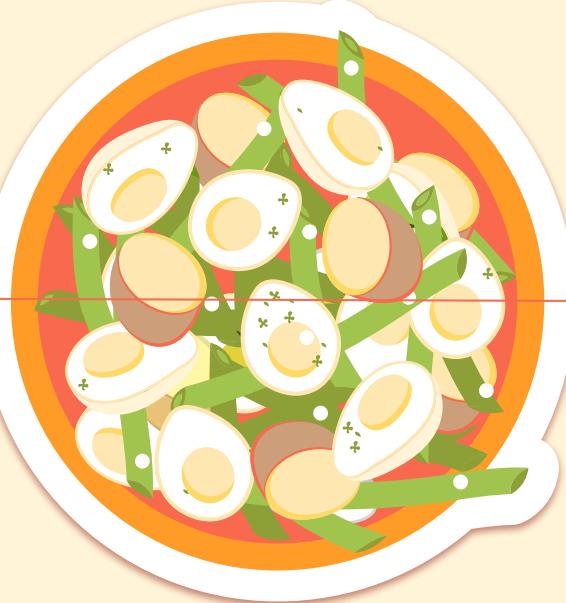


Problem Statement



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.

Why Dishcover? (Concept video)



Outline of Presentation



Design Evolution

**Needfinding, sketching,
heuristic evaluations.**



UI Description

**Usability goals, tasks, values, and
brand.**



UI Demo

Overview of V1 implementation.



Moving Forward

What's to come!

Needfinding

Narrowing the scope of our product

?

Interviewing

We interviewed:

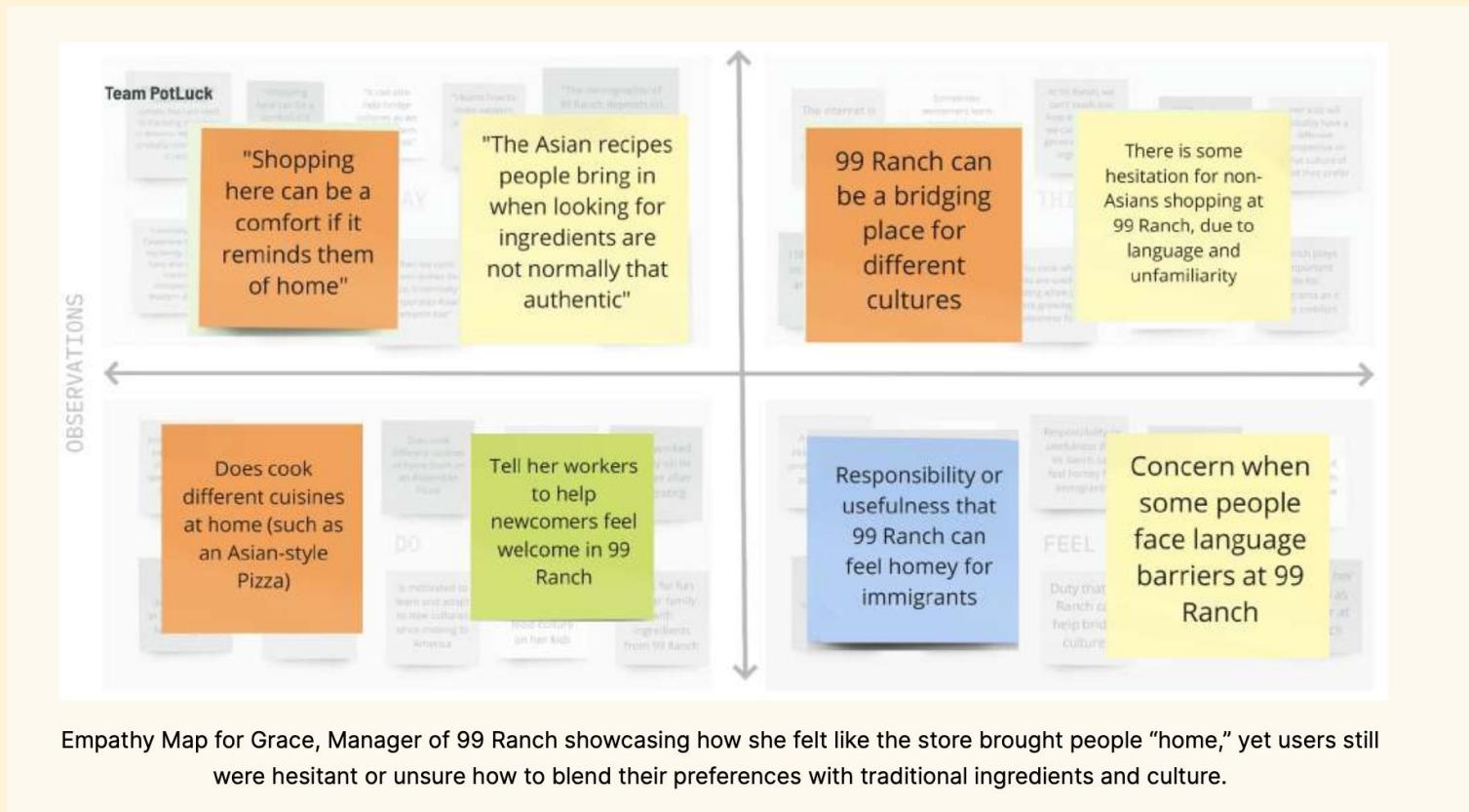
1. **Martin** 30's, no strong cultural ties, not particularly "food-motivated"
2. **Grace** Immigrant from Taiwan and store-owner of Asian grocery store
3. **Jaclyn** Immigrant from Peru and head-chef of Comida Peruana
4. **Sofia** Immigrant from Mexico, Chef at Xanadu House at Stanford
5. **Amy** Server at Decadence at Stanford
6. **Jeson** Immigrant from Malaysia, Founder of OpenChefs (cultural food delivery option)

What we observed

Recurring themes that we saw through our initial interviews were:

- The overarching value given to **authenticity** in cooking.
- **Differences in outlook** amongst potential users ranging from seeing cooking as transactional to deeply personal.
- Deep sense of **pride** in certain individuals in cooking their own cultural cuisine.
- A general **hesitation** of interviewees towards cooking foods from *other* cuisines.

What we observed



POVs & HMWs - Grace

We met...

Grace, the **manager of 99 Ranch** in Mountain View, who cooks at home and **observes customers** who are looking for ingredients for Asian cooking.

We were surprised to realize that...

- She noticed a lot of people didn't bring in authentic recipes when **looking for ingredients**, instead defaulting to westernized versions of traditional Asian foods.

We wonder if this means...

- She was concerned that a lot of authenticity behind food was **lost** through **language barriers or inauthentic recipes**.

It would be game-changing to...

- **Connect** people exploring new cuisines to authentic recipes or expert sources of information.

POVs & HMWs

HMW statements we generated included:

- “**How might we make it easier to find authentic recipes?**”
- “**How might we make grocery stores more informative to people unfamiliar with the types of cuisines offered?**”
- “**How might we create a measure of authenticity for recipes?**”

POVs & HMWs

**“How might we make
unfamiliar ingredients speak
for themselves?”**

Experience prototypes

Imported Russian Seasoning Khmeli-suneli



- **Origin/ Places Used:** Russia, Georgia, Eastern Europe
- **Taste/ function:** Khmeli Suneli is a wonderful and warming Georgian spice mix. It is great to flavour stews, soups, meats, chicken, and even rice or vegetables.
- **Contains:** ground coriander seed, celery seed, dried basil, dill, parsley, blue fenugreek, summer savory, bay leaf, mint and marigold.
- **Suggested Recipes:**

Khmeli suneli roasted chicken leg quarters and potatoes + walnut yogurt sauce [\[link\]](#)



- Georgian tomato and cucumber salad [\[link\]](#)



Imported Russian Seasoning Khmeli-suneli



- **Food tips:**

- [Imported Khmeli-Suneli - Aromatic Spice Blend](#)
- **Authentic Khmeli Suneli Recipe - The Legendary Georgian Spice Blend**
- [\[link\]](#)

evergreenkitchen [\[link\]](#) 1 min ago

Watch video [\[link\]](#) [\[link\]](#)

It's one of the most iconic seasonings - a tantalizing spice blend - Khmeli-suneli. Sounds very exotic, right? Khmeli suneli is a legendary Georgian seasoning blend of spices and herbs. It's a very aromatic golden-greenish spice mix with a hint of sweetness.

Khmeli suneli seasoning goes well with almost any dish, meat, vegetable, or salads. You can use it to flavor soups, casseroles, salads, vegetable dishes, rice, risotto, and savory pastries. Of course, it is a must-have ingredient when preparing traditional Caucasian dishes, such as khinkali, chashushuli, satsivi, ketsi, pshavi, and many others.

Presenting the user with different varieties of information to test whether this might influence decision-making around purchasing foreign ingredients. The context presented here included taste/function, geographic roots and origins, suggested recipes, and food tips, including YouTube video clips.

Solution Generation

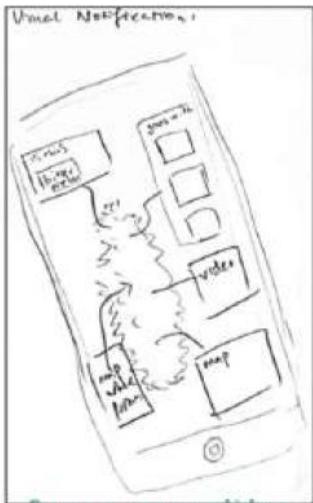
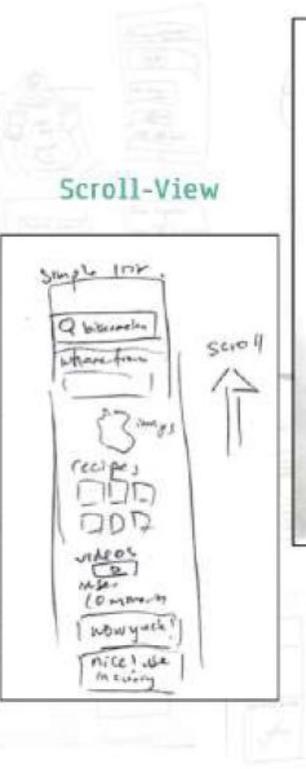
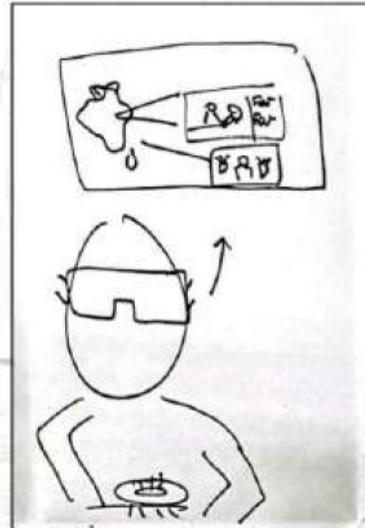


Image recognition
with cultural
context

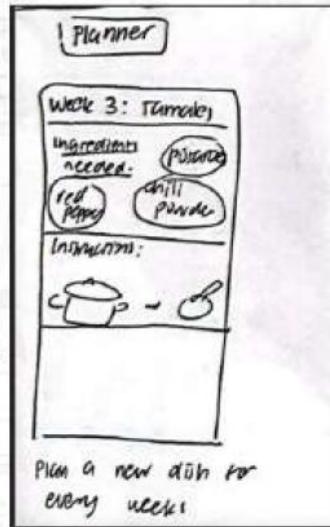


Scroll-View



Transport to
cultural location
via VR!

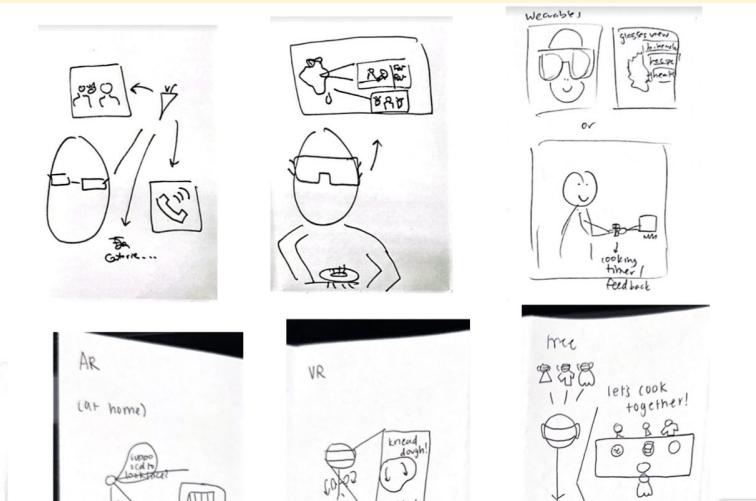
Meal planning &
suggesting combinations



Voice memos to
add personal
touch

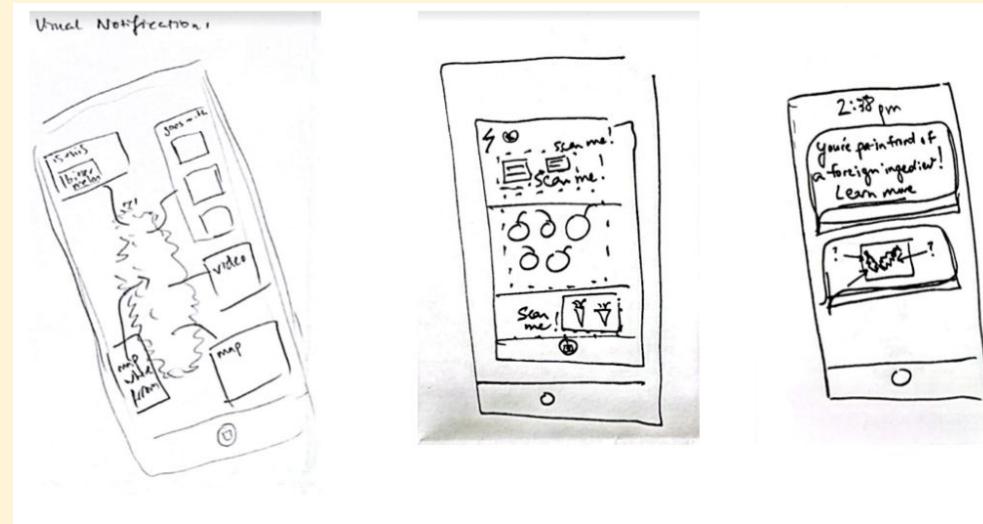
Solution Generation

Option 1: AR Cooking



Scan pantry and see finished dish with instructions.

Option 2: Image Recognition



Scan ingredient and receive information + recipe.

Solution Generation: Pros/Cons

Image Recognition

Pros:

- Fits into the cultural companion narrative
- Variety of information easily available
- Really clear connection to our original tasks
- No additional hardware

Cons:

- Accuracy is imperative and might take lots of training data
- Navigating bias toward more common foods
- Sourcing accurate data
- Visual focus might not be as accessible for visually impaired users

Augmented Reality

Pros:

- Novel software/product
- Lots of visual aid while cooking
- Documenting what user has cooked/wants to cook

Cons:

- Implementation much more difficult
- Requires additional hardware
- High-effort and potentially not intuitive to users

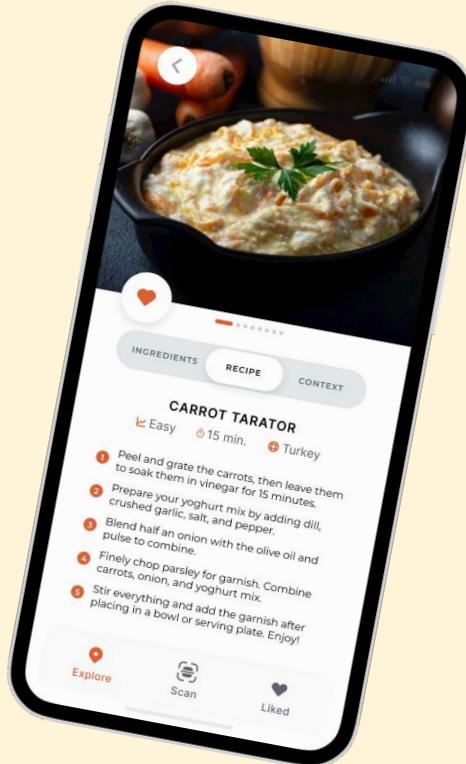
Selected Solution

Image recognition! Now on to...

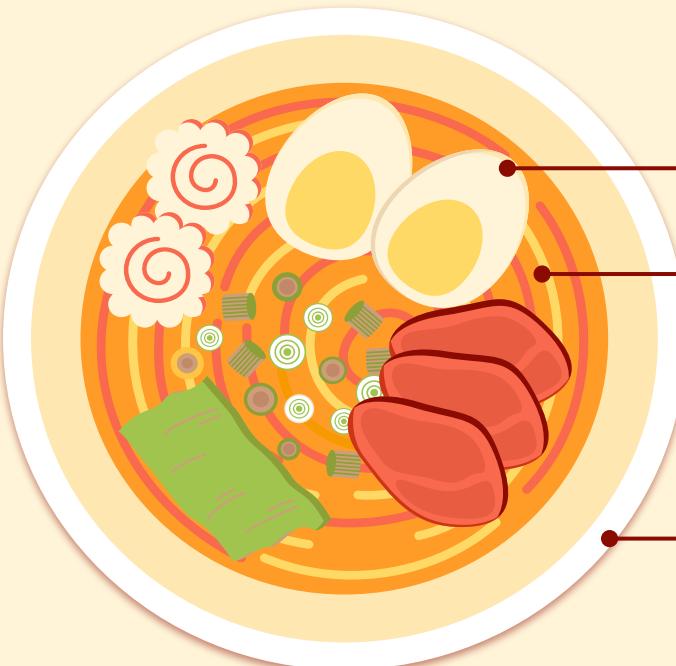


Design

Giving a face to the name



Recap of our Task Flows



1

Search

For an unfamiliar food item through scanning.

2

Contextualise

Using the information provided in the app.

3

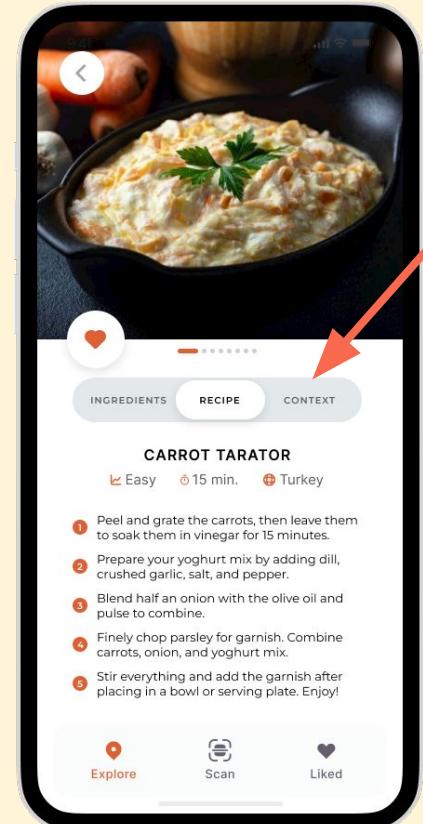
Authentic Cooking

Through recipes the user finds and/or saves.

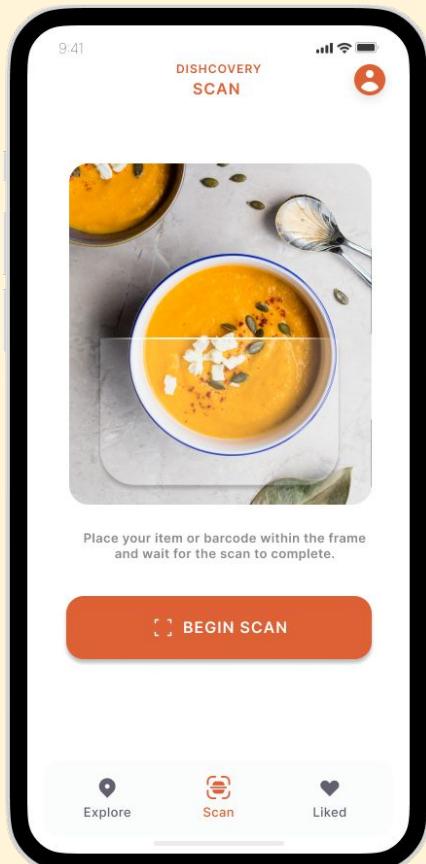
Recap of major design changes

After our heuristic evaluation, Dishcovery's redesign included:

- **Removal of gradients + switching to a single accent colour**
 - Rationale: Improved contrast and readability, more emphasis on accent colour
- **Improved consistency & usability**
 - Rationale: Font size, buttons, and navigation bar needed to be standardised and confirmation steps added to offer a better and more cohesive user experience.
- **Responsive components**
 - Rationale: Adding the ability to make text expand + collapse or to switch between text makes good use of space and makes the abundance of information in the app more intuitive.



Branding & Values



We want our app to feel:

- Approachable
- Appetising
- Exciting
- Welcoming



Main colour

For this, we opted for:

- Soft shadows
- Simple colour scheme
- Rounded corners
- Vibrant visuals

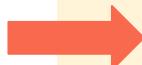
How we redesigned

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.

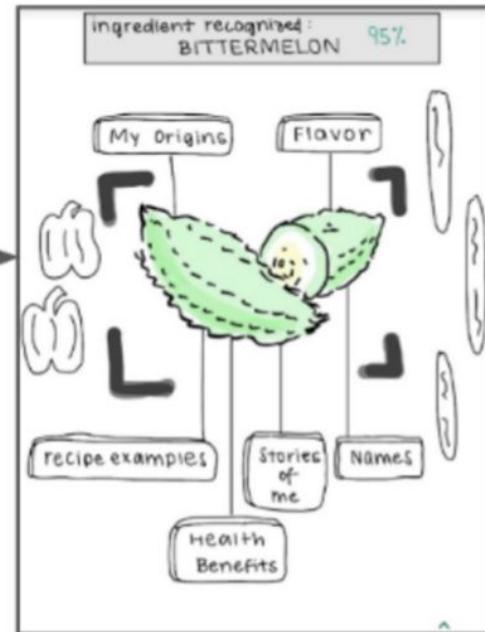
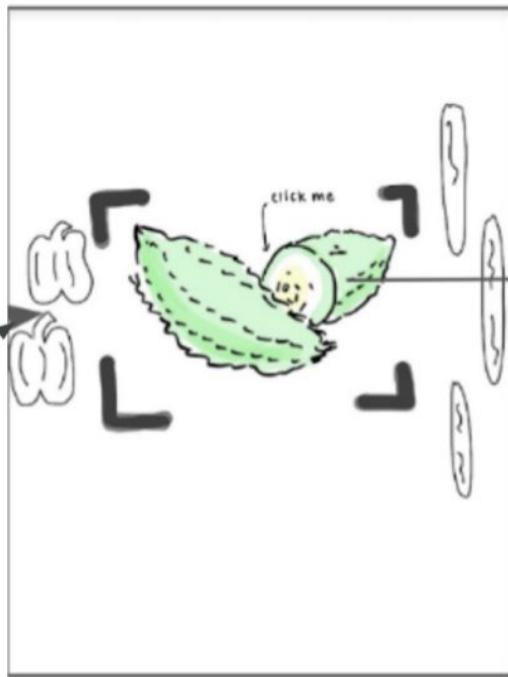


Task 1: Search for an unfamiliar food item

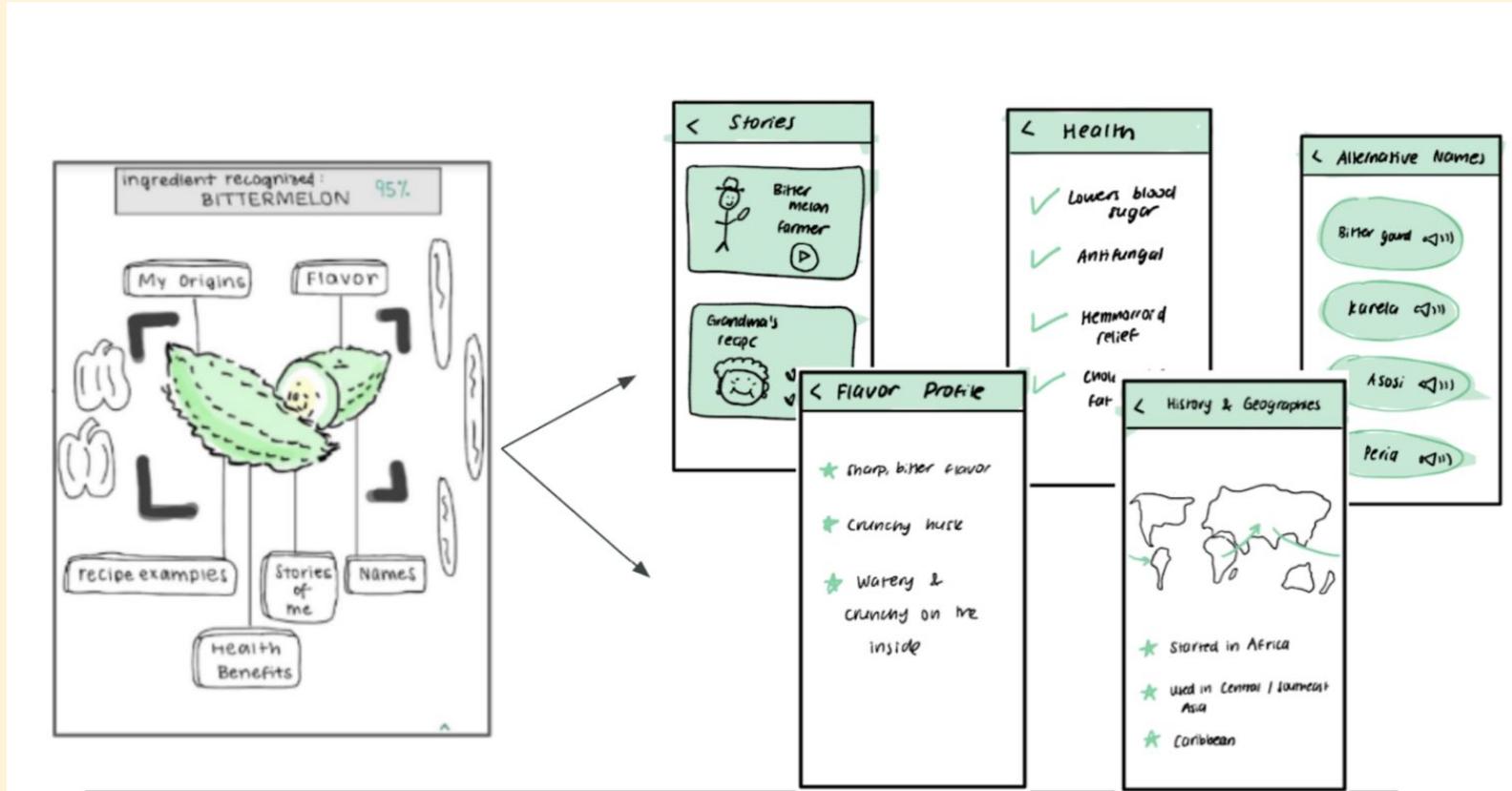
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- What happens if the user searches for an ingredient that doesn't exist?
- The Scan screen has instructional text saying "Place subject within focus!"
- You can check multiple user reviews for stars. Right now, you can click 5 star and up, 3 star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

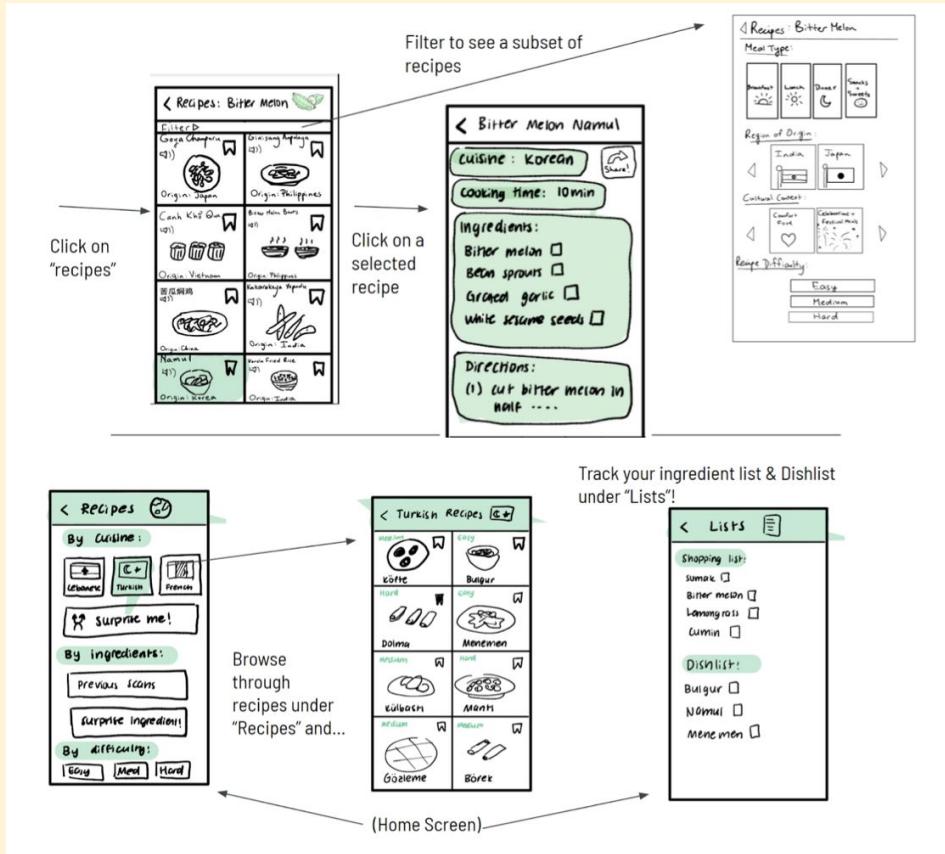
Task 1: Search for an unfamiliar food item (Low-Fi)



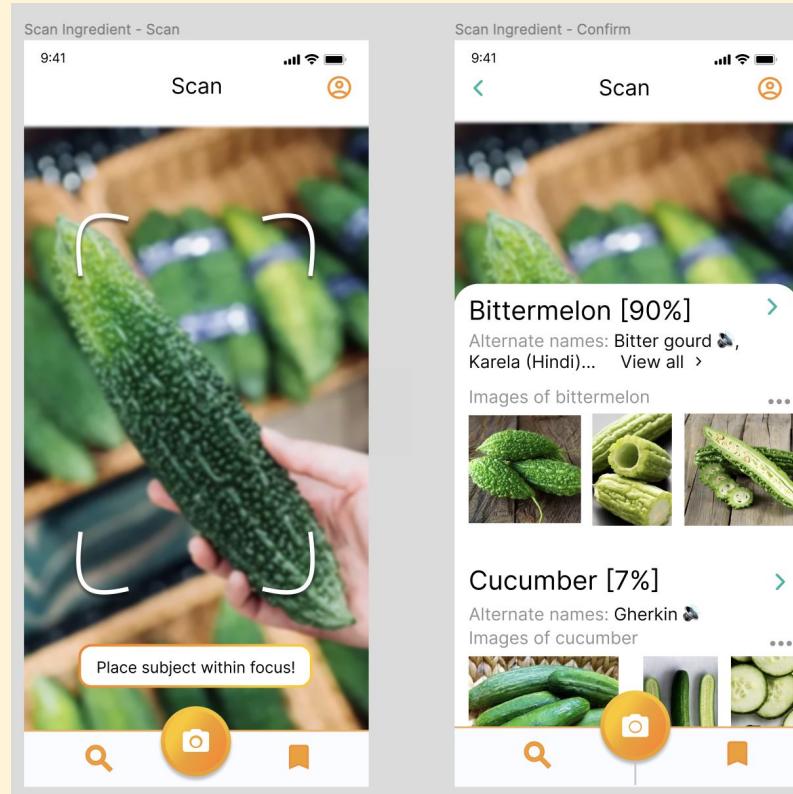
Task 2: Contextualization (Low-Fi)



Task 3: Authentic Cooking (Low-Fi)



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



Task 2: Contextualization (Med-Fi V1)

The screenshots illustrate the evolution of an ingredient profile from a basic card to a detailed informational page.

- Screenshot 1:** Shows a basic card for "Bitter Melon" with four expandable sections: "Flavor Profile/Texture", "Origins and Geography", "Cultural Context and Tips", and "Health Benefits".
- Screenshot 2:** The "Flavor Profile/Texture" section is expanded, displaying a bulleted list of characteristics.
- Screenshot 3:** The "Origins and Geography" section is expanded, showing a map of Asia and Africa with a red dot indicating the origin area. Below the map, a descriptive paragraph is visible.
- Screenshot 4:** The "Cultural Context and Tips" section is expanded, listing various cooking and cultural uses across different regions.
- Screenshot 5:** The "Health Information" section is expanded, providing nutritional facts and health benefits.

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

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.

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)

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

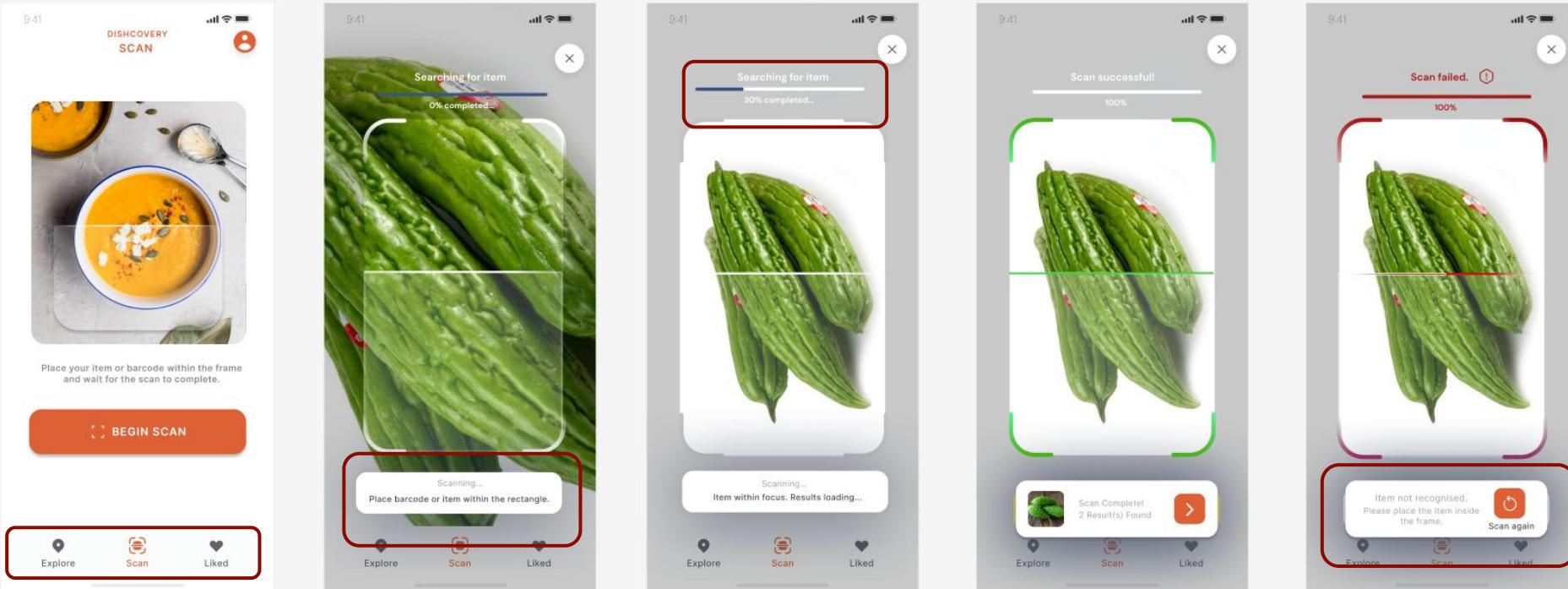
Explore Recipes →

Task 3: Authentic Cooking (Med-Fi V1)

The screenshots illustrate the Dishcovery app's interface and functionality:

- Screenshot 1: Dishcovery Profile**
 - Username: martinbikes123
 - Allergy Information: Peanuts, Green Bell Peppers, Oats
 - Nutritional Goals: Low-Fat, < 700 Calories
 - Preferred Spice Levels: Medium
- Screenshot 2: Explore - Based on your scans**
 - Search bar: Search an ingredient
 - Results: Lahmacun, Mixed Kebab
- Screenshot 3: Explore - Dishes (52 results)**
 - Search bar: Bitter melon
 - Results: Stir Fry, Narmul, Stuffed, Boiled, Crispy, Ginisang Ampalaya
- Screenshot 4: Ginisang Ampalaya Recipe Detail**
 - Share icon
 - Cuisine: Filipino
 - Ingredients:
 - Ampalaya (bittermelon thin slices)
 - Garlic
 - Black Pepper
 - Eggs
 - Onion
 - Recipe:
 - Place the ampalaya in a large bowl.
 - Add salt and lukewarm water and leave for 5 minutes.
 - Heat the pan and place the cooking oil.
 - Sauté the garlic and onion.
 - Add the ampalaya.
- Screenshot 5: Explore - Filters**
 - Filters applied: Bitter melon, Lunch, Snack, Vegetarian
 - Results: Narmul: Korea, Vepudu: India, Ginisang Ampalaya: Philippines

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



S3: Removal of gradients to introduce a cleaner aesthetic.

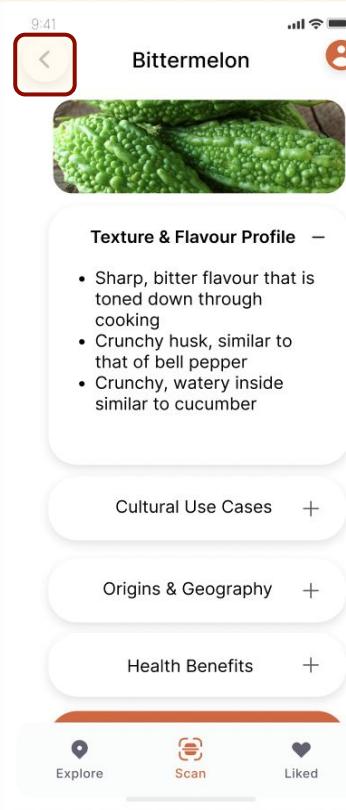
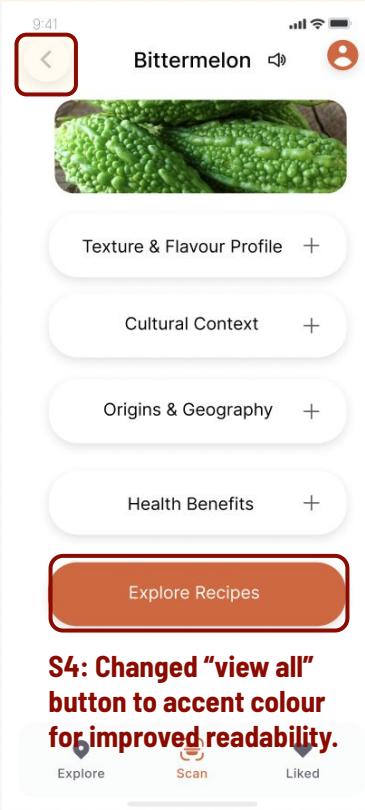
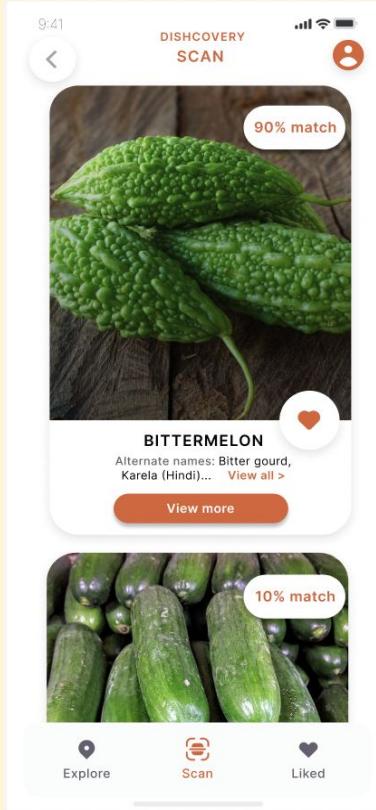
S3: Clear instructions for placing item in focus and search in progress.

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

Task 2: Contextualisation (V2+Rationale)

Usability goals: increasing learnability!

S4: Added a back button.



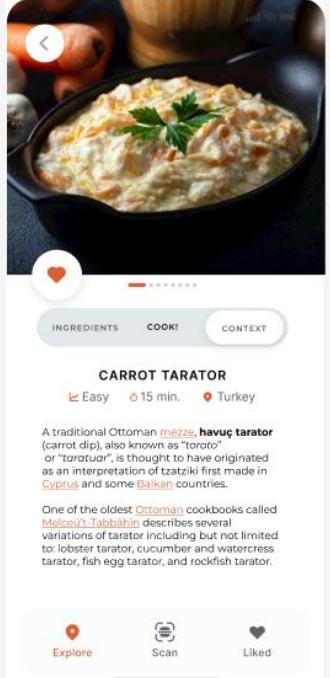
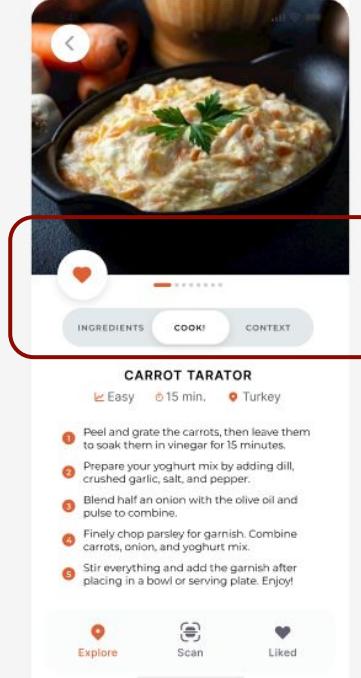
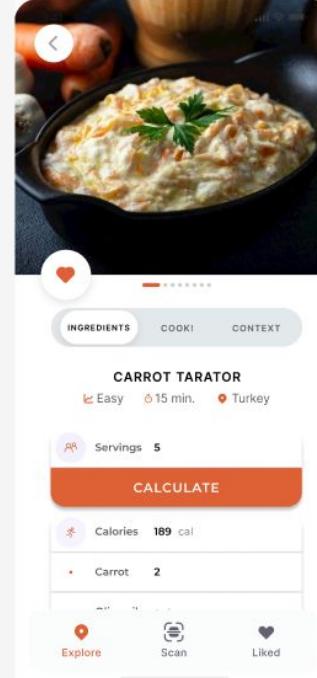
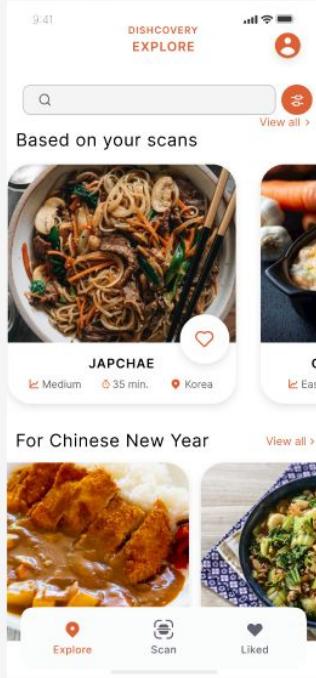
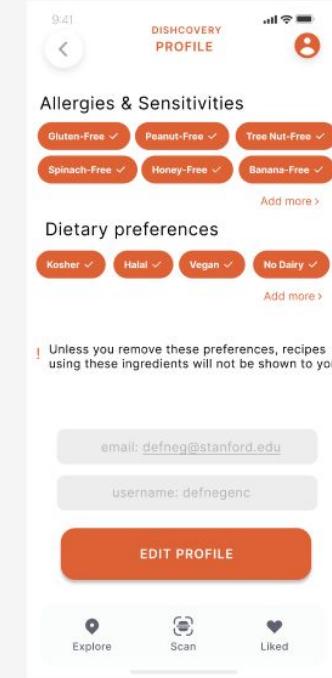
Task 2: Contextualisation (V2+Rationale)

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 the "Origins & Geography" section is collapsed. The "Health Benefits" section is expanded, showing the same nutritional data and antioxidant note.
- Screenshot 3:** The "Health Benefits" section is collapsed. A callout box appears over the "Origins & Geography" section, listing "Alternate Names (Bittermelon)" in orange text: Bitter Gourd (English), Karela (Hindi), Peria (Malay), Ampalaya (Tagalog), Kūguā (Chinese), and Asosi (Haitian).
- Screenshot 4:** The "REQUEST A RECIPE!" button is highlighted with a red rounded rectangle. The interface includes a header "DISHCOVERY SCAN", a "DISHCOVERY EXPLORE" section showing two recipes ("GINISANG" and "NAMUL"), and a footer with "Explore", "Scan", and "Liked" buttons.

S3: "Request recipe" option added for inclusivity of currently under-represented cultural foods within our app.

Task 3: Authentic Cooking (Med-Fi V2+Rationale)



S3: more consistent fonts and headers.

Usability goals: increasing efficiency of access to recipes!

Task 3: Authentic Cooking

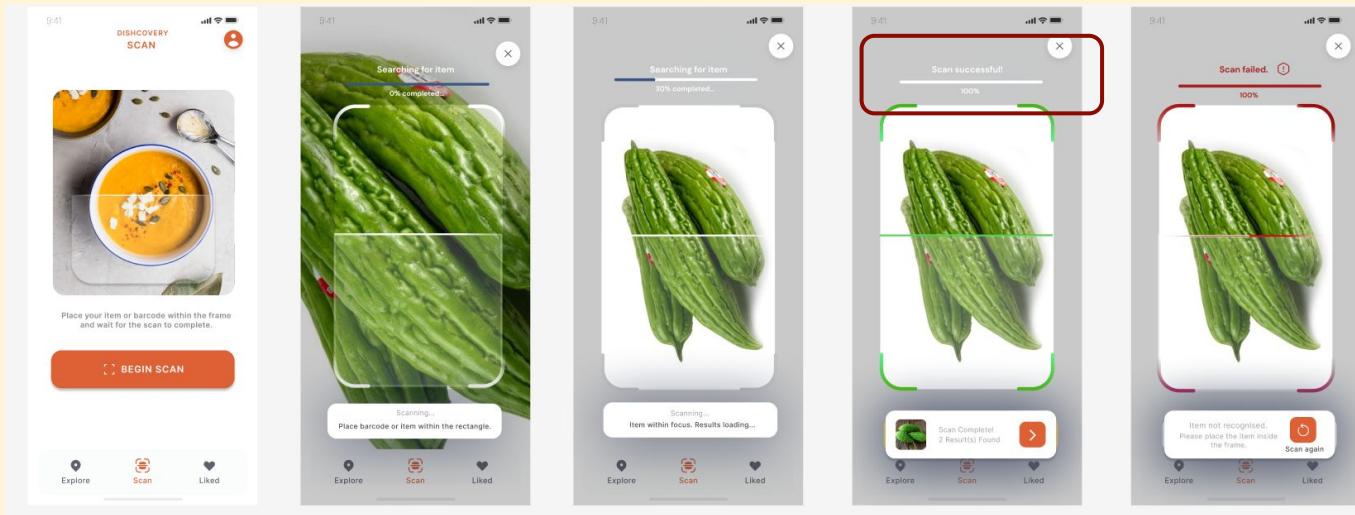
S3: Auto-layout for filters to improve readability

The image displays four screenshots of the Dishcovery app illustrating design improvements:

- Screenshot 1:** Shows the main "EXPLORE" screen 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), Time (15 min, 10min, 30min, 1 hr, 1.5 hr, 2 hr+), and User Review (5-star, 4-star, 3-star). A red box highlights the "Filters" modal.
- Screenshot 3:** Shows the "LIKED" screen displaying two recipe cards: "GINISANG" (Medium, 15 mins, Philippines) and "SPANAKOPITA" (Hard, 45 mins, Greece).
- Screenshot 4:** Shows the "LIKED" screen displaying two recipe cards: "GINISANG" (Medium, 15 mins, Philippines) and "SPANAKOPITA" (Hard, 45 mins, Greece). A red box highlights a confirmation dialog box at the bottom right asking "Unsave?" with "Confirm" and "Cancel" buttons.

S3: Unsave confirmation added for greater visibility of status

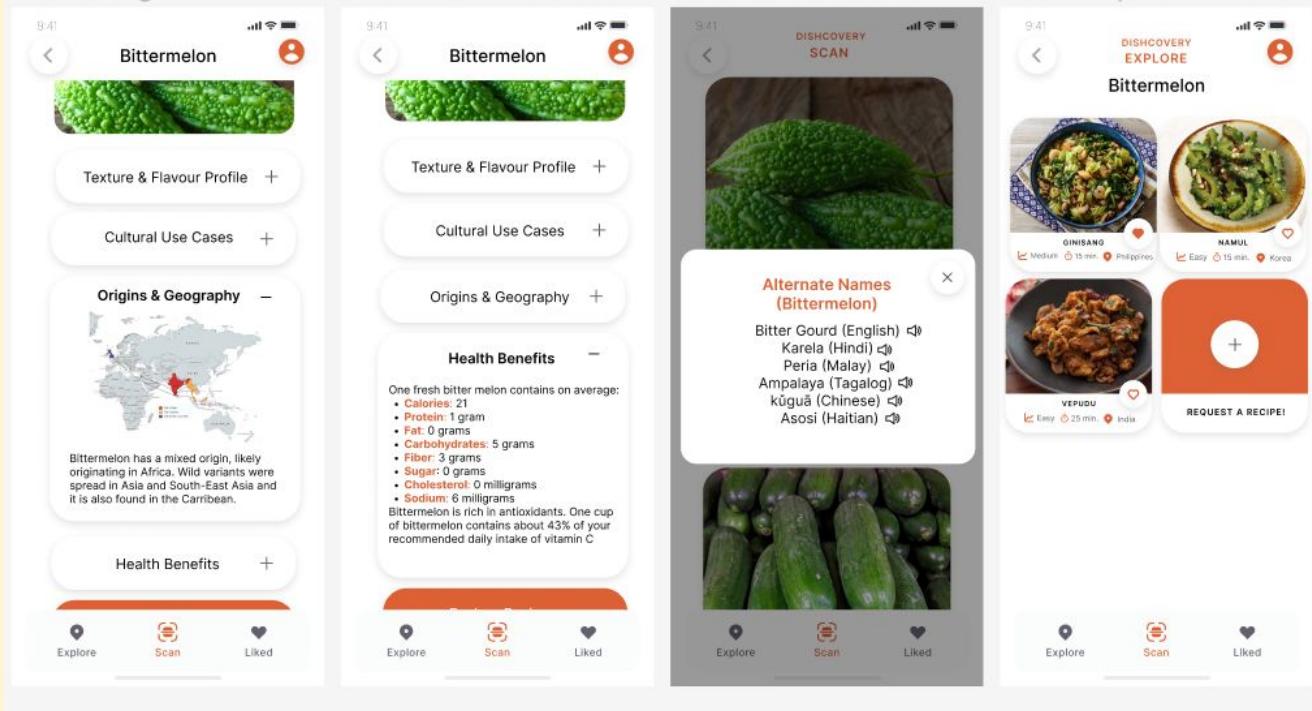
Importance of Task 1: Searching for an unfamiliar food item



- Uses the central functionality of the app, which we hope would draw intrigue from users.
- Generating excitement in users about this functionality will encourage them to learn more about many ingredients.

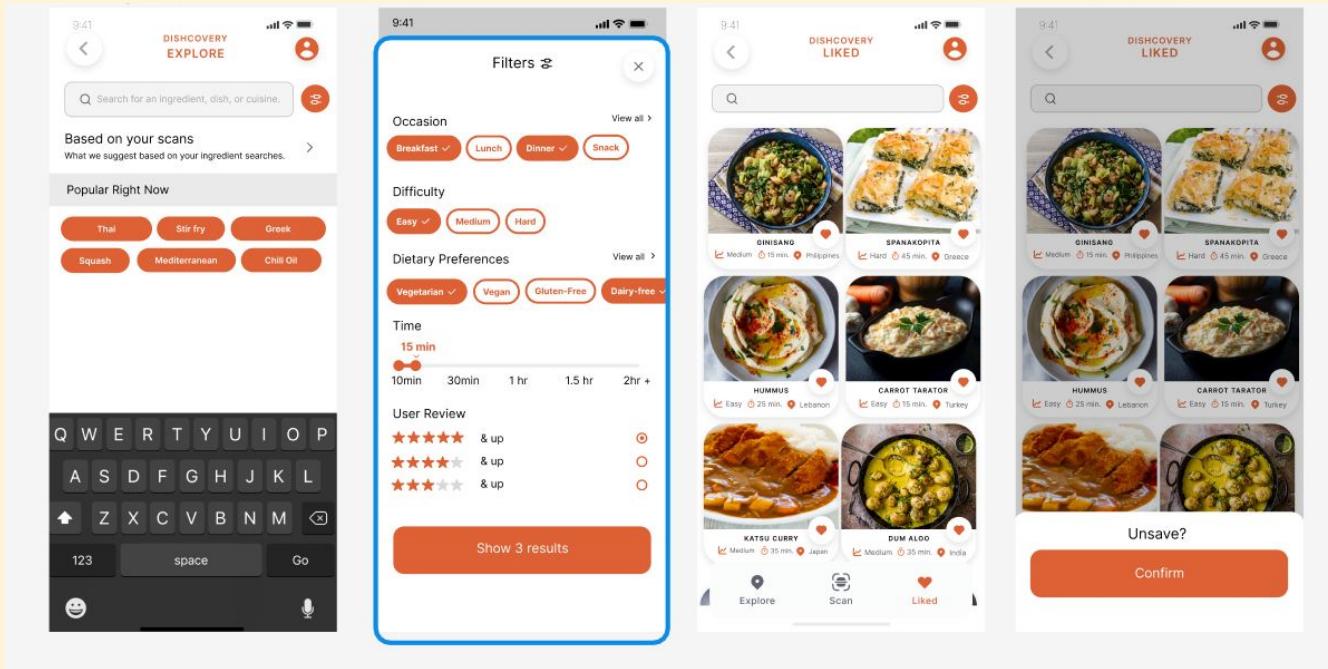
Most importantly, familiarises the users with ingredients they never thought they could use!

Importance of Task 2: Contextualisation



- Provides a transition between our simple and medium tasks.
- By learning more about the ingredient, users are **encouraged to experiment with it**, which was also a result affirmed by our experience prototypes.

Importance of Task 3: Authentic Cooking



- Users get the **fulfillment of enjoying a meal using a potentially intimidating ingredient**.
- Users obtain a new experience and add a new recipe to their arsenal, hopefully encouraging them to repeat the process with a different ingredient.

Implementation

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

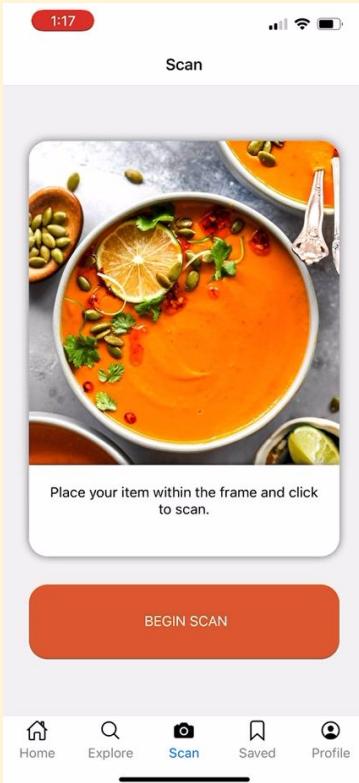
Especially when we are remote, LiveShare allows us to code collaboratively.

Expo

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

+ClarifAI API!

Implemented Features



Navigation for all main pages

- (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

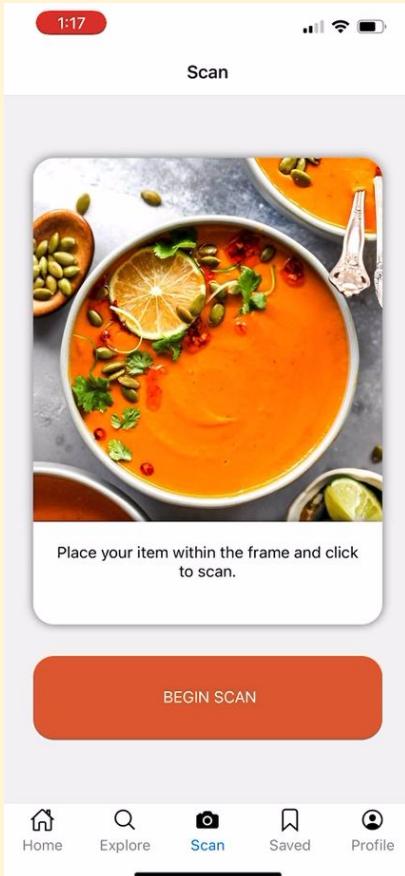
- ✓ Connected to camera
- ✓ Linked to Clarifai image recognition API
- ✓ If ingredient is found, links to additional context page
- ✓ If ingredient is not found, button to rescan

UI for Task 1: Scan an Unfamiliar Ingredient has also been completed

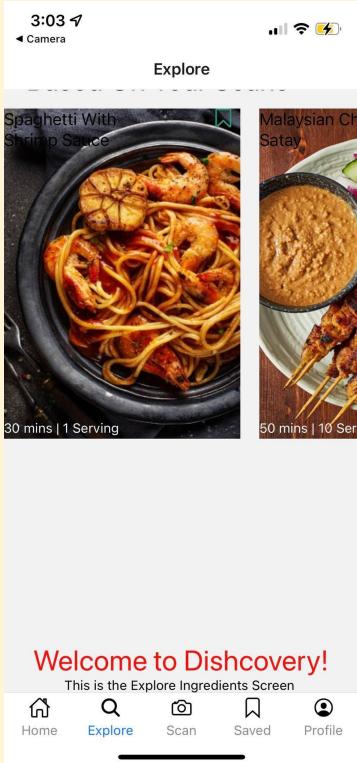
- ✓ Animated white scanning aimer gif on top of camera
- ✓ Progress bar as image recognition is searching
- ✓ Scan box and progress bar turn red or green

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



- No real database for recipes: hard-coded.
- The cultural context of items is currently hard-coded and stored locally on the app.
- Accuracy of image scanning is Wizard of Oz'd.
- Unimplemented recipe- 'liking' system - currently hard-coded.
- Unimplemented search feature.

Issues/Questions

Navigating API use:

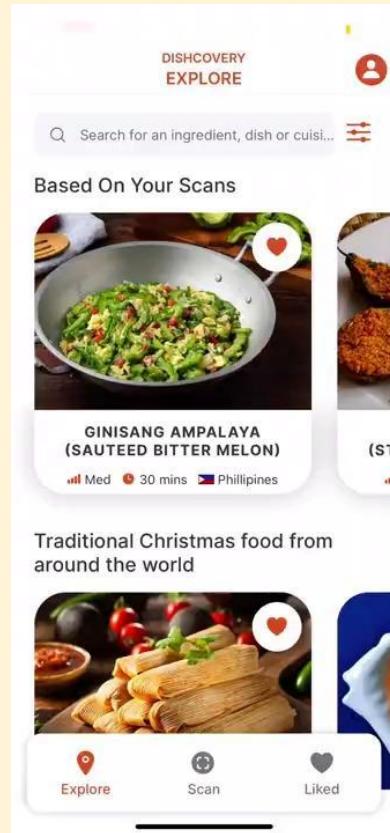
- **The Clarifai AI library only recognizes fairly generic food items.**
- The use of this API has other limitations as we only have access to the free trial

Sourcing:

- 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.

Implementation Prototype Demo

Filmed and narrated by Amrita Palaparthi!



What's next?

The future of Dishcovery

?

Qualitative Enhancements



Ethically Sourced Recipes

Variety of traditional dishes sourced and stored in a database to leverage in our app.



More Accurate Labeling

Depicting a more representative blend of cultures including variants of any one dish.



Community-Based Features

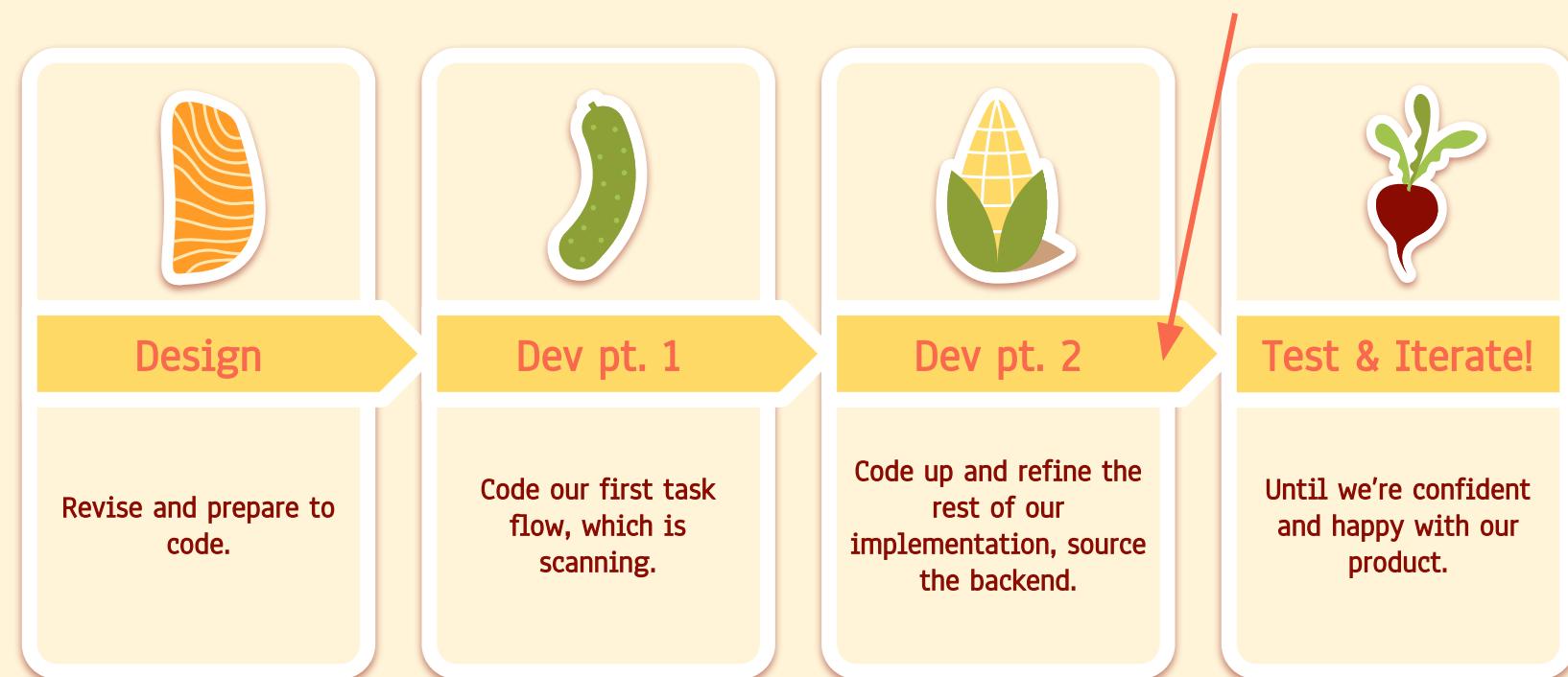
Including the option for users to add a known or local recipe if not already represented.



Experimentation with Media

Incorporate a common way people find food inspiration with food preparation videos.

Implementation Progress



Appen-dish

Experience prototypes



The cultural dish that our “teacher” participant had chosen to demonstrate on the left, and the tools used by the participant to recreate the verbal instructions provided once while receiving no feedback, another with verbal feedback, and another with haptic feedback.

Progress Towards Usability Goals

Efficiency

Increasing relevance of recipes

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

Prototype only presents the most likely ingredient prominently.

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.



Addressing Heuristic Evaluation

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

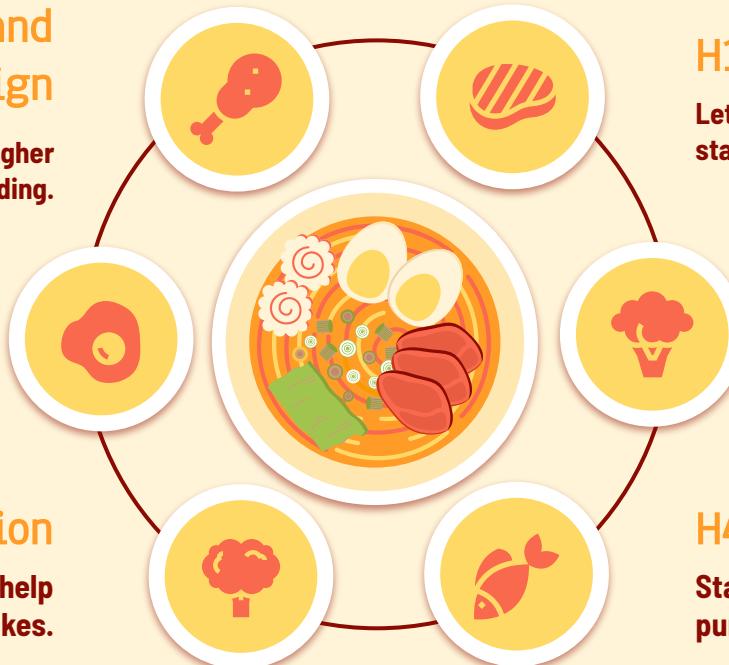
Letting the user know the status and result of the scan.

H7: Efficiency

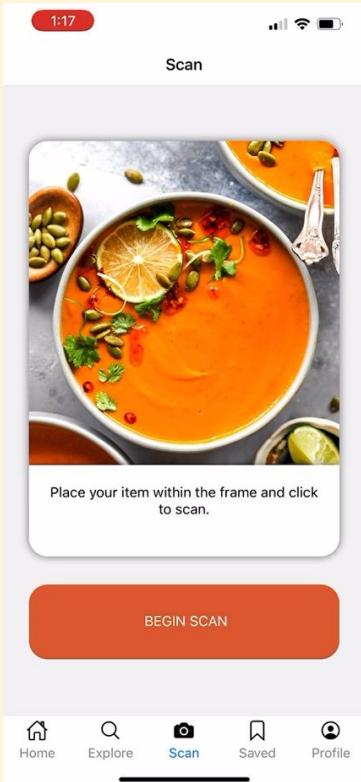
Making all buttons fully functional.

H4: Consistency

Standardising fonts, sizes, punctuation and names.

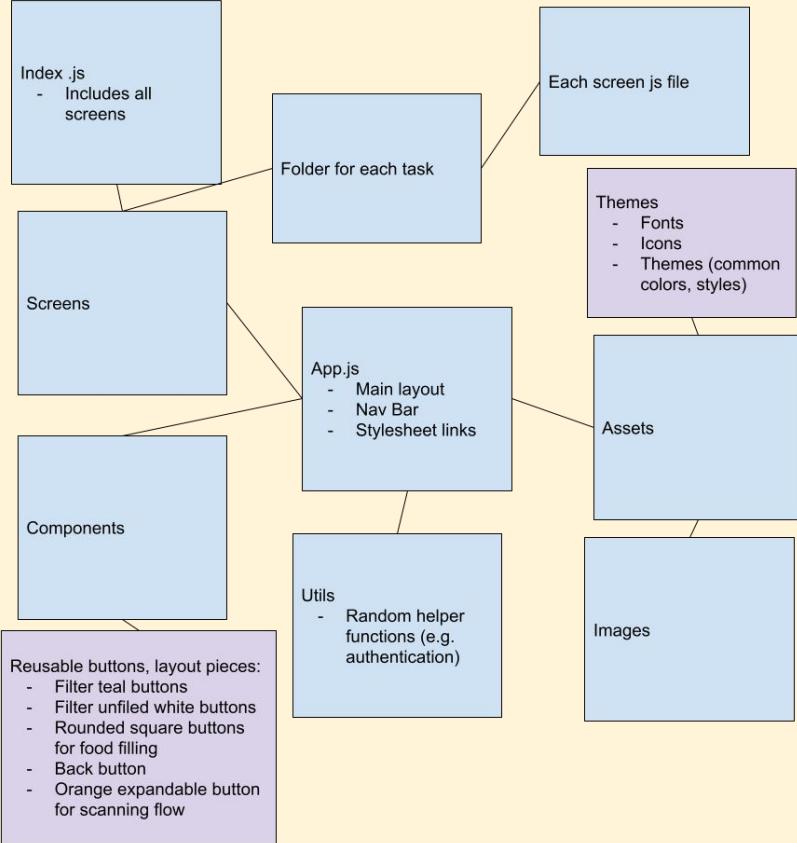


Implemented Features



- ✓ **Navigation for all main pages** (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 aim 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

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

Wizard of Oz / Hard-Coded Elements

Image Recognition Accuracy

Our image recognition is actually fully functional (woohoo!). However, the perceived accuracy is a Wizard of Oz technique as it only recognizes three ingredients from a pre-created list.

Ingredient Cultural Context

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 (more detailed)

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. A specialized annotated data set of cultural ingredients and trained computer vision model would be able to truly achieve Discovery's aim. This could potentially be done by sourcing foreign food items from ethnic online grocery websites.
 - The use of this API has other limitations as we only have access to the free trial
- 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.