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:

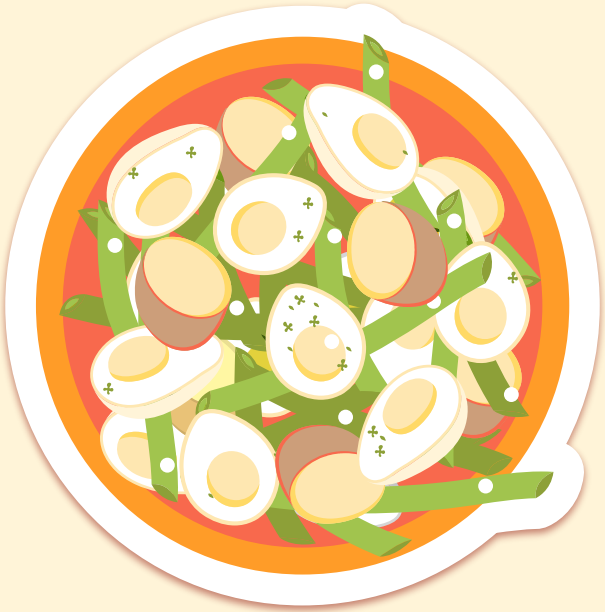
Abena

Dish of choice:

Kayla

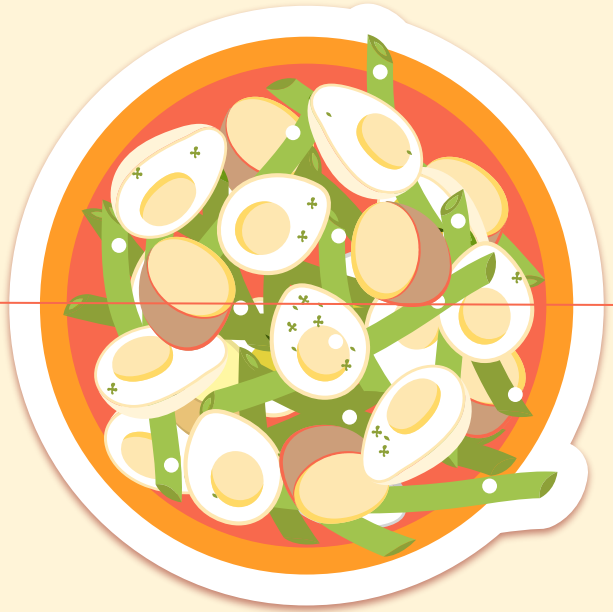
Dish of choice:

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

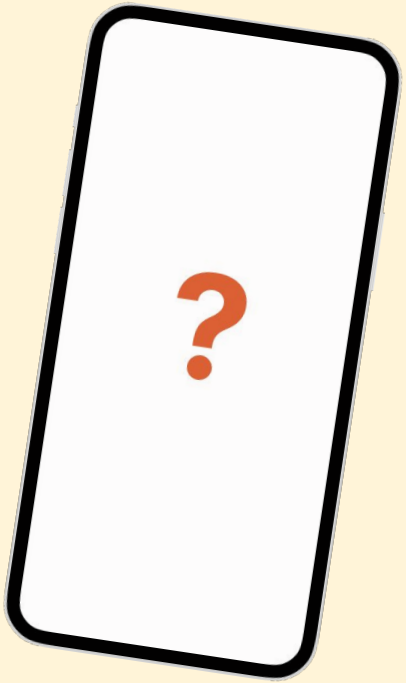
Overview of V1 implementation.

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

Empathy Map for Grace, Manager of 99 Ranch showcasing how she felt like the store brought people “home,” yet users still were hesitant or unsure how to blend their preferences with traditional ingredients and culture.

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

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

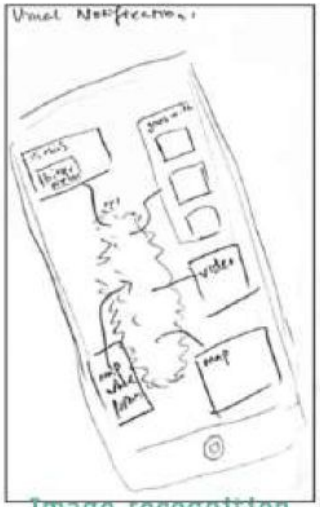
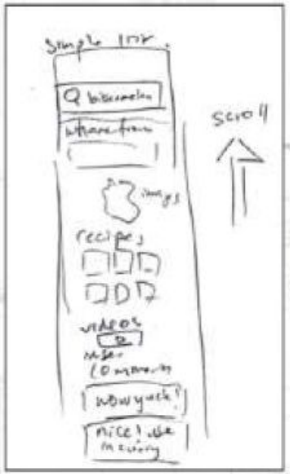
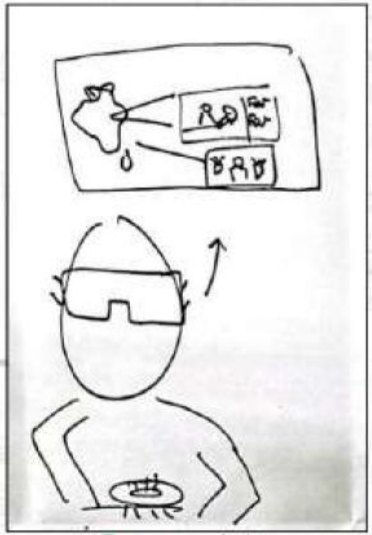


Image recognition with cultural context

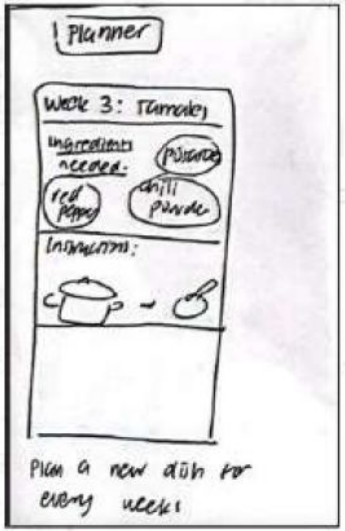
Scroll-View

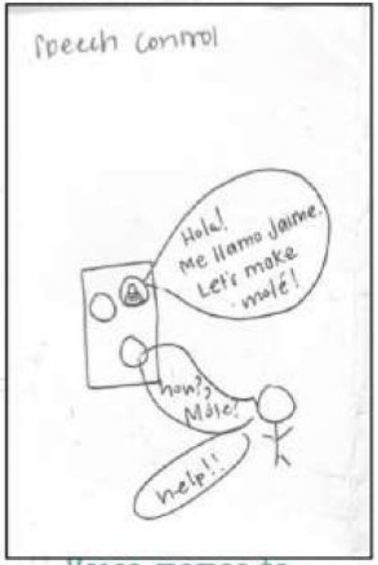




Transport to cultural location via VR!

Meal planning & suggesting combinations

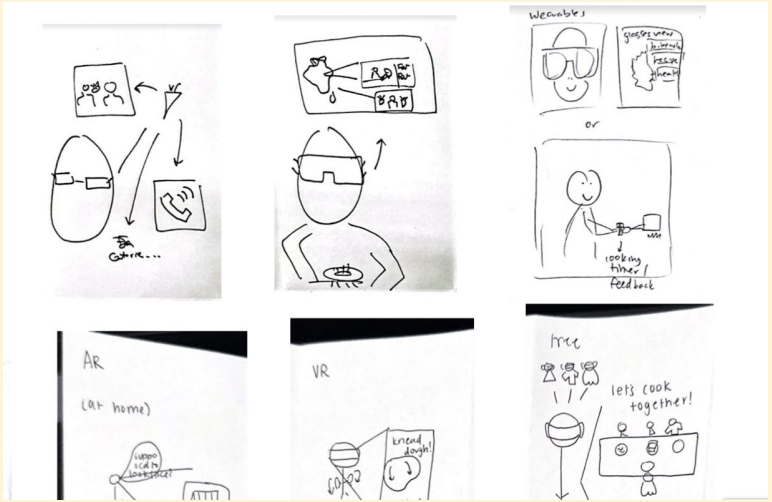




Voice memos to add personal touch

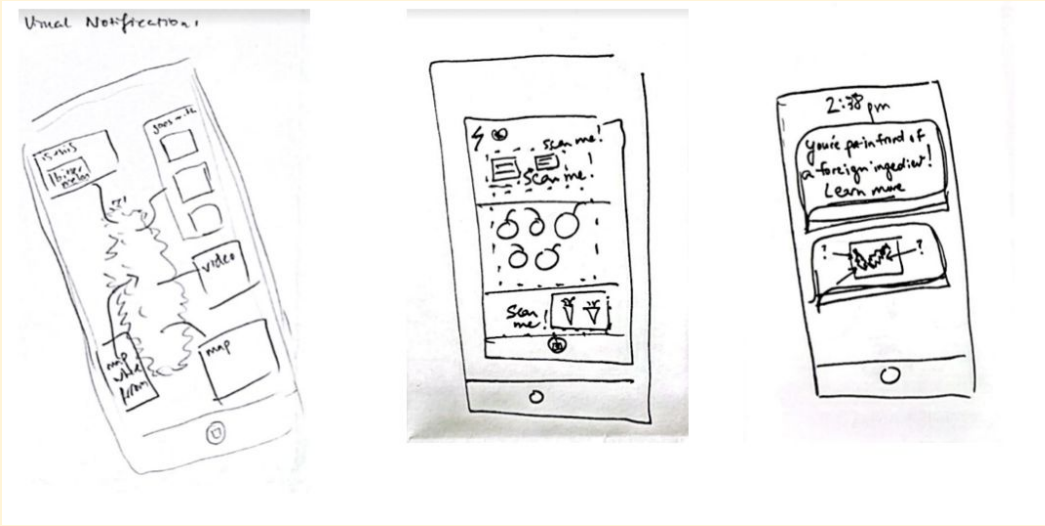
Solution Generation

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:

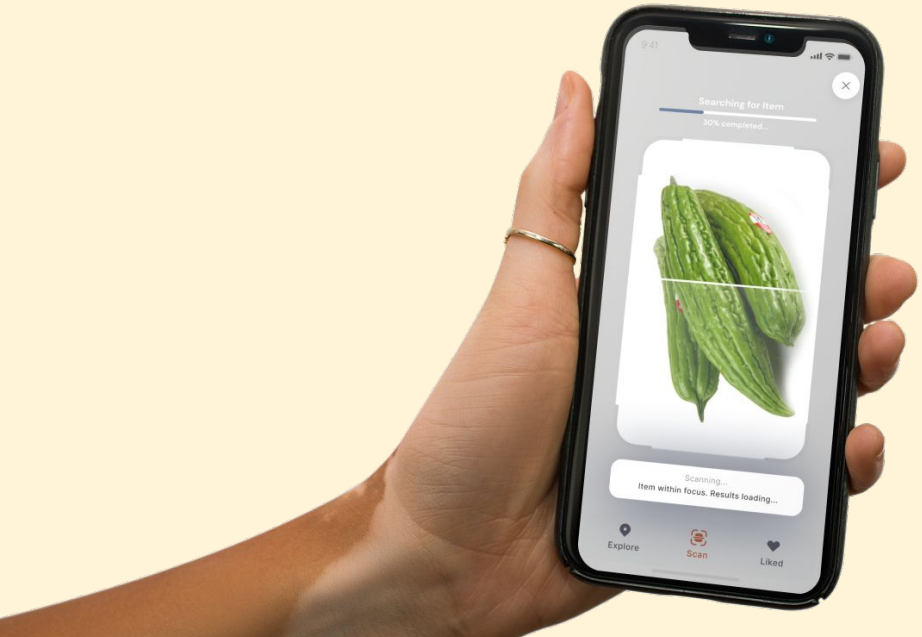
- Novel software/product
- Lots of visual aid while cooking
- Documenting what user has cooked/wants to cook

Cons:

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

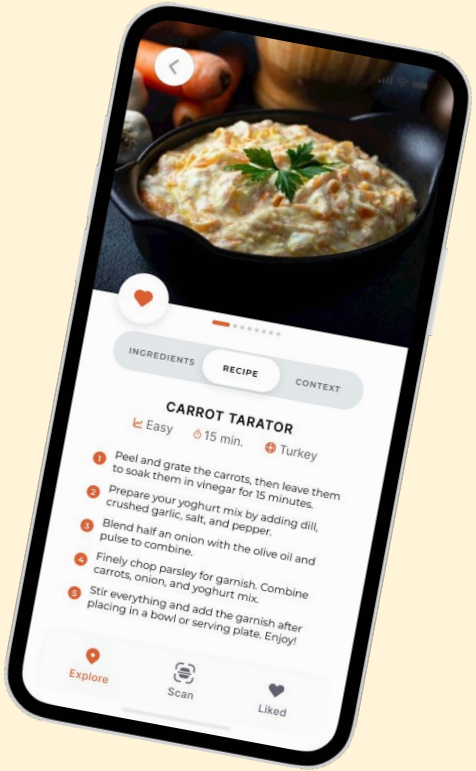
Selected Solution

Image recognition! Now on to...

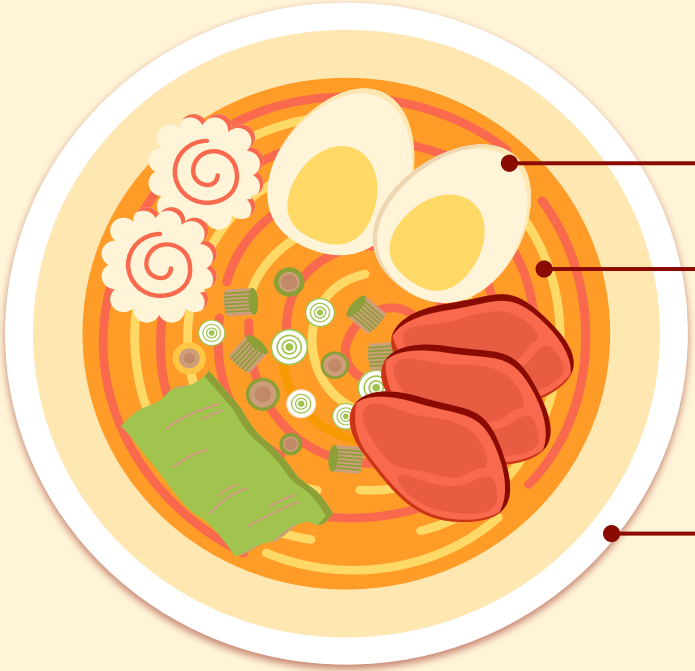


Design

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.

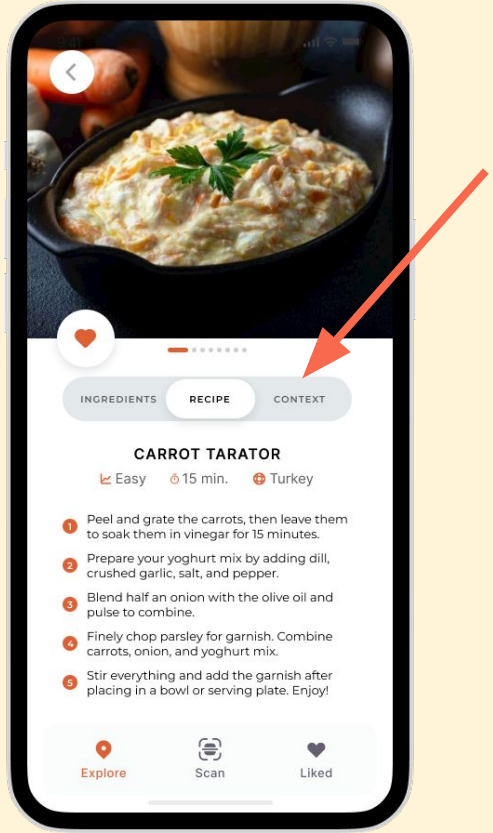
3 Authentic Cooking

Through recipes the user finds and/or saves.

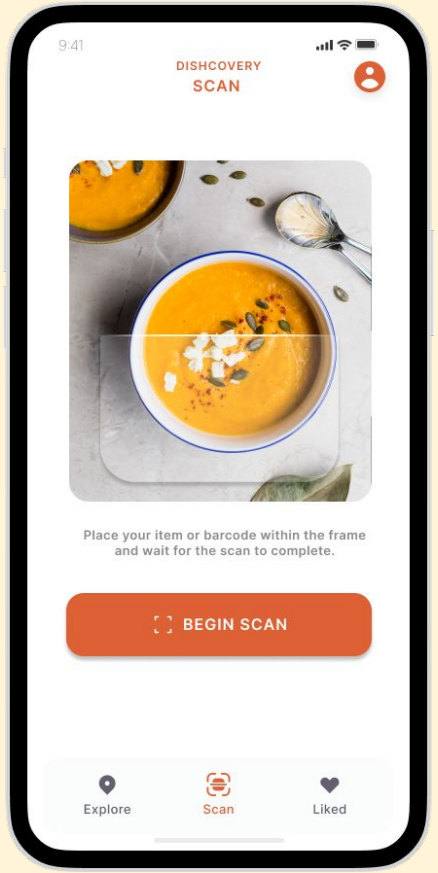
Recap of major design changes

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

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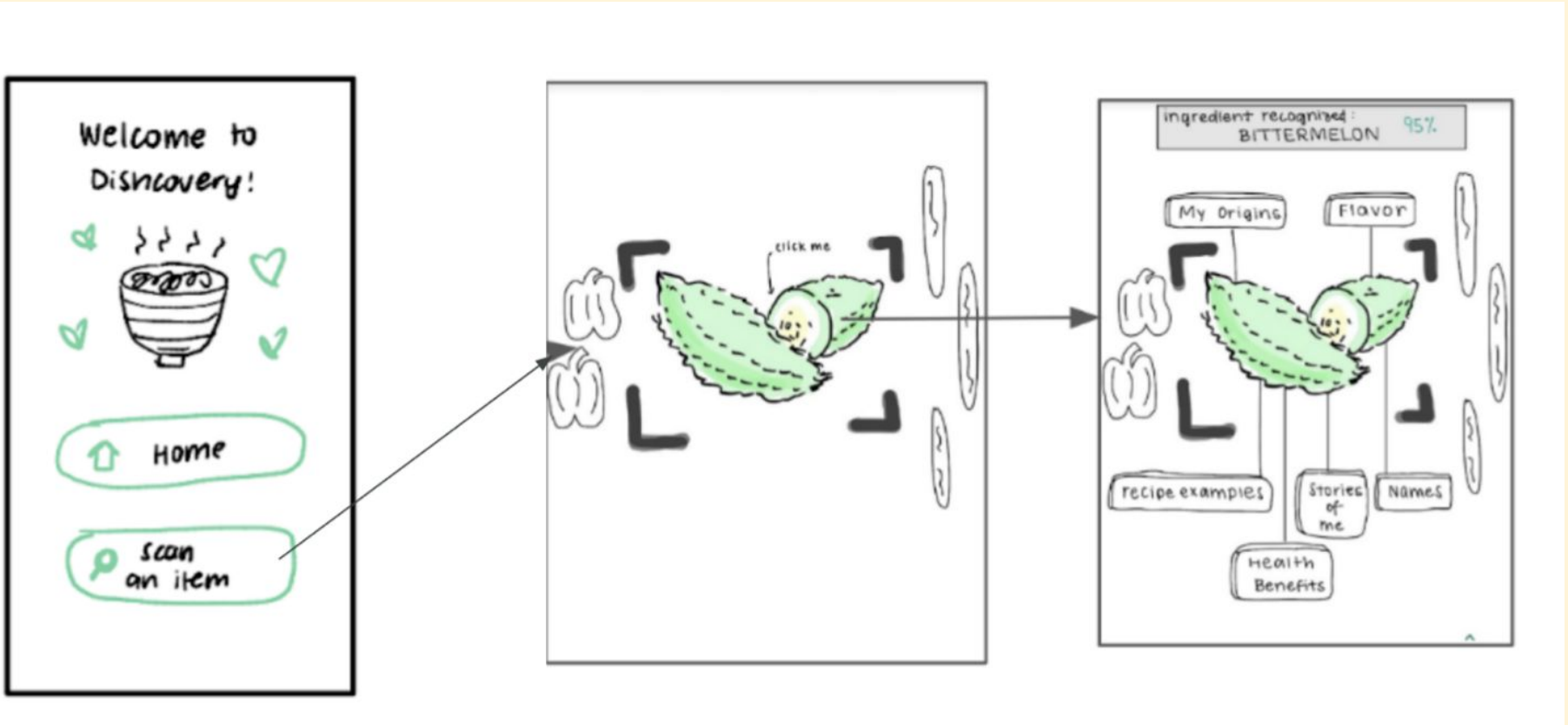
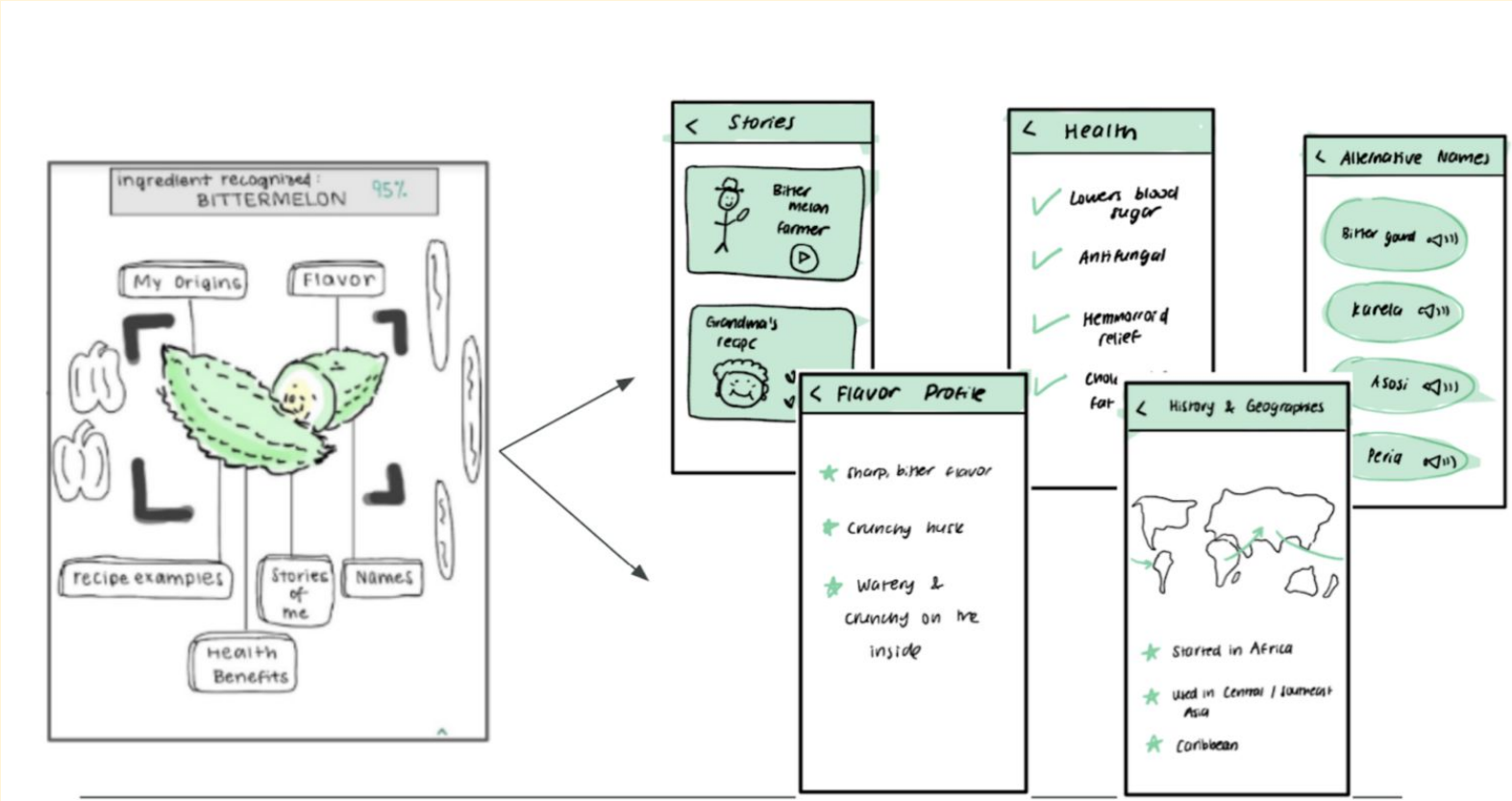
- What happens if the user searches for an ingredient that doesn't exist?
- The Scan screen has instructional text saying "Place subject within focus!"
- You can check multiple user reviews for stars. Right now, you can click 5 star and up, 3 star and up, and exclude 4 stars.
- In the Scan screen, there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

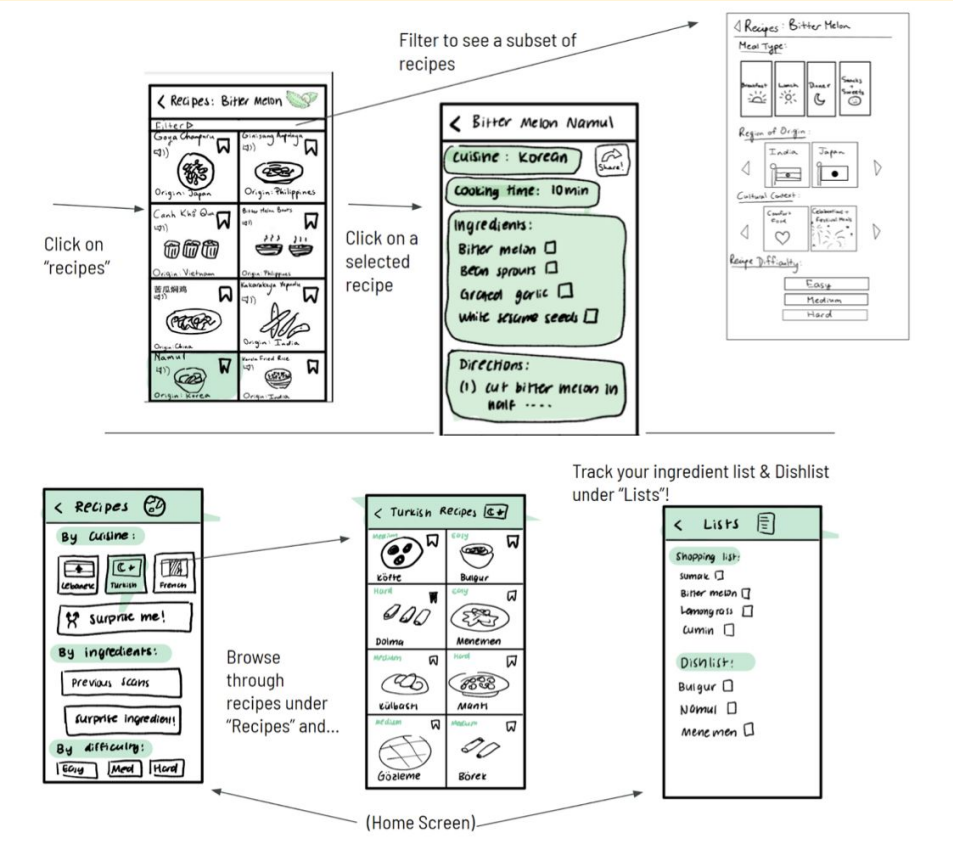
Task 1: Search for an unfamiliar food item (Low-Fi)



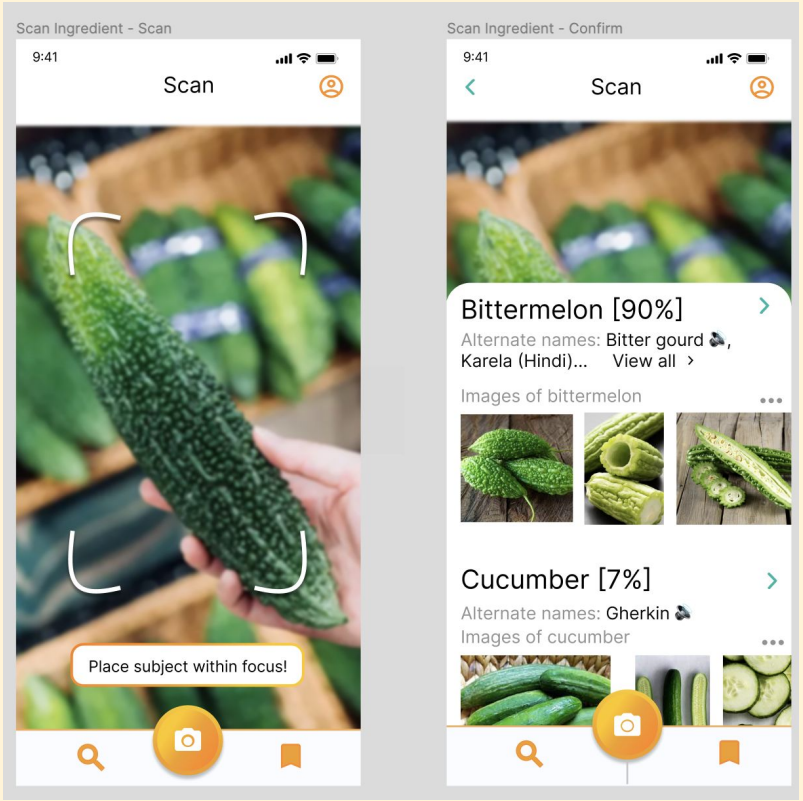
Task 2: Contextualization (Low-Fi)



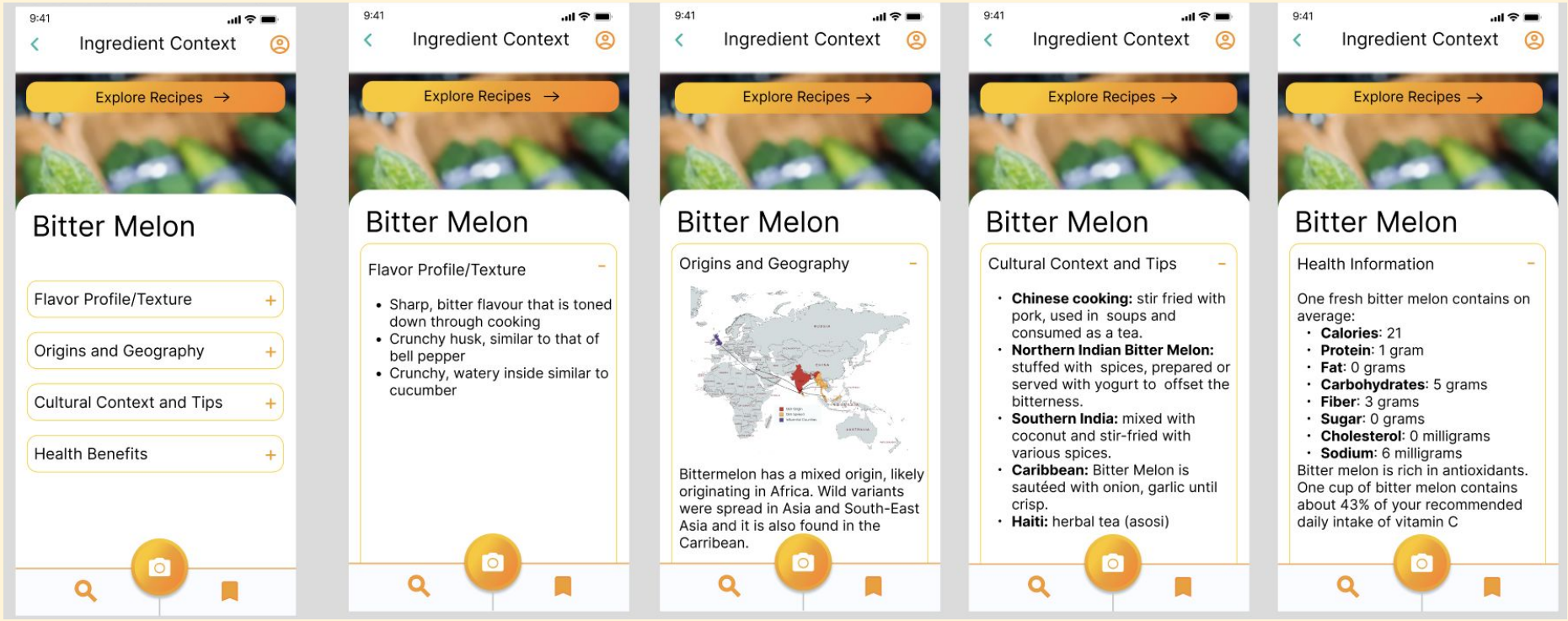
Task 3: Authentic Cooking (Low-Fi)



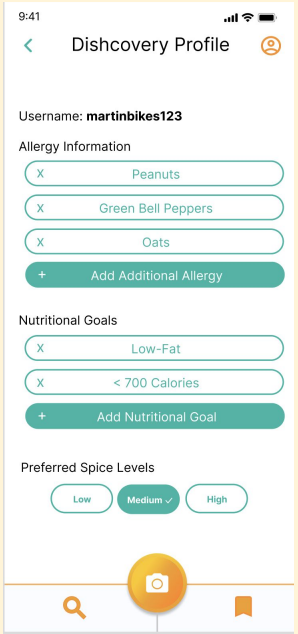
Task 1: Search for an unfamiliar food item (Med-Fi V1)

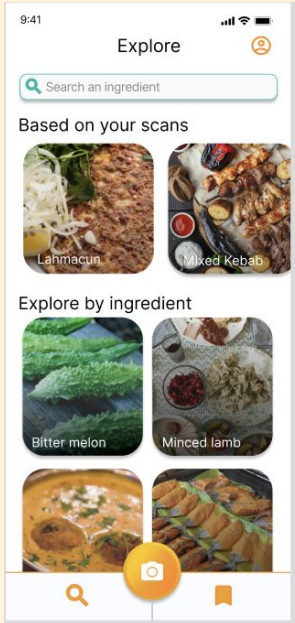


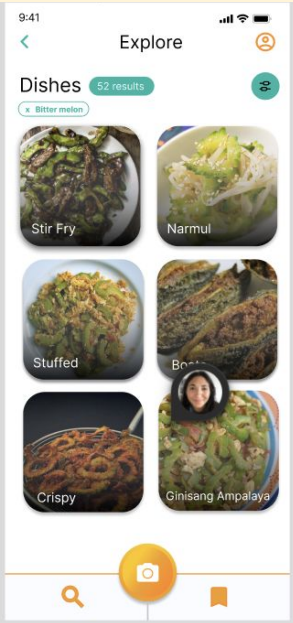
Task 2: Contextualization (Med-Fi V1)

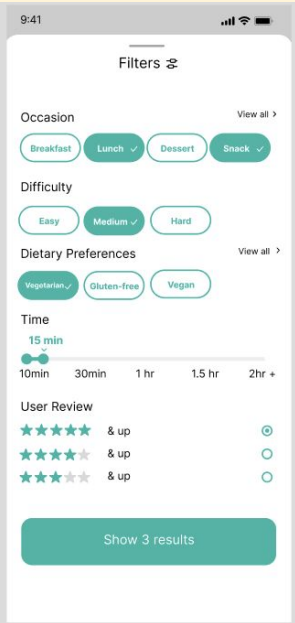


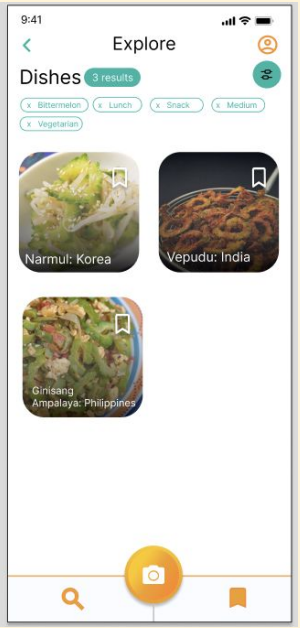
Task 3: Authentic Cooking (Med-Fi V1)



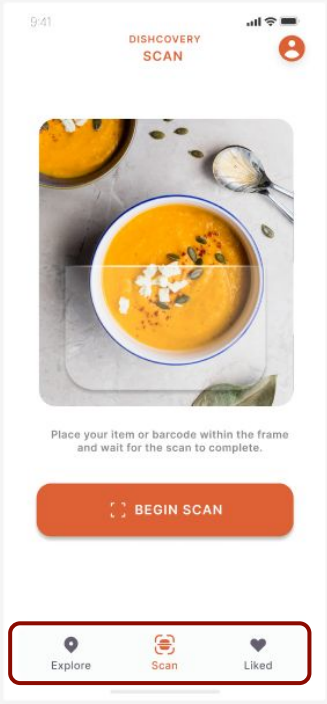








Task 1: Search for an unfamiliar food item (V2+Rationale)



S3: Removal of gradients to introduce a cleaner aesthetic.

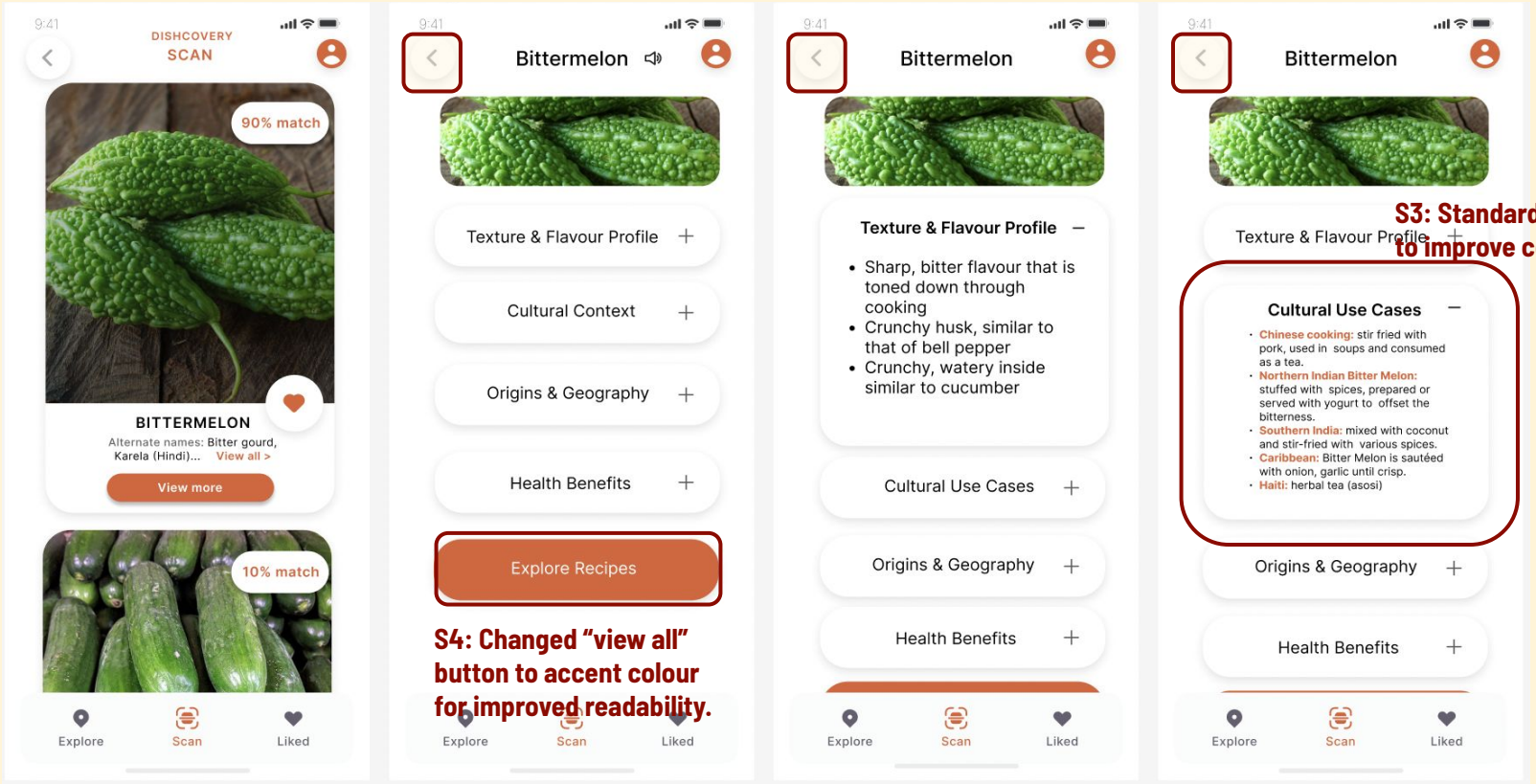
S3: Clear instructions for placing item in focus and search in progress.

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

Task 2: Contextualisation (V2+Rationale)

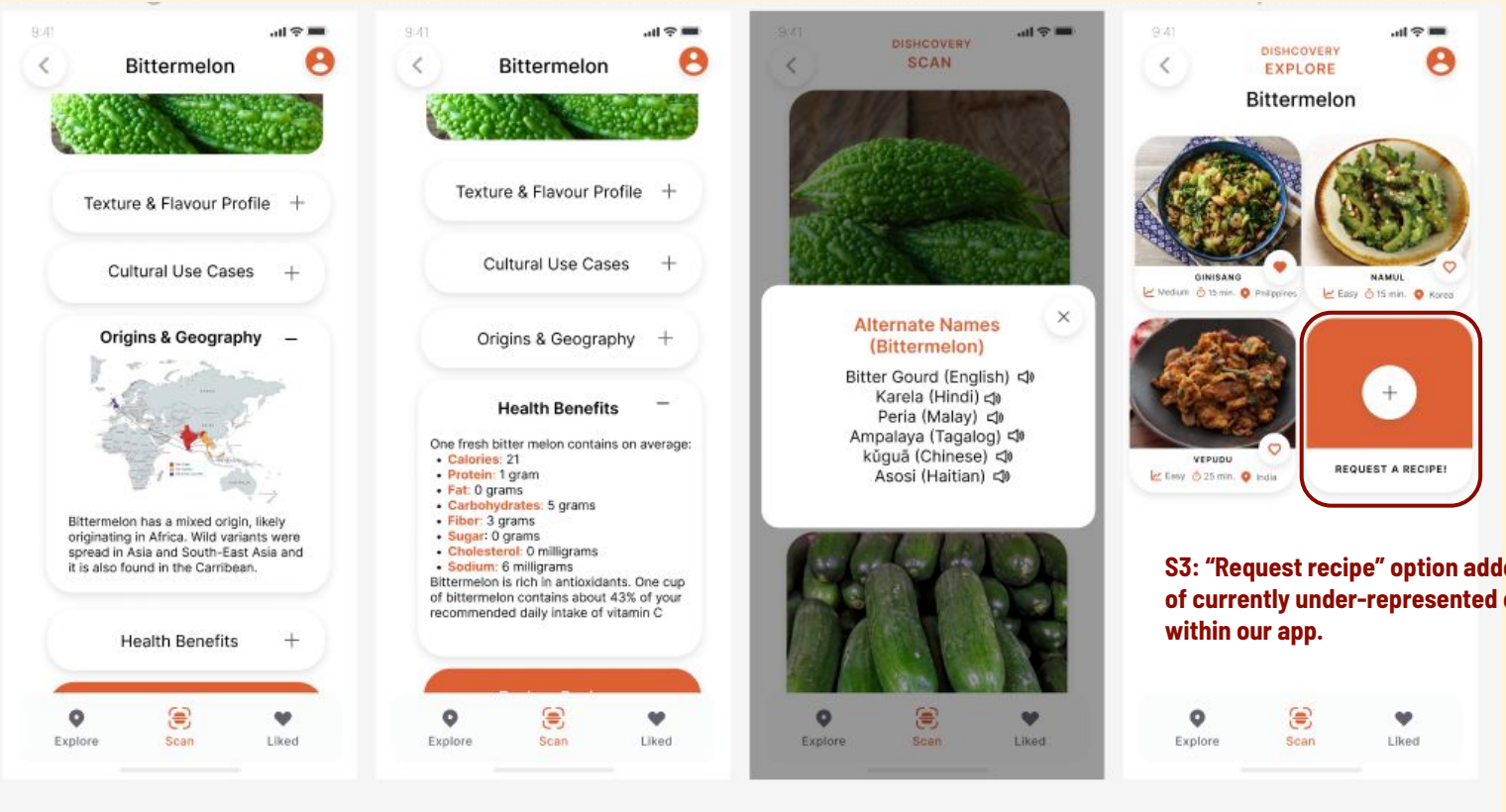
Usability goals: increasing learnability!

S4: Added a back button.



S3: Standardized styles to improve consistency.

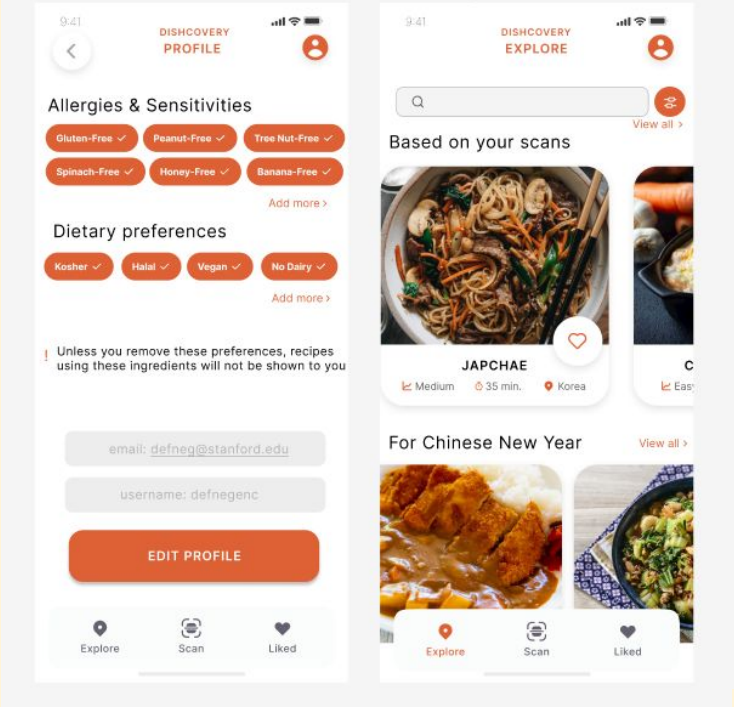
Task 2: Contextualisation (V2+Rationale)

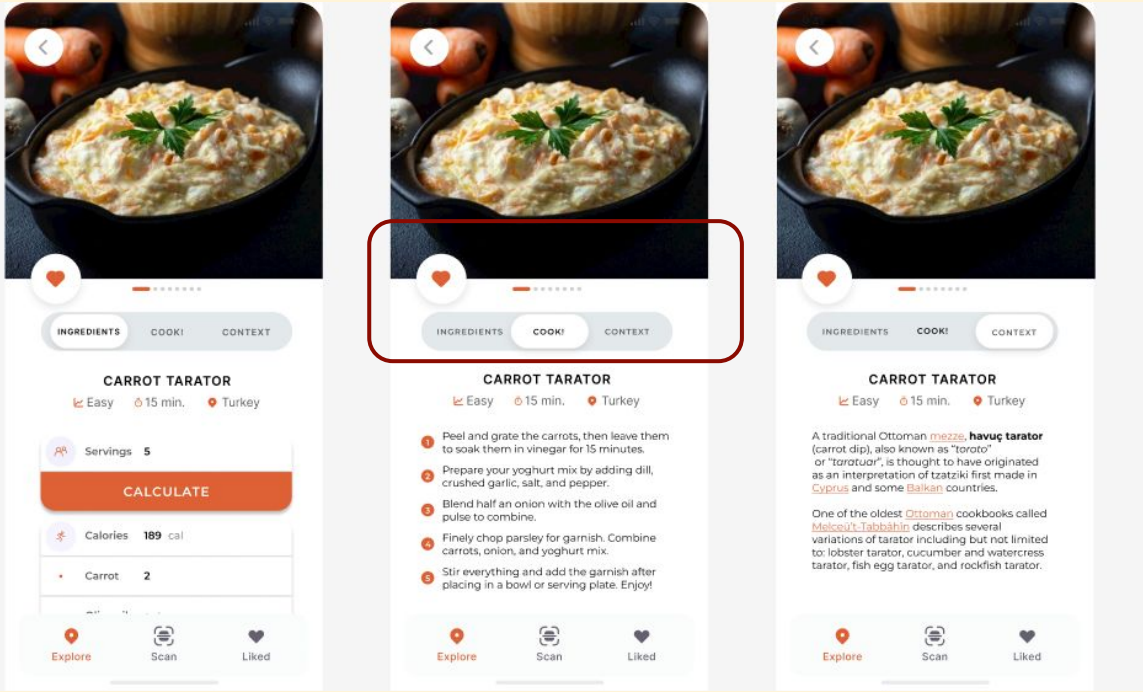


S3: "Request recipe" option added for inclusivity of currently under-represented cultural foods within our app.

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

S3: more consistent fonts and headers.

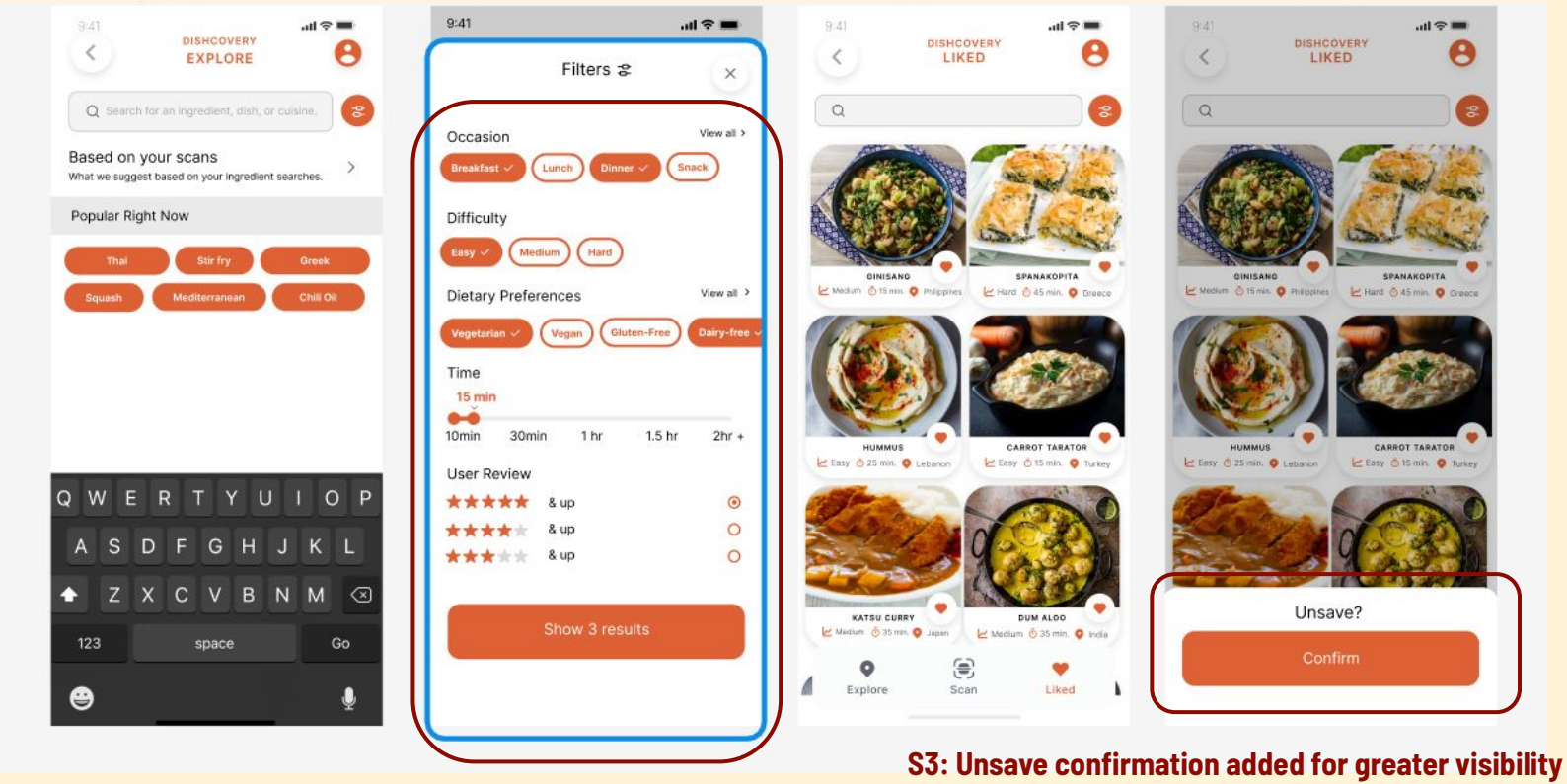




Usability goals: increasing efficiency of access to recipes!

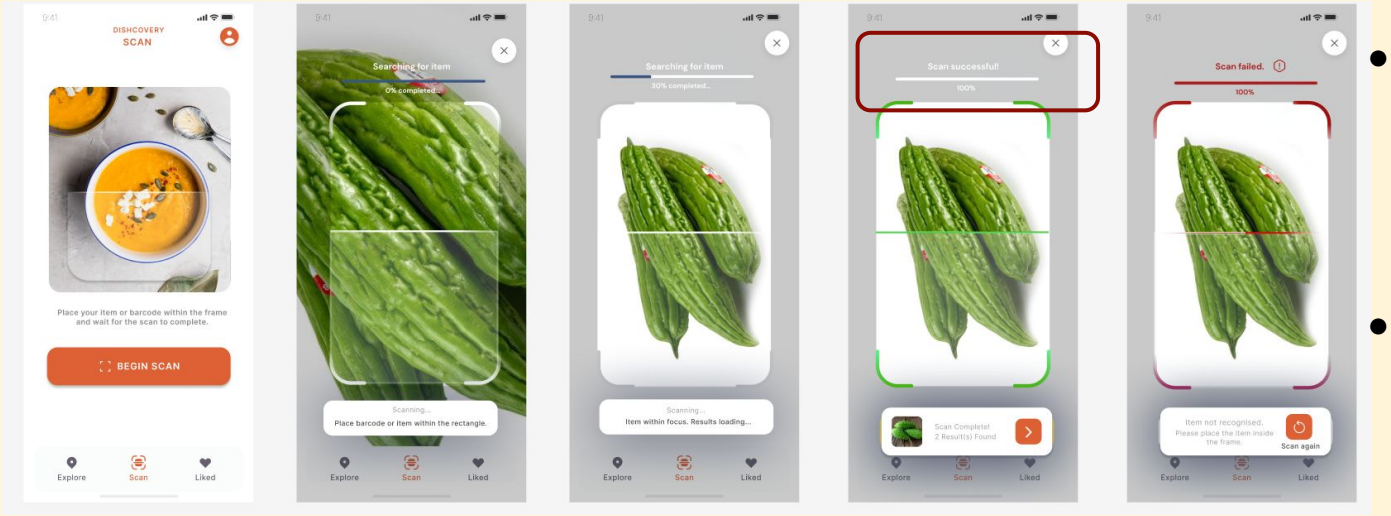
Task 3: Authentic Cooking

S3: Auto-layout for filters to improve readability



S3: Unsave confirmation added for greater visibility of status

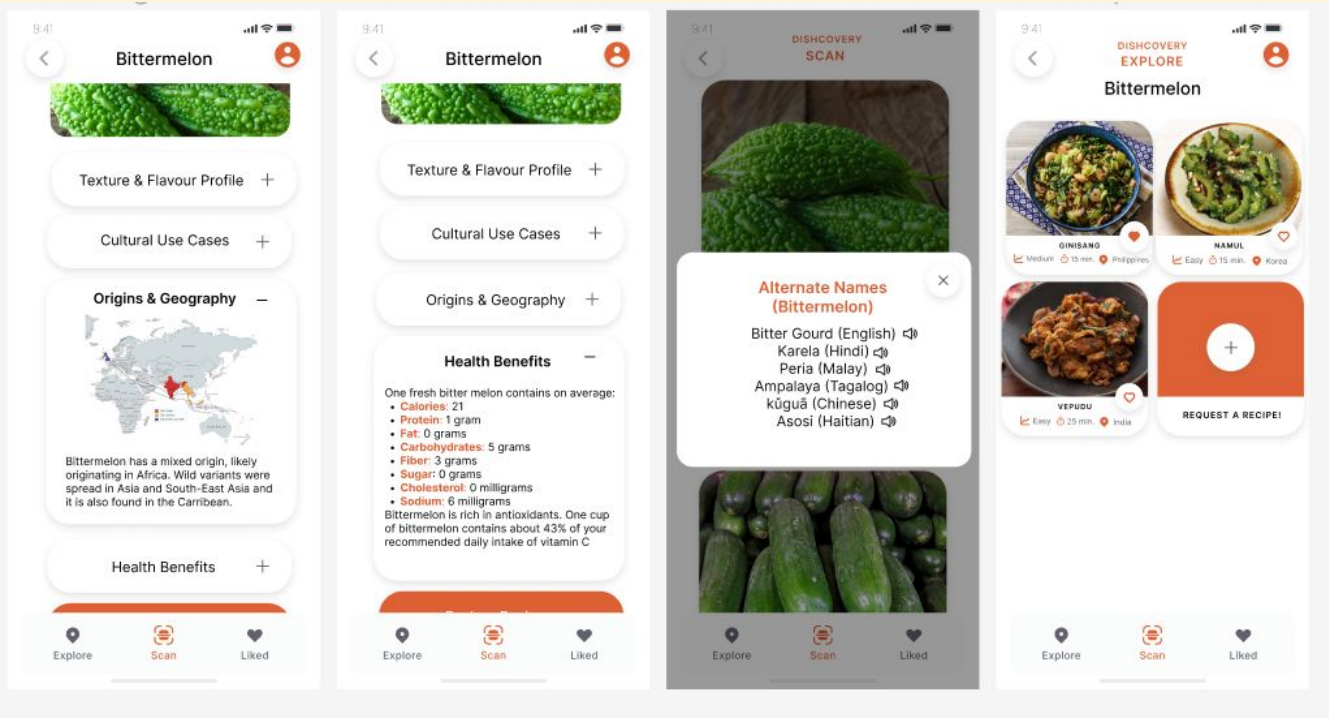
Importance of Task 1: Searching for an unfamiliar food item



- 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.

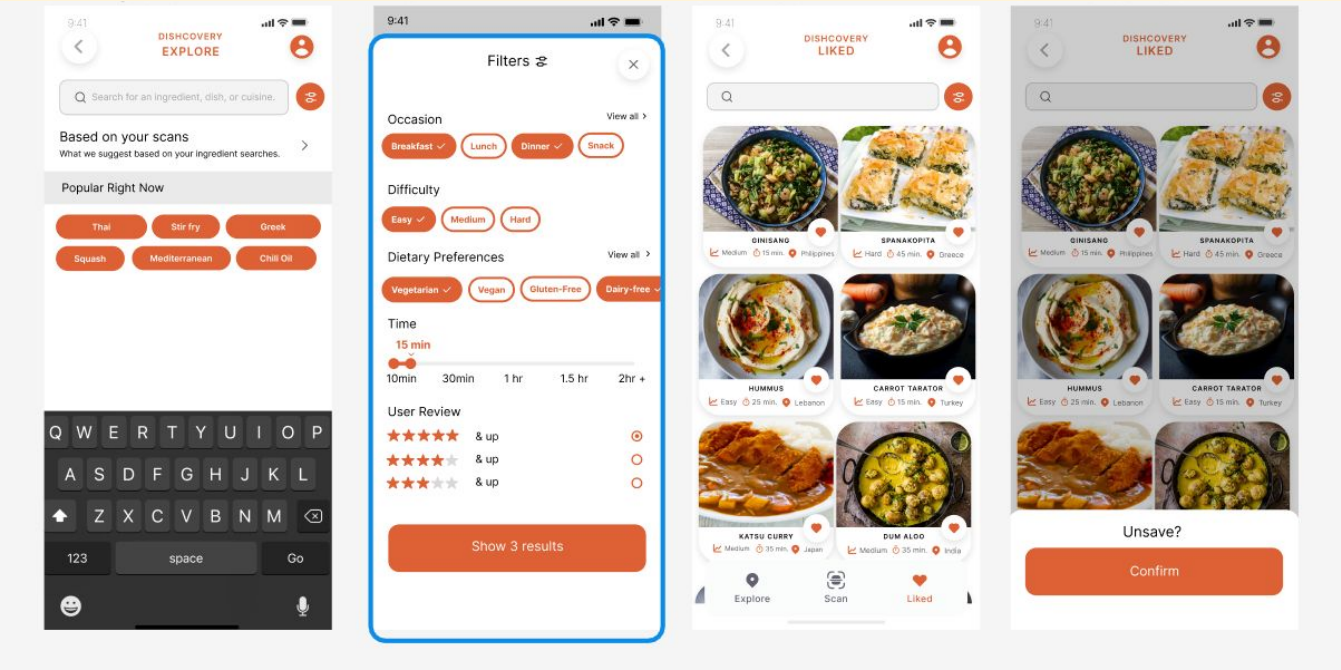
Most importantly, familiarises the users with ingredients they never thought they could use!

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



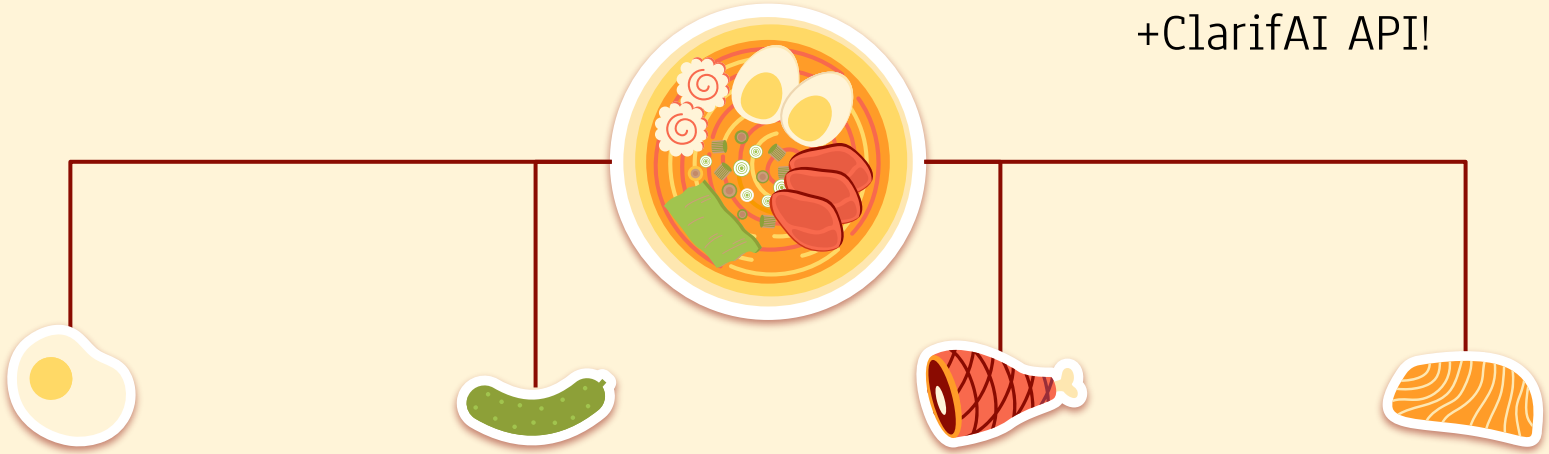
- Users get the **fulfillment of enjoying a meal using a potentially intimidating ingredient.**
- Users obtain a new experience and add a new recipe to their arsenal, hopefully encouraging them to repeat the process with a different ingredient.

Implementation

Converting design to code

Framework and Tools Used for Dev

+ClarifAI API!



GitHub

We have a central repo where we push updates to.

VSCode

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

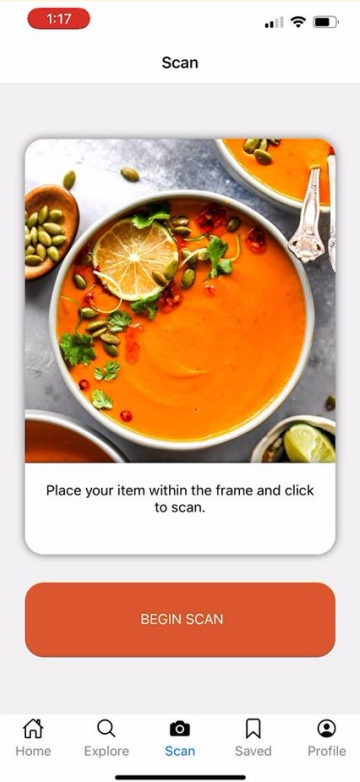
LiveShare

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.

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

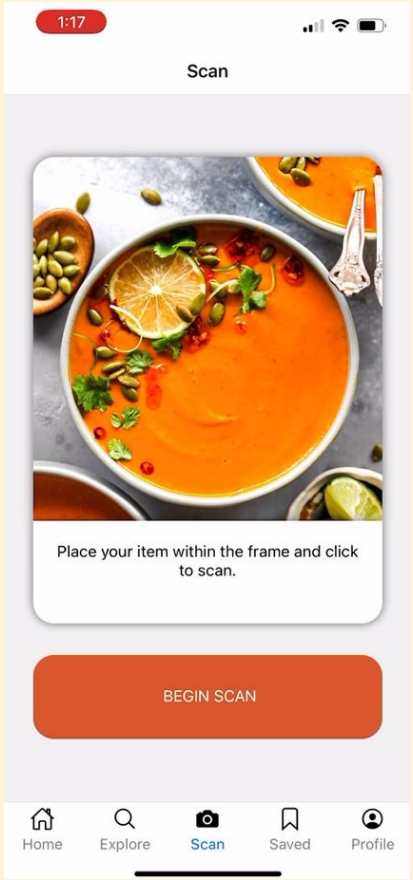
- ✓ Connected to camera
- ✓ Linked to Clarifai image recognition API
- ✓ If ingredient is found, links to additional context page
- ✓ If ingredient is not found, button to rescan

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

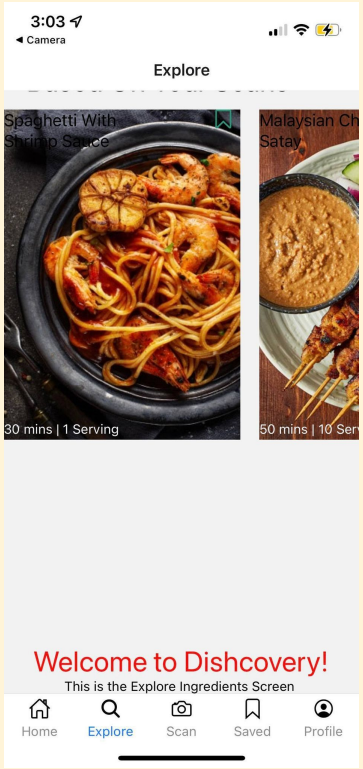
- ✓ Animated white scanning aimer gif on top of camera
- ✓ Progress bar as image recognition is searching
- ✓ Scan box and progress bar turn red or green

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:

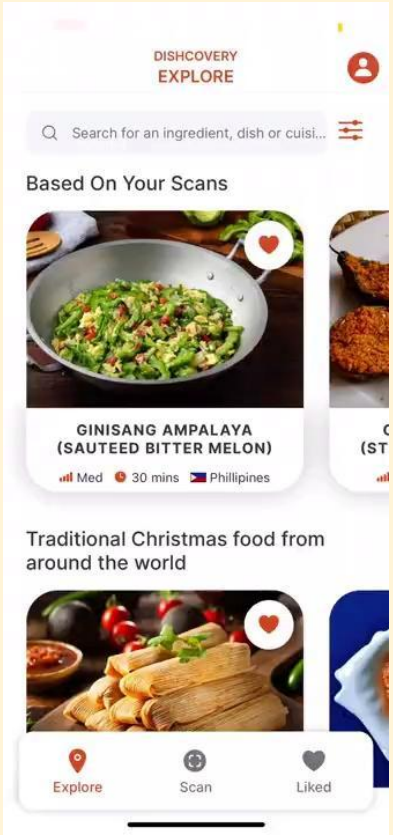
- **The Clarifai AI library only recognizes fairly generic food items.**
- The use of this API has other limitations as we only have access to the free trial

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.

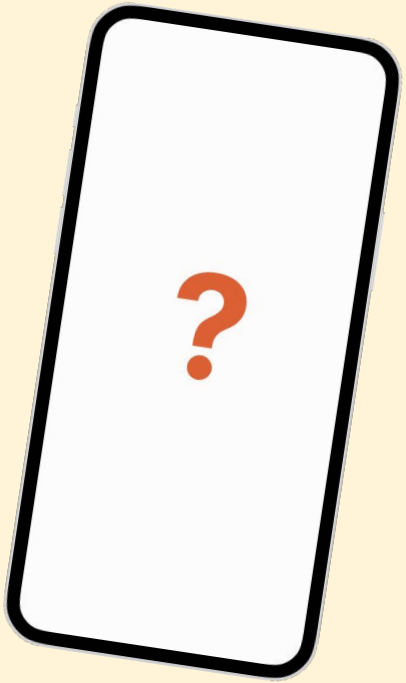
Implementation Prototype Demo

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

We are here!

Design

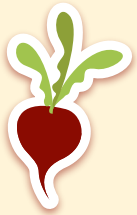
Revise and prepare to code.

Dev pt. 1

Code our first task flow, which is scanning.

Dev pt. 2

Code up and refine the rest of our implementation, source the backend.



Test & Iterate!

Until we're confident and happy with our product.

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

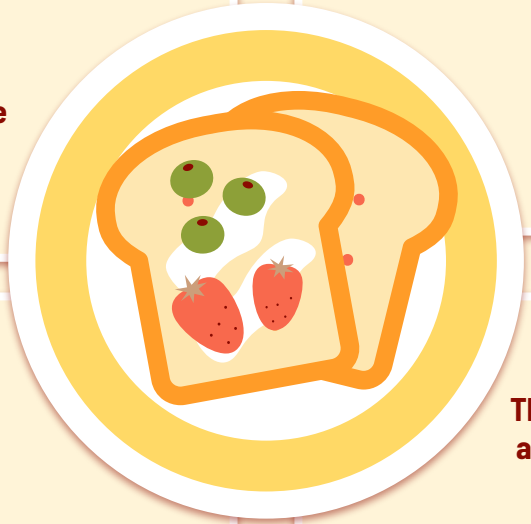
Efficiency

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

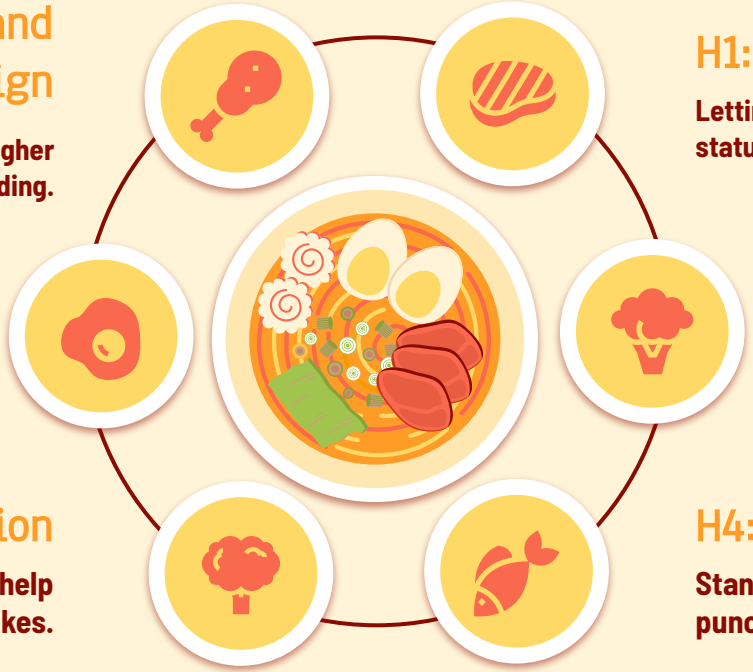
Fewer colours and higher contrast for ease of reading.

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.

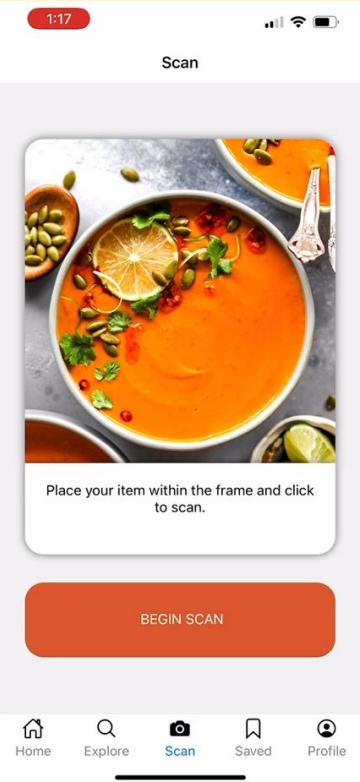
H7: Efficiency

Making all buttons fully functional.

H4: Consistency

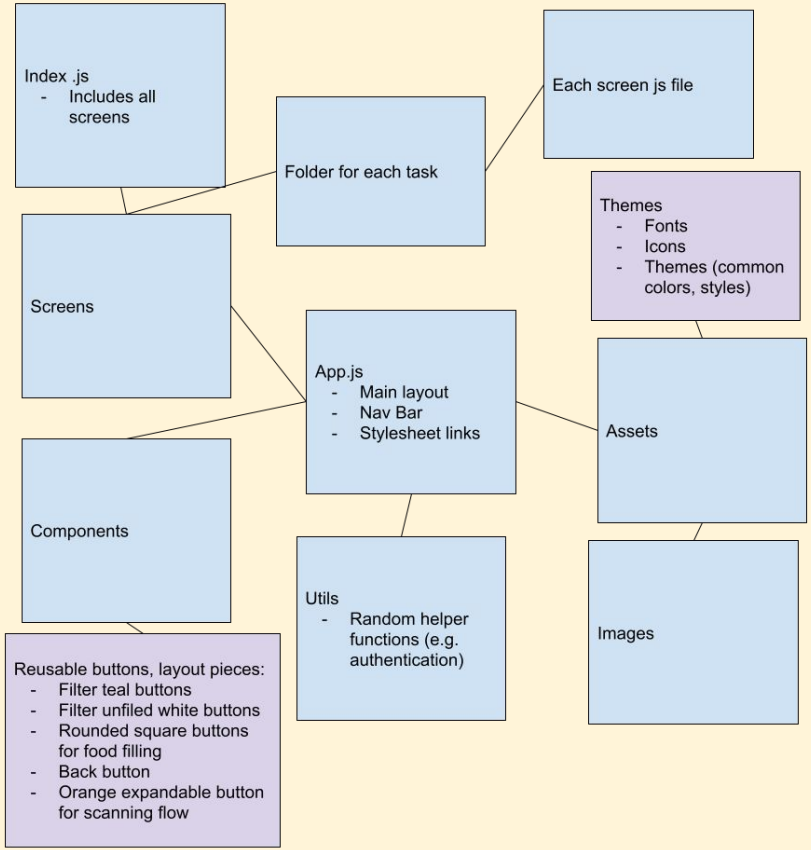
Standardising fonts, sizes, punctuation and names.

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 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

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.