# Menu Generation Assistant

Flutter + Supabase App

Haotian Sun, Dominic Pöltl, Joshua Lympany

**University of Tübingen**

23.05.2025

Department of Marketing

# Outline

Applications

Front End

Back End

# Applications

# User Story Examples (1)

**Image Upload**

Upload a photo of my ingredients → get a recipe.

**Diet Preferences**

App! I am vegan, or I am looking to lose fat.

# User Story Examples (2)

**Ingredient Edit**

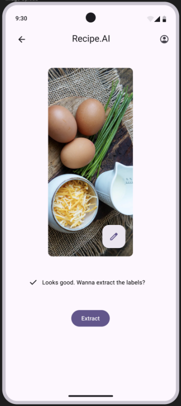
Adjust detected ingredients (even AI can make mistakes)

**Recipe Share**

Share my generated recipe via link with friends.

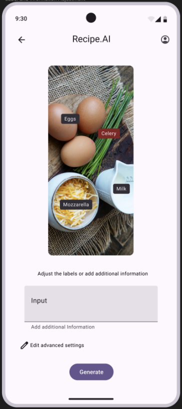
# Basic Idea

Image Upload



✓ Looks good. Wanna extract the labels?

Label and Information Adjustment

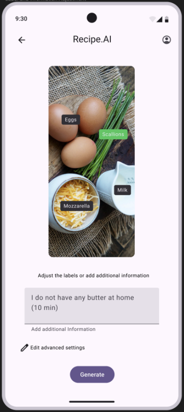


Adjust the labels or add additional information

Input

Add additional Information

Label and Information Adjustment



Adjust the labels or add additional information

I do not have any butter at home (10 min)

Add additional Information

# Potential Applications (1)

**Smart Cooking Guide**

Personalized step-by-step instructions based on ingredients

**Fast Cooking**

Instant recipe suggestions for meals under 15 minutes

# Potential Applications (2)

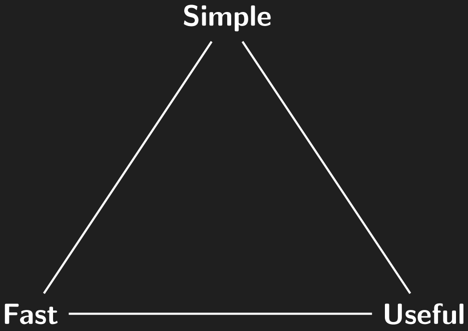
**Meal Planning & Tracking**

Auto-generate weekly menus from photos

**Minimalist Recipes**

Create tasty dishes using only 3–5 ingredients on hand

# Value Proposition



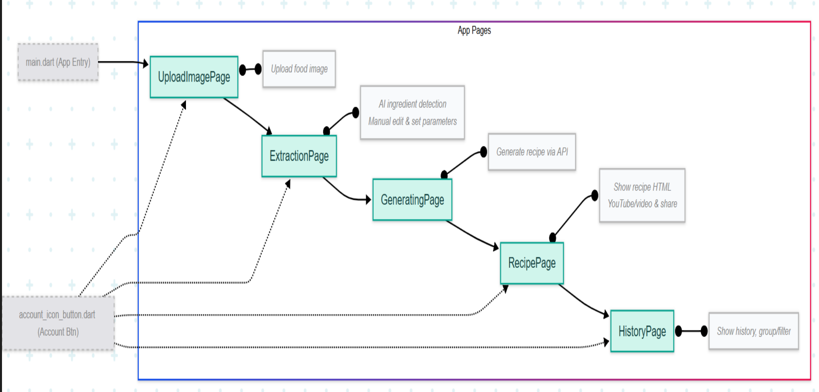
Simple

Fast

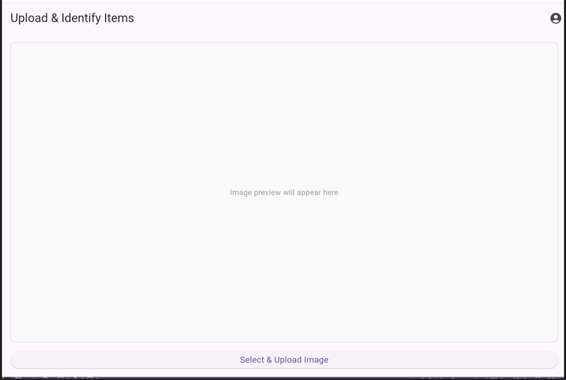
Useful

# Front End

# App Structure



# Initial Page

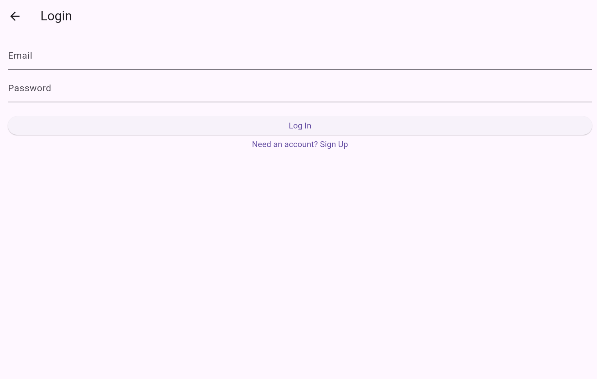


Upload & Identify Items

Image preview will appear here

- Unlogged-in user selects and uploads a food image to start the process.

# Log-in Page



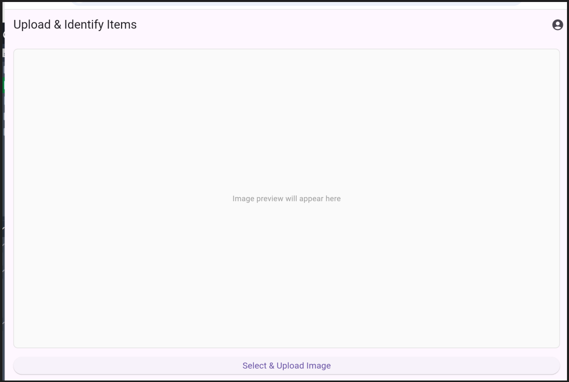
Login

Email

Password

- Users can securely log in or sign up with their email and password to access personal features like history.

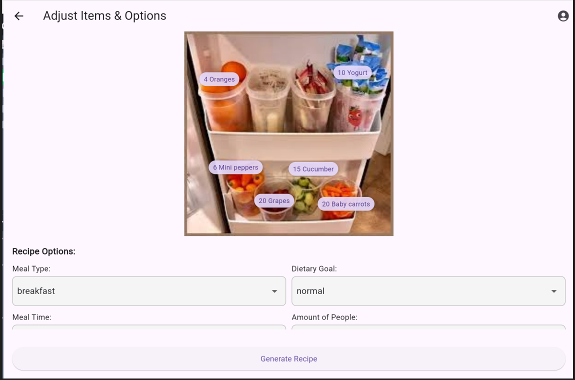
# Upload Page



Upload & Identify Items

- Logeed users select and upload a food image to start the recipe generation process.

# Extraction Page



Adjust Items & Options

**Recipe Options:**

Meal Type: breakfast

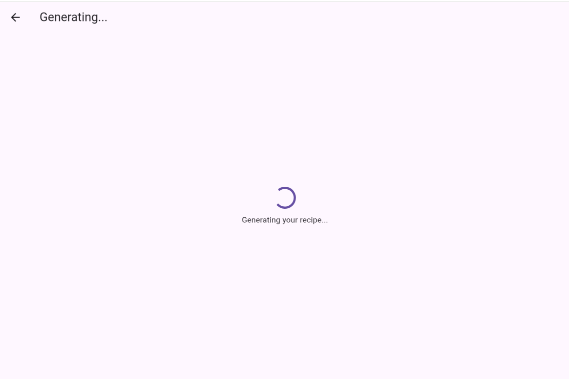
Dietary Goal: normal

Meal Time:

Amount of People:

- Users review and adjust AI-detected ingredients, and set preferences for the recipe.

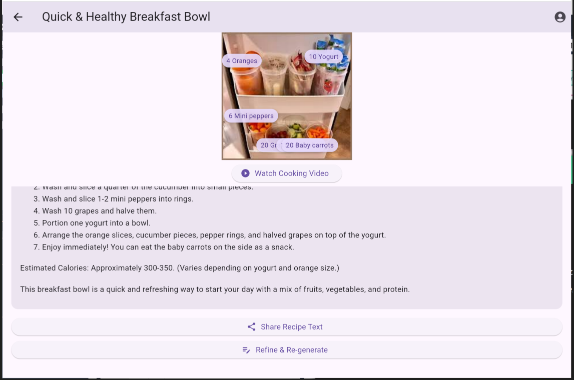
# Generating Page



Generating your recipe...

- The app calls the edge function from backend to generate a recipe based on the selected ingredients and user preferences.

# Recipe Page



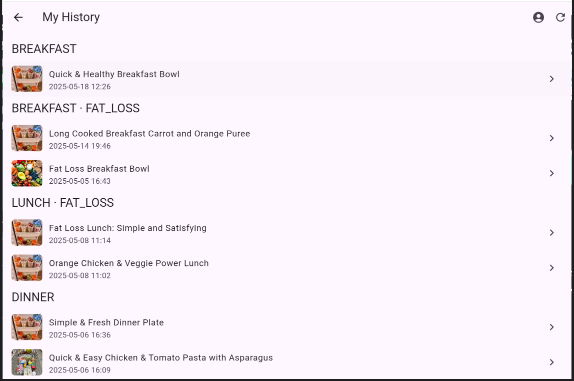
2. Wash and slice a quarter of the cucumber into small pieces.
3. Wash and slice 1-2 mini peppers into rings.
4. Wash 10 grapes and halve them.
5. Portion one yogurt into a bowl.
6. Arrange the orange slices, cucumber pieces, pepper rings, and halved grapes on top of the yogurt.
7. Enjoy immediately! You can eat the baby carrots on the side as a snack.

Estimated Calories: Approximately 300-350. (Varies depending on yogurt and orange size.)

This breakfast bowl is a quick and refreshing way to start your day with a mix of fruits, vegetables, and protein.

- Shows the generated recipe with steps, nutrition info, a video link, and sharing options.

# History Page



My History

BREAKFAST

Quick & Healthy Breakfast Bowl
2025-05-18 12:26

BREAKFAST · FAT_LOSS

Long Cooked Breakfast Carrot and Orange Puree
2025-05-14 19:46

Fat Loss Breakfast Bowl
2025-05-05 16:43

LUNCH · FAT_LOSS

Fat Loss Lunch: Simple and Satisfying
2025-05-08 11:14

Orange Chicken & Veggie Power Lunch
2025-05-08 11:02

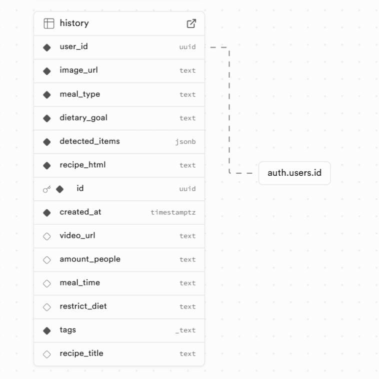
DINNER

Simple & Fresh Dinner Plate
2025-05-06 16:36

Quick & Easy Chicken & Tomato Pasta with Asparagus
2025-05-06 16:09

- Displays your recipe history, grouped by meal type and dietary tags for easy access.

# History Table



history

| | | |
|---|---|---|
| ◆ | user_id | uuid |
| ◆ | image_url | text |
| ◆ | meal_type | text |
| ◆ | dietary_goal | text |
| ◆ | detected_items | jsonb |
| ◆ | recipe_html | text |
| ⚷ ◆ | id | uuid |
| ◆ | created_at | timestamptz |
| ◇ | video_url | text |
| ◇ | amount_people | text |
| ◇ | meal_time | text |
| ◇ | restrict_diet | text |
| ◆ | tags | _text |
| ◇ | recipe_title | text |

auth.users.id

- All recipe generations are stored in a structured table, linked to user accounts, with key fields for filtering and display.

# Back End

# First Question: How do we develop the Backend?

| Consideration | Custom Backend | Out-of-the-Box Solution |
|---|---|---|
| **Customizability** | High | Moderate to High |
| **Time Investment** | Significant (Dev + Ops) | Low (Setup + Config) |
| **Opportunity Cost** | Higher (focus on infrastructure) | Lower (focus on core product) |
| **Pricing Model** | Variable (infra + dev) | Often Tiered (Free to Enterprise) |
| **Open-Source Nature** | Own Code | Varies (some are, some aren't) |

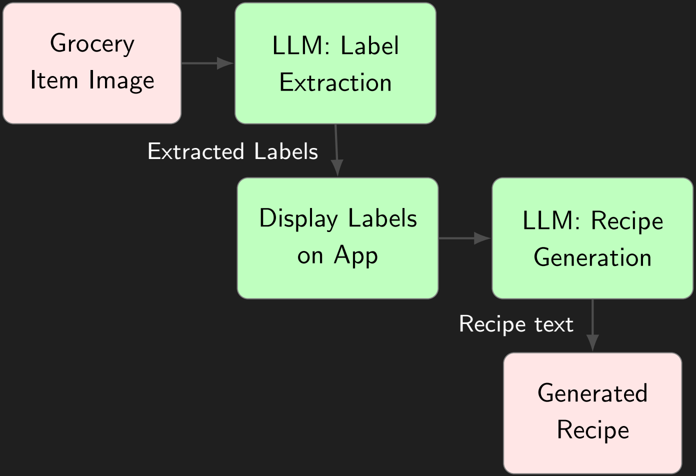
# How Supabase addresses these questions

**Benefits of using Supabase**

1. Rich out-of-the-box functionality
2. Low time-investment
3. Focus on core product features instead of infrastructure (Automated hosting by Supabase)
4. Generous free tier
5. Open-source code

# Second Question: How do we extract the labels and generate the recipe?

## Process Overview: From Image to Recipe



# How can we extract the labels consistently?

**The magic happens through Prompt Engineering:**

- **Precision in Detection:**

  *"Only include items that are clearly identifiable as food. Ignore any non-food items or objects whose edibility is ambiguous."*

- **Focus on the Item, Not Packaging:**

  *"Don't include information about the packaging... We are interested in the item itself, not the container."*

- **Structured and Reliable Output:**

  *"Return results in valid JSON, no extra text. Ensure 'quantity' is an integer."*

# The End

**Thank you for listening!**