FINAL PROJECT PROPOSAL

AI Powered Recipe and Grocery Helper

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PREPARED FOR

COMS/SE – Construction of User Interfaces

Iowa State University Computer Science Department

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1 Introduction

Cai Chen (achen23@iastate.edu) and Megan Chng (mkchng@iastate.edu) make up team MN1 in SE/COMS3190. We are sophomores in Software Engineering and Computer Engineering. We both evenly split our work in our projects, mostly depending on the schedules and time availability of each group member. We work together to do the bulk of our projects and then finish minor details separately and communicate through the changes we make. We both have a background in functional coding from taking classes like COM2270 and COM2280, along with what we have learned in this class, COMS319, up to this point. Cai also has experience with full stack web development from previous projects and is taking SE3090. We decided on this idea by identifying problems in our daily lives. We both enjoy cooking and food, and we also wanted something challenging. We came up with a few ideas but ended up deciding on an AI powered recipe and grocery helper.

2 Purpose of the Proposal

We are creating this website because we both enjoy cooking. Cai currently stores all of his recipes in the Apple Notes app, and we wanted to make something more streamlined. We wanted to have the same functionality of storing recipes but also more features such as grocery mode, and AI implementation.

3 Goals & Objectives

- Making a very user-friendly website that is easy to navigate and aesthetically pleasing.
- Learn more about web development technologies and techniques such as React, Node.js, and MongoDB.
- Gain Experience using UI/UX design software such as Figma

- Implementing major features such as: user authentication, recipe saving/editing, grocery mode, AI suggestions, paid plan for more AI credits or recipe packs, and possibly more
- We plan to use the Agile methodology to complete the project in time, splitting the project into sub-features.
    - We will use weekly meetings to discuss what features we will be working on during that week, along with implementing during these meetings in order to bounce ideas off each other

4 Project Description

The tech stack we plan to use includes:

- Frontend: React, Next.js, Typescript, and Material UI
- Backend: Node.js, Next.js MongoDB

The major pages we plan to have include:

- Landing Page (Also About Page)
    - A landing page that describes this project, along with a button to sign in/up, and a preview of the website
- Log In/Sign Up Page
- Recipes Page (Also Home/Main View)
    - A page that contains all of the users' recipes. There should be buttons to view, search, add/import, edit, and filter saved recipes. Also the first page the user lands on when logging in.
- Individual Recipe Page
    - A page for users to view the recipe in detail while they cook, they should be able to check off each step/ingredient they have prepared
- Grocery Page
    - A page for users to check off ingredients they have/are actively buying from multiple recipes. Maybe have a modal for suggested ingredient alternatives.

- Recipe packs/books page
    - A page where users can buy recipes books/packs
- Paid Plan Page
    - A page to show paid plan for more API use or increase total save recipes
- Cart & Transaction information page
    - A page that shows everything in the user's cart, along with places for credit info and etc.
- Checkout Confirmation Page
    - Confirmation page for successful checkout
- 404 Not Found Page

For more details about how everything connects see *9 Data Sources & Management and*, *10 User Experience Views*.

5 Project Path Selection

We decided to start a new project because our midterm project was a simple national parks page. There weren't enough features, and it wasn't challenging enough for the complexity required for the final project. For the project idea, features, and implementation, we have described them throughout the rest of this document such as in *3 Goals & Objectives*, *4 Project Description*, *6 Feature Ownership & Responsibility* etc.

6 Feature Ownership & Responsibility

- Landing Page - Megan Chng (Frontend & Backend)
- Log In/Sign Up Page - Cai Chen (Frontend & Backend)
- Recipe Page - Megan Chng (Frontend & Backend)
    - Search/Filter
    - Checklist Feature
    - Importing Recipes from the Web

- Individual Recipe Page - Megan Chng (Frontend & Backend)
    - Recipe CRUD functionality
- 404 Not Found Page - Megan Chng (Frontend & Backend)
- Payment Systems - Cai Chen (Frontend & Backend)
    - Recipe Books & Paid Plans
    - CRUD for Cart Management
- Grocery Page - Cai Chen (Frontend & Backend)
    - Recipes for the week
    - Checklist
- AI features - Cai Chen (Frontend & Backend)
    - Suggested Recipes
    - Alternative Ingredients

7 Resources and Tools

Main Tech Stack:

- Frontend: React, Next.js, Typescript, and Material UI
- Backend: Node.js, Next.js, MongoDB

Technologies and Libraries:

- General: GitLab, Figma, ChatGPT API etc.
- Frontend: Axios, React Context, React-Hook-Form (maybe), next-auth (maybe) etc.
    - React Router is not necessary since Next.js has built in Routing
- Backend: Mongoose, MongoDB Atlas, cors, Next.js libraries for API response etc.

8 File Structure & Project Organization

- Final Project
    - src/
        - Components/ - All reusable components
        - Pages/ - All separate pages that will exist in this project
        - Context/ - global state like cart
        - Utils/ - tools for extra functionality
        - Styles/ - CSS stuff
        - **Backend/ - All logic for the backend (NOTE THIS IS IN THE SRC INSTEAD OF A SEPARATE BACKEND DIRECTORY FOR SERVERLESS DEPLOYMENT ON VERCEL)**
    - assets/ - All images and static data
    - Types/ - typescript stuff
    - .env
    - .gitignore
    - (No Need for App.jsx/Main.jsx due to Next.js Framework)

To communicate to the backend, there will be API endpoints that the frontend can call to do CRUD operations, see *9 Data Sources & Management* for more details.

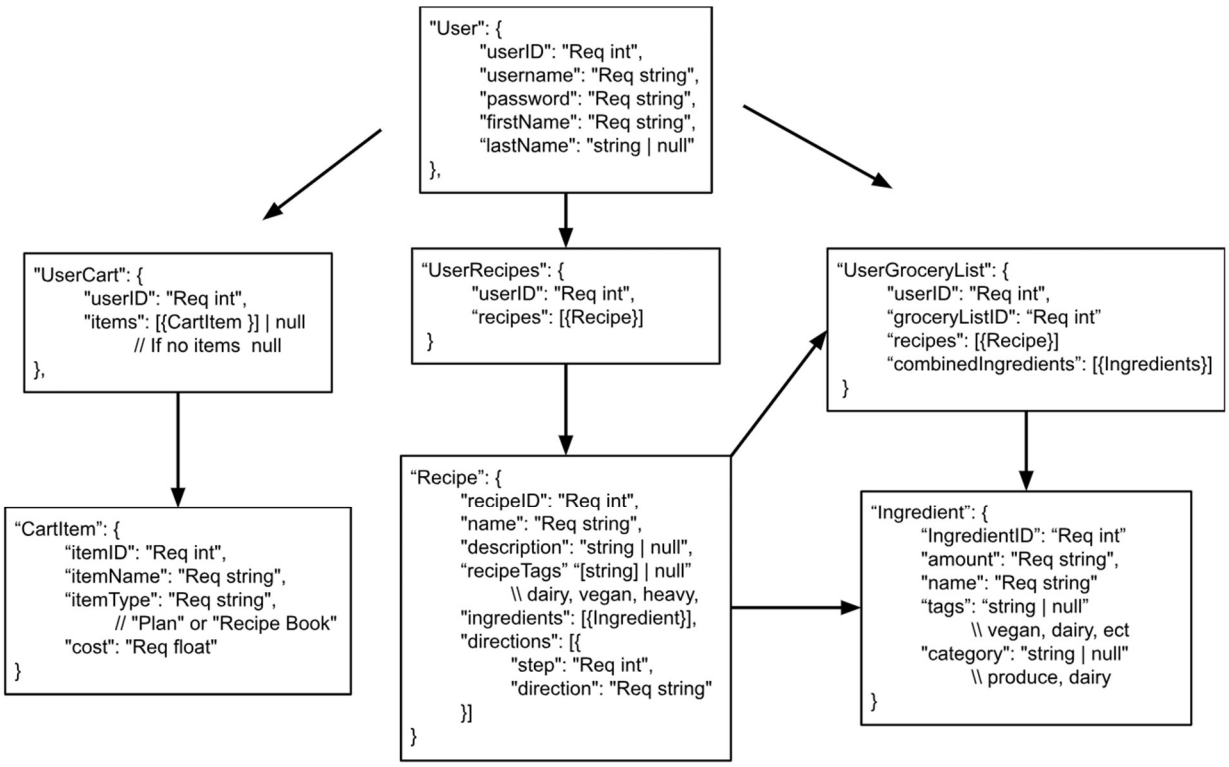
9 Data Sources & Management

Most of our data will come from custom-made schemas from Mongo. There will be some API calls to the ChatGPT API for AI integration. For CRUD we will create endpoints that we can call to do these operations such as:

- URL/api/getAllRecipes – gets all recipes stored in DB
- URL/api/{userID}/savedRecipes – gets all recipes saved from the user
- URL/api/{userID}/Cart – gets all of the items in the users cart
- URL/api/{userID}/addCart/{itemID} – Adds an item to the users cart
- Etc.

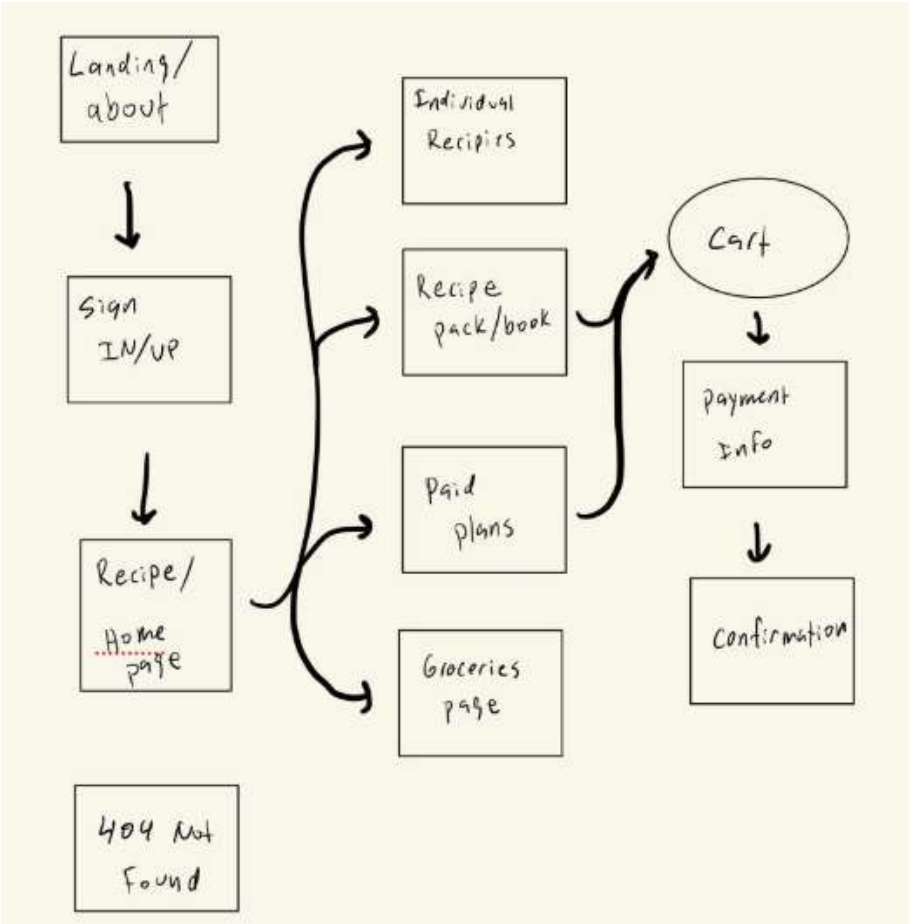
We will use these endpoints when we want to do any CRUD operations, for example, when navigating to the cart page there will be an API call to the URL/api/{userID}/Cart endpoint to retrieve the data of the user's cart to display.

Here is how the Json data looks:



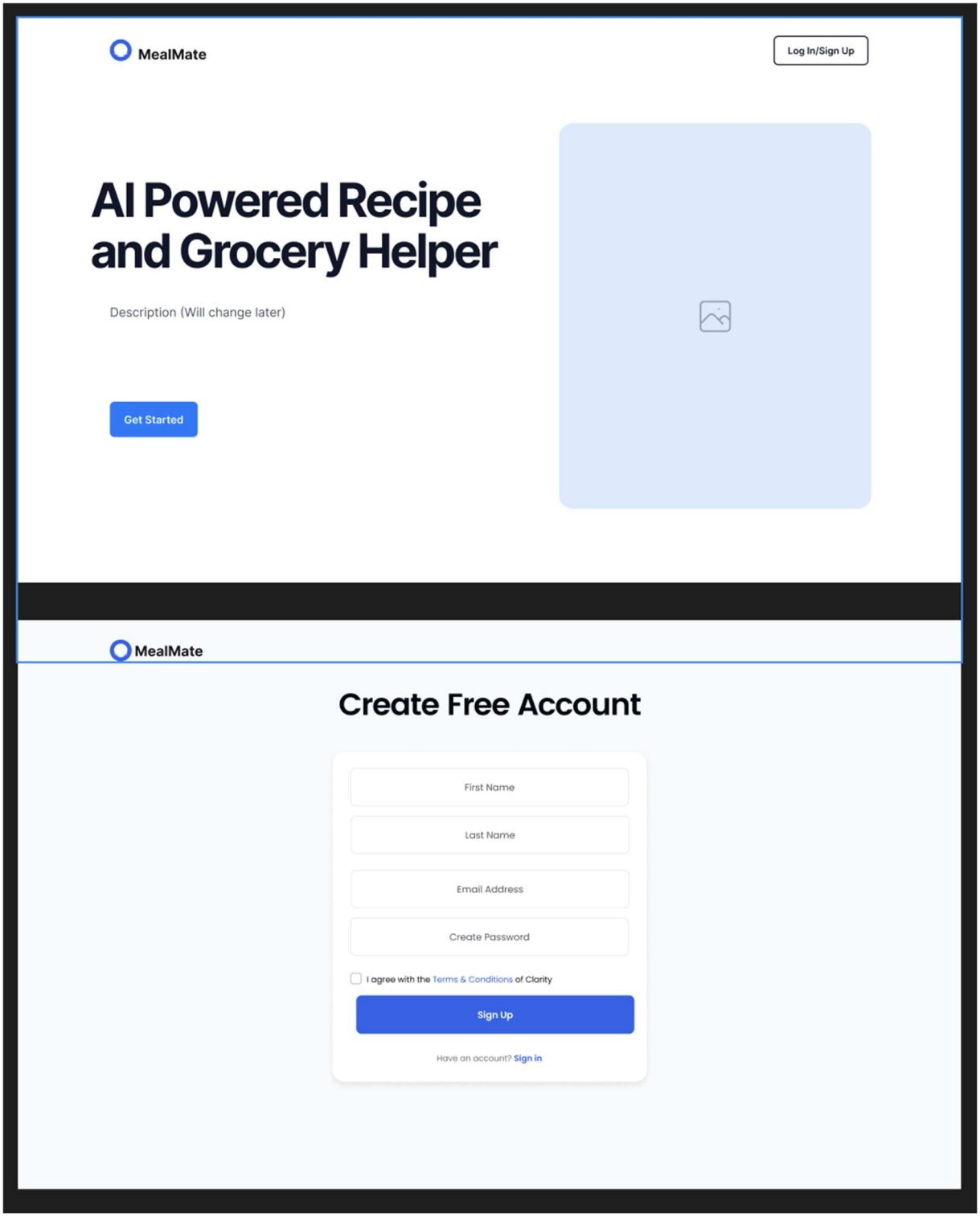
10.1 User Experience Views

In the overall layout, users can navigate back and forth between pages after user authentication. When users are not signed in, they can only see the landing/about and sign in/up pages:



10.2 Individual Screen Sketches

Due to time constraints these are bare bone sketches of the major pages, and will be updated later



Navigation

logoipsum

Recipes Grocery Mode Recipe Books Paid Plans About

Cart Profile

Name's Recipes

Search/Filter

Heavy

Stew

Description

Vegan

Salad

Description

Vegan

Salad

Description

Vegan

Salad

Description

Vegan

Salad

Description

Vegan

Salad

Description

Load more

Navigation

logoipsum

Recipes Grocery Mode Recipe Books Paid Plans About

Cart Profile

Stew

Heavy

Stew

Description

Ingredients

- [ ] 1/2 cup Ingredient 1
- [ ] 1/2 cup Ingredient 1
- [ ] 1/2 cup Ingredient 1
- [ ] 1/2 cup Ingredient 1
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- [ ] 1/2 cup Ingredient 1
- [ ] 1/2 cup Ingredient 1

Directions

- [ ] 1. Step 1
- [ ] 2. Step 2
- [ ] 3. Step 3
- [ ] 4. Step 4

Navigation

logoipsum

Recipes | Grocery Mode | Recipe Books | Paid Plans | About

Cart | Profile

Recipe Books

Search/Filter

Heavy

Stew

$5

Get 10 different Stew Recipes

Vegan

Salad

$10

Get 10 different Salad Recipes

Vegan

Food by Ramsey

$20

Get all the recipes made by Gordan Ramsey

Vegan

Food by ___

Description

Vegan

Food By ___

Description

Load more

Navigation

logoipsum

Recipes | Grocery Mode | Recipe Books | Paid Plans | About

Cart | Profile

Grocery Mode

Current recipes

Heavy

salad

Description

Heavy

Stew

Description

Add/Remove Recipes

All Ingredients

- List item
- List item
- List item
- List item
- List item
- List item
- List item
- List item
- List item

11 Final Comments

Contact Cai Chen in the 319 discord or through email (achen23@iastate.edu) for any questions about this document