Project Proposal: MealMuse – Smart Food Inventory Manager

Project Title: MealMuse

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Abstract

MealMuse is a mobile application built with the Flutter framework designed to reduce food waste and simplify kitchen management. The app allows users to digitally track food items in their pantry, refrigerator, and freezer. By providing features like expiry date alerts, recipe suggestions based on available ingredients, and a sleek, user-friendly interface, MealMuse aims to help users save money, time, and contribute to a more sustainable lifestyle.

Manual Entry: For full control, users can always manually enter an item's details, including its name, category, quantity, and storage location.

Once items are in the inventory, users maintain complete control:

Edit Any Detail: Easily adjust the quantity of an item as it's used up.

Flexible Expiry Management: Update the expiry date of any product at any time. The app's notification system will dynamically recalculate alert timing based on the new date.

Intuitive Removal: Manually remove items that have been used, consumed, or discarded.

Objectives and Goals

The primary goal is to develop a fully functional, production-ready mobile application that addresses the problem of domestic food waste.

Primary Objectives:

- Provide a digital inventory system for tracking food items and their expiry dates
- Implement a notification system that alerts users about impending expirations
- Integrate with a recipe API to generate cooking suggestions from available ingredients, reducing waste
- Create an aesthetically pleasing and highly usable interface with support for dark mode and multiple languages

Technical Learning Objectives:

- Master the Flutter SDK and Dart programming language
- Implement robust **CRUD** (Create, Read, Update, Delete) operations
- Manage application state effectively using an advanced state management solution.
- Integrate third-party services via **RESTful APIs** (Spoonacular/Edamam)
- Implement platform-specific features like **local notifications**
- Support **internationalization (i18n)** and **accessibility** features

Features and Functionalities

Core Inventory
- Add/Edit/Delete items with name, category, quantity, and expiry date.
- Categorize items by type (Fruit, Vegetable, Protein).
- **Search bar** to quickly filter inventory.

Intelligent Alerts
- **Local push notifications** for items expiring within user-defined timeframes. In-app list view sorted by expiry date.

Recipe Integration
- **"Suggest Recipes"** feature that queries an external API (Spoonacular) with available ingredients
- Display recipes with details, ingredients, and instructions
- Filter recipes by dietary preference (e.g., vegan, gluten-free)

User Experience (UX)
- Clean, intuitive, and **aesthetic design** with smooth animations
- **Dark mode / Light mode** support, following system settings or user preference
- **Offline mode**: View, add, and edit inventory without an internet connection. Data syncs when connectivity is restored

Inclusivity

- Multi-language support **(Internationalization) for at least two languages (e.g., English & Spanish)**

Recipe & Food Insights

- **Nutritional Info Display:** Show calories, macros, and nutrients for recipes and food items.

- **AFavorite Recipes & Collections:** Save and organize recipes into categories (e.g., quick meals, family favorites).

Shopping & Meal Planning

- **Smart Shopping List:** Auto-generate shopping lists based on missing ingredients for saved recipes.
- **Smart Inventory Addition:** Easily move items from shopping list to inventory.