Literature and Tech Review

Background & Internal Knowledge

Our team consists of three members: Rishitha (CS Major, UX Design Minor), Vibha (CS Major, UX Design Minor), and Meghana (CS Major, Business/Math Minor). Through previous projects in React, Flask, Figma, Python, and more, we have strengthened our skill in front-end and back-end development. Additionally, we have experience using project management tools like Jira and Kanban, which will help us maintain efficiency throughout development.

Problem Statement & Industry Context

The food industry has seen a rise in applications focused on meal planning, recipe discovery, and nutrition tracking. However, existing solutions often fail to consider ingredient optimization based on users' pantry inventory, leading to food waste and unnecessary spending. Our application aims to bridge this gap by providing personalized meal recommendations based on available ingredients, dietary preferences, and nutritional goals.

Existing Solutions & Competitor Analysis

Several existing applications focus on aspects of sustainability, nutrition tracking, and food waste management, but none fully integrate all the features our project aims to offer. Our primary competitors include **GreenChoice** and **EWG Healthy Living**, both of which incorporate receipt scanning technology to minimize manual data entry.

Our app integrates and expands upon the strengths of both competitors while addressing their shortcomings. Specifically, we differentiate ourselves through various aspects such as:

1. **Comprehensive Sustainability + Nutrition Tracking** – Unlike GreenChoice, which focuses solely on environmental impact, and EWG Healthy Living, which is limited to nutritional information, our app combines both, giving users a holistic view of their food choices.
2. **Automated Inventory Management** – We introduce **expiry date alerts** and a **digital pantry** that syncs with receipt scanning, ensuring users can track food consumption and minimize waste effectively.
3. **Personalized Meal Planning + Inspiration** – Our app provides **customized meal suggestions** based on the user's pantry inventory and dietary preferences, making it easier to use ingredients before they expire.
4. **Reward System for Sustainable Choices** – Rooted in **Self-Determination Theory**, our reward system motivates users to make environmentally conscious decisions by providing incentives for reducing food waste and making sustainable grocery purchases.

Technology Stack

To implement our solution, we will be utilizing the following technologies:

- **Frontend:** React (for an interactive UI)
- **Backend:** Flask (for handling API requests and logic), Firebase (for real-time data storage and authentication)
  - Specific APIs to use for image processing includes: Google's Cloud Vision API, Microsoft's Azure Cognitive Services

Relevant Research & Design Considerations

1. **User Behavior & Food Waste:** Studies have shown that a significant portion of household food waste comes from poor meal planning and lack of inventory tracking (Quested et al., 2013). Our app will address this by providing real-time updates and intelligent suggestions.
2. **UI/UX Design for Food Apps:** Research on user engagement in meal-planning applications highlights the importance of minimal cognitive load and visually appealing interfaces (Nielsen, 2016). Our design will prioritize ease of use and accessibility.
3. **Personalized AI Recommendations:** AI-driven personalization has been shown to enhance user retention in food-related applications (Zhang et al., 2021). By leveraging machine learning, our app will tailor recommendations based on dietary habits and preferences.

Conclusion

By leveraging our team's technical expertise and utilizing AI-driven personalization, our app aims to improve meal planning efficiency while reducing food waste. The combination of real-time inventory tracking and intelligent recipe recommendations differentiates our product from competitors and aligns with the growing demand for sustainable consumption, furthering our ultimate goal of pushing our customer base to become more eco-friendly.

References

Quested, T. E., Marsh, E., Stunell, D., & Parry, A. D. (2013). *The food waste challenge: An introduction to issues and drivers.* Waste and Resource Management.

Nielsen, J. (2016). *Usability Heuristics for User Interface Design.* Nielsen Norman Group.

Zhang, H., Lu, Y., & Wang, B. (2021). *Personalized AI-based recommendations in food-related applications: An empirical study.* Journal of Consumer Research.