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Project Part 1: Project Idea

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Abstract

The AI Assisted Grocery and Meal Planner helps users save time and money by simplifying meal preparation and grocery planning. It assists health oriented individuals who want to maintain balanced diets and their personal goals. Users enter what they already have in their refrigerators, the period of time they are shopping for, and any allergies or dietary restrictions. The system uses AI (API platform like OpenAI's platform) to generate customized meal plans and grocery lists that fit within the boundary of user's needs. This app combines inventory tracking, scheduling, and adaptive feedback with a interface that is interactive for the user's personalized experience that simplifies and speeds up the decision making and preplanning that is involved in shopping. In addition, this reduces waist by avoiding any unnecessary items that might be outside of the dietary plan.

Description

A. Product details

Main idea and goals

The project is an AI based shopping assistant with good usability that also performs meal planning. The purpose is to simplify grocery shopping decisions, reduce planning time, help with dietary goals, keep costs, and waist low. The assistant is able to reduce food waste by good planning techniques centered around meal prepping with individual needs. A secondary effect of this is that users will save time as a result of reduced planning time to make their own lists that might not be as good. The guiding HCI principles are clarity, low cognitive load, and fast completion with simple prompts guiding users through the process. The system focuses on a

smooth flow that asks questions that guide the planning of AI. At the end, users are presented with a concise list of items and a simple meal plan.

Main functionality and characteristics

The AI agent starts off by prompting the user with the key questions using simple text boxes. First, the current inventory of the refrigerator and pantry so that list doesn't repeat already owned items and also gives the user a chance to get rid of expired ingredients. Second, the user records their diet goals such as weight loss, weight gain, maintenance, etc. Third, the user provides an allergy list, so the agent avoids unsafe ingredients and suggests safe substitutions. Fourth, the user selects a time period and maximum budget to stay in. Lastly user to set cooking frequency for the meal plans. With these inputs the system generates a json prompt that gets sent of to the AI agent that has all the strict instructions and also checks so that the user can't jail break the prompts. Users will then receive a detailed grocery list with prices from multiple stores and a list of recipes to follow in order to use up all those groceries and reduce waste. As an additional exploratory feature, the agent would look around for coupons to reduce prices of items.

Planned technology

For this project, the priority is a fast and reliable prototype, so there is no need for a full production stack. The system will be a lightweight web application with a minimal front end. Also incorporated will be code that sends and receives API calls to the OpenAI service. Those will be requests and lists for the meal plan and shopping list. There won't be a need for a database as for the prototype this app won't be storing long term data. The front end can be a simple React page or even a plain HTML form with a small amount of JavaScript. The server can be implemented in Python and Flask to generate the json style output that will be sent as a API call. The client will render the list immediately after receiving it. This design keeps the

technical complexity low and has a simple interaction path for the user. This is done to meet HCI goal of rapid iteration.

Notes on existing similar and related systems

HelloFresh and similar meal kit services offer curated meal plans and deliver exact ingredients to the user. They give users convenience and reduce planning but charge extra for their service. The AI assistant is going to compete by going directly to the stores iventory and making suggestions based on metrics the user has provided. This removes the markup associated with meal kits and planning time for shopping and meal prep.

Link: https://www.hellofresh.com

B. Expected significance and impact

Intended users and key usability goals

The AI-Powered Grocery and Meal Planner is designed for individuals who want to maintain a good diet. By saving time it takes to research, calculate, or organize meal plans. The system focuses on reducing cognitive effort with conversational AI that asks key questions that it build the plan around. The usability goals emphasize simplicity and efficiency. Users do minimal work by providing important information and AI takes on the heavy load of planning.

innovative aspects

This project introduces several innovative elements. It will have information tracking for a single intelligent workflow that adapts through conversation rather than rigid forms. Users can shop directly at their preferred stores, saving money while keeping full control. The AI core also allows easy scaling for features such as live price comparison or online store cart integration like Walmart's Pickup and Delivery.

impact of solution

Globally, it supports healthier eating through accessible AI. Economically, it reduces grocery costs and encourages retailer partnerships. Environmentally, it cuts food waste by using existing ingredients. Societally, it sparks competition among retailers to offer better deals and technology.

professional growth

This project will strengthen skills in AI API integration and usability design. provides hands on experience with human computer interaction principles, and skills in developing practical systems.

Project Resources

Related References

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