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HEALTHWISE GUIDE FOR RECIPE USING CONTENT BASED FILTERING

Janhavi Khopade[*1], Bharati Sonawane[*2], Riya Shinde[*3],
Ayush Chandane[*4], Prof. Tanuja Mulla[*5]

[*1,2,3,4]Student, Department Of Computer Engineering, Smt. Kashibai Navale College Of Engineering, Pune, Maharashtra, India.

[*5]Assistant Professor, Department Of Computer Engineering, Smt. Kashibai Navale College Of Engineering, Pune, Maharashtra, India.

Affiliated To Savitribai Phule Pune University, India.

ABSTRACT

The Smart Recipes project deals with innovating how one cooks at home. It seeks to provide healthier sustainable meals, and in a quest for healthier eating and easy cooking solutions, the demand for customized menus increases for people. Most of the existing machines, however, are not self-sufficient. Rather, the food gets wasted, and poor preparation of it is witnessed. Smart Recipes answer these through use of machine learning and intelligent language processing to offer recipes fitting the user's preferences, dietary restriction, and the available ingredients. The idea is to get as many users as possible to try seasonal and local ingredients, reducing their carbon footprint and promoting an eco-friendly way of cooking. It also fosters community engagement through feedbacks and collaborations from the users. A smart recipe is, therefore, a programmable solution with intuitive user interface, and it is suitable for any level of skill. Advanced algorithms in the system ensure that its recommendations are constantly changing as it interacts with users. It also manages a rich and diverse menu library by incorporating external food data and menus. Positive effects on the user's nutrition and overall health are found to arise from this program. Smart food only brings improvement into the cooking process but also health and well-being. With continuous development and involvement of users, this system is ready for future growth and increased functionality.

I. INTRODUCTION

Smart Recipe Project is one of the recent ideas developed to bridge the gap between personal, health and fitness tips, the use of machine learning, natural language processing (NLP) and sustainable applications to help users source out foods that match their dietary preferences, availability, and food or beverage availability. With almost everyone immersed in health and environmental issues daily, Smart Recipes sets out to change the way people cook with its new smart food ideas that not only suit the individual's choice but also guarantee their sustainability.

Smart food abides with an essence of making personal nutrition recommendations through the utilization of such information as preferences, restrictions and ingredients available. The system reduces meal complexity while all recommendations can be in congruence with health and safety goals. Smart Recipes can help many problems caused by traditional cooking methods, such as food waste, under-use of ingredients, and unhealthy eating habits, through the use of advanced algorithms.

By using the content-based filtering algorithms, employing methods such as TF-IDF and Word2Vec, Fish Guide analyzes information used by one person and information used by another, thus providing the most viable recommendation for users' needs. Designed with the MERN stack including MongoDB, Express.js, React.js, and Node.js to provide large capacity, flexibility, and speed in processing big data and the user's cart.

This initiative responds to the increasing demand for sustainable and environmentally friendly food due to growing health concern and environmental awareness. Food production and consumption directly impact public health as well as the environment, and the effort of Smart Recipes is to achieve a healthier eating habit by recommending the use of sustainable ingredients and minimizing food waste.

II. LITERATURE SURVEY

The development of Smart Recipe is based on extensive research in the fields of artificial intelligence (AI), machine learning, natural language processing (NLP), and cooking. Some studies explore the use of AI in creating personalized recipes, while others examine how machine learning models can be used to improve

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recommendations. This literature review examines the key activities that underlie smart map projects, focusing on the most important outcomes in map design, recommendations, and food choice sustainability.

1. AI-based map creation and assistance

In recent years, the use of AI in map creation has attracted attention, and many studies have been conducted on how to do this. Use machine learning models based on user input Accept or generate a report. A significant study in this area is the research of Tejaswini and Sankar Reddy (2024), who developed an AI-based electric and cooking machine using machine learning and positive language (NLP). The system creates personalized recipes by considering dietary restrictions, available ingredients, and flavor profiles. It is designed to provide health and entertainment, including nutritional information to provide healthy food. This algorithm evaluates user preferences and ideas and creates recipes (Smart Recipes) that suit individual health goals and taste preferences.

2. Outlier Analysis of Recipe Recommendations

The first study by Yu-Wen Lo et al. (2015) focused on the use of outlier analysis when recommending recipes. The system synthesizes new recipes by analyzing outliers in a dataset of traditional recipes to ensure they meet dietary needs. The authors said that by identifying and using unusual ingredients that are useful but often neglected, the system can recommend healthy foods to the same people with nutritional issues such as diabetes or high blood pressure. The system is part of an overall food management system that aims to improve the quality of food through automatic recommendations (smart food).

3. A deep learning approach to conceptual mapping

Himanshu Rawlani et al. (2018) proposed a deep learning-based feedback map. Their model uses FasterRCNN, a deep convolutional neural network (CNN), to identify ingredients in user-downloaded images and then recommend foods based on those ingredients. The system is designed to work with a recipe database to store nutritious meals based on visible ingredients. This tutorial demonstrates that computer vision can be combined with deep learning to create an interactive map recommendation (smart food).

4. Personalized Recommendations Using Machine Learning

Kavya Srivastava and Shagufta Siddiqui (2024) developed a personalized recommendation based on machine learning to improve the user's cooking experience. The system reduces the vast selection found on traditional map websites by generating map recommendations using user preferences and historical data. The authors highlight the challenge of information overload in map search and propose solutions (smart food) to filter food based on consumer preferences such as dietary restrictions, food preferences, and ingredient availability.

5. Ontology-Based Ingredient Replacement

The concept of ingredient replacement in food has been investigated by Agnieszka Åawrynowicz et al. (2022) for their work on an alternative ontology design for food products. This work presents a model for replacing ingredients in food based on ontology design, which can help users in cases where certain ingredients are not available. The system can create an existing food and include other ingredients to preserve the nutritional value and flavor profile of the recipe. This work is particularly important for the Smart Recipes project as it can provide more flexibility in the suggestions in the recipe and enable users to still create recipes (Smart Recipes) even if some ingredients are not available.

III. METHODOLOGY

The smart food guide gives recommendations of recipes and environmental direction using machine learning, natural language processing, and user interaction. These are the main steps in the process:

Data gathering and preparation

Data: include personal tips, guides online, food blogs, food websites, and seasonal products. Gather user-specific information such as dietary restrictions, product availability, and food preferences through research or from account profiles. The model of Frequency (TF-IDF) and Word2Vec make use of vectors to present recipes and user preferences. This allows the model to parse the content of the recipe and advise dishes to prepare based on content vectors between what the user prefers and the content of the recipe given. Food pairing promotes waste-free cooking. The collaboration of the content updates to show other people's choices and feedback for increased personalization with collaborative filtering.

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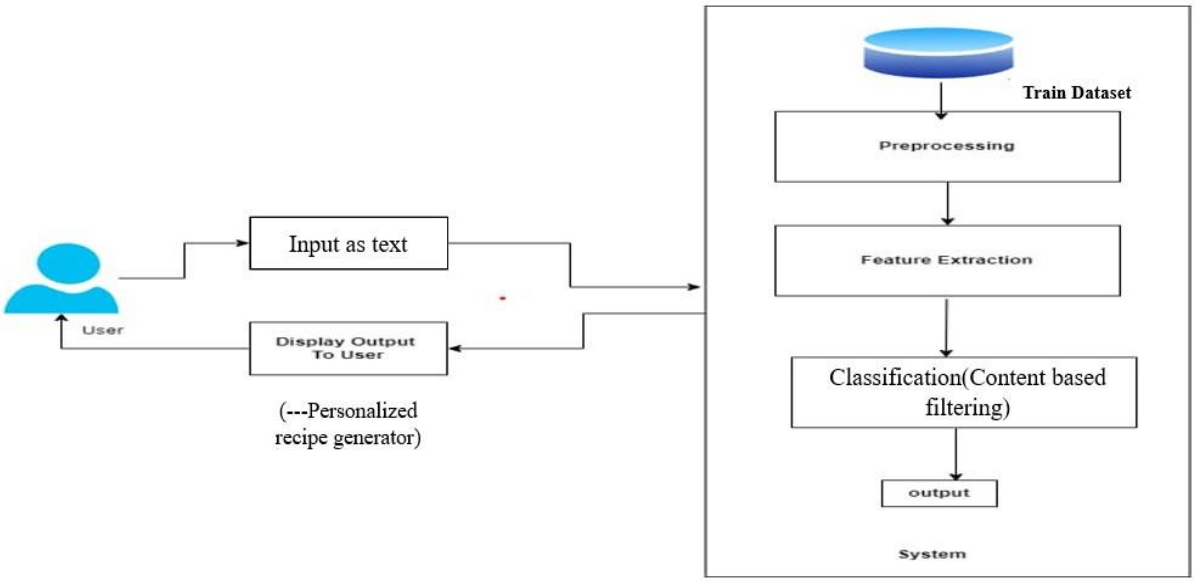
Health and Sustainability Score Calculations

Nutritional Analysis-Integrated nutritional analysis that takes into account calorie content, macro and micronutrient composition, and dietary requirements. Ingredients used are seasonal, location-appropriate, and have less of a carbon footprint.

Use MERN Stack for developing applications with MongoDB, Express.js, React.js, and Node.js with high performance, scalability, and interoperability features. User interface - searching recipes, nutritional information, preferences, and feedback. The user can then learn to benefit future recommendations. Sex tips. Performance. KPIs: mapa engagement, less food wastes, more healthy users. Optimize computing efficiency. New foods and improved menu variety.

Architecture Overview

The architecture for our resume shortlisting and ranking system using BERT is designed with a focus on efficiency and accuracy in mind. It comprises the following key components:



1. Smart Recipe's system architecture consists of multilayered architecture and has three main layers: presentation layer, application layer, and data layer. This architecture supports separation of concerns, scalability, and maintainability.

1. Presentation layer

Front-end framework: The presentation layer is built using React.js to provide a responsive and user-friendly interface for users to interact with the application form.

- User interaction: Users can enter their food preferences, browse recipes, and get personalized recommendations from a clean and intuitive user interface.
- Accessibility: The front-end will also include accessibility features to ensure disabled users can easily navigate the platform.

2. Application Layer

Back-end Framework: The application layer is built using Node.js and Express.js and handles server-side logic, API requests, and routing.

- Recommendation Engine: The Python-based recommendation engine will analyze user data, preferences, and external food data to create recommendations based on technology learning algorithms.
- Business Process: This process also includes business logic for managing user input, managing conversations, and integrating with external APIs for different food and nutrition information.

3. Data layer

- Database: The data layer uses MongoDB as a data management system to store user information, recipes, food information and feedback. NoSQL database allows flexible and scalable data.

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- External API: The system will interact with external data and APIs (such as food data, menus) to retrieve important information regarding the message accepted on the map.

IV. CONCLUSION

The Smart Recipe Platform marks another advance step in in-kitchen solutions as well as catering to booming market demand on health, wellness, and simple wellness. Fueled by advanced machine learning, natural language processing, and user-friendly models, Smart Recipes provides recipe recommendations that meet a person's dietary preferences and health goals.

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