iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 14 **Issue:** III **Month of publication:** March 2026

DOI: https://doi.org/10.22214/ijraset.2026.78531

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 14 Issue III Mar 2026- Available at www.ijraset.com

Smart Food Tracker and AI Meal Planner

Ms. R. Divyadhrashini[1], Mr. S. Srikanth[2], Mr. M. Thamarikannan[3], Ms. Sathya Velmurugan[4]
[1, 2, 3]*B. Tech AGRI Final Year,* [4]*Assistant Professor, Department of Agricultural Engineering, Rathinam Technical Campus, Coimbatore – 641 021*

Abstract ***The SMART FOOD TRACKER and AI MEAL PLANNER is a web-based application developed to improve household food management by integrating grocery tracking, meal planning, and nutritional monitoring into a single platform. Traditional food management methods often rely on memory or manual records, which can result in food wastage, forgotten expiry dates, and poor diet planning. The proposed system helps users manage their groceries efficiently by tracking food items, sending expiry alerts, and suggesting recipes based on available ingredients. It also provides detailed nutritional information and proper storage guidance for food items. Developed using PHP for the front end and MYSQL for the back end, the system offers a user-friendly interface that promotes healthier eating habits, reduce food waste, and improves overall kitchen efficiency.***

Keywords: Smart Food Tracker, AI Meal Planner, Grocery Tracking, Recipe Recommendation, Nutrition Monitoring, Expiry Alert System, Food Waste Reduction, Web-Based Application.

I. INTRODUCTION

Managing food in households has been become increasingly due to busy lifestyles and the lack of organized tracking methods. Many people depend on memory or simple written lists to remember grocery items and plan meals. This often leads to problems such as purchasing duplicate items, forgetting available ingredients, ignoring expiry dates, and ultimately wasting food. In addition, many individuals do not have sufficient awareness about the nutritional value of the food they consume, which can affect their overall health and dietary balance.

The Smart Food Tracker and AI Meal Planner is developed to address these issues by providing a digital platform for efficient food management. The system allows users to record and monitor grocery items, track their availability, and receive alerts when certain items are nearing their expiration date. It also suggests recipes based on the ingredients that users already have, helping them prepare meals without unnecessary purchases. This feature saves time, reduces food wastage, and improves the overall efficiency of kitchen management.

II. LITERATURE REVIEW

A study by K. R. Sundaram (2020) in the research article “Smart Food Management Systems Using Web Technologies” highlights the growing need for digital solutions to manage household food consumption efficiently. The author explains that traditional methods of tracking groceries and planning meals are often inefficient and lead to significant food wastage due to lack of proper monitoring and awareness. The study proposes a web-based system that integrates food inventory tracking, recipe recommendation, and basic nutritional analysis to support better food management practices. It emphasizes the importance of automation in tracking expiry dates and generating alerts to minimize spoilage. Additionally, the research discusses how personalized recipe suggestions based on available ingredients can improve resource utilization and reduce unnecessary purchases.

However, the existing system described in the study has certain limitations, such as limited personalization, lack of advanced nutritional insights, and absence of comprehensive storage guidance. It mainly focuses on basic tracking and does not provide detailed step-by-step cooking assistance or real-time user interaction features. Furthermore, the study does not deeply address user engagement and data security concerns, which are critical in modern web applications.

In comparison, the proposed Smart Food Tracker and AI Meal Planner project extends beyond the existing systems by integrating multiple advanced features into a single platform. It includes automated grocery tracking with expiry alerts, personalized recipe suggestions, detailed cooking instructions with video support, comprehensive nutrition management, and proper food storage guidance. The system also ensures better user interaction and aims to reduce food wastage while promoting healthy eating habits. Thus, the proposed system provides a more complete, user-friendly, and efficient solution compared to earlier approaches.

©IJRASET: All Rights are Reserved

ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 14 Issue III Mar 2026- Available at www.ijraset.com

III. EXISTING SYSTEM

A. Manual Tracking Issues

Manual tracking of grocery items and their expiry dates is inefficient and unreliable. People often forget to update records or check dates regularly, which results in food items expiring unnoticed. This leads to unnecessary food wastage, increased expenses, and poor inventory management in households.

B. Lack of Personalized Recipe Suggestions

Most available recipe suggestions are generic and do not consider the actual ingredients present at home. As a result, users may not utilize existing food items effectively and may end up purchasing additional ingredients unnecessarily. This reduces convenience and increases both time and cost in meal preparation.

C. Limited Nutritional Awareness

Access to nutritional information such as calories, proteins, vitamins, and minerals is often limited or not user-friendly. Without proper insights into food intake, individuals find it difficult to maintain a balanced diet, track their health goals, or manage conditions like weight control and nutrition deficiencies.

IV. PROPOSED SYSTEM

A Automated Grocery Tracking and Expiry Alerts

The system automatically tracks all grocery items along with their expiry dates, eliminating the need for manual monitoring. It sends timely alerts and notifications when items are close to expiration, helping users consume them before they spoil. This significantly reduces food wastage, saves money, and ensures better inventory management in the kitchen.

B Personalized Recipe Suggestions

The platform provides recipe recommendations based on the ingredients currently available at home. This personalized approach helps users make the most out of their existing groceries without needing to buy extra items. It also encourages creativity in cooking and ensures efficient utilization of resources.

C Step-by-Step Cooking Guidance with Tutorials

Users are provided with clear, step-by-step cooking instructions along with video tutorials. This makes meal preparation easier, especially for beginners, by guiding them through each stage of cooking. It improves the quality of dishes, reduces cooking errors, and builds confidence in the kitchen.

V. METHODOLOGY

A Requirement Analysis

In this phase, the key problems in food management are identified, such as food wastage due to expiry, lack of meal planning, and inefficient grocery tracking. Based on these issues, system requirements are defined, including features like expiry date alerts, inventory management, recipe suggestions, and nutritional information tracking.

B System Design

The overall structure of the application is designed in this stage. It includes designing the system architecture, user interface layouts, and database schema. The database is structured to store user details, grocery items, recipes, and nutritional data efficiently.

C System Development

The actual development of the system is carried out using technologies such as PHP for backend processing, HTML and CSS for frontend design, JavaScript for interactivity, and MySQL for database management. Each component is developed and integrated to ensure smooth functionality.

D Module Implementation

The system is divided into modules such as Admin and User modules. The admin module manages overall system control, including data updates and monitoring. The User module allows users to add groceries, track expiry dates, access recipes, and view nutritional information.

©IJRASET: All Rights are Reserved | SJ Impact Factor 7.538 | ISRA Journal Impact Factor 7.894 |

E Testing and Implementation

In this phase, the system is tested for errors, bugs, and performance issues. Functional and usability testing are conducted to ensure reliability. After successful testing, the application is deployed as a web-based system, making it accessible for users.

VI. SYSTEM ARCHITECTURE

The system architecture of the Smart Food Tracker and AI Meal Planner is designed as a layered structure consisting of the frontend, application logic, and database. The frontend handles user interactions, while the backend processes requests, manages grocery, recipe, and nutrition data, and communicates with the database. An admin panel is included to manage and update system data efficiently.

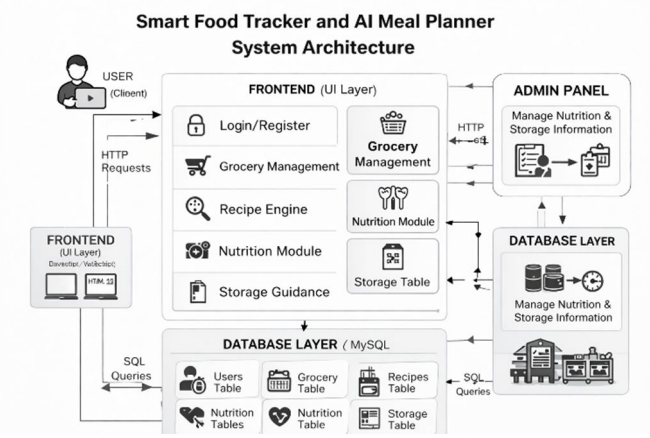


Figure 1. Smart Food Tracker and AI Meal Planner System Architecture

VII. APPLICATIONS

A. Household Food Management

This system is highly useful in homes for managing daily groceries efficiently. It helps users track items, monitor expiry dates, and reduce food wastage through timely alerts.

B. Healthy Diet Planning

The application supports users in maintaining a balanced diet by providing detailed nutritional information. It helps in calorie tracking and promotes healthier food choices.

C. Smart Cooking Assistance

Users can prepare meals easily using instant recipe suggestions based on available ingredients. Step-by-step cooking guidance and videos improve cooking accuracy and confidence.

D. Food Waste Reduction Systems.

The system plays a major role in minimizing food wastage by alerting users about expiring items. It encourages optimal usage of food resources and better planning.

VIII. ADVANTAGES OF AGENTIC AI

A. Automated Grocery Tracking

The system automatically tracks grocery items along with their expiry dates. It sends timely alerts for expiring products, helping users take action quickly. This reduces food spoilage and avoids unnecessary wastage.

B. Reduction of Food Wastage

By notifying users about near-expiry items and suggesting their usage, the system ensures efficient utilization of food. It promotes sustainable consumption and minimizes waste in households.

C. Personalized Recipe Suggestions

Users receive recipe recommendations based on the ingredients available at home. This avoids the need for extra shopping and helps in making quick cooking decisions with existing resources.

D. Step-by-Step Cooking Guidance

The system provides detailed cooking instructions along with video tutorials. This helps users, especially beginners, to prepare dishes accurately and confidently without errors.

IX. CHALLENGES AND ETHICAL ISSUES

A Data Accuracy and Reliability

Ensuring correct nutritional values, recipe details, and storage information is a major challenge. Inaccurate data can mislead users and raises ethical concerns, especially when it affects health and dietary decisions.

B Privacy and Data Security

The system stores sensitive user information such as login details and food habits. Protecting this data from breaches is both a technical challenge and an ethical responsibility to maintain user trust.

C User Input Dependency

The system depends on users to enter correct grocery and ingredient details. Incorrect input can lead to wrong suggestions, which may affect usability and reliability of the system.

D System Scalability and Performance

Handling a large number of users and data efficiently is challenging. Poor system performance can reduce user satisfaction and limit accessibility.

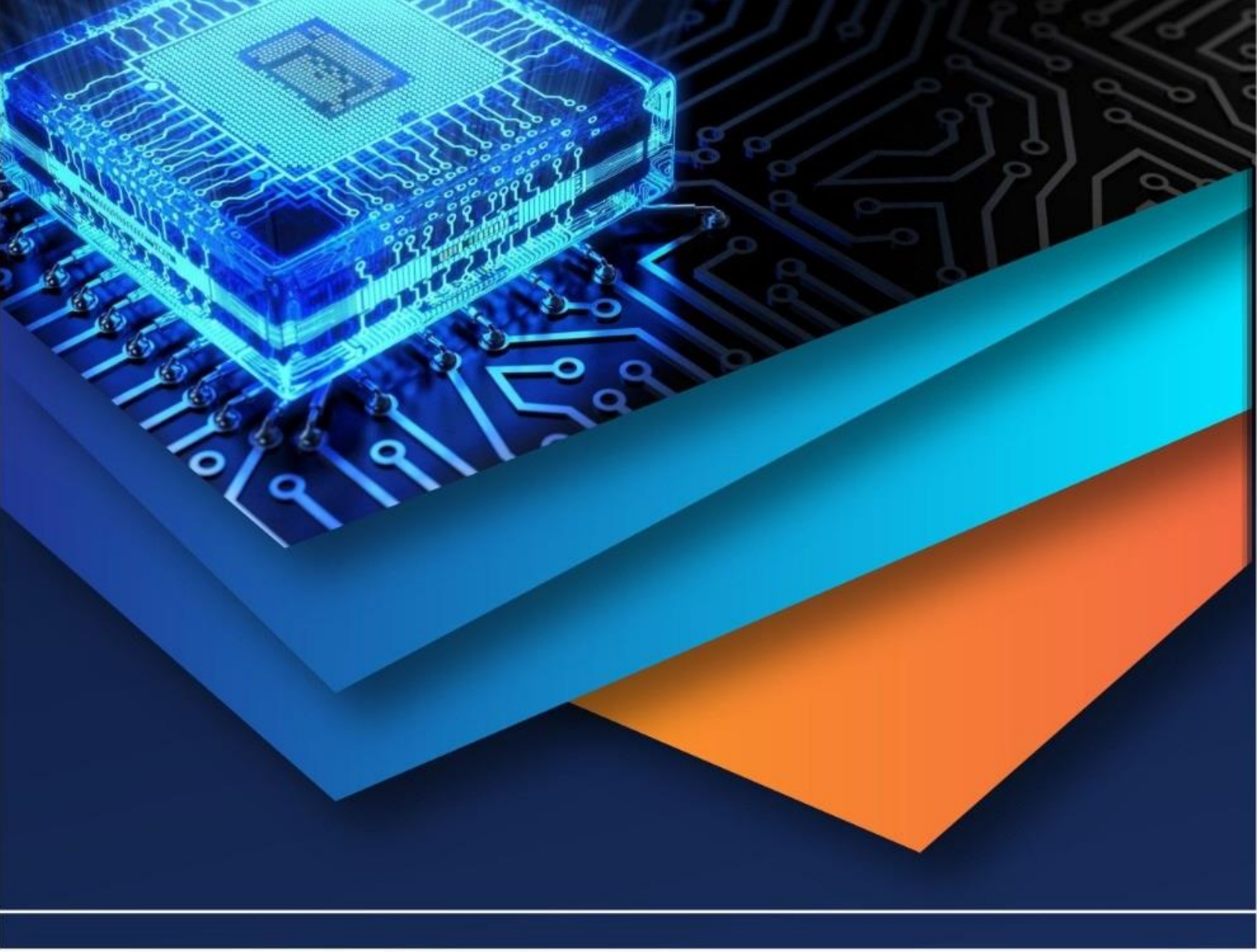
X. CONCLUSION

The Smart Food Tracker and AI Meal Planner is a web-based application developed to improve household food management by integrating grocery tracking, expiry alerts, recipe suggestions, and nutritional information into a single platform. The system helps users manage groceries efficiently, reduce food wastage, and prepare meals using available ingredients. By providing organized food tracking and intelligent suggestions, it saves time and encourages healthier eating habits. Developed using PHP and MySQL, the application offers a user-friendly and reliable solution for modern kitchen management, promoting better nutrition awareness and sustainable food usage.

REFERENCES

[1] “Artificial Intelligence in Personalized Nutrition and Diet Planning” by Laura Mitchell et al. (2021)
[2] “Digital Food Tracking Systems for Nutritional Awareness” by Michael J. Brown et al. (2019)
[3] “Smart Kitchen Technologies for Efficient Food Management” by Sarah K. Thompson et al. (2022)
[4] “Nutritional Information Systems and Their Role in Diet Management” by David R. Wilson et al. (2018)
[5] “Web-Based Health Monitoring Systems for Dietary Management” by Emily Carter et al. (2020)
[6] “Machine Learning Approaches for Personalized Meal Recommendation Systems” by Daniel Roberts et al. (2022)
[7] “Mobile Applications for Diet and Nutrition Monitoring” by Laura Mitchell et al. (2019)
[8] “Food Waste Reduction through Digital Food Management Systems” by Kevin Anderson et al. (2021)
[9] “Data Analytics in Nutrition and Food Consumption Patterns” by Robert Green et al. (2020)
[10] “Smart Systems for Household Food Inventory Management” by Karen Douglas et al. (2021)
[11] “Digital Nutrition Platforms for Healthy Lifestyle Management” by Lisa Morgan et al. (2020)
[12] “IoT-Based Smart Kitchen Systems for Food Monitoring” by Samuel Lee et al. (2022)
[13] “Technology-Based Diet Planning Systems” by William Parker et al. (2019)
[14] “Artificial Intelligence in Food Recommendation Platforms” by Jennifer Adams et al. (2021)
[15] “Digital Food Consumption Tracking Systems” by Thomas Richardson et al. (2018)
[16] “AI-Driven Food Recommendation Systems for Personalized Diet Planning” by Andrew Patel et al. (2021)
[17] “Web-Based Food Tracking Applications for Nutritional Monitoring” by Rebecca Turner et al. (2020)
[18] “Digital Systems for Household Food Management” by Jonathan Blake et al. (2019)
[19] “Nutritional Analysis Platforms for Healthy Diet Management” by Laura Mitchell et al. (2018)
[20] “Digital Meal Planning Systems for Healthy Diet Management” by Christopher Allen et al. (2021) P. Stone and M. Veloso, “Multiagent systems: A survey,” AI Magazine, vol. 22, no. 2, pp. 73–80, 2000.

©IJRASET: All Rights are Reserved | SJ Impact Factor 7.538 | ISRA Journal Impact Factor 7.894 |



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089 (24*7 Support on Whatsapp)