Mobile Application for Diet Recall

Mr. Yash Sarode¹, Prof. Ravina Popli², Mr. Uday Bagade³, Miss. Deepshikha Lokhande⁴, Miss. Nikita Ramchaware⁵

^{1,3,4,5} Student, Computer Science, Sipna COET, Amravati, Maharashtra, India ²Assistant Professor, Computer Science, Sipna COET, Amravati, Maharashtra, India

Abstract-The increasing emphasis on health and wellness has highlighted the importance of personalized diet management as a key factor in maintaining a balanced lifestyle. To address this need, a mobile application is designed to provide users with tailored diet plans based on their specific health parameters and preferences. Built using Flutter for seamless crossplatform functionality, the app offers an intuitive interface with features like user login and registration, where individuals can create profiles by entering basic information such as age, height, weight, gender, and dietary habits (vegetarian or non-vegetarian). Users can also specify allergies to customize their diet further. Once registered, the system processes the input data to generate a personalized diet plan displayed on the dashboard. To ensure users stay on track, the app sends timely notifications for meal reminders. By leveraging modern technology, this application aims to simplify diet planning and promote healthy eating habits, making it an ideal tool for users seeking a structured approach to nutrition. Development will be carried out in VS Code, utilizing Flutter's robust framework to deliver a smooth and user-friendly experience.

Key words: Personalized Diet Plan, Mobile Application, Data-Driven Dieting, Meal Tracking, Diet Recommendation System, BMI-Based Diet Planning

I. INTRODUCTION

In the modern era, rapid urbanization and the increasing pace of daily life have significantly altered lifestyle habits, making it more challenging for individuals to maintain a balanced and healthy diet. People often prioritize convenience over nutrition, leading to the consumption of unhealthy, processed foods. Simultaneously, the global rise in lifestylerelated health issues such as obesity, diabetes, and cardiovascular diseases has underscored the need for better dietary management [1], [2]. Despite the wealth of information available on healthy eating, many individuals struggle with implementing personalized diet plans due to a lack of time, awareness, or access to expert guidance [3], [4]. This has created a pressing demand for technology-driven solutions that can simplify the process of planning

and adhering to a nutritious diet, tailored to individual needs and preferences.

In this paper, a mobile application is developed as an innovative response to these challenges, offering a streamlined, personalized approach to dietary management. With an intuitive and user-friendly interface, the application allows users to create accounts and input essential health parameters such as age, height, weight, and gender. Additionally, users can specify dietary preferences like vegetarian or non-vegetarian choices and highlight allergies to ensure accurate customization. Leveraging this data, the app generates a tailored diet plan displayed on the user's dashboard, along with notifications to remind users about their meals and encourage adherence. By combining technology with nutritional guidance, the app aims to bridge the gap between dietary awareness and implementation [5], [6], [7]. Built using Flutter for cross-platform compatibility and developed on VS Code, this app seeks to empower users with a practical tool to achieve their health and wellness goals amidst the demands of modern life.

II. LITERATURE REVIEW

With the increasing prevalence of diet-related health concerns, mobile health (mHealth) applications have gained popularity as tools for dietary tracking, assessment, and behavior change. These apps use a combination of artificial intelligence, deep learning, image processing, and user-centered interfaces to enhance dietary monitoring and encourage healthier eating habits. Scarry et al. [1] conducted a systematic review exploring the impact of mobile applications on users' diet quality. Their analysis included 10 studies with 1,638 participants, showing that most apps focused on dietary improvement, while others targeted weight and blood sugar control. However, the review highlighted a significant gender imbalance (4:1, female to male), suggesting the need for more inclusive research designs. Sari et al. [2] developed SITAMARI, an educational app for nutrition students

to practice 24-hour dietary recall. The study used a quasi-experimental design and demonstrated improved understanding and positive perception among students, indicating the app's effectiveness in educational settings. Nadeem et al. [3] introduced Smart Diet Diary, a smartphone-based diet-tracking app using deep learning. Trained on 16,000 food images, the model achieved 80.1% accuracy and estimated calorie values within 10% of the actual, demonstrating the potential of AI in automated nutrition tracking.

Kusuma et al. [4] validated a mobile app against the Food Frequency Questionnaire (FFQ), using Bland-Altman analysis and AI-based analytics. The app slightly underestimated macro- and micro-nutrient values but achieved high correlation (0.87 for macronutrients, 0.84 for micro-nutrients), highlighting the influence of factors such as diet type and caloric range. Healy et al. [5] evaluated mFR24, an app using before-and-after food images. Participants found the tool acceptable and easy to use, especially for remembering consumed items, indicating that photobased logging may help reduce recall errors. Blanchard et al. [6] assessed PIQNIQ in a randomized clinical trial comparing it with the 24hour recall method. The results showed comparable performance in capturing energy and nutrient intake, suggesting that mobile-based self-reporting could be a viable alternative to traditional methods.

Mahal et al. [7] designed the Diet DQ Tracker to measure dietary diversity indicators like MDD-W and HDDS. With real-time logging, automatic scoring, and SAIN/LIM-based feedback, the app reduces memory burden and helps users diversify their diet. Kong et al. [8] created MyDietCam, tailored for Malaysian adults. Focus group discussions helped shape the app's features, and usability testing via the Malay M-Health Application Usability Questionnaire (M-MAUQ) confirmed positive reception and cultural appropriateness. Béjar et al. [9] studied the e-12HR app, designed to improve adherence to the Mediterranean diet among primary care professionals. Their randomized controlled trial showed better adherence with the feedback-enabled version, supporting the role of realtime feedback in behavior change. Moyen et al. [10] evaluated the Keenoa[™] app against the ASA24 dietary recall system in adolescents. Using a randomized crossover design and statistical tests like Bland-Altman analysis, the study validated Keenoa's

relative accuracy, showcasing AI's potential in youth diet tracking.

These studies reveal several key themes: integration of AI and machine learning [3], user engagement and feedback [5], cultural and educational relevance [2], and strong emphasis on validation [4], [6], [10]. Overall, mobile applications present promising avenues for diet recall, though ongoing improvements in accuracy, usability, and inclusivity are necessary to maximize their effectiveness.

III. PROBLEM STATEMENT

In spite of the growing awareness about the significance of a well-balanced diet, individuals find it challenging to adhere to a balanced diet because of the absence of tailored advice and organized meals. Current solutions are either too generic and do not account for individual aspects like allergies, age, gender, and unique food preferences.

Furthermore, users usually lack the necessary motivation or forget to follow through with their diet plans because they lack timely reminders. This leads to inefficient diet management, preventing individuals from reaching their health objectives. There is an obvious necessity for a mobile app that offers personalized diet plans according to individual profiles and sends regular reminders to promote compliance, leading to a more efficient and sustainable method of healthy food eating.

IV. OBJECTIVES

- 1. To provide users with a personalized diet plan based on their unique health parameters and dietary preferences.
- 2. To simplify the process of meal planning and promote healthy eating habits through a userfriendly mobile application.
- 3. To send timely notifications and reminders to users, ensuring consistent adherence to their diet plans.
- 4. To account for dietary restrictions such as allergies and preferences, enhancing the app's adaptability and reliability.

V. MATERIALS AND METHODS

The Diet Recall mobile application is designed to generate personalized diet plans based on user-

specific health profiles. The app begins with user registration and profile setup, collecting key health information such as age, gender, height, weight, dietary preferences, and allergies. This data is used to calculate BMI and generate a tailored meal plan, displayed on a user-friendly dashboard. Notifications remind users to follow their plan, and a progress tracker allows them to log and monitor weight changes over time.

5.1 TECHNOLOGIES USED

The application is built using Flutter and Dart, offering a cross-platform experience with responsive UI powered by Material Design. Local data is stored using SQLite or SharedPreferences. No external cloud services like Firebase are used, ensuring offline functionality and enhanced data privacy.

5.2 DATASET AND STRUCTURE

User data is manually entered and includes food type, quantity, meal time, and nutritional values. It is crossreferenced with publicly available nutrition databases for accuracy. All data is organized in structured local storage, supporting efficient tracking of calories, macronutrients, and progress.

5.3. SYSTEM DESIGN

The app follows a modular structure with five core components:

- User Registration & Profile Setup
- Diet Plan Generation via BMI and static logic
- Meal Dashboard with nutritional breakdown
- Daily Notifications for adherence
- Progress Tracker with weight logs and charts

5.4 WORKING

The mobile application for diet recall begins with a user-friendly login and registration process, where users can easily sign up by entering basic details. Once registered, users fill out a comprehensive form including age, height, weight, gender, dietary preferences (vegetarian/non-vegetarian), and any allergies. Using this information, the system generates personalized diet plans tailored to each user's health profile. These plans are conveniently displayed on the user's dashboard for easy access and tracking. The application also features proactive notifications that remind users about meal times, ensuring they stay on track with their dietary goals. Developed using Flutter for cross-platform prioritizes efficiency, compatibility, the app customization, and seamless user experience.

users to connect with others by batch, location, or industry. An admin panel allows administrators to handle records, events, and platform maintenance in general. Last but not least, the user interface module provides a clean, responsive layout for an intuitive user interface.

5.5 SYSTEM WORKFLOW

The system workflow of the Diet Recall mobile application is carefully structured to provide a seamless and engaging experience for users, guiding them from initial onboarding to sustained dietary tracking and progress monitoring. The workflow focuses on data-driven personalization, consistent user interaction, and long-term health goal support. illustrates the complete system workflow, which is described in detail below:



Fig.1 Flowchart of the Diet Recall Application

The system workflow of the Diet Recall mobile application is designed to offer a structured and intuitive user journey from the point of app launch to daily usage and long-term progress tracking. The process follows a step-by-step progression as outlined below:

- 1. Application Launch: The workflow begins when the user opens the application on their mobile device. The home screen presents options to either register as a new user or log in with existing credentials.
- 2. User Registration and Login: New users are guided to a registration page where they input essential details such as their name, email address, and password. This information is

securely stored on the device to ensure user privacy. Returning users can log in using their saved credentials, which are authenticated locally to maintain data integrity and secure access.

- 3. Profile Creation: Once logged in, users are prompted to complete their personal health profile. This includes inputting age, height, weight, gender, dietary preferences (vegetarian or non-vegetarian), and any known food allergies. These details serve as the foundation for generating a personalized diet plan.
- 4. System Analysis: Upon submission of the health profile, the application calculates the user's Body Mass Index (BMI) using standard formulas. Based on this analysis, along with the user's dietary preferences and allergy information, the system applies rule-based logic to generate an appropriate diet plan tailored to the user's needs.
- 5. Dashboard Display: After the analysis is complete, users are directed to a personalized dashboard. This dashboard presents a daily meal plan including breakfast, lunch, dinner, and snacks. Each meal includes a nutritional breakdown with calorie count and macronutrient distribution (carbohydrates, proteins, and fats). Users are also provided with alternative food options to allow flexibility in their diet choices.
- Notifications: To ensure users adhere to their recommended meal plans, the application sends timely notifications for each scheduled meal. In addition, motivational messages or prompts may appear to reinforce consistent usage and healthy habits.
- 7. Progress Tracking: The application includes a module for tracking health progress. Users can log their weight regularly and monitor changes through weekly or monthly visual charts. A simple daily check-in feature allows users to indicate whether they followed their meal plan, helping them remain accountable.
- 8. Logout / Exit: Users can choose to log out or exit the app at any time. All user data is securely stored on the device

VI. RESULTS AND DISCUSSION

The result of the mobile diet recall application demonstrates its effectiveness in generating personalized diet plans based on individual health profiles and dietary preferences. Users are able to conveniently access their customized meal schedules and receive timely reminders, which promotes consistency and better adherence to their dietary goals. The system successfully streamlines the process of diet management by offering a userfriendly interface and tailored recommendations. Overall, the application proves to be a practical and efficient tool for improving nutritional habits and supporting a healthier lifestyle.



Fig. 2 shows a comprehensive Indian diet plan including daily nutritional goals and breakfast suggestions

As shown in the above fig.2, this step highlights the complete daily nutrition breakdown tailored for weight gain through a vegetarian Indian diet. The top section summarizes total daily calorie intake along with macronutrients—protein, carbohydrates, and fat. Below that, a protein-rich breakfast plan is presented with calorie count and nutrition values. It also offers alternative meal options like Cheese Masala Dosa with Butter, ensuring dietary variety. This step plays a crucial role in helping users visualize their daily goals and plan meals effectively, making the diet plan both practical and adaptable for long-term results.



Fig. 3 shows the daily check-in feature that tracks user adherence to the meal plan

The above fig.3 illustrates the daily diet check-in prompt that helps reinforce accountability and habit formation. The app asks users whether they followed their meal plan the previous day, offering three response options: No, Partially, and Yes. This simple interaction not only encourages users to reflect on their consistency but also helps the system better understand adherence patterns. Over time, this data can contribute to personalized suggestions, nudging users toward more sustainable and healthy eating behaviors.

VII. CONCLUSION

In a world where maintaining a healthy lifestyle is becoming increasingly important yet challenging, technology offers a promising avenue to bridge the gap between knowledge and implementation. This mobile application is a step forward in this direction, addressing the complexities of personalized diet management with an intuitive and efficient solution. By integrating user-friendly features such as customizable diet plans, allergy consideration, and timely notifications, the app empowers individuals to take control of their dietary habits with minimal effort. Its cross-platform functionality, built using Flutter and developed on VS Code, ensures that the app is accessible and reliable, catering to a diverse range of users. Through its emphasis on personalization and convenience, the application not only promotes healthier eating habits but also

contributes to the broader goal of improving lifestyle quality in an increasingly fast-paced world. By merging modern technology with the essential need for nutrition, this paper provides a practical tool for individuals striving to achieve long-term health and wellness goals.

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