International Journal for Modern Trends in Science and Technology
Volume 12, Issue 04, pages 897-901
ISSN: 2455-3778 online
Available online at: http://www.ijmtst.com/vol12issue04.html
DOI: https://doi.org/10.5281/zenodo.19644332

Fitness and Diet Planner Application with Personalized Plans and Progress Visualization

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To Cite this Article
Ch. Venkat Reddy, K. Venkatesh, P. Harshitha Devi, L. Mounika & K. M. M. V. Nageswara Reddy (2026). Fitness and Diet Planner Application with Personalized Plans and Progress Visualization. International Journal for Modern Trends in Science and Technology, 12(04), 897-901. https://doi.org/10.5281/zenodo.19644332

Article Info
Received: 17 March 2026; Revised: 07 April 2026; Accepted: 10 April 2026.

KEYWORDS

health management system, customized solutions, diet management, progress tracking, personalized workouts , progress visualization, integrating fitness planning

ABSTRACT

The Fitness and Diet Planner Application with Personalized Plans and Progress Visualization is an advanced health management system designed to assist individuals in achieving their fitness and nutritional goals through intelligent and customized solutions. In the modern era, where sedentary lifestyles, unhealthy eating habits, and lack of proper guidance are common, there is a growing need for a reliable and user-friendly platform that can guide users toward a healthier lifestyle. This application aims to bridge that gap by integrating fitness planning, diet management, and progress tracking into a single digital platform. The system collects essential user information such as age, gender, weight, height, Body Mass Index (BMI), fitness goals, and daily activity levels. Based on this data, the application generates personalized workout plans and diet schedules tailored to individual needs. The workout module includes various exercises categorized by intensity and target muscle groups, while the diet module provides nutritional recommendations, calorie calculations, and balanced meal plans.A key feature of this application is its progress visualization capability. The system continuously monitors user activities and records data such as weight changes, calorie intake, calories burned, and workout consistency. This data is presented through interactive graphs, charts, and dashboards, enabling users to easily analyze their performance over time.

1. INTRODUCTION

The Fitness and Diet Planner Application with Personalized Plans and Progress Visualization is a centralized, web-based health management platform built using Spring Boot. It is designed to help users achieve their fitness and nutritional goals through automated, data driven personalization [1], [2], [9]. The system analyses user-provided data including age,

weight, height, activity level, dietary habits, and fitness objective to generate tailored workout schedules and nutrition plans [3], [14]. The system analyses user-provided data including age, weight, height, activity level, dietary habits, and fitness objective to generate tailored workout schedules and nutrition plans. Key features include BMI calculation, goal-based plan generation, calorie tracking, meal logging, progress dashboards with interactive charts, reminder notifications, and performance analytics [6], [7]. By replacing fragmented manual tools with a single integrated solution, the application eliminates data inconsistency, reduces user effort, and enables real-time feedback [8]. The platform empowers users to monitor improvements, stay motivated through visual progress, and make informed lifestyle decisions promoting sustainable long-term wellness [12], [20].

PURPOSE

The purpose of the Fitness and Diet Planner Application is to develop a centralized platform that provides personalized fitness and diet plans based on user data while enabling real-time tracking of health metrics like BMI and calorie intake [1], [6], and progress through interactive dashboards, thereby simplifying health management, improving user convenience, and It supports informed decisions for maintaining a healthy and sustainable lifestyle [12], [19].

MOTIVATION

The motivation behind the Fitness and Diet Planner Application with Personalized Plans and Progress Visualization is to overcome the limitations of existing health management methods that rely on fragmented tools such as spreadsheets, generic diet plans, and multiple disconnected apps, which often lack personalization, accuracy, and user engagement [7], [8]; this project is driven by the need to provide a unified, user-friendly solution that delivers customized fitness and nutrition guidance, enhances motivation through visual progress tracking and reminders [9], [20], and encourages users to adopt consistent and sustainable healthy lifestyle habits.

PROBLEM STATEMENT

The proposed system introduces a centralized, automated web-based fitness management platform that replaces the manual and segmented process [14]. This system is implemented as a monolithic Spring Boot application, integrating all fitness-related functionalities into a single cohesive solution [6].

LITERATURE SURVEY

Fitness and diet management systems aim to improve individual health by providing personalized workout plans, nutrition guidance, and progress tracking [1], [14]. With advancements in web technologies and data-driven approaches, modern applications focus on integrating multiple health-related features into a single platform [6], [7]. Existing systems highlight the importance of personalization, real-time monitoring, and user engagement, but many still face challenges such as lack of integration, limited adaptability [8], and dependency on manual inputs. These studies provide a foundation for developing a more efficient, automated, and user-friendly fitness and diet planner application.

1. **Personalized Fitness Recommendation Systems**
   Author: John Smith, Michael Brown

Existing fitness recommendation systems utilize user data such as age, weight, BMI, and activity levels to generate customized workout plans [1], [3]. These systems often use rule-based logic or basic machine learning techniques to suggest exercises tailored to individual needs. The primary advantage of these systems is their ability to provide personalized guidance, which improves user engagement and effectiveness [9]. However, most of these systems focus only on workout planning and do not integrate diet recommendations or real-time progress tracking. Additionally, they lack dynamic adaptability based on user progress, limiting their long-term effectiveness [14].

2. **Smart Diet and Nutrition Management Applications**
   Author: Emily Johnson, David Wilson

Diet management applications are designed to help users monitor calorie intake, track meals, and maintain balanced nutrition [6], [10]. These systems provide features such as food logging, calorie estimation, and nutritional analysis. They play a significant role in promoting healthy eating habits and weight management [11]. However, many existing applications require extensive manual data entry, which can reduce user consistency over time. Moreover, these systems often do not integrate with fitness tracking modules,

resulting in a fragmented user experience and less effective health management.

3. BMI-Based Health Monitoring Systems
Author: Robert Lee, Sarah Taylor

BMI-based systems are widely used to evaluate an individual's health condition based on height and weight. These systems provide general health recommendations such as weight loss or gain strategies [12]. They are simple, easy to use, and widely accepted in healthcare applications. However, BMI alone is not sufficient for comprehensive health analysis, as it does not consider factors like muscle mass, lifestyle, and dietary habits. Existing systems also lack personalized workout and diet planning features, limiting their usefulness in achieving specific fitness goals.

4. Fitness Progress Tracking and Visualization Systems
Author: Daniel Clark, Olivia Martinez

Progress tracking systems use dashboards, charts, and graphs to visualize user fitness data [8] such as weight changes, calorie consumption, and workout performance. These visual tools help users stay motivated and monitor their improvements over time. While these systems enhance user engagement [19], they are often standalone modules and not integrated with personalized recommendation engines [14]. As a result, users may find it difficult to correlate their progress with actionable fitness or diet plans.

5. Integrated Health and Fitness Platforms
Author: Andrew Thomas, Sophia Anderson

Integrated fitness platforms combine workout planning, diet management, and progress tracking into a single system [6], [14]. These platforms aim to provide a holistic approach to health management. They improve user convenience and reduce dependency on multiple applications. However, many existing systems still lack advanced personalization, real-time feedback, and intelligent analytics. Some platforms also face challenges related to scalability and user adaptability [9]. These limitations highlight the need for a more comprehensive and efficient system like the proposed Fitness and Diet Planner Application.

PROPOSED SYSTEM

The proposed system is a centralized, automated web-based fitness management platform designed to replace manual and fragmented health tracking methods. It is developed using Spring Boot as a monolithic application, integrating all functionalities into a single system. The platform allows users to enter personal details such as age, weight, height, activity level, and fitness goals. Based on this data, it generates personalized workout and diet plans. The system includes BMI calculation to evaluate health status. It also provides calorie tracking and meal logging features. Users can monitor their progress through interactive dashboards and visual charts. Real-time feedback helps users make better health decisions. Reminder notifications ensure consistency in workouts and diet routines. The monolithic architecture ensures smooth integration of all components. The user interface is simple and easy to use. The system improves data consistency and reduces manual errors. It eliminates the need for multiple applications. The platform enhances user engagement and motivation. Overall, it provides an efficient and reliable solution for fitness and diet management.

Advantages of Proposed System

- Eliminates manual tracking and disconnected tools.
- Provides a single source of truth for all fitness data.
- Enables real-time monitoring and structured progress tracking.

SYSTEM ARCHITECTURE

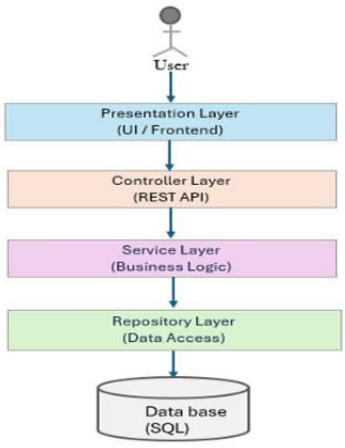


Fig 1: System Architecture — Fitness & Diet Planner

Class Diagram

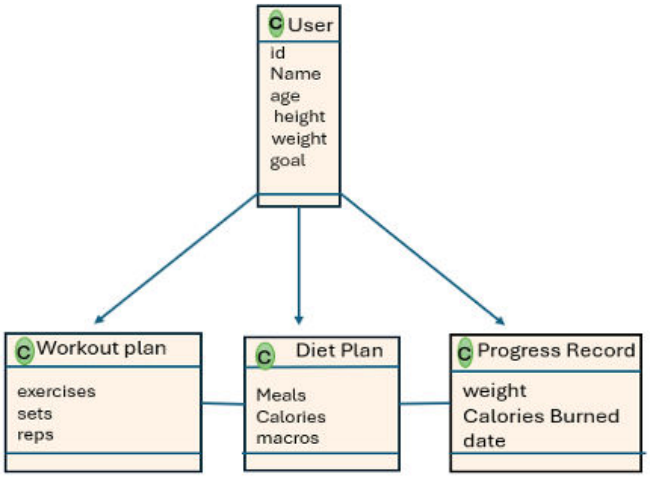


Fig 2: Class Diagram

Sequence Diagram

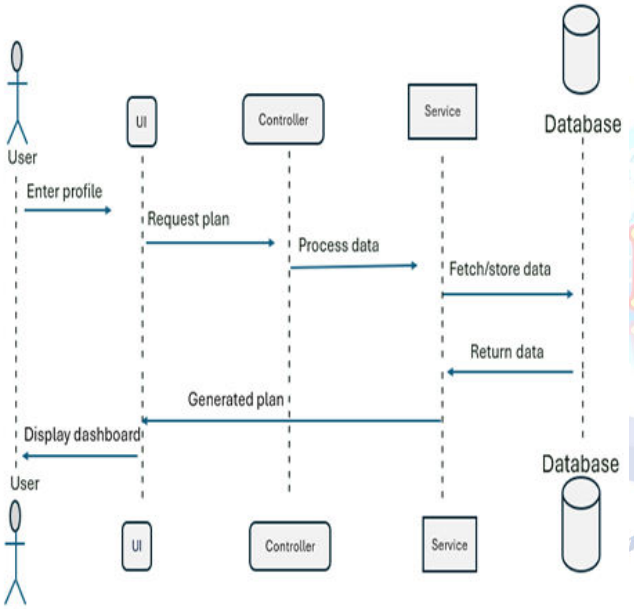
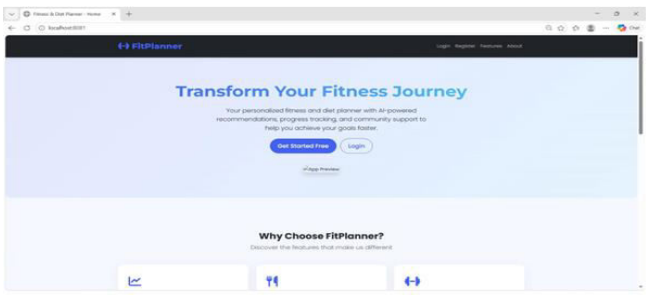


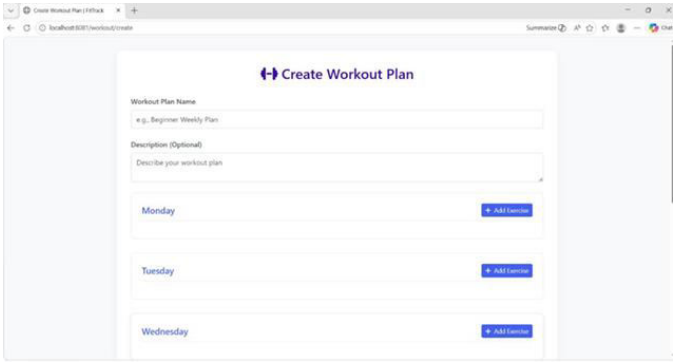
Fig 3: Sequence Diagram

RESULTS

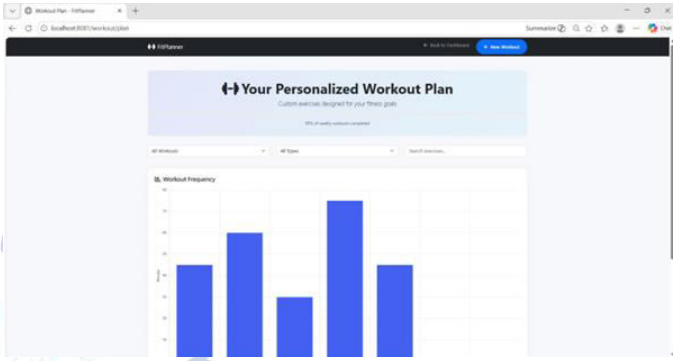
Home screen



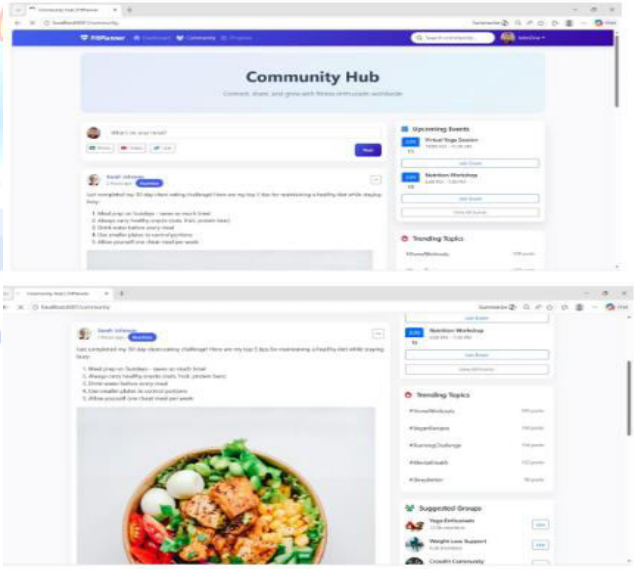
Personalized workout plan



Workout plan creation



Community Hub



CONCLUSION

The Fitness and Diet Planner Application with Personalized Plans and Progress Visualization provides a centralized and automated solution for managing personal health and fitness effectively. The system is designed to simplify the process of maintaining a healthy lifestyle by integrating workout planning, diet management, and progress tracking into a single platform. The application generates personalized workout routines and diet plans based on user-specific

data such as age, weight, and fitness goals. This customization ensures that users receive appropriate and effective recommendations tailored to their individual needs. Additionally, the system offers interactive dashboards and analytical tools to track fitness progress over time. These features help users monitor their improvements, stay motivated, and make informed decisions regarding their health. By eliminating the need for manual tracking and reducing dependency on multiple fragmented tools, the application enhances efficiency and user convenience. Continuous monitoring and feedback further encourage users to stay committed to their fitness journey.

FUTURE SCOPE

1. **Integration with Wearable Devices**
   The application can be integrated with wearable fitness devices such as smartwatches and fitness bands to collect real-time data like heart rate, steps, calories burned, and sleep patterns. This will prove the accuracy of fitness tracking and recommendations.
2. **AI-Based Personalization**
   Advanced Artificial Intelligence and Machine Learning algorithms can be incorporated to provide more accurate and dynamic fitness and diet plans based on user behavior, preferences, and progress over time.
3. **Mobile Application Development**
   A mobile version of the application can be developed for Android and iOS platforms to provide better accessibility and convenience for users to track their fitness anytime and anywhere.
4. **Nutrition Database Integration**
   The system can be enhanced by integrating a detailed nutrition database that provides calorie counts, nutrient values, and meal suggestions for a wide variety of foods.
5. **Social and Community Features**
   Adding social features such as community groups, fitness challenges, and progress sharing can motivate users through competition and peer support
6. **Real-Time Notifications**
   The application can include reminder systems for workouts, meals, and hydration to help users maintain consistency in their fitness routines.
7. **Multi-Language Support**
   Providing support for multiple languages can make the application accessible to a wider audience.

Conflict of interest statement

Authors declare that they do not have any conflict of interest.

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