

SOMA – DESIGN YOUR PHYSIOLOGY**Mudireddy Rohan Reddy, K Kishore, Islavath Gowtham, Devarakonda Sahithi**

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ABSTRACT

The project “SOMA – Design Your Physiology” introduces a personalized health and fitness management system designed to help users maintain a healthy lifestyle through customized diet and workout plans. The system collects user information such as age, weight, height, fitness goals, and activity levels to calculate important physiological parameters like Basal Metabolic Rate (BMR) and daily calorie requirements. Based on these calculations, SOMA generates personalized recommendations for nutrition and exercise using a transparent rule-based approach. The application also provides an interactive and user-friendly interface where users can easily track and manage their fitness plans. By combining health analysis, customized recommendations, and efficient web technologies, the system enables users to make informed fitness decisions and improve their overall well-being.

Keywords:

Personalized Health Management, Diet Planning, Workout Recommendation, Basal Metabolic Rate (BMR), Calorie Tracking, Rule-Based Expert System, FastAPI, MongoDB, Fitness Analytics, Health Technology

INTRODUCTION

The healthcare and fitness industry has rapidly evolved with the increasing use of digital technologies and personalized wellness solutions. Individuals today seek effective ways to maintain their health, achieve fitness goals, and follow balanced lifestyles. However, many existing fitness applications provide only generic recommendations, lack personalization, and often use non-transparent methods that do not clearly explain how suggestions are generated. As a result, users may find it difficult to follow plans that truly match their physiological needs and personal preferences.

The project “SOMA – Design Your Physiology” is proposed as a solution to address these challenges. This system collects user-specific information such as age, height, weight, activity level, and fitness goals, and processes it to calculate important physiological parameters like Basal Metabolic Rate (BMR) and daily calorie requirements using scientifically validated formulas. By applying a rule-based expert system, the platform generates customized diet plans and workout routines tailored to each individual user.

Furthermore, the system provides practical and transparent recommendations that users can easily understand and follow. With the support of an interactive web interface and efficient backend processing, the platform ensures a smooth and user-friendly experience. Thus, the proposed system acts as an integrated digital nutritionist and personal trainer, helping users make informed health decisions and improve their overall fitness and well-being.

OBJECTIVES

The main objective of this study is to identify the challenges faced by individuals in maintaining a healthy lifestyle and achieving fitness goals, and to develop an effective system that supports personalized health and fitness management.

The specific objectives of the study are as follows:

- To analyze the difficulties faced by users in following generic diet and workout plans that do not match their physiological needs.
- To design a system that accurately calculates physiological parameters such as Basal Metabolic Rate (BMR) and daily calorie requirements using standardized formulas.

- To develop a rule-based expert system that generates personalized diet and workout recommendations based on user inputs and fitness goals.
- To provide customized and practical health plans that are easy for users to understand and follow.
- To create a transparent recommendation system where users can clearly understand how suggestions are generated.
- To develop an interactive and user-friendly web interface for managing fitness and nutrition plans effectively.
- To support users in improving their overall health, fitness, and lifestyle through informed decision-making and personalized guidance.

METHODOLOGY

This study was conducted using a system design and implementation approach to develop **SOMA – Design Your Physiology**, a personalized health and fitness management system. A user-based methodology was employed to represent individuals with different health conditions, activity levels, and fitness goals as samples for analysis. The system collects user data such as age, height, weight, gender, lifestyle habits, and fitness objectives.

The collected data is processed and validated to ensure accuracy and consistency. Physiological parameters such as Basal Metabolic Rate (BMR) and daily calorie requirements are calculated using scientifically validated formulas. Based on these calculations and user preferences, the system applies a rule-based expert approach to generate personalized diet plans and workout routines tailored to individual needs.

The system also analyzes user fitness goals and activity levels to provide suitable nutritional guidance and exercise recommendations. An interactive web interface is developed to display personalized plans, calorie information, and fitness recommendations in a clear and user-friendly manner, enabling users to make informed health decisions.

The overall methodology ensures a structured approach from user data collection to analysis, calculation, recommendation generation, and plan management, providing a practical and effective solution for personalized health and fitness improvement.

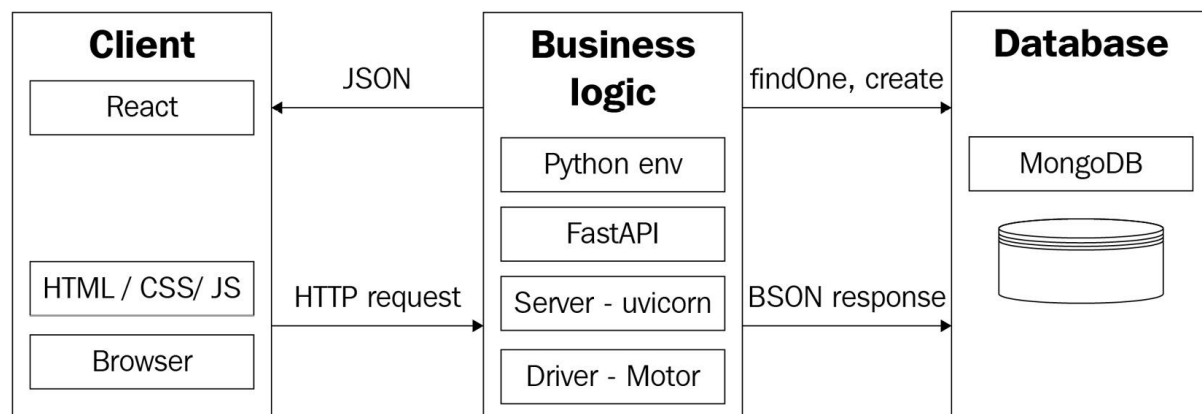


Figure 1 Overall System Architecture Diagram of the Project

RESULTS AND DISCUSSION

The SOMA – Design Your Physiology system helps users improve their health and fitness by providing personalized diet and workout recommendations. However, several factors affect its effectiveness:

User Data Accuracy.

Incorrect or incomplete user information such as weight, height, age, or activity level can reduce the accuracy of health calculations and recommendations.

Lifestyle and Habit Variations.

Different daily routines, food habits, and fitness levels among users can make it difficult to create universally effective plans.

User Consistency and Motivation.

The success of the system depends on how consistently users follow the recommended diet and exercise routines.

Technology Accessibility.

Limited access to digital devices or internet connectivity may affect the usability of the web-based application for some users.

Health Awareness and Understanding.

Lack of awareness about nutrition, exercise, and healthy lifestyle practices can reduce user engagement and effectiveness of the recommendations.

Overall, the system provides practical and personalized fitness guidance, but overcoming these challenges is essential for achieving better health outcomes and long-term user satisfaction.

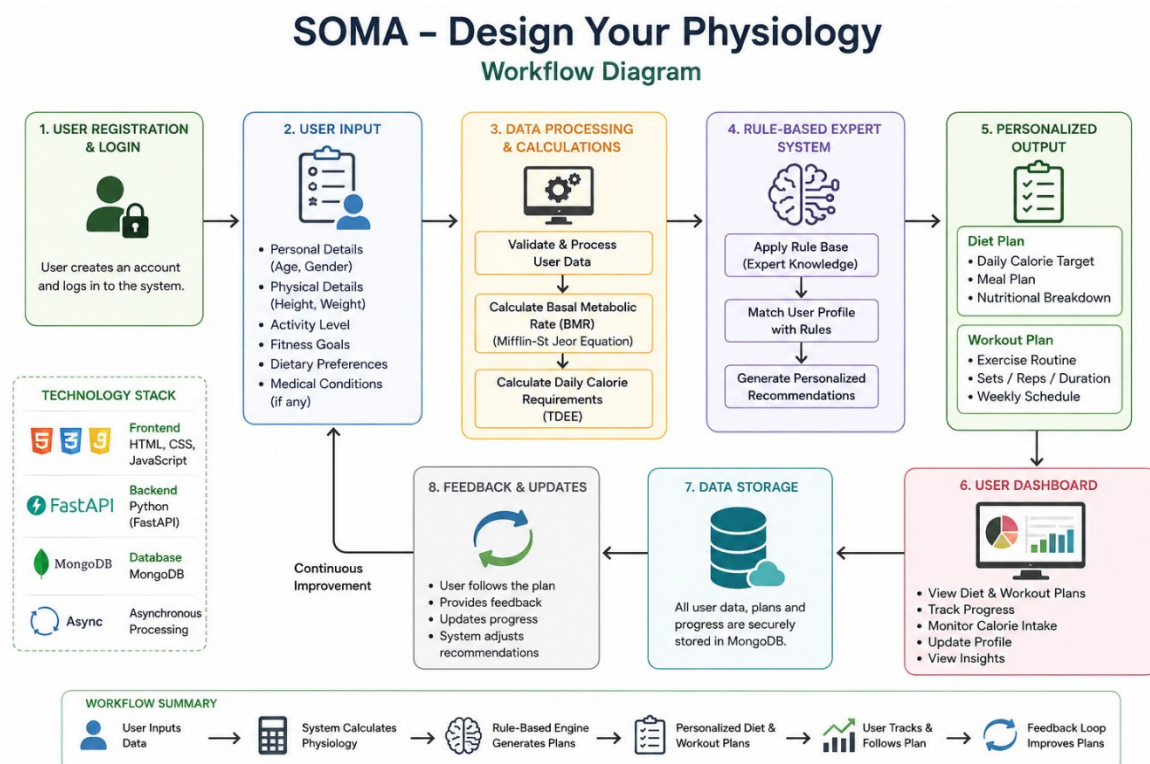


Figure 2 Workflow of the Project

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CONCLUSION

Based on the findings, the SOMA – Design Your Physiology system effectively helps users manage their health and fitness through personalized diet and workout recommendations. However, challenges still exist in areas such as user data accuracy, consistency in following fitness plans, and adaptability to different lifestyle patterns.

To achieve better health outcomes, users require accurate data input, regular monitoring, and increased awareness about healthy lifestyle practices. Enhancing the system with advanced AI features, wearable device integration, and real-time health tracking can further improve personalization and user experience. Overall, the system supports individuals in making informed health decisions, maintaining fitness goals, and improving overall well-being through an efficient and user-friendly digital platform.

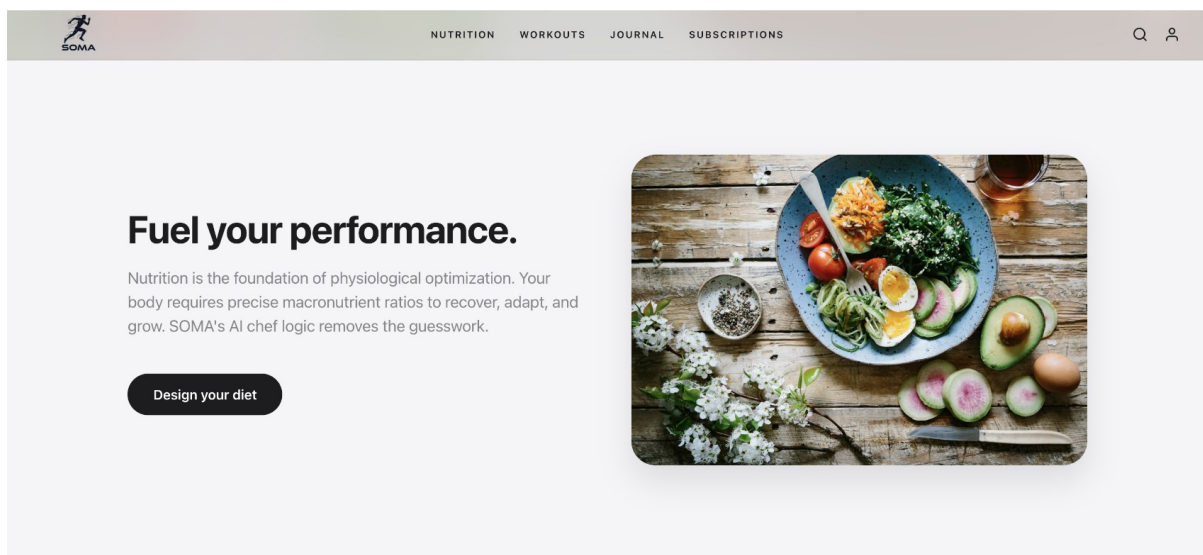


Figure 3 User Interface of the Project

REFERENCES

1. Machine Learning-Driven Precision Nutrition: A Paradigm Evolution in Dietary Assessment and Intervention - PMC, accessed February 20, 2026, <https://pmc.ncbi.nlm.nih.gov/articles/PMC12787445/>
2. Precision Nutrition - The Nutrition Source, accessed February 20, 2026, <https://nutritionsource.hsph.harvard.edu/precision-nutrition/>
3. An AI-based nutrition recommendation system: technical validation with insights from Mediterranean cuisine - Frontiers, accessed February 20, 2026, <https://www.frontiersin.org/journals/nutrition/articles/10.3389/fnut.2025.1546107/full>
4. Artificial intelligence in personalized nutrition and food manufacturing: a comprehensive review of methods, applications, and future directions - PMC, accessed February 20, 2026, <https://pmc.ncbi.nlm.nih.gov/articles/PMC12325300/>
5. Living well? The unintended consequences of highly popular commercial fitness apps through social listening using Machine-Assisted Topic Analysis: Evidence from X - PMC, accessed February 20, 2026, <https://pmc.ncbi.nlm.nih.gov/articles/PMC12541294/>
6. Perspectives, challenges and future of artificial intelligence in personalised nutrition research | Proceedings of the Nutrition Society - Cambridge University Press & Assessment, accessed February 20, 2026, <https://www.cambridge.org/core/journals/proceedings-of-the-nutrition-society/article/perspectives-challenges-and-future-of-artificial-intelligence-in-personalised-nutrition-research/B5CDFBADAF443312457E822A5863630A>
7. Development of New Equation for Predicting State of Normometabolism from Cohort of Hospitalized Patients with Obesity - MDPI, accessed February 20, 2026, <https://www.mdpi.com/2072-6643/17/3/482>
8. Energy expenditure measurement in critical care: Implications for personalized nutrition support - PMC, accessed February 20, 2026, <https://pmc.ncbi.nlm.nih.gov/articles/PMC12305103/>.

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<https://ijetrm.com/issue/>

9. Predictive Equations Overestimate Resting Metabolic Rate in Young Chilean Women with Excess Body Fat - MDPI, accessed February 20, 2026, <https://www.mdpi.com/2218-1989/13/2/188>.
10. Mifflin-St Jeor Equation in Nutrition - NutriAdmin Blog, accessed February 20, 2026, <https://nutriadmin.com/blog/mifflin-st-jeor-equation-in-nutrition/>
11. Mifflin-St. Jeor for nutrition professionals - Nutrium Blog, accessed February 20, 2026, <https://nutrium.com/blog/mifflin-st-jeor-for-nutrition-professionals/>
12. Comparing Mifflin-St Jeor vs Harris-Benedict: The Best Calorie Formula for Accurate Daily Needs, accessed February 20, 2026, <https://caloriecalculator.cloud/comparing-calorie-calculation-formulas-for-accuracy/>
13. Mifflin-St Jeor Equation Calculator | Find Your Daily Caloric Burn - Leigh Peele, accessed February 20, 2026, <https://www.leighpeele.com/mifflin-st-jeor-calculator>
14. A Comparative Study of Rule-Based and Data-Driven Approaches in Industrial Monitoring, accessed February 20, 2026, <https://arxiv.org/html/2509.15848v1>
15. A Comparative Study of Rule-Based and Data-Driven Approaches in Industrial Monitoring, accessed February 20, 2026, <https://arxiv.org/html/2509.15848v1>
16. How Health Apps Calculate Resting Energy Expenditure - Ecreee, accessed February 20, 2026, <https://web.ecreee.org/fresh-field/how-health-apps-calculate-resting-energy-1770844852>