

**PROJECT REPORT**  
**ON**  
**Health Manager System**

**AT**



*In partial fulfillment of the requirement  
for the degree of  
Bachelor of Technology in  
Computer Science & Engineering*

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APRIL 2023

## CANDIDATE'S DECLARATION

I declare that the final semester report entitled “**Health Manager System**” is my own work conducted under the supervision of **Prof. Ashwin Patani** (Internal Guide).

I further declare that to the best of my knowledge, this report for the B.Tech final semester does not contain part of the work which has been submitted for the award of a B.Tech Degree either in this university or any other university without proper citation.

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**INDUS INSTITUTE OF TECHNOLOGY AND  
ENGINEERING COMPUTER ENGINEERING**

**2022 – 2023**



**Date: /04/2023**

This is to certify that the project work entitled “**Health Manager System**” has been carried out by **MAULI DESAI & VIPSA KAMANI** under my guidance in partial fulfillment of the degree of Bachelor of Technology in **COMPUTER SCIENCE & ENGINEERING (Final Year)** of Indus University, Ahmedabad during the academic year 2022 - 2023.

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## **ABSTRACT**

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The main objective of the “HEALTH MANAGER SYSTEM” is to help users improve their physical health and well-being by providing a comprehensive set of tools and resources. The app includes features such as customized workout plans, meal plans, calories tracking and progress monitoring. The app utilizes machine learning algorithms to provide personalized recommendations based on the user’s goals and preferences. Additionally, the app is designed with a user-friendly interface and intuitive navigation, making it accessible and easy to use for users of all levels of fitness experience. Overall, this app aims to empower users to take control of their health and achieve their fitness goals.

In this project, we have developed a web-app that helps people in achieving their fitness goals. The web-app is built with Flask (Python) that provides users information with regard to fitness, diet, training and membership plans. The project is aimed to provide an efficient, secure, and scalable web-app design.



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## **ABBREVIATIONS**

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**Following are the abbreviations that are used in this document:**

- **ML:** Machine Learning
- **CSS:** Cascading Style Sheets
- **HTML:** Hypertext Markup Language
- **API:** Application Programming Interface
- **RDBMS:** Relational Database Management System
- **RAM:** Random Access Memory
- **ROM:** Read Only Memory
- **SRS:** Software Requirement Specification
- **IDE:** Integrated Development Environment
- **DFD:** Data Flow Diagram

# **CHAPTER – 1**

## **INTRODUCTION**

- **PROJECT SUMMARY**
- **PROJECT PURPOSE**
- **PROJECT SCOPE**
- **PROJECT OBJECTIVES**
- **TECHNOLOGY OVERVIEW**

## 1.1 PROJECT SUMMARY

---

The “Health Manager System” is a web-based system created using Flask (Python) coding language which helps the users to tackle health-related issues by taking daily exercise details and storing it into a table which user can get access to. So that they can check their daily progress and routine. It also has a feature of sending a notification or email to user if they do not complete their goal. In this project we have created an intuitive and effective platform that helps user achieve their health and fitness goals with its personalized workout plan, nutrition recommendations. The workout tracking feature will allow users to log their workouts, track progress and receive reminders to stay on track. The nutrition tracking feature will enable users to log their meals, monitor their calorie intake, and track their macronutrient consumption.

As technology continues to advance, our daily lives have become increasingly sedentary. Many people now rely on online services for everything from shopping to food delivery, and spend more time on their mobile devices than engaging in physical activities. Furthermore, modern-day busy schedules make it challenging for individuals to prioritize exercise and maintain a balanced diet. All this narrow down to unhealthy lifestyle choices which can cause obesity, underweight and many diseases.

The present study aimed to develop a health management system to support users in maintaining a healthy lifestyle and to keep them motivated. To achieve this goal, we included a food and exercise tracker, which enables users to monitor their calorie consumption and expenditure. The system facilitates user interaction in natural language processing style, allowing users to input information about their food intake and exercise routine with ease.

Furthermore, based on the total calorie calculator, the system provides recommendations for appropriate food items and exercises that align with the user's calorie gain or burn requirement. As the user provides their schedule, the system sends customized messages to the user, which are tailored to the user's timeframe and goals. These messages mention whether the user needs to gain or burn calories and recommend a few exercise or food items. This feature creates a live interaction with the user, which may prove beneficial in promoting adherence to healthy habits.

## 1.2 PROJECT PURPOSE

The main objective of “**Health Manager System**” is to create a user-friendly platform that makes it easy for users to create and customize their own workout plans. The IT sector has boomed in recent years which has huge working opportunities, but due to this people are becoming inactive and spend most of their time on computers and mobile phones that lead to the obesity in adults which results into health-related issues. The purpose of a workout manager web app is to help individuals track and manage their fitness routines in an organized and efficient way. The app should allow users to create custom workout plans, track their progress and access helpful resources such as exercise tips and nutritional advice.

➤ Some specific project goals are:

- Incorporating a tracking system that allows users to log their workouts and monitor their progress over time.
- Allowing users to set and track goals, and providing reminders to help them stay motivated.

Overall, the purpose of a workout manager web app is to provide users with the tools they need to take control of their fitness and achieve their health goals.

## 1.3 PROJECT SCOPE

The Health Manager System is a software application that will help users to manage their fitness goals, schedule, and track their progress. The project aims to develop a web-based application that will allow users to create and manage their workout plans, and monitor their progress. The application will also provide a database to store information related to users, exercises, and workout plans etc. ←

### **Features:**

1. A dashboard to display user's workout plans and progress.
2. Create and manage workout plans.
3. Search for exercises and add them to workout plan.

4. Schedule workouts and set reminders.
5. Track progress and provide feedback. The application will be developed using the Python programming language and it will be compatible with all modern web browsers. This app. will be developed with security in mind and measures will be taken to ensure data confidentiality and integrity.

**Deliverables:**

- Functional health manager system application
- System documentation, including system design, user manual, and technical manuals.
- Project Management documents (Project Report).

## **1.4 PROJECT OBJECTIVES**

Following are the main objectives of this System:

1. To create a user-friendly application.
2. To create an app that provides information about weight loss, weight gain, and all necessary nutritional details.
3. To reduce cost and save time.
4. To make an app available to user any time.
5. To provide clear and easy to understand information.
6. To reduce paper work.

## **1.5 TECHNOLOGY & LITERATURE OVERVIEW**

To create and understand the whole system we require to get the basic knowledge of these technologies:

### **1.5.1 Python**

Python is an interpreted, object-oriented, high-level programming language with dynamic semantics developed by Guido van Rossum. It was originally released in 1991. Designed to be easy as well as fun, the name "Python" is a nod to the British comedy group Monty Python. Python is one of the most popular and fastest-growing programming languages in

the world. Python is a programming language that is utilized for many different things. You can use Python to develop web apps, mobile apps, desktop apps, test software, and even for hacking.

### **1.5.2 HTML 5**

HTML5 is a markup language used for structuring and presenting content on the World Wide Web. It is the fifth and last major HTML version that is a World Wide Web Consortium recommendation. The current specification is known as the HTML Living Standard. It is maintained by a consortium of major browser vendors (Apple, Google, Mozilla, and Microsoft)

### **1.5.3 CSS**

Cascading Style Sheets (CSS) is a style sheet language used for describing the presentation of a document written in a markup language such as HTML. CSS is designed to enable the separation of presentation and content, including layout, colors, and fonts. This separation can improve content accessibility; provide more flexibility and control in the specification of presentation characteristics; enable multiple web pages to share formatting by specifying the relevant CSS in a separate .css file, which reduces complexity and repetition in the structural content; and enable the .css file to be cached to improve the page load speed between the pages that share the file and its formatting.

### **1.5.4 JAVASCRIPT**

JavaScript, often abbreviated JS, is a programming language that is one of the core technologies of the World Wide Web, alongside HTML and CSS. Over 97% of websites use JavaScript on the client-side for web page behavior, often incorporating third-party libraries. It has dynamic typing, prototype-based object orientation, and first-class functions. It is multi-paradigm, supporting event-driven, functional, and imperative programming styles. It has application programming interfaces (APIs) for working with text, dates, regular expressions, standard data structures, and the Document Object Model (DOM).



### **1.5.5 PYCHARM**

PyCharm is an IDE (Integrated Development Environment) which is used to write code and develop applications. Specifically, It is designed for Python programming and supports web development using Django.

### **1.5.6 MICROSOFT VISIO 2007**

Microsoft Visio is software for drawing a variety of diagrams. These include flowcharts, org charts, building plans, floor plans, data flow diagrams, process flow diagrams, business process modeling, swim lane diagrams, 3D maps, and many more. It's a Microsoft product, sold as an addition to MS Office.

### **1.5.7 MICROSOFT WORD 2021**

Microsoft Word or MS Word (often called Word) is a graphical word processing program that users can type with. It is made by the computer company Microsoft. Its purpose is to allow users to type and save documents.

# **CHAPTER – 2**

# **PROJECT MANAGEMENT**

- **PROJECT MANAGEMENT APPROACH**
- **TIMELINE CHART**

## **2.1 PROJECT MANAGEMENT APPROACH**

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Effective management of a software project depends on thoroughly planning the progress of the project. A well-planned strategy leads to the best and optimal use of the resources available and ensures the completion of the project on time. The project plan sets out the resources available to the project, the work breakdown, and a schedule for carrying out the work. The project needs a lot of research and thus scheduling was a difficult task as there was a need for carrying out a lot of study about various algorithms and techniques and testing them at various stages, thus maintaining the schedule was also difficult.

### **2.1.1 Project Development Approach and Justification**

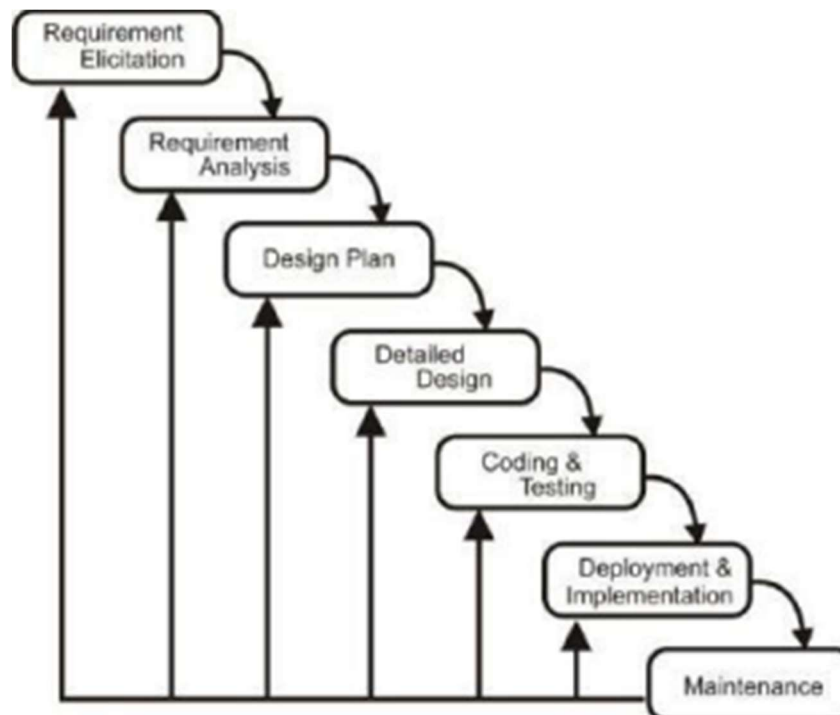
The Software development Model used is the “Iterative Waterfall Model”.

### **2.1.2 Systems Development Life Cycle Method**

Systems Development is a process consisting of the two major steps of systems analysis and design. The system development life cycle method is classically thought of as the set of activities that analysts, designers, and users carry out to develop and implement the information system.

The system development life cycle method consists of the following activities:

1. Preliminary investigation
2. Determination of system requirements
3. Design of system
4. Development of software
5. System testing
6. Implementation and evaluation



[Figure 1: Iterative Waterfall Model]

### 2.1.3 Justification

In the Software Development Life Cycle, there are different stages for requirement gathering, feasibility study, requirement determination, designing, coding, and implementation, and then testing and debugging so we can first identify requirements and we can do the feasibility study. Thus, it is beneficial to first identify the requirements and then through a feasibility study, we can analyze these requirements<sup>9</sup> and determine them for implementation. Then after gathering all the necessary requirements, we can easily design them and then the implementation becomes very easy and faster. The Requirements are very fuzzy then which enforces us to choose a model that allows us to move back to any previous phase of the development life cycle, make changes<sup>1</sup> over there, & again get it implemented in the next phase. This repeats until the satisfactory level is reached. Thus, as and when requirements arise the changes can be made in the system in a very short period of time.

Take for example Design Phase is going on and the client came upon a new requirement, so this could only be achieved if we are allowed to move back to the Analysis Phase. This makes it clear why we have chosen the “Iterative Waterfall Model”.

## 2.2 TIMELINE CHART

The project plan sets out the resources available to the project, the work breakdown, and a schedule for carrying out the work. The project plan should be regularly revised during the project. Some parts such as the project schedule will change frequently. The plan for developing an Educational Social Network is to fully operate at a high level of efficiency and all the company members and administrators associated with the system should understand its advantage. The system solves the problem. It is intended to solve as a requirement specification.

ACTIVITY	START DATE	END DATE
Requirement Analysis	01/01/2023	15/01/2023
System Analysis	16/01/2023	31/01/2023
System Design	01/02/2023	28/02/2023
System Coding	01/03/2023	03/04/2023
Testing and Integration	04/04/2023	11/04/2023
Documentation	12/04/2023	19/04/2023

# **CHAPTER – 3**

## **SYSTEM REQUIREMENTS**

- **HARDWARE REQUIREMENTS**
- **SOFTWARE REQUIREMENTS**
- **FUNCTIONAL REQUIREMENTS**
- **NON-FUNCTIONAL REQUIREMENTS**

### 3.1 HARDWARE REQUIREMENTS

The complete hardware requirements of the system have been listed in Table 2 below.

[Table 2: Hardware Requirements]

EQUIPMENT MINIMUM REQUIREMENT	
RAM	4 GB
ROM	256 GB
Processor	Intel Core i3
CPU	Quad-Core
Cores	4

### 3.2 SOFTWARE REQUIREMENTS

Table 3 lists the software specifications used to process the project.

[ Table 3: Software Requirements]

<b>SOFTWARE</b> Supported Operating Systems	<b>MINIMUM REQUIREMENT</b> Windows XP or above, Linux, MAC
Programming Server	Apache 2.4.41
IDE	PyCharm
UML Tool	Draw.io
SRS Tool	Microsoft Word 2021

### 3.3 FUNCTIONAL REQUIREMENTS

A **functional requirement** defines a function of a system or its component. A function is described as a set of inputs the behavior and outputs.

- Functional requirements of this app include:
- User Authentication: Users should be able to create a new account, sign in, and sign out securely.
- User Profile: Users should be able to create a profile that contains their personal information, such as name, age, weight, height and fitness goals.
- Exercise Catalogue: The app should have an extensive database of exercises that user can search and select from.
- Workout Plans: The app should offer a range of pre-designed workout plans that are tailored to different fitness levels and goals.
- Custom Workouts: The app should allow users to create and save their own workouts.
- Tracking Progress: The app should track user progress, including exercise completed, calories burned and overall fitness improvement.
- Notifications: The app should be able to send notification to remind users of scheduled workouts or to congratulate them on their progress.
- Diet Plans: The app should provide users with a range of diet plans to support their fitness goals.

### 3.4 NON-FUNCTIONAL REQUIREMENTS

A **non-functional requirement** is a requirement that specifies criteria that can be used to judge the operation of a system, rather than specific behaviors.

- Non-Functional requirements are:
- Security: The app should be designed with strong security measures to protect user data and prevent unauthorized access.
- Performance: The app should be fast and responsive with minimal lag or downtime.
- User-friendly interface: The app should have a clean intuitive interface that is easy to navigate and use.



- Compatibility: The app should be compatible with different operating systems and devices.
- Scalability: The app should be designed to handle increasing numbers of users and data without compromising performance.
- Privacy: The app should respect user privacy and comply with relevant data protection laws.
- Availability: The app should be available to user 24/7 with minimal downtime for maintenance or updates.

# **CHAPTER – 4**

## **SYSTEM ANALYSIS**

- **STUDY OF CURRENT SYSTEM**
- **REQUIREMENT OF THE NEW SYSTEM**
- **FEASIBILITY STUDY**

## **4.1 STUDY OF CURRENT SYSTEM**

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The current system for this project is designed to help users track their fitness progress and provide them with a range of exercises and nutrition plans to achieve their fitness goals. In this study, we will examine the current system for the project including its features functionality and user experience.

Overall, the current system for the fitness & health manager system project is designed to be user friendly, engaging and motivating. The app provides users with a range of features and functionality to help them achieve their fitness goals, including workouts and nutrition tracking, exercise catalogue, diet plans customized workout plans and community support.

## **4.2 REQUIREMENT OF THE NEW SYSTEM**

It is to minimize the cost and save time by providing a web-based app that provides various features to the user. As maintaining daily habit of workout is essential to avoid being obese and having several health related issues. Hence, this app helps the user to be fit and healthy and motivates users to achieve their daily goals. Fitness/Health Manager app is one of the grooming projects in the current market. The scope of project is high as the age group from teen to adult uses such online platform.

## **4.3 FEASIBILITY STUDY**

### **4.3.1 Financial Feasibility:**

The first thing you will estimate before starting any work is how much expense will be coming for the project. You are going to make a web app, so you must have a high-speed internet connection. Just analyze what will be the cost of that. Because analyzing every step's expense will help you in estimating the overall expense of the project. The development cost for this project will depend on the scope of the project, the complexity of the features etc.

### **4.3.2 Technical Feasibility:**

The novice person can easily access and understand the whole procedure. The following should be taken when writing a feasibility report:

- A brief description of the business to access more possible factors which could affect the study.
- The part of the business being examined.
- The human and economic factors.
- The possible solution to the problem.

#### **4.3.3 Legal Feasibility:**

Determine whether the proposed system conflicts with legal requirements, e.g., a data processing system must comply with the local data protection regulations and if the proposed venture is acceptable in accordance with the laws of the land.

#### **4.3.4 Schedule Feasibility:**

This involves mainly timelines/deadlines is analyzed for proposed project which includes how much time team will take to complete final project which has a great impact on the organization as purpose of project may fail if it cannot be completed on time.

#### **4.3.5 Operational Feasibility:**

Operational feasibility study tests the operational scope of the system to be developed. The proposed system should have high operational feasibility.

- The usability is high.
- Response time of the app is quick.
- The application is developed with clear and straightforward to know navigation that permits user to seek out info. quickly.
- The operational feasibility of this project depends on a combination of technical, financial and human factor.
- The project team can ensure that the app is effectively implemented and used to meet the needs of its user.
- The fitness app should be scalable and able to handle a growing number of users without compromising performance.

- The project team must consider the operational cost associated with maintaining and updating the health & fitness app.
- The app should be secure can protect user's sensitive information such as personal details , health data and payment information.

# **Chapter-5**

## **Detail Description**

- **USER MANAGEMENT MODULE**
- **EXERCISE MODULE**
- **TRACKING & PROGRESS MODULE**
- **MEAL & NUTRITION MODULE**

A Health Manager is a web based application designed to help users achieve their fitness goals. It typically includes features such as tracking workouts, meal planning, goal setting, progress tracking etc. The first step in creating a fitness web app project is to define the target audience and their needs. This app is designed for beginners who are looking for an easy to use tool to track their workouts and progress. It is also helpful to the users who want more detail analytics and custom workout plans.

This app includes several modules:

### **5.1 User Management Module:**

This module is responsible for managing user accounts including user registration, login and profile management. User has to login/ signup, signup user details such as name, gender, age, height and weight are also taken as input then based on them calculate **bmr**.

### **5.2 Exercise Module:**

This module provides user with access to a database of exercise and allow them to create customized workout routines based on their fitness goals and preferences. The app will allow users to log their workouts, including the type of exercise, its duration and the number of calories burned. Users will also be able to track their progress over time.

### **5.3 Tracking and progress monitoring:**

This module allows users to track their progress over time including their weight, body measurements and workout performance. This data be used to set goals, adjust routines, and measure success. The app will provide users with detailed analytics on their fitness progress, such as the number of calories burned, distance travelled, and muscles mass gained. This app will also allow users to set fitness goals such as running a certain distance, lifting a certain weight, swimming for a certain time period, or cycling etc. Users should be able to track their progress towards these goals and receive reminders and motivation to help them stay on track.

#### **5.4 Meal planning and nutrition tracking:**

This module allows users to track their food intake and plan meals based on their dietary needs and preferences. Users will be able to access healthy meal plans to help them stay on track. It can also provide personalized nutritional recommendations based on the users age, sex, weight, height and activity level. Users will be able to view reports and analytics that Summarizes their daily, weekly and monthly nutritional intake and progress towards their goals. This app will also provide users with the nutritional information of foods including their macronutrient and micronutrient contents.



# **CHAPTER – 6**

## **SYSTEM DESIGN**

- **DATA DICTIONARY**
- **PROCESS DIAGRAM**
- **USE CASE DIAGRAM**

## 6.1 DATA DICTIONARY

---

### ➤ Table 1 : User

[Table 1: User]

Field name	Data type	Constrain
NAME	String	Primary key
AGE	Integer	Not null
GENDER	Qualitative	Not null
HEIGHT	Quantitative	Primary key
WEIGHT	Quantitative	Primary key

### ➤ Table 2: Login

[Table 2:Login]

Field name	Data type	Constrain
LOGIN/SIGNUP	Varchar	Primary key
E-mail	String	Not null
Password	Varchar	Not null

### ➤ Table 3: Workout

[Table 3:Workout]

Field name	Data type	Constrain
DATE	Integer	Primary key
TIME	Integer	Not null
EXERCISE	String	Not null
DURATION	Integer	Primary key
CALORIES	Quantitative	Primary key

SYSTEM DESIGN

➤ **Table 4: Schedule**

[Table 4: Schedule]

Field name	Data type	Constrain
NAME	String	Primary key
TIME	Integer	Not null

➤ **Table 5: Message**

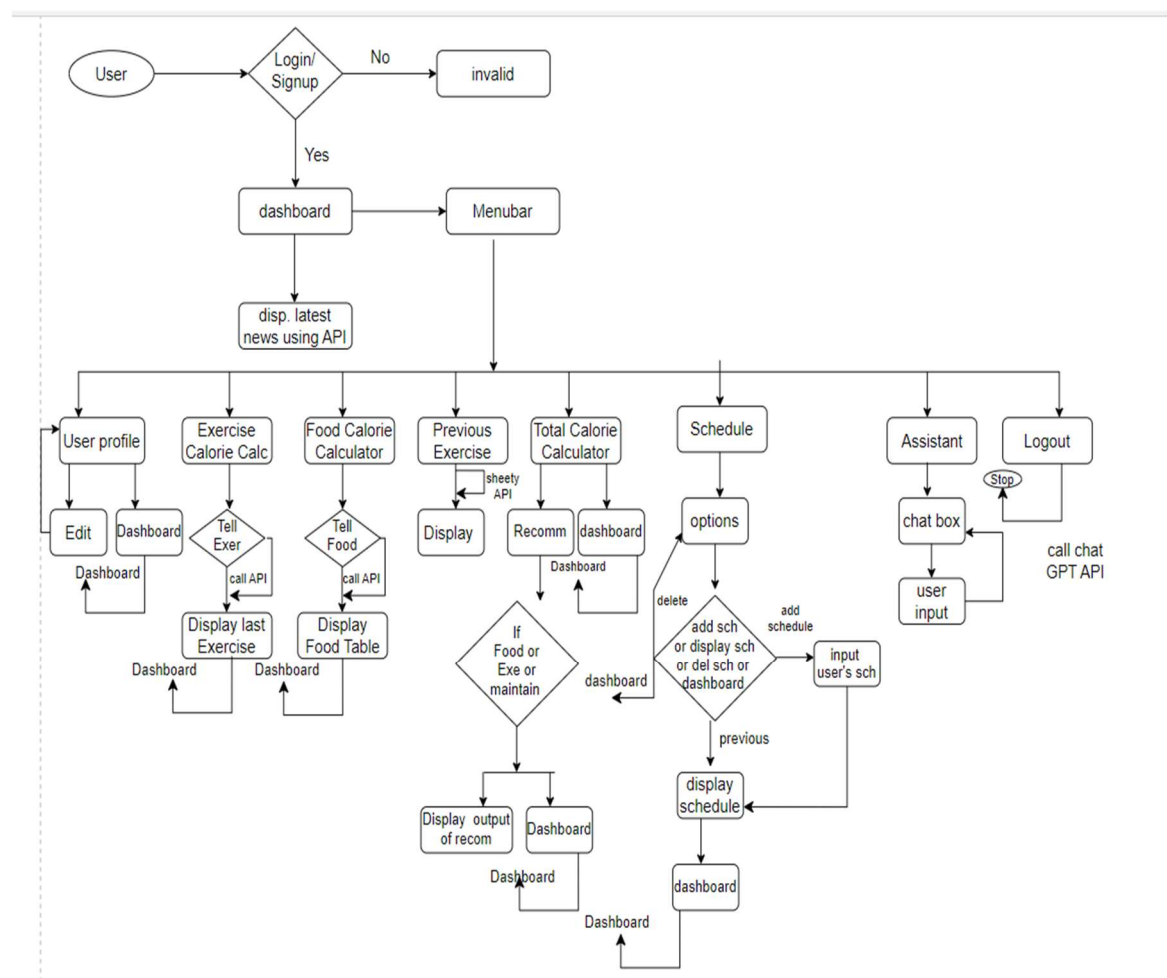
Field name	Data type	Constrain
MESSAGE	Varchar	Not null

## SYSTEM DESIGN

## 6.2 PROCESS DIAGRAM

A Process diagram is a type of visual representation that illustrates the sequence of steps or actions involved in a particular process or system. It is often used to explain complex processes, workflows, or systems to a wide range of audiences. Process diagrams typically use flowcharts, block diagrams, or other types of graphical representations to show the various stages of a process or system, and the relationships between them. The purpose of a process diagram is to help viewers understand the process or system in a clear and structured manner.

## 6.2.1 Front end logic



### **Proposed Technical Methodology:**

In today's rapidly changing world, customers prefer applications that are easy to use and fast. The main objective of our project is to establish an automated web application that simplifies user interaction with the system. Our web-based software has a user-friendly and reliable UI design. The front-end development is implemented using HTML, CSS, JS, jQuery, and Bootstrap. Furthermore, the backend has been developed using Python, Flask, and some external APIs.

- **Client-side Development:** Upon successful login, the user encounters a dashboard that displays the latest health-related articles and a menu bar on the right-hand side with almost eight options to choose from.
- **User Profile:** The personal details of the user stored in the database (filled by the user when they first sign up for the system) are displayed on the user profile page. However, these details can be changed anytime using the edit button.
- **Exercise Calorie Calculator and Food Calorie Calculator:** Both options have similar functionality, as they call an API that works on natural language processing. For instance, when the user inputs a sentence in English, such as "Today, I did swimming for 2 hours," the result is automatically displayed on the page. The result includes the exercise name, current date and time, duration, and the total amount of calories burned during that timeframe. Similarly, when the user inputs food items like "Today for breakfast, I had 1 cup of coffee, 1 banana, and 1 piece of brown bread," the table is shown, which contains the food item names, weight (in grams), unit (cup, medium, etc.), quantity, and calories (in kcal).
- **Previous Exercise:** All the exercises performed in recent months are showcased in the form of a table.
- **Total Calories Calculator:** It displays the "total calories needed" that a person's body should maintain according to their height, weight, gender, and age, "calories burned during exercise," "food calories," and "net calories." It also has the recommendation button that shows the exercise/food recommendation according to the calories burn/gain. For exercise recommendation, it recommends ten exercises based on the calories that need to

be burned. The table contains the workout type, calories, and duration (in minutes). For food recommendation, it displays 20 food items according to the calories needed to gain. The table has food item names, calories, measurement, weight (in grams), category of food items, and other nutrients (like protein, fat, saturated fats, etc.). If the calories are maintained, then it goes to the same page with the message "your calories are maintained."

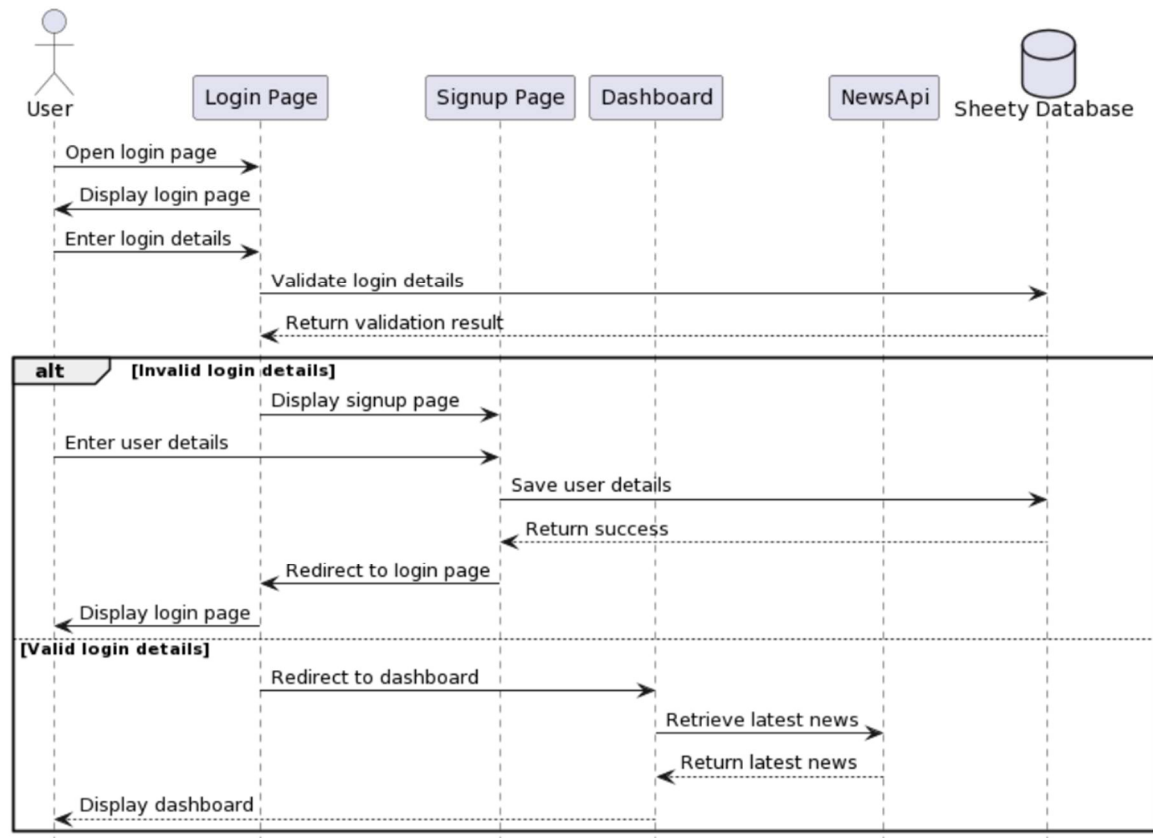
- **Schedule:** The application allows users to efficiently manage their schedule by providing three options - adding, viewing, and deleting their schedule. Upon adding the schedule, all the data is automatically sent to the database for storage. Furthermore, based on the time, the system sends customized messages to the user's mobile phone at regular intervals. This feature ensures that users are reminded of their schedule and can plan their day accordingly.

- **Assistant:** It's like a guide who answers the client's health-related queries. Using the ChatGPT API.

Logout.

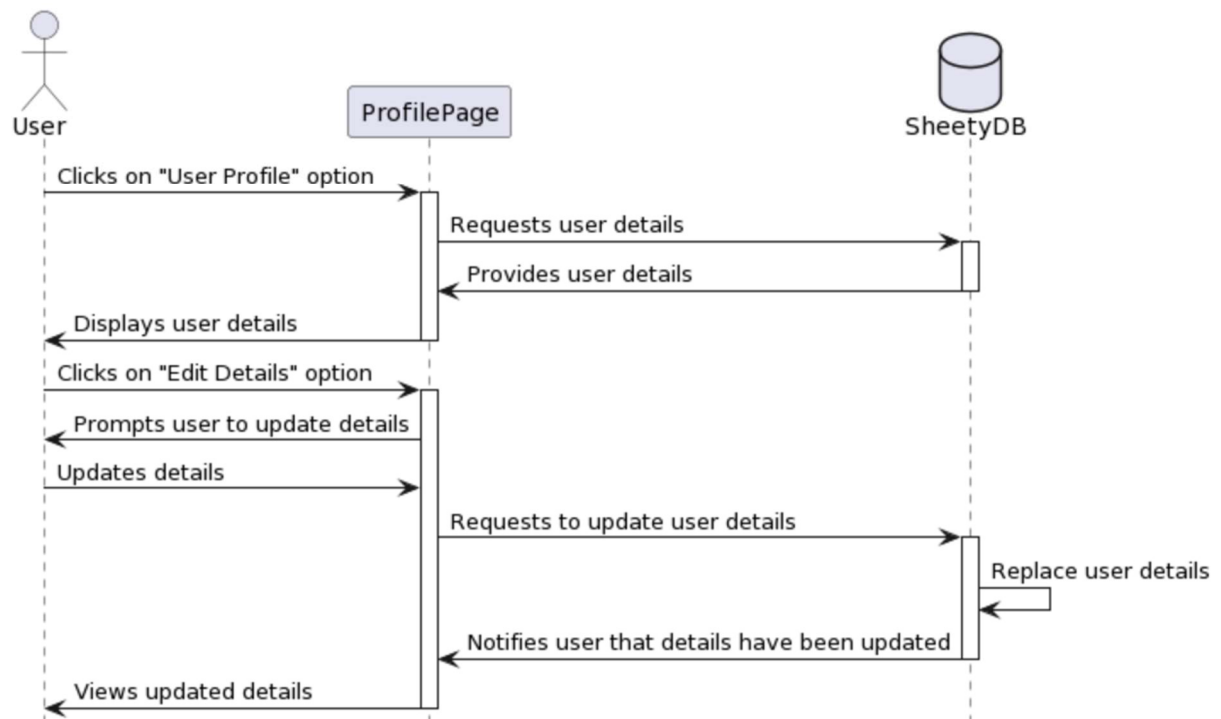
### 6.2.2 Application logic Development

In our project, we used Python for the backend logic and utilized the Flask library as an interface between the front-end and back-end development. To implement dynamic features on the HTML page, we opted for the popular Jinja templates. Additionally, we integrated several external resources to support some functionalities of our project. For instance, we used a CSV formatted database through the Sheety API. With this API, updating data on a Google Sheets document will automatically reflect in the API responses, without requiring any code modification.

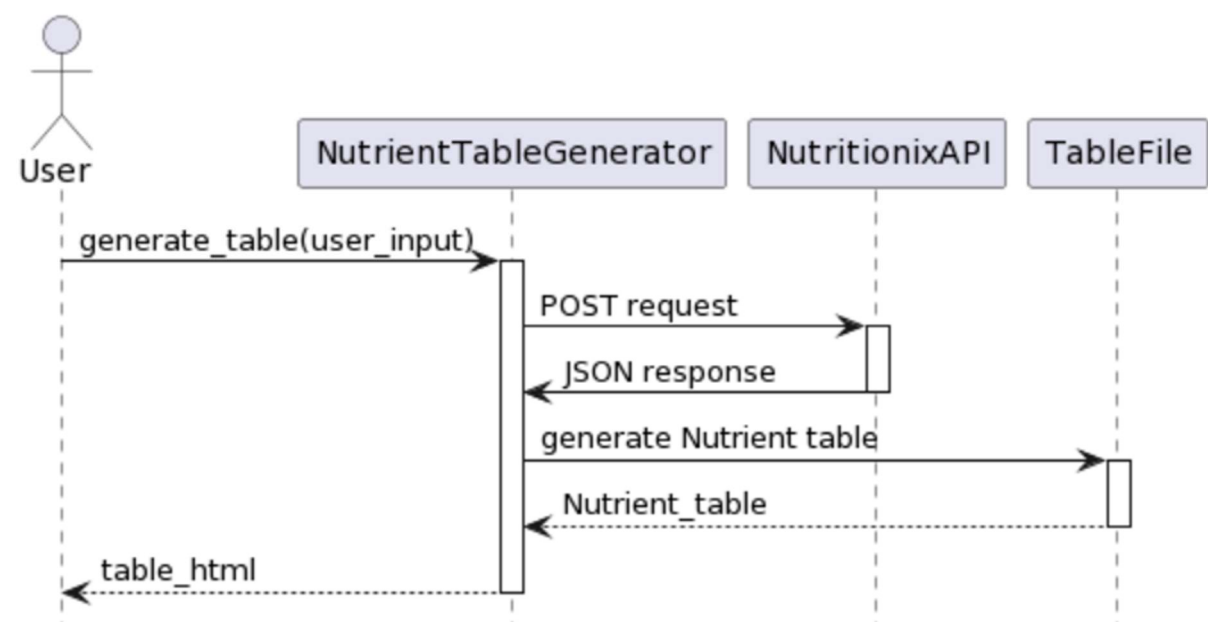


The software system's first step is the login/signup process, depicted in the accompanying diagram. Users open the login page and provide their email and password details. If the information matches those stored in the database, the login is authorized, and the dashboard displaying the latest health-related news articles is displayed. To obtain these articles, the system calls the NewsAPI.

If the user's details do not match the stored data, the system redirects them to the signup page. This page requests the user's personal information, including height, weight, gender, name, and age. The following page asks for the email and password setup, which is stored in the database. Finally, the user is redirected to the login page.

**Sequence Diagram for User Profile**

When the user clicks on the "User profile" option, the system fetches their data from the database via the Sheety API and displays it on the profile page. If users wish to update their personal details, they can fill in the information again, and the data in the database will be replaced. The Jinja library facilitates dynamic updating in the software system, displaying the updated version of the user's details.

**Nutrient Table Generator Sequence Diagram**

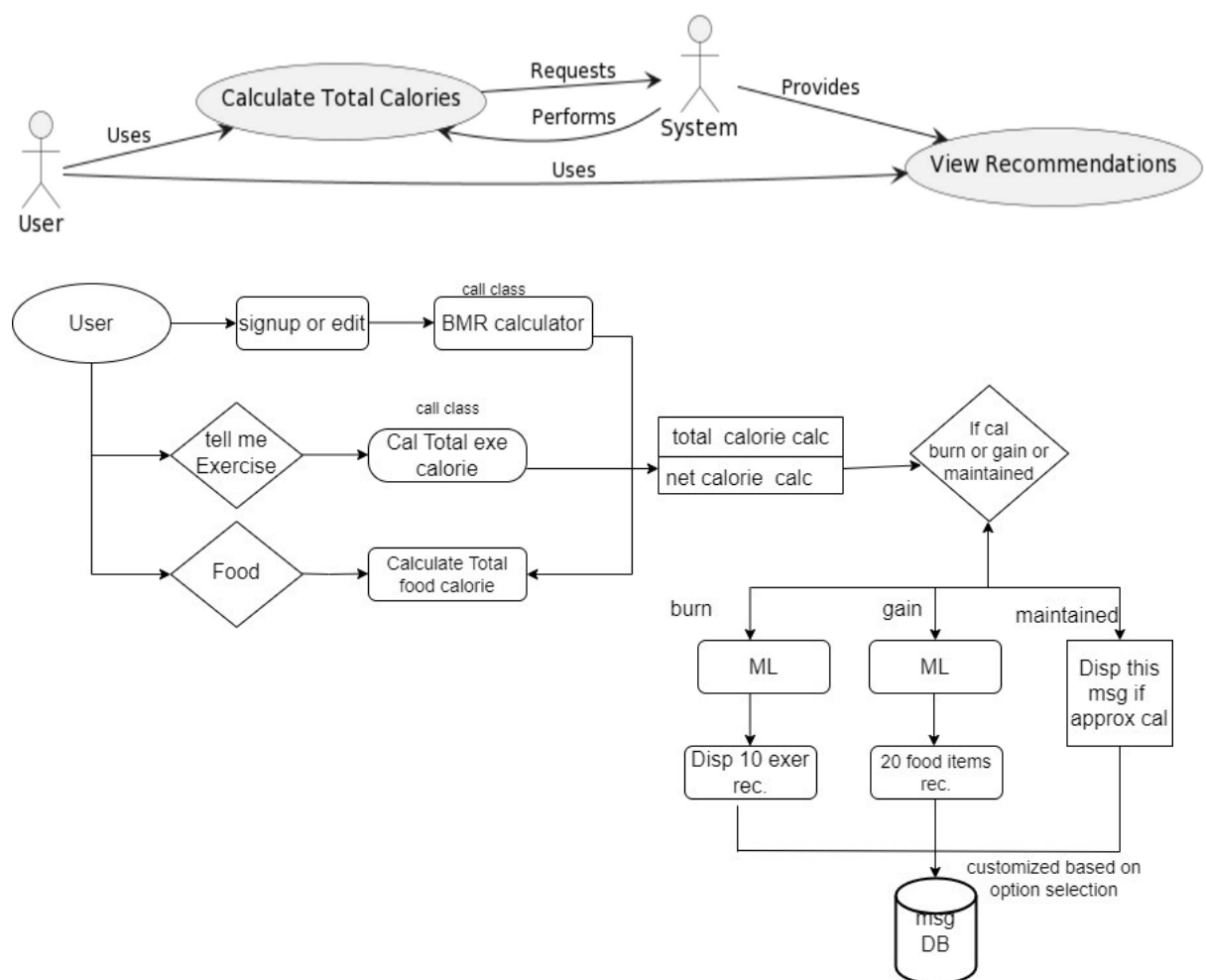


Furthermore, the system offers a "food calorie calculator" option. Upon selecting this option, the system calls the NutrientTableGenerator class, passing the user's input. The NutritionixAPI generates a response, which is converted into a table format and stored in a file. The data from this file is fetched and sent to the HTML template displayed to the user. The system calculates the "total food calories" by summing up the calories of each food item.

Similarly, the system offers an "exercise calorie calculator" option that uses the same logic as the food calorie calculator. However, the difference is that exercise calories are calculated based on the user's personal details (gender, age, height, and weight) passed to the NutritionixAPI and as per the person's body count. As a result, the calories burned would vary for each person, depending on their personal details. Furthermore, the system stores the exercise details in the database, allowing users to review their previous exercises by clicking on the "previous exercise" option in the menu bar.

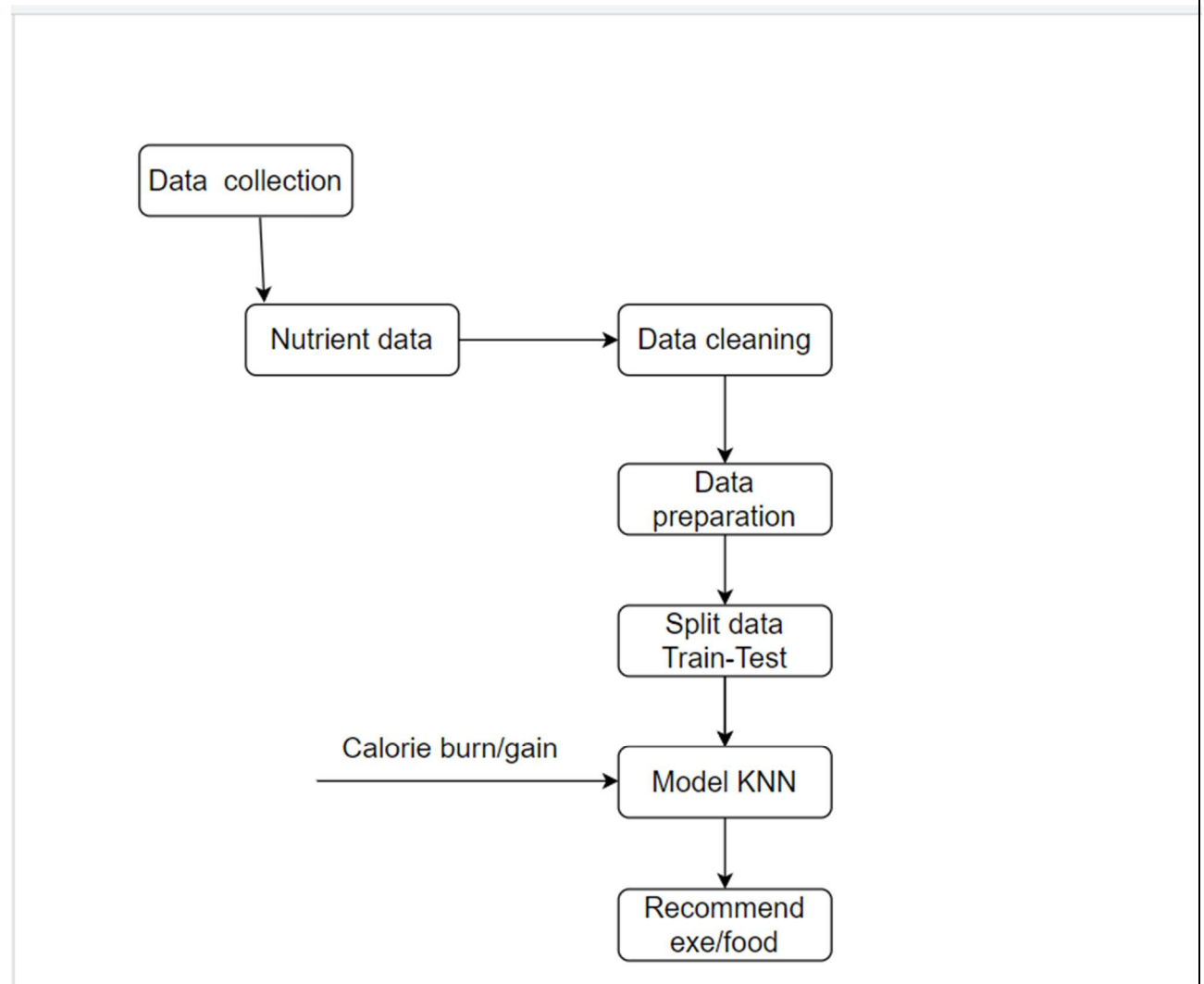
### 6.2.3 Total calorie logic

**Use Case Diagram for Total Calorie Calculator**



The system includes a "total calorie calculator" option that leverages a BMR calculator class to calculate the user's basal metabolic rate. This class retrieves user details from the database, such as age, gender, height, and weight, and utilizes standard equations to estimate the user's BMR. Additionally, the system computes the total exercise and food calorie variables and calculates the net calorie based on these values. Upon clicking the recommendation button, the system determines whether the calorie intake needs to be maintained, or whether the user needs to burn or gain calories. Based on this result, the system displays food or exercise recommendations or a message indicating that the calorie intake is already maintained.

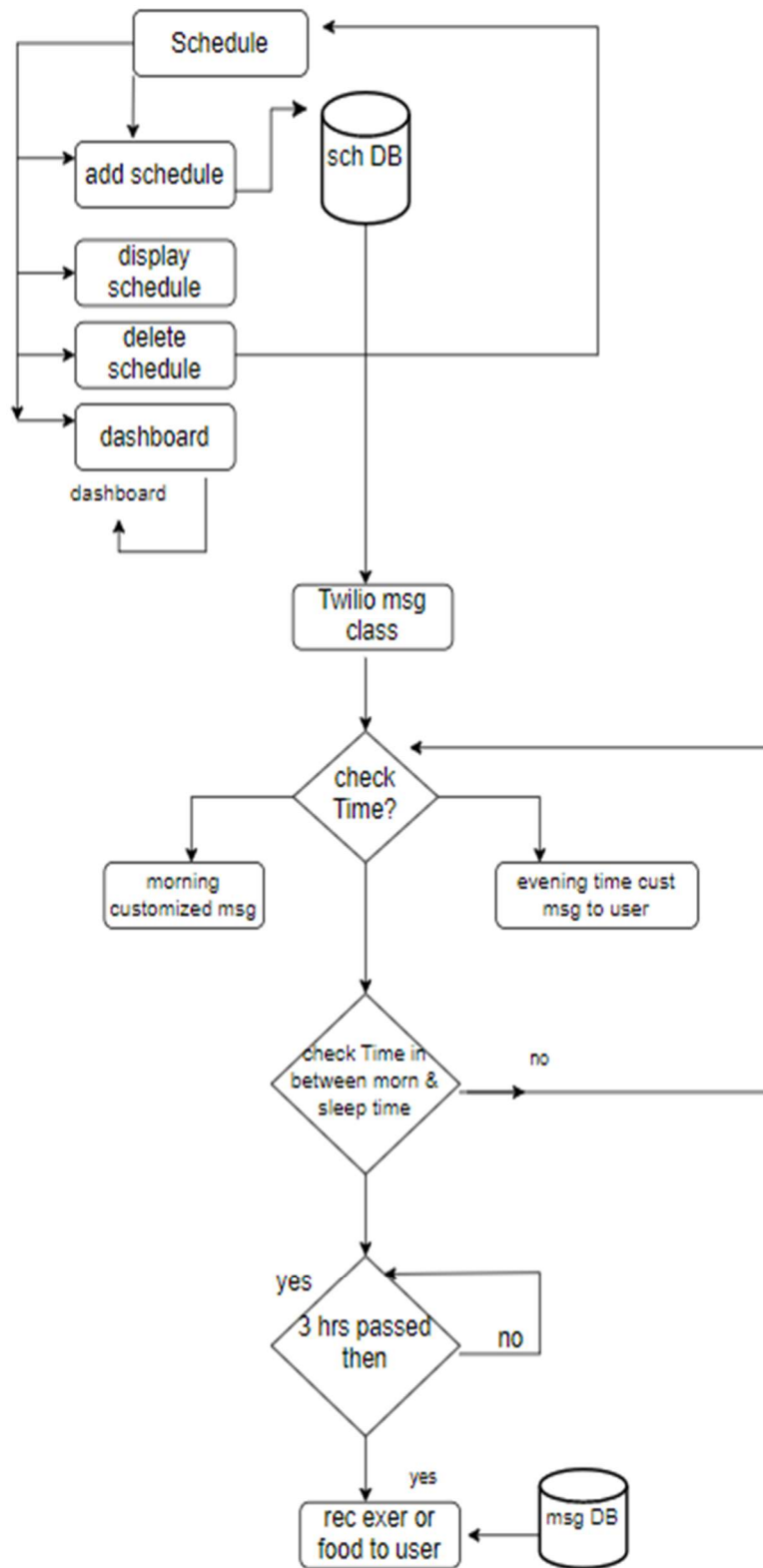
### ML LOGIC

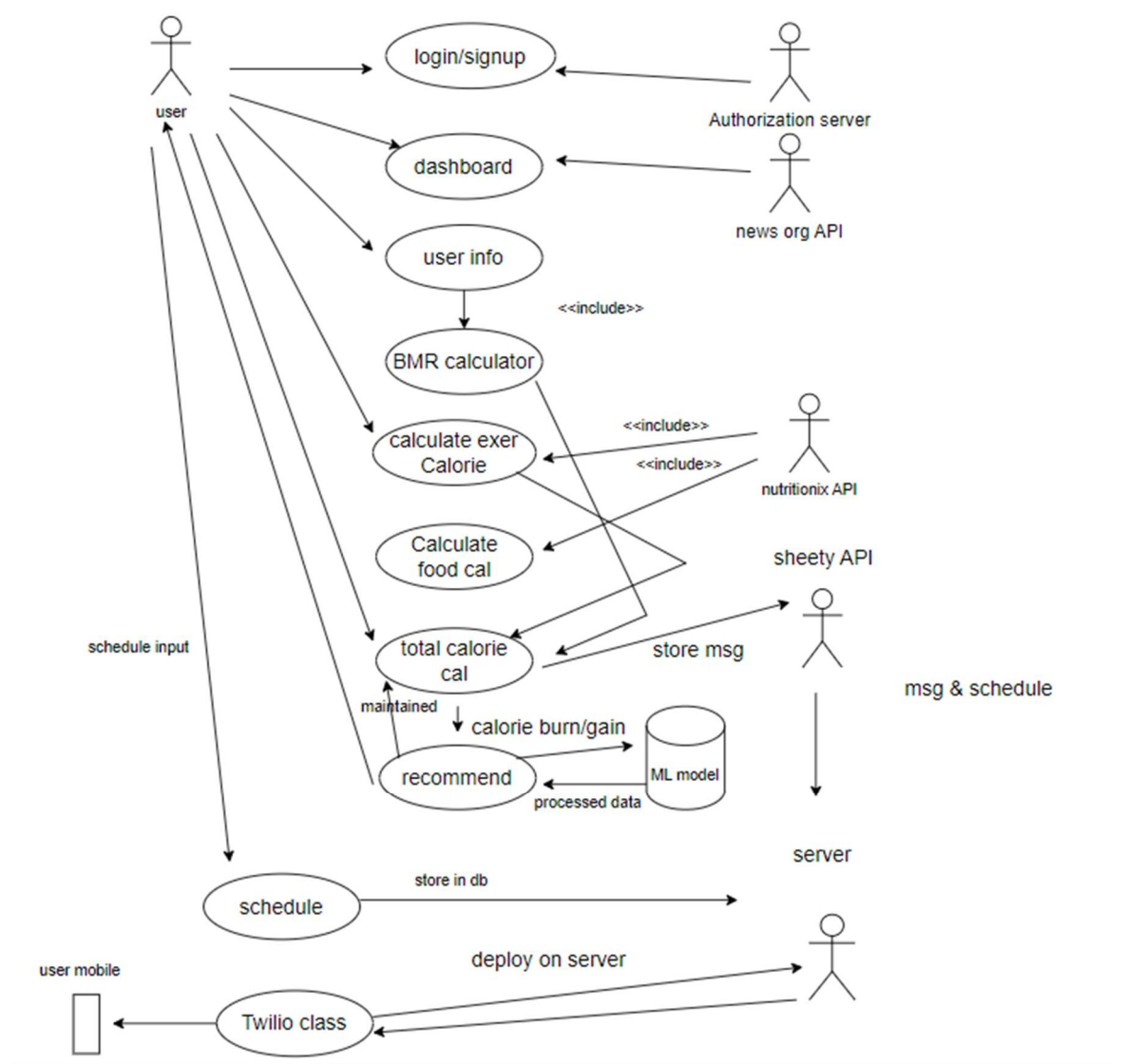


In terms of the food recommender component, the system employs a machine learning algorithm based on k-nearest neighbors (KNN) to recommend food items to the user based on their calorie needs. The algorithm identifies the K nearest food items in terms of their calorie content, and recommends those items to the user. The FoodRecommender class is defined, which takes a "calorie to gain" parameter, and the nutrient data is loaded from a CSV file sourced from the Kaggle platform. The data is preprocessed by replacing 't' values with 0, converting commas to numerical data, dropping null values, and converting data types to int or float. The KNN model is trained with the training data and used to predict food items based on the input calorie value. Additionally, the system generates an HTML table of the recommended food items with their nutrient information, which is saved to a file.

Similarly, the exercise recommender component works on the same principle as the food recommender. It employs a KNN algorithm that recommends exercises to the user based on their calorie needs. The system uses an exercise.csv file created by the team as the training data.

## 6.2.4 SCHEDULE





Use case diagram can create a broad, high-level view of the relationship between use case, actors involved. Use case diagram are an important tool for visualizing the behavior and functionality of a system. The use case diagram shows different entities involved in a fitness application.

- **Sign up for an account:**

The user can create a new account by entering their personal information, email address, and password.

- **Log in to an account:** The user can log in to their account using their email address and password.

- **Dashboard:** Upon successful login, the user is directed to the dashboard. The dashboard displays the latest news fetched from an external API and a menubar with different options.

- **Enter personal information:** The user can enter their personal information, such as age, height, weight, and gender.

- **Calculate BMR:** The user can calculate their basal metabolic rate using the BMR calculator module.

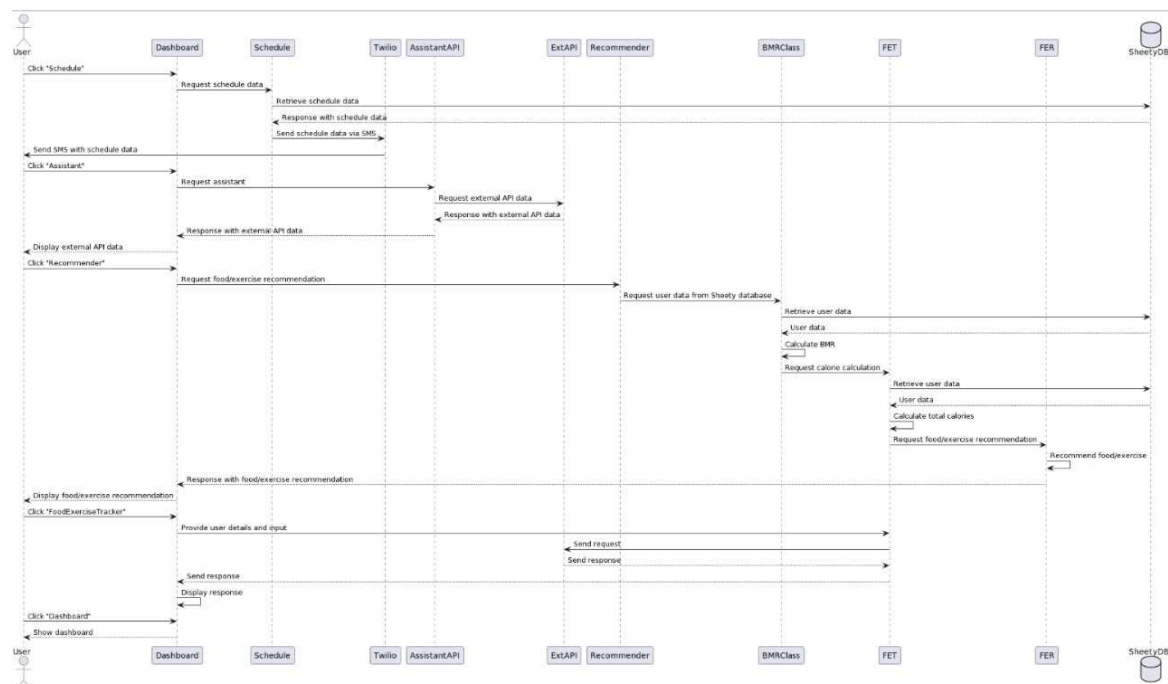
- **Calculate exercise calories:** The user can calculate the number of calories burned during their exercise routine using the Calculate Exercise Calories module.

- **Calculate food calories:** The user can calculate the number of calories consumed during the day by entering information about the food they eat using the Calculate Food Calories module.

- **Calculate total calorie intake:** The Total Calorie Calculator combines the calories burned during exercise and consumed through food to calculate the user's total calorie intake.

- **Recommend optimal calorie intake:** The Recommend module suggests the optimal calorie intake based on the user's goals, such as weight loss or muscle gain.
- **Schedule exercise routine:** The user can schedule their exercise routine and set reminders using the Schedule module.
- **Send reminders and notifications:** The Twilio Class module sends reminders and notifications to the user's phone via SMS.

## 6.4 Sequence Diagram



The UML diagram represents the interactions between various components of a software system. The system appears to be a health and wellness app that provides various features to the user. The main actor of the system is the "User", who interacts with the system through the "Dashboard". The Dashboard component communicates with various other components to provide the desired functionality.

The first interaction in the diagram is the user clicking the "Schedule" button on the dashboard. The dashboard component requests schedule data from the "ScheduleClass" component, which in turn retrieves the data from the "Sheety DB" database. The retrieved data is then sent to the "Twilio Class" component, which uses the Twilio API to send an SMS message containing the schedule data to the user. The next interaction involves the

user clicking the "Assistant" button on the dashboard. The Dashboard component requests an assistant from the "AssistantAPI" component, which then sends a request to an external API to retrieve data. The external API responds with the requested data, which is then sent back to the Dashboard component and displayed to the user.

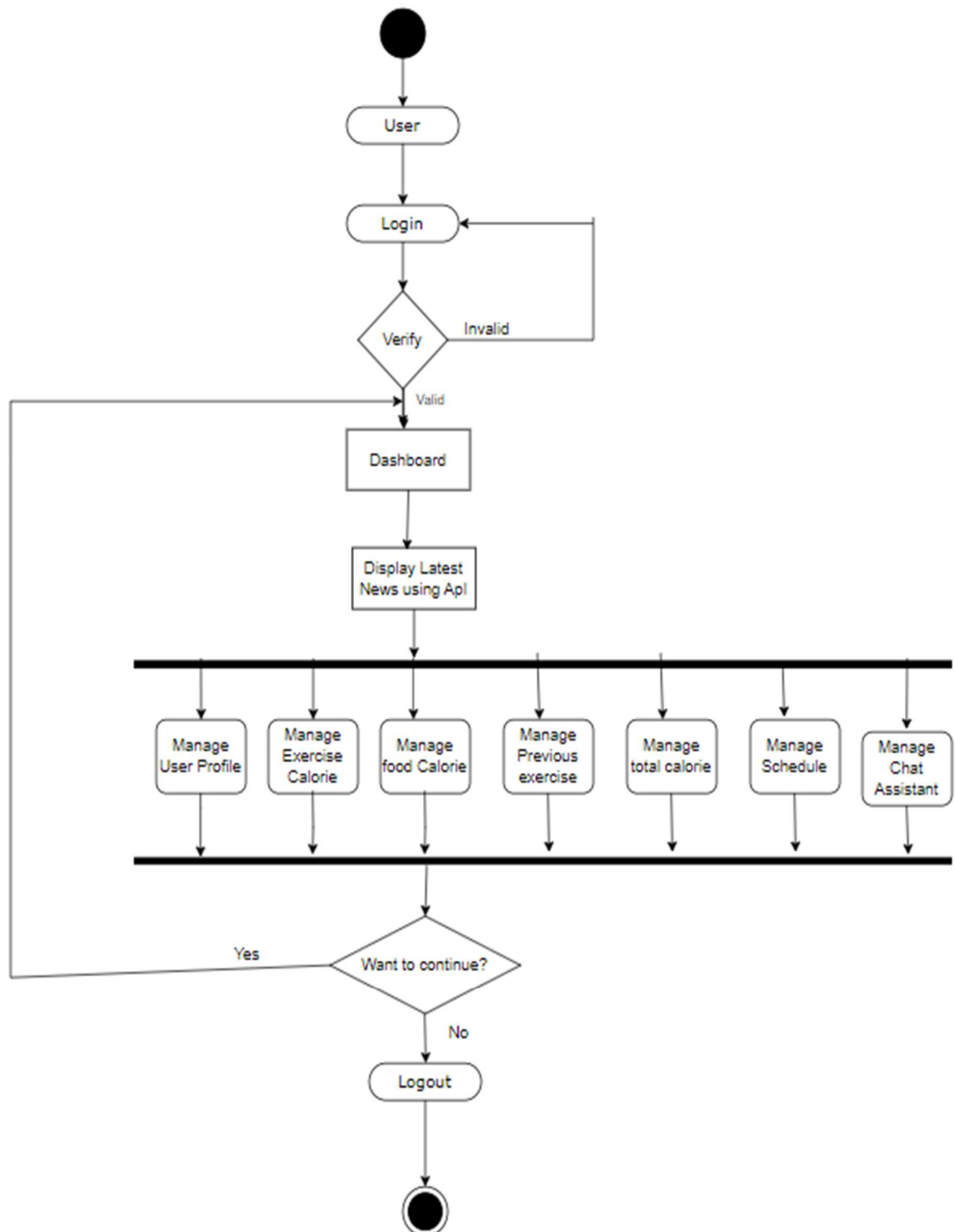
The third interaction involves the user clicking the "Recommender" button on the dashboard. The Dashboard component requests food and exercise recommendations from the "Recommender" component, which then requests user data from the Sheety database using the "BMRClass" component. The BMRClass component retrieves the user data from the database and calculates the user's Basal Metabolic Rate (BMR). The "FETClass" component is then used to calculate the total number of calories the user should consume based on their BMR and activity level. The "FERClass" component is then used to recommend food and exercise based on the user's calorie requirements, and the recommendations are sent back to the Dashboard component, which displays them to the user.

The final interaction in the diagram involves the user clicking the "FoodExerciseTracker" button on the dashboard. The Dashboard component provides the necessary user details and inputs to the "FETClass" component, which sends a request to an external API. The API responds with data, which is sent back to the Dashboard component and displayed to the user.

## 6.5 Activity Diagram

Activity diagram is essentially an advanced version of flowchart that models the flow from one activity to another activity. Activity is a particular operation of the system but they are also used to construct the executable system by using forward and reverse engineering techniques. This is the login activity diagram of health manager System which shows the flow of login activity where user will be able to login using their username. After login user can manage various operations such as Manage user profile, Manage exercise calories, Manage food Calories, Manage previous exercise, Manage total Calories, Manage Schedule and also Manage Chat assistant. If in case a user could not login successfully then the user will not be able to access this app.





# **CHAPTER – 7**

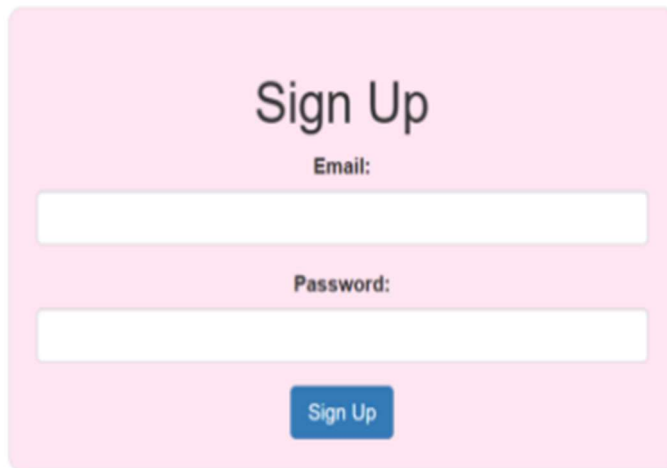
## **SYSTEM DESIGN LAYOUT**

● SCREENSHOTS OF THE SYSTEM

## 7.1.1 SCREENSHOTS OF THE SYSTEM

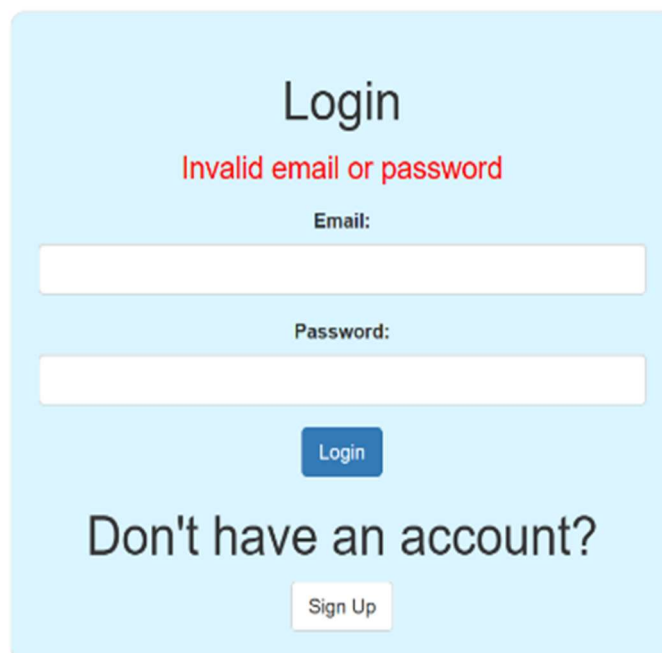
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### ➤ Signup Page:

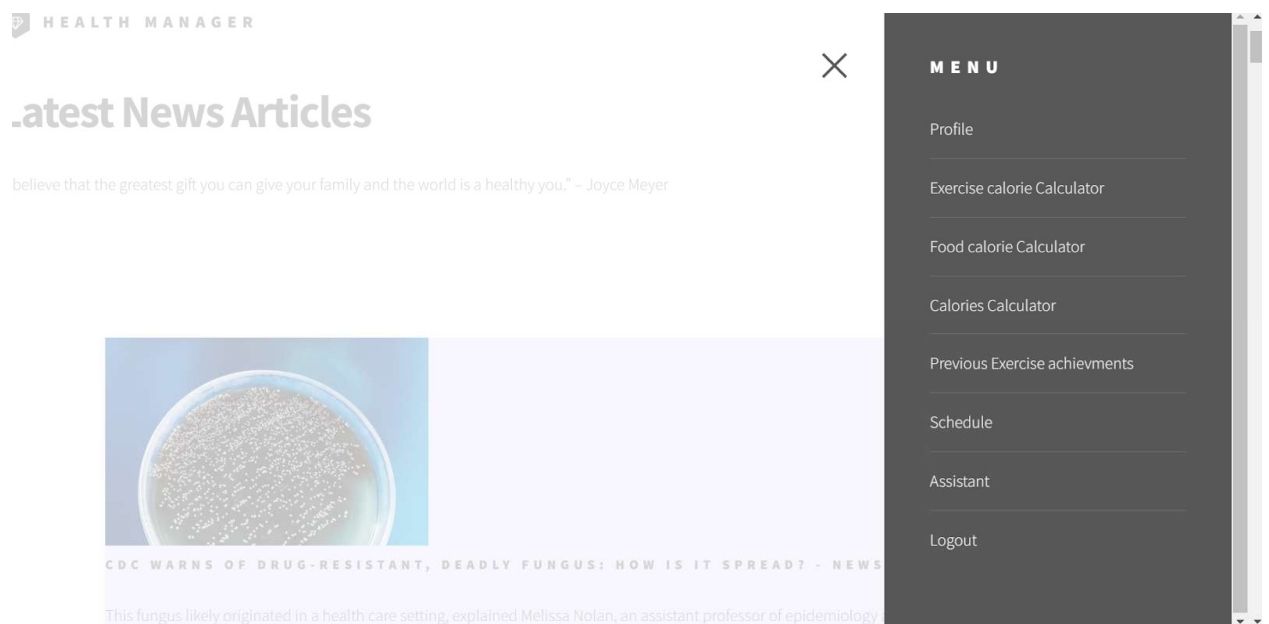
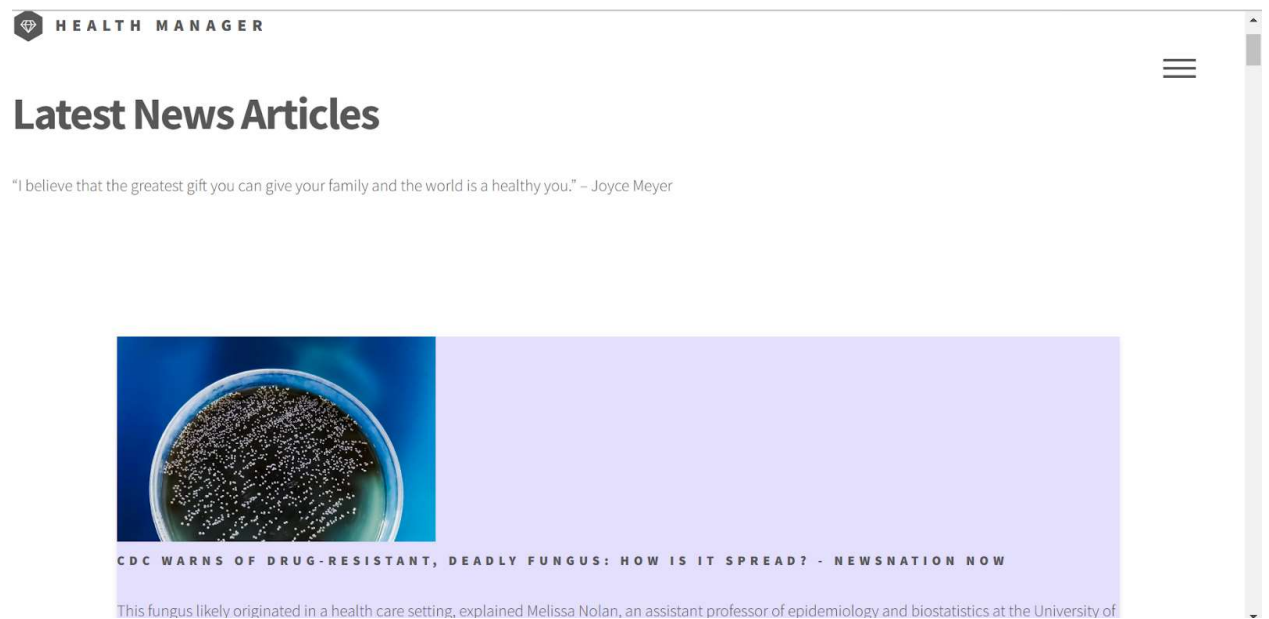


A screenshot of a 'Sign Up' form. The form is titled 'Sign Up' in a large, dark font. Below the title, there are two input fields: one for 'Email:' and one for 'Password:'. Both fields are empty. Below the 'Password:' field, there is a blue button with the text 'Sign Up' in white.

### 7.1.2 ➤ Login Page:



A screenshot of a 'Login' form. The form is titled 'Login' in a large, dark font. Below the title, there is a red error message: 'Invalid email or password'. Below the error message, there are two input fields: one for 'Email:' and one for 'Password:'. Both fields are empty. Below the 'Password:' field, there is a blue button with the text 'Login' in white. At the bottom of the form, there is a link that says 'Don't have an account?' followed by a button with the text 'Sign Up' in white.



**7.1.5 ➤ User Profile Page:**

## User Profile

**Name:** vipasa kamani

**Age:** 21

**Gender:** female

**Height:** 154

**Weight:** 45

**BMR:** 1146.5

Edit

Dashboard

**➤ User Profile Page:**

## User Profile

**Name:** vipasa k

**Age:** 22

**Gender:** female

**Height:** 160

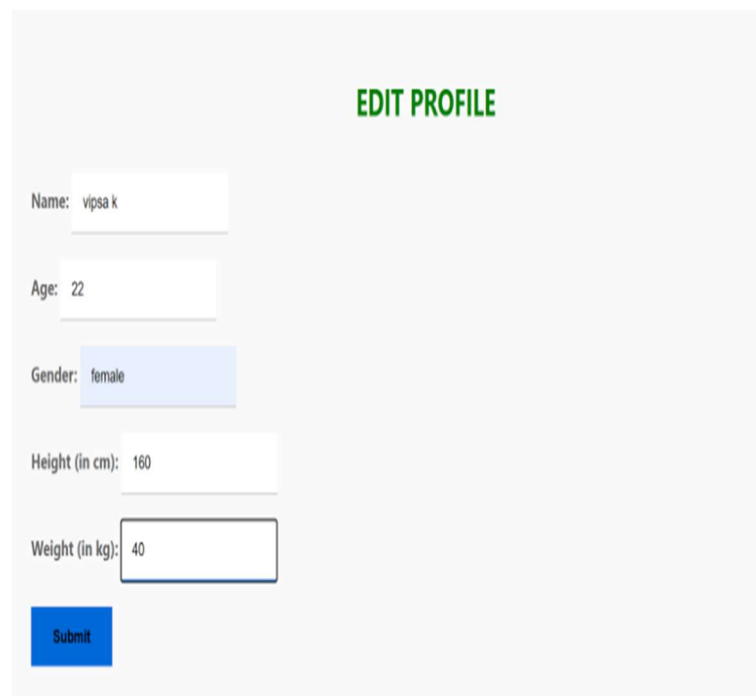
**Weight:** 40

**BMR:** 1129.0

Edit

Dashboard

**7.1.6 Edit Profile Page:**



**EDIT PROFILE**

Name: vipsa k

Age: 22

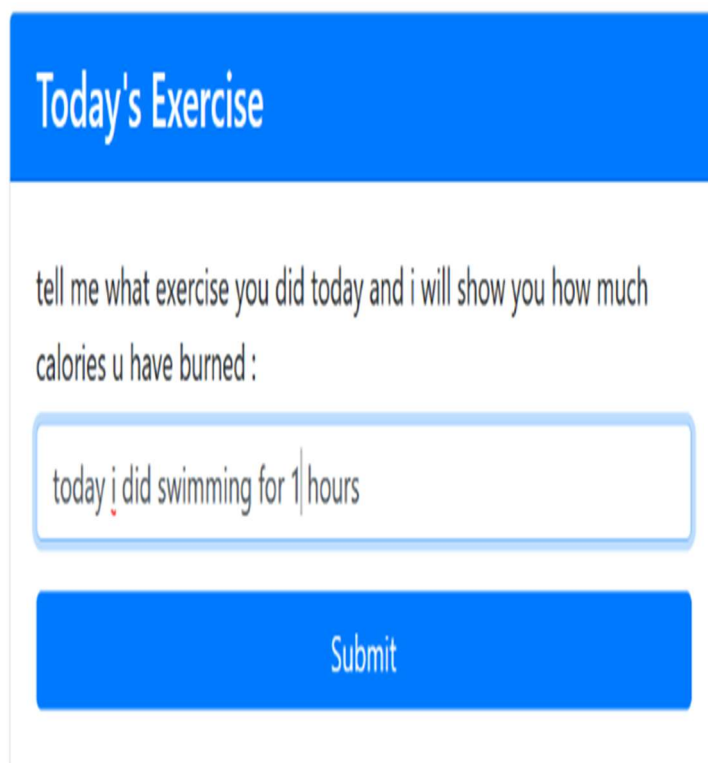
Gender: female

Height (in cm): 160

Weight (in kg): 40

Submit

**➤ Today's Exercise Page:**



**Today's Exercise**

tell me what exercise you did today and i will show you how much calories u have burned :

today i did swimming for 1 hours

Submit

**7.1.7 ➤ Exercise Details:**

## User Exercise Details

**Date:** 30/03/2023

**Time:** 19:30:02

**Exercise:** Swimming

**Duration:** 60

**Calories Burn:** 240

[Dashboard](#)

**➤ Food Details Page:**

### Today's food

tell me what you eat and i will show you how much calories u have consumed :

[Submit](#)

Qty	Unit	Food	Calories	Weight (g)
1	cup	coffee	2.37	236.98
1	medium	roti	119.6	40

Dashboard

➤ **Calories Calculator:**

## Calories Calculator

Calories intake needed: 1146.5

Exercise Calorie : 0.0

Food Calories : 121.97

Net Calories : 1268.47

Recommend Dashboard



**7.1.8 ➤ Exercise Recommender:**

## Exercise Recommender

Calories needs to burn: 121.97

[Dashboard](#)

Workout Type	Calories	Duration (min)
Weight lifting	123.0 Kcal	30
Walking	123.0 Kcal	30
Walking	123.0 Kcal	30

Workout Type	Calories	Duration (min)
Weight lifting	123.0 Kcal	30
Walking	123.0 Kcal	30
Walking	123.0 Kcal	30
Treadmill	123.0 Kcal	30
Treadmill	123.0 Kcal	30
Marching	131.0 Kcal	25
Boating	117.0 Kcal	40
Cricket	112.0 Kcal	20
Freestyle(swimming)	135.0 Kcal	20
Cricket	140.0 Kcal	25

# Calories Calculator

Calories intake needed: 1146.5

Exercise Calorie : 270.0

Food Calories : 0.0

Net Calories : 998.47

Recommend

Dashboard

## 7.1.9 ➤ Food Recommender Page:

## Food Recommender

Calories needs to gain: 148.03

Dashboard

	Food	Calories	Grams	Category	Measure	Protein	Fat	Fiber	Carbs	Sat. Fat
26	Eggs raw	150.0	100	Dairy products	2	12.0	12	0.0	0.0	10
58	Chicken livers fried	140.0	100	Meat Poultry	3 med.	22.0	14	0.0	2.3	12
81	Mackerel	155.0	85	Fish Seafood	3 oz.	18.0	9	NaN	0.0	0
94	Lima	140.0	160	Vegetables	1 cup	8.0	0	3.0	24.0	0
141	French-fried	155.0	60	Vegetables	10 pieces	NaN	7	0.4	20.0	3
144	Scalloped with cheese potatoes	145.0	100	Vegetables	3/4 cup	6.0	8	0.4	14.0	7
153	Sweet potatoes	155.0	110	Vegetables	1 med.	2.0	1	1.0	36.0	0
169	Nectar or juice	140.0	250	Fruits	1 cup	1.0	0	2.0	36.0	0
188	Grape juice	160.0	250	Fruits	1 cup	1.0	0	0.0	42.0	0
236	Macaroni	155.0	140	Breads cereals fastfoodgrains	1 cup	5.0	1	0.1	32.0	0

	Food	Calories	Grams	Category	Measure	Protein	Fat	Fiber	Carbs	Sat. Fat
26	Eggs raw	150.0	100	Dairy products	2	12.0	12	0.0	0.0	10
58	Chicken livers fried	140.0	100	Meat Poultry	3 med.	22.0	14	0.0	2.3	12
81	Mackerel	155.0	85	Fish Seafood	3 oz.	18.0	9	NaN	0.0	0
94	Lima	140.0	160	Vegetables	1 cup	8.0	0	3.0	24.0	0
141	French-fried	155.0	60	Vegetables	10 pieces	NaN	7	0.4	20.0	3
144	Scalloped with cheese potatoes	145.0	100	Vegetables	3/4 cup	6.0	8	0.4	14.0	7
153	Sweet potatoes	155.0	110	Vegetables	1 med.	2.0	1	1.0	36.0	0
169	Nectar or juice	140.0	250	Fruits	1 cup	1.0	0	2.0	36.0	0
188	Grape juice	160.0	250	Fruits	1 cup	1.0	0	0.0	42.0	0
236	Macaroni	155.0	140	Breads cereals fastfoodgrains	1 cup	5.0	1	0.1	32.0	0
240	Oatmeal	150.0	236	Breads cereals fastfoodgrains	1 cup	5.0	3	4.6	26.0	2
244	Popcorn salted	152.0	28	Breads cereals fastfoodgrains	2 cups	3.0	7	0.5	20.0	2
271	Split-pea soup	147.0	250	Soups	1 cup	8.0	3	0.5	25.0	3
274	Apple betty	150.0	100	Desserts sweets	1 serving	1.0	4	0.5	29.0	0
278	Cupcake	160.0	50	Desserts sweets	1	3.0	3	0.0	31.0	2
290	Doughnuts	135.0	33	Desserts sweets	1	2.0	7	0.0	17.0	4
291	Gelatin made with water	155.0	239	Desserts sweets	1 cup	4.0	0	0.0	36.0	0
329	Cola drinks	137.0	346	DrinksAlcohol Beverages	12 oz.	0.0	0	0.0	38.0	0
330	Fruit-flavored soda	161.0	346	DrinksAlcohol Beverages	12 oz.	0.0	0	0.0	42.0	0
332	Root beer	140.0	346	DrinksAlcohol Beverages	12 oz.	0.0	0	0.0	35.0	0

**7.1.10 ➤ Calories Calculator:**

### Calories Calculator

Your Calories are Maintained

Calories intake needed: 1146.5

Exercise Calorie : 73.5

Food Calories : 0.0

Net Calories : 1167.08

RecommendDashboard

**7.1.11 ➤ Schedule Page:**

## Set your Daily Schedule to receive SMS reminders

Add Schedule

List of Schedules


Delete Schedule

Go Back to Home Page


**7.1.12 ➤ User Schedule:**

## User Schedule


Wake Up At:




Breakfast Time :




Lunch Time :



Dinner Time :



Sleep At :



Submit

**7.1.13 ➤ User Information:**

## User's Information

ID	Activity Name	Time
1	wakeup	08:30
2	breakfast	09:30
3	lunch	13:00
4	dinner	21:00
5	sleep	22:30

[Go Back](#)

**7.1.14**

➤ **Chat Assistant:**

# Chat Assistant

You: banana has how much calories ?

Bot: A banana has approximately 105 calories.

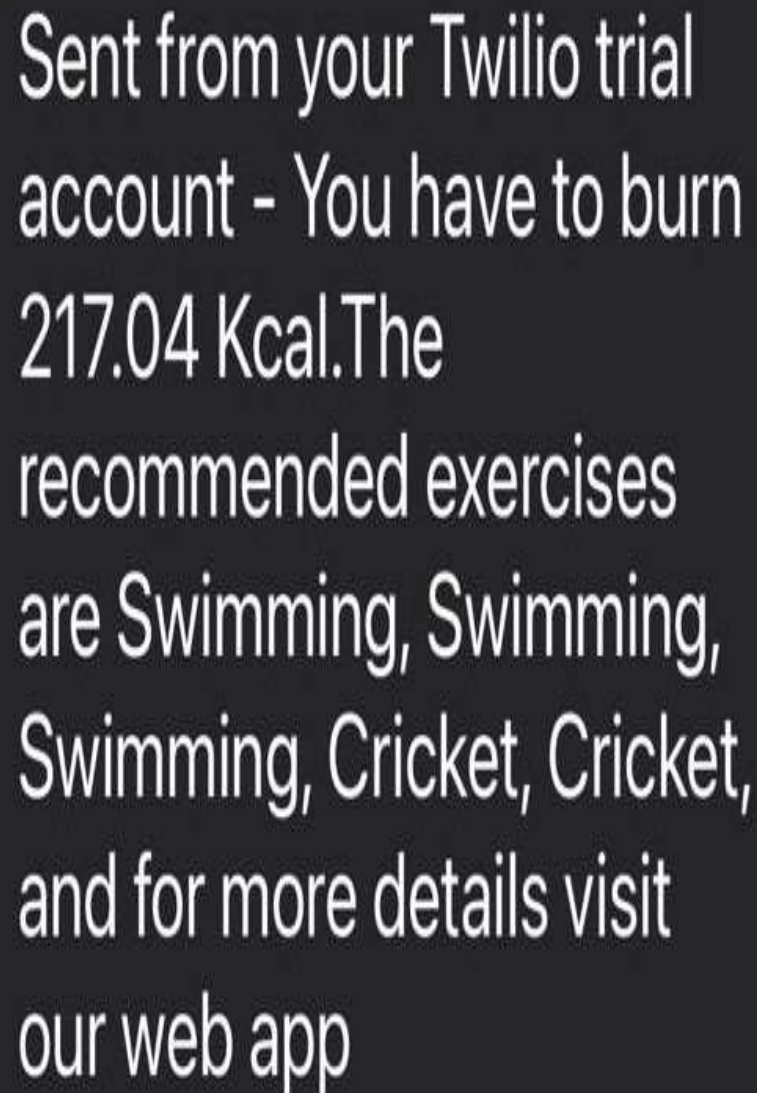
Send



Sent from your Twilio trial  
account - Good morning!  
start your day with Exercise  
and healthy Breakfast!! also  
don't forget to keep us  
updated



7.1.16



Sent from your Twilio trial  
account - You have to burn  
217.04 Kcal. The  
recommended exercises  
are Swimming, Swimming,  
Swimming, Cricket, Cricket,  
and for more details visit  
our web app

# **CHAPTER – 8**

# **SYSTEM TESTING**

● **BLACK BOX TESTING**

● **WHITE BOX TESTING**

## 8.1 BLACK BOX TESTING

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Black Box Testing is also known as Behavioral Testing, is a software testing method in which the internal structure/design/implementation of the item being tested is not known to the tester. These tests can be functional or non-functional, though usually functional.



[Figure: Black Box Testing]

This method is named so because the software program, in the eyes of the tester, is like a black box; inside that one cannot see. This method attempts to find errors in the following categories:

- Incorrect or missing functions.
- Interface errors
- Errors in data structures or external database access.
- Behavior or performance errors.

## **8.2 WHITE BOX TESTING**

White Box Testing (also known as Clear Box Testing, Open Box Testing, Glass Box Testing, Transparent Box Testing, Code-Based Testing, or Structural Testing) is a software testing method in which the internal structure/design/implementation of the item being tested is known to the tester. The tester chooses inputs to exercise paths through the code and determines the appropriate outputs. Programming know-how and implementation knowledge are essential. White box testing is testing beyond the user interface and into the nitty-gritty of a system. This method is named so because the software program, in the eyes of the tester, is like white/transparent box; inside which one clearly sees.

# **CHAPTER – 9**

## **LIMITATIONS AND FUTURE ENHANCEMENT**

**a● LIMITATIONS**

**● FUTURE ENHANCEMENT**

## 9.1 LIMITATIONS

- **Security Issues:** There are a lot of people who scam through online business.
- **User Engagement:** Even if users initially adapt the app, they may not continue to use it over time. This can lead to a lack of engagement with the app and limit its effectiveness in helping users achieve their fitness goals.
- **Internet Required:** To achieve daily health-related goals internet connection is must without the internet nothing can be done.
- **Basic Knowledge of Computer:** To use this app basic knowledge of the computer is essential.
- **User Adoption:** Not all users may be interested in using a fitness app or may not be willing to consistently track their activity and nutrition data. This can limit the usefulness and effectiveness of the app.
- **App Complexity:** The complexity of the app may limit its usefulness to users who are not technologically sound or who find the app difficult to navigate.

## 9.2 FUTURE ENHANCEMENT

- **Integration with wearable devices:** Allow the app to integrate with popular wearable devices such as Fitbit or Apple watch, providing more accurate data tracking and analysis.
- **Social Features:** Add social features to the app to enable users to connect with other like-minded individuals, share their progress and get support and encouragement.
- **Gamification:** Add a gamification feature that incentivizes users to exercise by Offering rewards, challenges and competition.
- **Mindfulness & Meditation:** Add guided meditation and mindfulness exercises to promote mental wellness and relaxation.
- **Virtual Personal Trainers:** Provide users with virtual personal trainers that can offer personalized advice, motivation, and feedback.
- **Augmented Reality Workouts:** Integrated augmented reality technology to create immersive workout experiences that motivate users to exercise and challenge themselves.

# **CHAPTER – 10**

## **CONCLUSION**

### **◎ CONCLUSION**

## 10.1 CONCLUSION

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The development of a '**Health Manager**' app can provide a powerful tool for individuals to achieve their fitness and wellness goals. The app can offer personalized plans for nutrition and exercise, track progress and provide motivation and support. It can also be integrated with wearable technology to provide real-time feedback and analysis.

With the increasing popularity of health and fitness, an app that can help users stay accountable and motivated while on the go can be a valuable asset. The app is designed to cater to various fitness levels and offer a wide range of activities to suit the user's preferences. Overall, this project has the potential to make a positive impact on people's lives by promoting healthy habits and improving overall wellbeing.

Hence, this app will encourage user to maintain a consistent habit of workout.



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