APPLICATION FOR PLANNING DIET PLAN AND EXERCISE

Project Proposal Report

IT20644208

Dewappriya M.D.V.K

Ms. Tamali Dassanayake
(Supervisor)

B.Sc. (Hons) Degree in Information Technology (IT)

Department of Information Technology

Sri Lanka Institute of Information Technology

Sri Lanka

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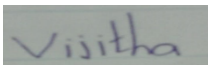
Declaration

I declare that this is my own work, and this proposal does not incorporate without acknowledgment any material previously submitted for a degree or diploma in any other university or institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgment is made in the text.

Name	Registration No	Signature
Dewappriya M.D.V.K.	IT20644208	

The above candidates are carrying out research for the undergraduate Dissertation under my supervision.

…..... …….

Signature of Supervisor Date

Abstract

Maintaining good health is crucial. People who exercise often, play sports, and engage in other strenuous activities are physically fit. However, following the Covid-19 pandemic, we all miss our regular activities, such as working out. As a result, some people use fitness apps to perform exercises at home [1].

However, most apps provide basic fitness routines that are ineffective, and occasionally, certain challenging workout recommendations may result in muscle injuries such as muscle pulls and strains, sprained ankles, shoulders, knees, Shin splints, tendinitis, and dislocated or sprained wrists.

The human body is more vulnerable to infection such as virus when it chills severely since it uses more energy to keep a normal body temperature. Exercise without a doubt strengthens the body's immune system and improves fitness [2].

By analysing their photos and other health factors, we developed this research strategy to deliver individualized workouts and nutrition schedules in order to address this problem. According to this study's conclusion, exercise, and nutrition recommendations are given to users by processing and analysing their photos and other health information, such as their calorie-burning rate.

TABLE OF CONTENTS

Declaration	iii
Abstract	iv
TABLE OF CONTENTS	v
LIST OF FIGURES	vi
LIST OF TABLES	vi
1. INTRODUCTION	2
1.1 Background	
1.2 Research Gap and Research Problem	2
2. OBJECTIVES	2
2.1 Main Objective	2
2.2 Specific Objective	2
3. METHODOLOGY	2
3.1 Gather and classify user inputs	3
3.2 Workout Recommendation	3
3.3 Overall Architecture	3
4. REQUIREMENTS	
4.1 Software / Library Requirements	4
4.2 Functional Requirements and Non-Functional Requirements	
5. SOFTWAER SOLUTIONS	5
5.1 Work Breakdown Structure	5
5.2 Gantt Chart	
6. REFERENCE	6

LIST OF FIGURES

		Page
Figure 3.1	System Overall Architecture	3
Figure 5.0	Agile Methodology	5

LIST OF TABLES

		Page
Table 4.2	Functional Requirements and Non-Functional Requirements	1
Table 5.2	Work Breakdown	5
Table 5.3	Gantt Chart	5

1. INTRODUCTION

1.1 Background

The promotion of a healthy lifestyle, food, and physical activity can help avoid both communicable and non-communicable diseases. When we have diabetes, high blood pressure, or hypertension, we are more vulnerable to getting heart attacks and kidney failure [3].

Moderate exercise has been demonstrated to lower morbidity and death following viral infection [4,5]. In preclinical trials, exercise and meditation are harmful for the treatment of respiratory viral infections [6].

Through physical activity, meditation, and yoga postures, traditional health practices strengthen and boost immunity. These exercises can improve sleep quality, increase immunity, and reduce stress and sadness [7,8]. Also, The World Health Organization (WHO) advises physical activity to combat viral infections.

However, home workouts or gym workouts without proper guidance from trainers can pose significant risks. If exercises are not performed correctly, there is a potential for harm to muscles and tissues. Furthermore, optimal results are achievable when engaging in exercises tailored to one's individual physical condition.

Through Health websites can be used to get information about a balanced lifestyle Online communities offer high-quality medical treatment, but their contradictory advice may be harmful to health, making them unreliable and requiring the use of filtered, accurate information.

Dietary considerations also play a pivotal role in effective workout regimens. Selecting appropriate dietary plans aligned with workout routines and caloric expenditure rates holds great importance.

Given the concerns, it is advisable for individuals to undertake workouts under the supervision of qualified trainers. However, envision a scenario where trainers could be substituted by intelligent applications utilizing Machine Learning (ML) and Artificial Intelligence (AI) technologies.

1.2 Research Gap and Research Problem

1.2.1 Research Gap

The App Store and Plat Store both have a large selection of software. But the personalization in those applications is little. This means that they have a few pre-defined programs, and the application will recommend them when users select their desired level of fitness. Therefore, all users will receive generic recommendations that are not efficient at all. To fill this gap, we used AI to add more intelligence and personalized the application.

Features	Proposal System	Existing System		
		Research A	Research B	Research C
Suggest workouts for desired result	Yes	Yes	Yes	Yes
Suggest diet and nutrition plan	Yes	Yes	Yes	Yes
Process user's body condition to provide personalized routines	Yes	No	No	No
Adjusting diet plans aautomatically based on user's gained and burn calories	Yes	No	No	No

1.2.2 Research Problem

Well-trained machine-learning models are needed to make decisions and recommend appropriate workout plans correctly. The trained models ought to have all the information required to decide correctly, just like professionals.[9] Image processing can also be used to determine the user's physical condition.

The application will continue to track users' workouts and calorie burn rates in order to advise diet regimens. The application will recommend the appropriate diet regimens for the user to follow based on those figures.

In this research, our Research Problem is “How can we maintain a perfect body shape without affecting our health conditions, without more additional cost, in a reliable way (can be done in anytime, from any place) without any prescriptions of the related domain experts?”

2. OBJECTIVES

2.1 Main Objective

By analysing a user's body composition and dietary habits, an expert system is being built with the aid of machine learning and artificial intelligence to provide individualized workout and nutrition recommendations.

2.2 Specific Objective

1. collect body images of people and predict their accurate body type.
2. Predict some diseases of them like diabetes, cholesterol etc.
3. Predict and suggest an accurate, suitable, and comprehensive diet plan by analysing their body type and diseases.
4. Predict and suggest an accurate, suitable, and comprehensive workout by analysing their body type, the user’s age group diseases(respiratory diseases), heart rate, BMI, gender and user recommendations(dream weight).

3. METHODOLOGY

The workout suggestion system can be broken into following parts.

1. Gather and classify user inputs.
2. Workout Recommendation

3.1 Gather and classify user inputs.

Gathering information from users includes physical body condition, historical workout plans, individual characteristics, health conditions, goals, time commitment, nutritional information, diseases, and habits. Based on the analysis, the information will be classified as relevant user's characteristics, goals, preferences, and constraints

user's characteristics

- Age: Age can influence exercise intensity, recovery time, and susceptibility to certain injuries
- Gender: Men and women may have different physiological responses to workouts.
- Body Mass Index (BMI): BMI provides a general indication of body composition.
- Weight and hight: These factors can affect exercise load and intensity.

Fitness goals

- Identify the user's main fitness objective (e.g., weight loss, muscle gain, cardiovascular fitness).

Preferences

- Workout type: Preference for specific workout types (e.g., strength training, cardio, yoga).
- Intensity level: Preferred intensity level (low, moderate, high) for workouts.
- Duration: Desired workout duration (e.g., 30 minutes, 1 hour).
- Frequency: Frequency of workouts per week.

3.2 Workout Recommendation

The workout recommendation components will start to classify the results to find more suitable workouts. it will consider factors like physical body condition, the user’s age group, diseases (respiratory diseases), heart rate, BMI, gender, and user recommendations(dream weight) to find the most suitable workout.

3.3 Overall Architecture

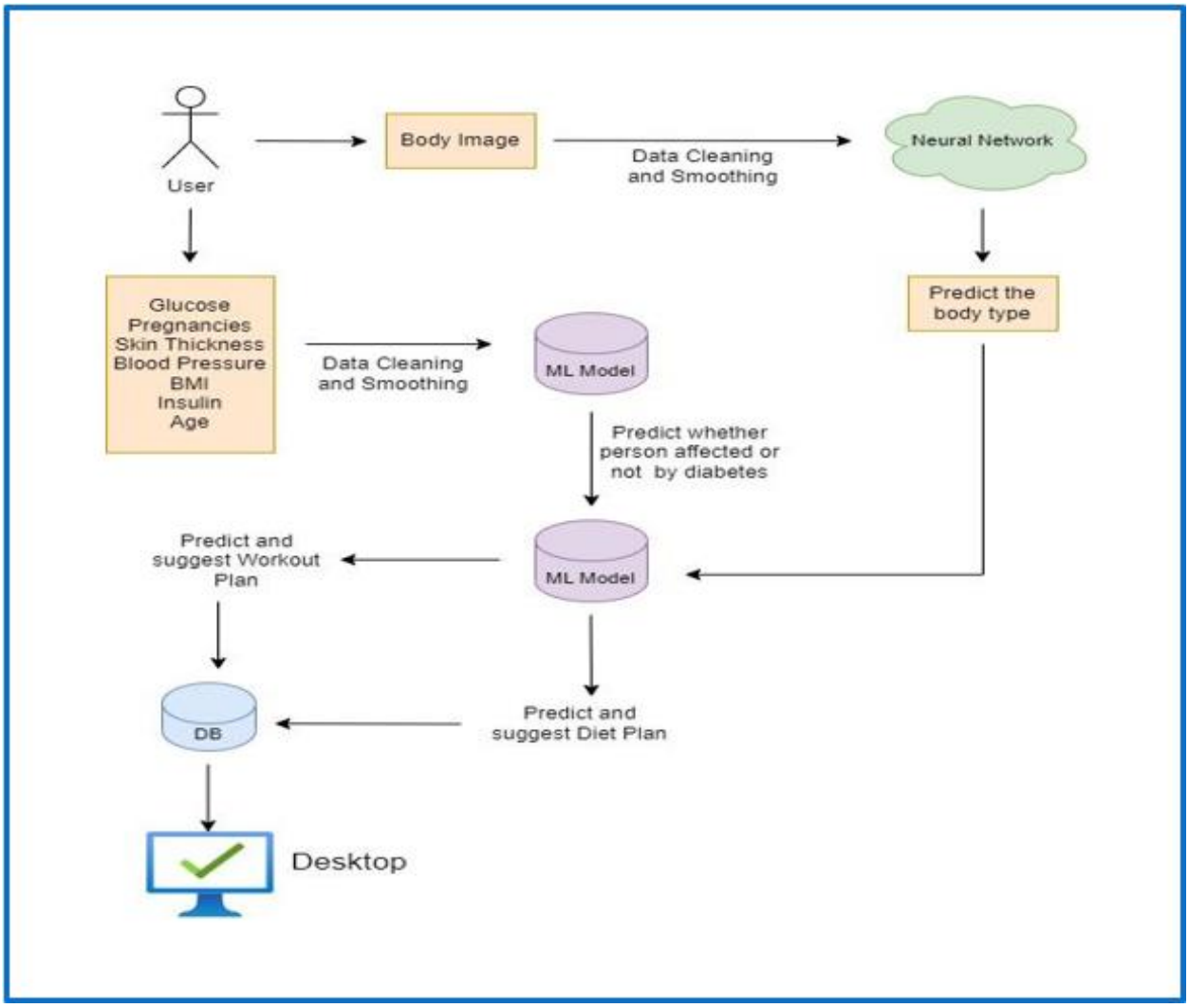


Figure 3.3System Overall architecture.

3. Project requirements

4.1 Functional Requirements and Non-Functional Requirements

Functional Requirements	Non-Functional Requirements
1. system should be able to get multiple inputs.	1.System should be Easy to use.
2. should be able to understand the body type and disease.	2. System's Performance should be at the perfect level.
3. should be able to predict the number of days the diet plan must be followed, and calories totally needed for every day.	3.System should have high security.
4. System should be able to predict the suitable personalized workout plan.	4.Interfaces should be user-friendly.

Table 4. 1 Functional and Non-Functional Requirements

4.2 Software / Library Requirements

- Software requirements are React Native, Node Server, and VS code, Python METALAB, TensorFlow.
- The libraries are SciPy, OpenCV.

5. Software Solution

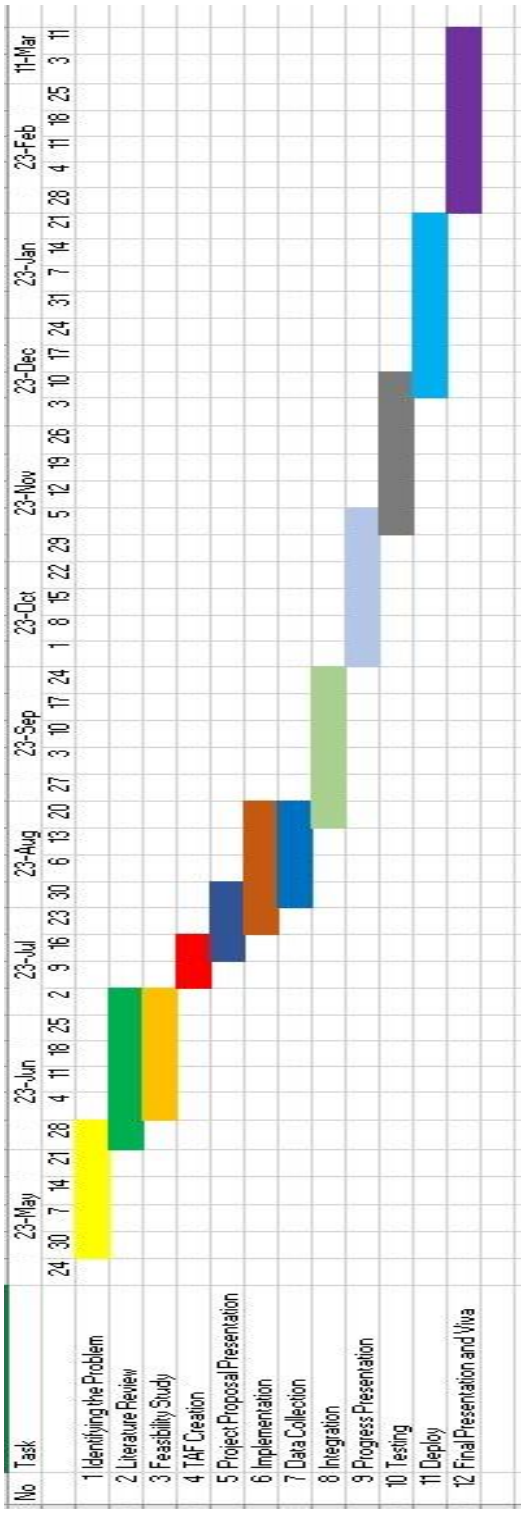
The Agile Scrum approach is used in the suggested software development life cycle. Scrum is an iterative software development framework that is based on the agile principles of the Agile Manifesto [10]. In addition, Scrum is described as a lightweight development approach that offers complete transparency and quick adaptation [10]. Agile allows for frequent modifications to the component throughout the implementation phase with fluctuating needs because of the aforementioned tendencies. The agile scrum technique will be used to assist the changes effectively. As a result, the suggested solution will be put into practice in accordance with the framework while facilitating ongoing modifications and quick adaptabilities.

Figure 5.1 Agile Methodology [11]

5.1 Work Breakdown Structure

Initial Stage	Planning Stage	Design Stage	Implementation Stage	Final stage
Identify the Research Problem.	Collecting data.	Design system diagrams.	Implement solution to identify body types by processing image.	Final Presentation.
Topic Assessment Form.	Feasibility Study	Create ER diagram.	Implement solution to predict the diseases.	Research Paper.
Creating project proposal.	Meet a workout Trainers to get more domain information.	Design Wireframes for mobile and web applications.	Train models to predict suitable diet plans and workouts.	

5.2 Gantt Chart



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