

# Development of Smart Health Monitoring System

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## Abstract

*In the last few eras the humanity has witnessed an increase in visiting and downloading of fitness applications. The theme of this project is to provide every possible tool which can be helpful for Ones fitness journey. This app is used to track the fitness level of a person. It shows user the holistic view of their health so that they never lose the track of their fitness. This app is having certain options through which user can keep check on their fitness. It can be used to track user's progress by keeping check on their weight and their Calorie Intake. This app will let user calculate BMI, BMR, calorie requirement and accordingly provide meal plan and workout plan. There are researches and studies are going on every day on various aspects of fitness, healthy living and diet. This app is also having a discussion forum where people can post about various researches and their personal health issues which can be resolved in the further posts.*

**Key Words:** Health Monitoring, Fitness Tool, BMI, BMR, Diet Plan

## I. INTRODUCTION

After the emergence and increase in popularity of smart phones, many mobile apps have been that pathway and the evidence about their users. Some of the examples are the pedometer which can be utilized in the mobile device as built-in accelerometer to calculate how many steps the user walks in a day. Application of this kind of categories, that can be used to tracking and recording the health condition and movements about the users. This kind of tracking systems is called fitness Apps. [1]. This Wellness application can be formed to aid the user to achieve a good physical shape and live a healthy life by keep checking on their weight and a variety of ratios like BMI and BMR. The factors which are characteristically embattled by this kind of applications including workouts, sleeping time, and diet. Mobile applications like this kind can be used to drive users to maintain a sequence of constructive way of life decisions and infringement a cycle of pessimistic daily life decisions. Through the debates they can post their opinions. Right food, proper workouts and sleeping can control quite a lot of psychological pathways linked with gloominess and bidirectional connection among misery and the standard of living [2].

### A. Objective

After using a number of fitness apps, I became frustrated because of inappropriate characteristics included in it. Some kinds of these applications are too multifaceted and for the reason that the apps main purpose is getting lost. Simplicity is very important in health/fitness application. This is main the reasons which motivated me to build a simpler app. The active person who is interested in sports and going to gym on a regular basis from them the things were noticed by and included this mobile application. There are too many intricate and profligate applications are at hand in the marketplace however those are too difficult to recognize and to use on a regular basis [3]. Hence, this app is developed to understand the most important basics.

### B. Scope of the Project

The major principle of this system is to develop a mobile application that is important to gym going people and who are all working out regularly and the people would like to track their movements and to accomplish their physical condition goals[4]. The mobile application should make available and to provide enjoyable understanding. It should trouble-free and to comprehend and despite the consequences of the user's acquaintance with this applications. Whether the user is an inexpert or experienced, the app should be appropriate for both. The key to this app is plainness and this app will make available the description admired in this marketplace in a simpler approach. The main description incorporated in this app are; BMI calculator, BMR calculator, Workout Plan, Meal Plan and a Discussion forum. The aim of this work is to generate an application for the mobile android podium accomplished for tracking, recording, and displaying data relevant to a user's BMI, BMR, consumption habits and cardiovascular exercise routine [5]. This goal is to show the user his taken as a whole corporal condition and assist them to create option that will effect in a well again standard of living.

### C. Problem Formulation

To mobile app developed is to calculate your BMI, BMR, Macros, Calories Requirement through which user can keep track of health and fitness level. It also provides workout plan, meal plan accordingly so that user can achieve their fitness goal. It will also let you discuss your fitness queries on discussion forum. Workout and right food are going to make user healthier and reduce the risk of some cancers, including colon and lung cancer. It also helps in controlling weight and reduces the risk of heart disease. It helps to keep user thinking, learning, and judgment skills sharp as they age [6].

## II. SYSTEM ANALYSIS

The principle of System Analysis is to construct concise investigation assignment and to create full information regarding the model, performance and other constraint like preventive measures and the scheme optimization. The objective of the System Analysis is to absolutely specify the technological details for the major idea in a brief and unmistakable manner.

### A. Existing System

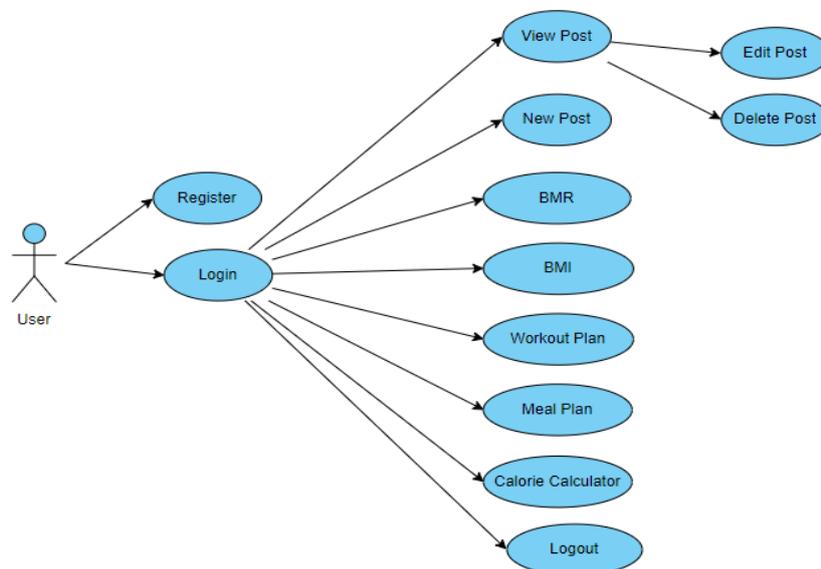
Fitness is very important for people nowadays. Everyone wants to be Fit and disease free so that they could be able to do anything they want. It also makes them attractive. Unfit people have to face many difficulties in their day to day life. Obesity is associated with an increased risk of getting cardiovascular disease (CVD), mostly heart failure (HF) and coronary heart disease (CHD). The mechanisms through which obesity increases CVD risk involve changes in body composition that affects hemodynamic and changes heart structure. The disadvantages of existing methods are difficult to manage, high cost, not reliable and not accurate. So this can be overcome by proposed System.

### B. Proposed System

The proposed system consists of the various calculators which is going to calculate the various ratio which determine the fitness level of a person; accordingly, the meal plan and workout plan will be provided. It is going to have a discussion forum where one can share their views and problems. The advantages of this proposed system is it is a complete package, ultra reliable and free of cost.

## III. SYSTEM DESIGN

The process by which the desires are transformed into demonstration of software is called system design. This approach provides the demonstration of software with the purpose to access for superiority. The use case diagram for this mobile application is shown in fig.1.



*Fig. 1 Use case diagram of Fitness App*

Activity diagram is same as a UML diagram which focuses on top of the implementation and run of the performance of a system as an alternative of implementation.

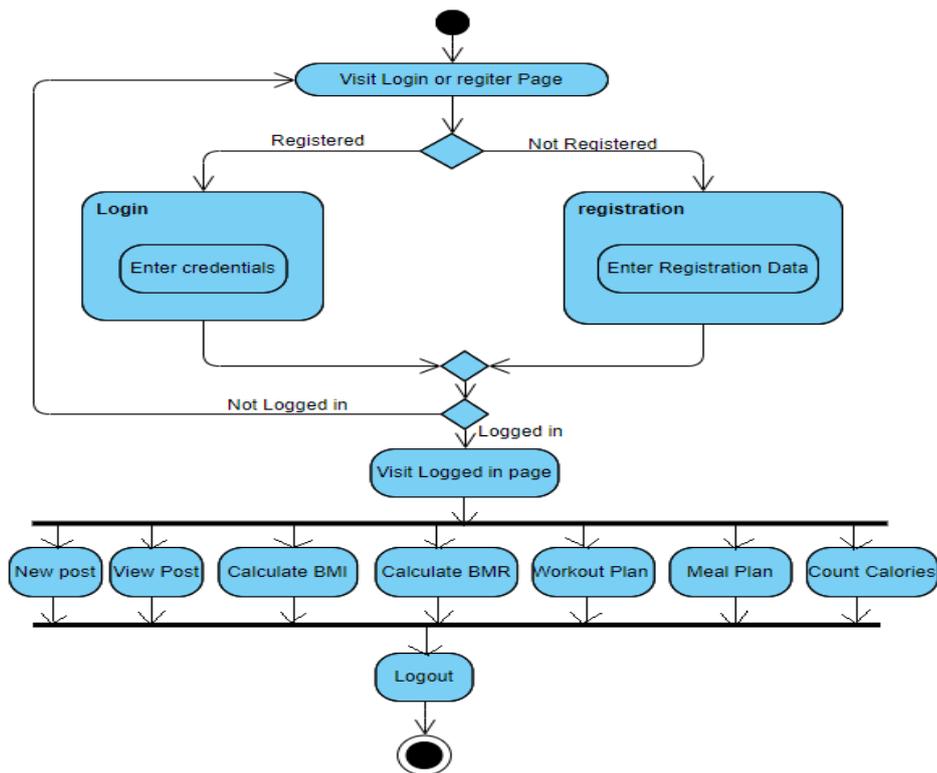


Fig.2 Activity diagram of Fitness App

The activity diagram of this fitness application is shown in fig.2. The various activities that are being followed in this android application is user registration, user login, new post, view post, calculate BMI and BMR, get workout and meal plan and calculating calorie requirement.

The class diagram shows the static approach of this application. Class diagram can be used to construct executable component of this application. The function of this class diagrams shows static organization of classifiers in this system. The class diagram for this mobile application is shown in fig.3.

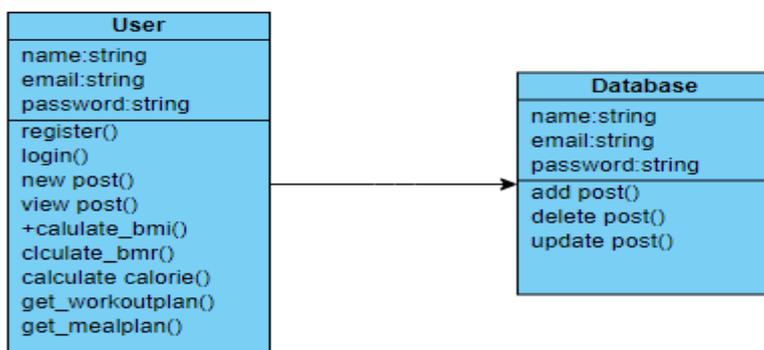
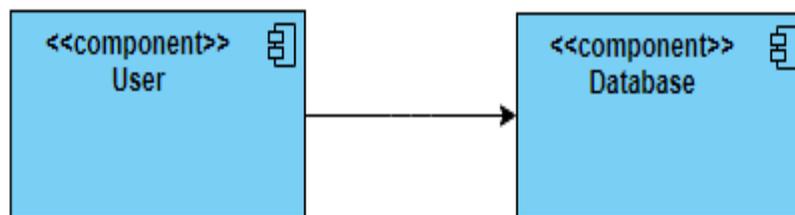


Fig. 3 Class diagram of Fitness App

Component diagrams are different from other UML diagrams. Component diagrams are used show the physical aspects of a specific system. Physical aspects about which we are

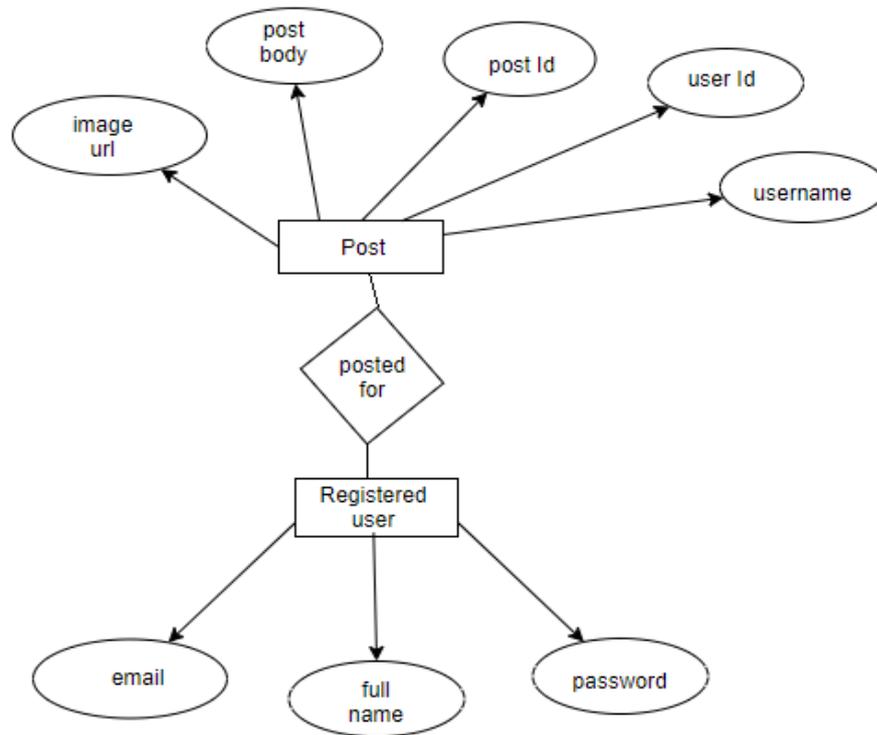
talking are files, documents etc. which are placed in nodes. Component diagrams are fundamentally used to identify the associations in the midst of the system. Executable System approaches are also completed by means of these diagrams. Component diagrams are particular type of UML diagram.

The principle of this diagram is also dissimilar from other diagrams. Component diagram does not tell about the relation to the functionality of the system to a certain extent about the components that are used to construct these functionalities. It can be believed that component diagrams are second-hand to imagine the physical components in a system. Those components are libraries, packages, files, etc. Component diagrams are also being represented as a stable implementation approach of the system. Fundamentally, a component diagram splits the base system that is underneath into different stages of the functionality. The component diagram of this fitness approach is shown in fig.4.



*Fig. 4 Component diagram of Fitness App*

The ER diagram is shown in fig.5 which helps to plan database in a resourceful way. The attributes in this ER diagram is typically model in the form of oval with the person's name of the attributes, which connected to the unit or association that contain the attributes. Surrounded through the relational replication the final stride can normally be out of order into additional steps that of formative the group of information's contained by the system, usually determining which are the fundamental objects about which information is being stored and determine the relations amid those groups of information's. An entity relationship diagram is an illustrative representation of dissimilar data using convention that tell association between those data. ER diagrams are frequently used to represent composite databases in the field of software engineering and information technology. The ER diagram of database used in this approach as follows.



*Fig.5 ER diagram of Application*

#### IV. MODULES

##### A. User Login

The user will enter their mail id and password for creating an identity to use this application. If already created, the user will have to enter their credentials to log into the application.

##### B. New Post

The user can post picture and text.

##### C. Registration

If not registered already the user has to register here by entering his details such as email, full name etc.

##### D. BMI

The user has to enter his measurements and this will let the user calculate his Body Mass Index.

##### E. BMR

The user has to enter his measurements and this will let the user calculate his Basal Metabolic Rate.

*F. Workout Plan*

The user has to select his goal and the Workout plan will be provided accordingly.

*G. Meal Plan*

The user has to select his goal and the Meal plan will be provided accordingly.

*H. Calorie calculator*

The user has to enter his measurements and this will let the user calculate his daily calorie requirement according to his activity levels.

*I. Logout*

To logout from the user account

**v. TESTING**

Testing is a group of actions that can be performed in move forward direction and conducted methodically. For this motivation a pattern of software testing and a set of steps into which can place specific test case design techniques[7]. The test case login is shown in Table-1.

**Table - 1 Test Case Login**

Login Id	Ct 01
Developed by	xxxx
Login Details	Testing login credentials in Fitness Application
Verified by	xxxx
Edition	1.1
Verifier Name	xxx
Test day	22-Feb
Test Case (Pass/Fail/Not Executed)	Pass

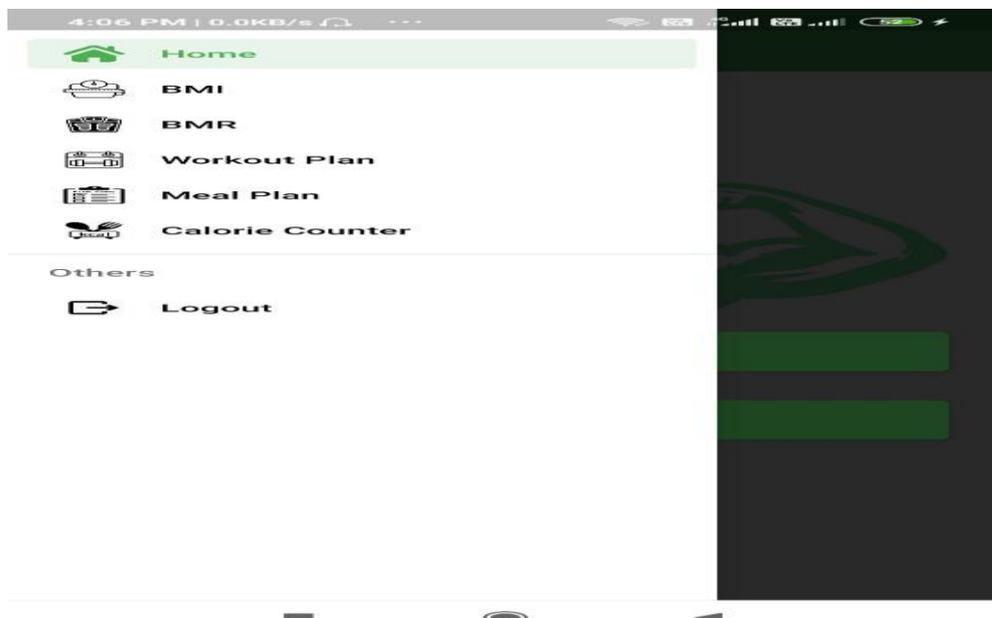
The most important goal of unit testing is to obtain the smallest number of piece of testable software in this mobile application. Segregate from the residue of the codes, and identify whether it behave precisely as expected. Each unit is experienced independently previous to integrating them into modules to verify the interface among the modules. Unit testing has demonstrated its worth with a large proportion of defects was acknowledged throughout its use in the corporation and the user registration form. The sample test data is shown in table-2 and the test scenarios are shown in table-3. The performance of this approach can be enhanced with intelligent techniques discussed in [8].

**Table - 2 Test Data**

Sl. No.	Test Data
1	Email=Mail_id
2	pass=123456789
3	Login=page
4	post text
5	upload image

**Table - 3 Test Scenarios**

Step No.	Steps Information	Expected Output	Actual Output	Pass/Fail/Not executed/Incomplete
1	Navigate to submission	Application should be opened	Expected	Pass
2	Enter the details	Data's can be entered	Expected	Pass
3	Enter user id and password	User is logged in	Expected	Pass
4	Login to Application	User is logged in	Expected	Pass

**Fig.6 Output Screen**

All the features such as BMI calculator, BMR calculator, Workout Plan, Meal Plan, Calorie Counter and others of this fitness mobile application output screen is shown in fig.6.

## VI. CONCLUSION

Now a day's people are more concerned about their fitness than ever before which is very good and they should be. But for achieving a great fitness level there are several things which are needed to be kept in mind whether it be right food, proper workout routine etc, and these all are not easy to maintain because of people's busy life. Also, there are researches and studies are going on every day on various aspects of fitness, healthy living and diet and these are needed to be shared for everyone's benefit. The proposed application shows an effective Android Application to achieve all these goals and added almost all features such as BMI calculator, BMR calculator, Workout Plan, Meal Plan, Calorie Counter, Discussion forum to this Fitness Application to smart someone's fitness journey. This can be someone's ultimate companion which would help them to achieve his desired fitness level.

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