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Fitverse: A Fitness Assistant Application using Flutter

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Abstract: With reference to this document, it describes the process and components of the development of the project. A fitness schedule is any behavioral pattern that one often and regularly does, by and large automatically; and Fitverse- the fitness assistant application, is a tool that aids the user in their fitness journey by providing them with customized diet recommendations and workout schedules. It also monitors if and when you complete your desired diet and fitness targets and acts as a guide in one's journey to achieve the aspired fitness goals. Turning good behaviors into habits makes them our default, automatic choices of action. This all but eliminates the willful effort required to repeat them. It aids users with their fitness journey by being the virtual fitness trainer. Fitverse is an android-based application built using Flutter that helps in achieving fitness goals and building concrete habits. The Prototype Model is used to develop this system along with iterative software development model. As for the software used to develop this system is Visual studio code and programming language used is Dart with Firebase as the database. This technology can transform the current daunting task to develop a fitness schedule or a habit and make it more efficient and easier.
Keywords: Dart language, Flutter, Iterative Software Development Model, Prototype Model, Firebase

I. INTRODUCTION

Everyone wishes to build a fitness schedule and new healthy habits to reach their fitness goals but the process of developing that fitness schedule and following the process of achieving that fitness goal is not easy. There are a lot of obstacles that come in the way to maintaining that consistency to build a schedule e.g., getting overwhelmed, getting distracted or forgetting the order of activities. Fitverse can help you reach your fitness goals and also form long-lasting positive habits. Fitverse, a fitness assistant application recommends diets and workouts for you and helps you document your progress on the diet and workouts you have followed throughout the month. It encourages you to keep going and provide clear insight into how well you're really doing. Using Flutter app development method, we have tried to create an efficient, free-of-cost and low-end device supported Fitness Assistant Application that aids in creating fitness centric lifestyles.

II. LITERATURE SURVEY

Steven S. Coughlin, PhD1,* , Mary Whitehead, MPH, CHES2, Joyce Q. Sheats, RN, MPH3, Jeff Mastromonico, concluded from their literature review that the accuracy from results obtained through fitness applications is found to be accurate and applications tend to increease awareness of food intake and weight management. [2]

Prof. Pooja Nagdev, Simran Batra , Sahil Pamnani , Pranav Parab ,Karan Parikh aimed to provide diets and workout using Machine Learning algorithms. [1]

Gourangi Taware, Rohit Agarwal, Pratik Dhende, Prathamesh Jondhalekar, Prof. Shailesh Hule, proposed an Artificial Intelligence based approach to develop an application that aims at improving overall fitness including posture correction and workout recommendation.[3]

Existing Fitness Assistant Applications like HealthifyMe and Nike Training Club provide digital fitness assistance through mobile applications. HealthifyMe charges a premium subsscription fee for providing fitness trainers and supports higher versions of android. Nike Training Club uses quiz based approach to determine the fitness schedules based on a variety of questions.

III. METHODOLOGY

The exisitng technologies use Java based application developments that use object-based approach to store and pass data for functioning of the application. We have proposed to develop a fitnesss assistant application using flutter which uses widget-based approach that consumes less functioning space and caters to users with lower-end phones with lower specs.

To use an easier and more programmer-friendly method, we have used Dart programming language which is based on flutter. Fitverse provides efficient diet recommendations by calculating manintainence calories, weight gain caloriess, weight loss calories, extreme weight gain calories and extreme weight loss calories, by taking user-provided inputs like height, current weight and target weight.

A. Dart Programming Language
Dart is an open-source, general-purpose, object-oriented programming language with C-style syntax developed by Google in 2011. The purpose of Dart programming is to create a front-end user interfaces for the web and mobile apps. It is under active development, compiled to native machine code for building mobile apps, inspired by other programming languages such as Java, JavaScript, C#, and is Strongly Typed. Since Dart is a compiled language so you cannot execute your code directly; instead, the compiler parses it and transfer it into machine code.

B. Flutter
Flutter is an open source framework to create high quality, high performance mobile applications across mobile operating systems - Android and iOS. It provides a simple, powerful, efficient and easy to understand SDK to write mobile application in Google's own language, Dart. This tutorial walks through the basics of Flutter framework, installation of Flutter SDK, setting up Android Studio to develop Flutter based application, architecture of Flutter framework and developing all type of mobile applications using Flutter framework.

C. Maintenance Calories Calculation
To calculate your daily maintenance calorie intake, or the calories you'd eat to stay at the same weight, grab a calculator – and your most recent weight and height in kilos and cm. We'll start by calculating your basal metabolic rate, or BMR, using the Mifflin St. Jeor equation, one of several options – but is commonly researched and regarded as a good estimate.
BMR= 10 x weight (kg) + 6.25 x height (cm) + 5

IV.IMPLEMENTATION
A user first logs into the system by either entering their already existing user credentials or registers as a new user. Upon which they're redirected to the home page. There, the user enters their current weight, height and target weight in the application. The system runs a calculation that returns the Basal Metabolic Rate (BMR) according to the user given paramters. The computer then computes to determine what diets to recommend according to categories like maintainence, weight loss, extreme weight loss, weight gain, extreme weight gain, all of which have a unique code id associated with it linked to a BMR range.
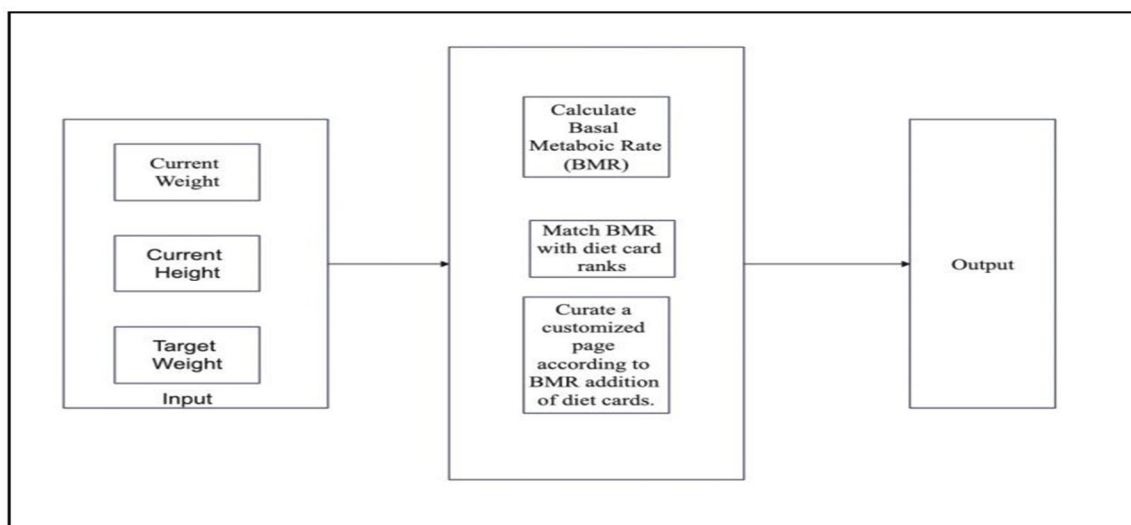

Fig 1. System Design

As shown in Fig.1, user-entered parameters are first collected by the system. A Basal Metabolic Rate is cacluated from it using the formula: BMR= 10 x weight (kg**) + 6.25** x height (cm**) + 5.** The system then searches for the closest ranked page with BMR that falls in the given unique ranges. The recommendation system then generates customized diets and workouts based on unique indexing that is relative to the BMR value of the user. Using this approach, the dynamic space required for calculation is significantly reduced which is combined with Dart Programming Language's charecteristic of being a compiled language (Compiler directly parses the code and trasnfers it to machine code). This makes the application light-to-use for all the platforms it runs on and enables users with low-end phones with lower android version and lower specifications to operate it as well.
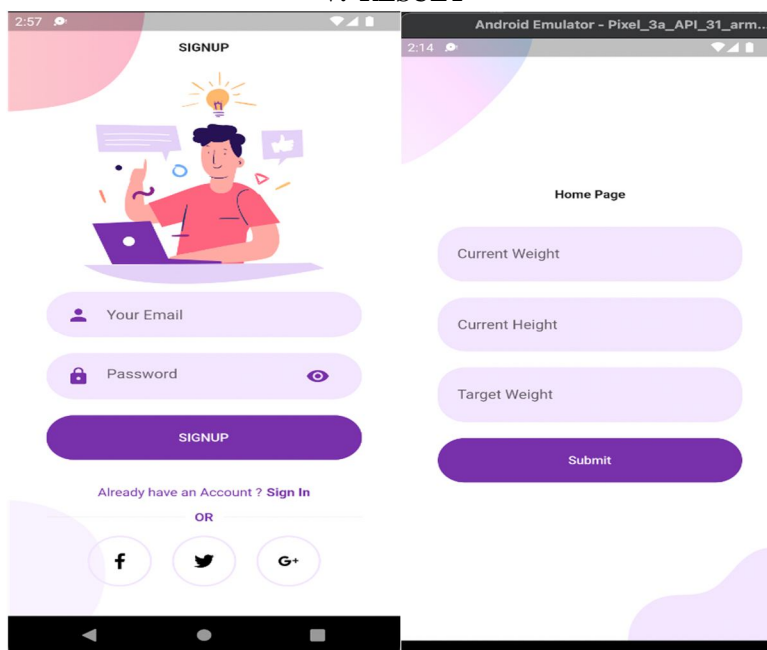
V. RESULT

Fig. 2.1

Fig. 2.2

As shown in the figure 2.1, first the user uses their user credentials to login to the system. Then in screen showed in Fig 2.2, users enter their body paramters like current weight, height and target weight. This system then does the computation to fetch result which has a customized diet plan and workout.
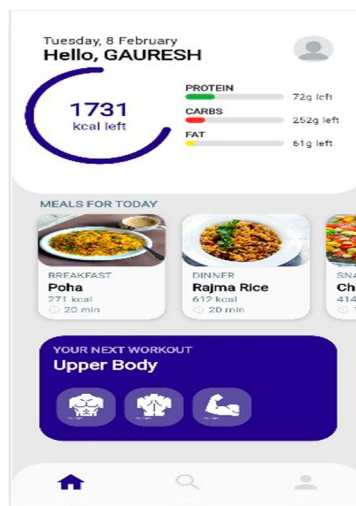

Fig. 2.3

A customized diet and workout is then generated using the calculated BMR value as shown in Fig.2.3

VI. CONCLUSION

Our fitness assistant application manages to efficently generate customized diets and workouts according to unique user given body parameters. It uses Dart programming language which is a compiled lanuage i.e. the compiler parses the code and transfers it to machine code making it store less data in cache memory. In addition, it does not use dynamic computing making it consume less space without compromising on the efficiency. It enables users with lower-end devices and android softwares to use a fitness assistant application which is free of cost, works with lower-spec containing devices and which provides efficient customised workout plans and diets.

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