

Business Model For Health And Fitness Application with Activity And Progress Tracking.

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Abstract—Tablets and smartphones are gradually but surely altering the way we think about our fitness and health. Nowadays, a variety of high-quality apps for mobile devices are available to users, and they cover the entire healthcare chain, i.e. information collection and prevention, diagnosis, care, and tracking. Our team, with the guidance of our mentors, have created a mobile health and fitness app called Evolve. More people are worried about their bodies and determined to take action in the present. Technology is inextricably linked with the way it has developed in such a rapid manner. The market overview of the moment indicates that the market has plenty of potential. As the market expands and develops to the next level, more division of apps has been observed including exercise and workout apps, diet and nutrition apps, and activities and log apps. The application that incorporates all of these essential features into one app on mobile can make tracking and calculating everyday fitness routines simple and efficient for users. Based on the information supplied from the users, the application suggests an everyday Net Calorie target for the user to reach their weight reduction (or growth) goals. While the user eats food and exercise all day long, they can record their meals and exercises in the app's diary for exercise and food. The application calculates the number of calories the user has consumed through food and burnt through exercising and will inform the user of the number of calories they've to consume for the entire day. The application also makes use of barcode scanning for packaged food products. The user can scan their packaged food items and retrieve nutritional information about the food product. The most appealing aspect of the system is that it makes logging simpler the more one is able to do it. The program remembers what exercises the user performs, making it simple for the user to add their daily exercise routine within a short span of time.

Keywords: Health and Fitness, Activity Tracking, Mobile Health And Fitness App.

I. INTRODUCTION

The growth of mobile technology has revolutionized the way we keep track of our health and keep active. Today, more than 89 percent of the population are using smartphones and the rise of food and fitness tracking apps has gained significant popularity and are currently utilized by 33 percent of the people who are using them worldwide. However, with more than 97,000 wellness apps accessible through the mobile US apps stores, we understand it's a challenge to choose the one that meets your requirements or to determine if they're worth your time. The goal of the app is to help you make yourself healthy by tracking your intake of food and exercise routine.

1. Apps for fitness can help steer you in the direction you need to go. If you want to live a healthy life all you require is the right nudge from a reliable source. This will help you change your daily routine and lifestyle if required. They can provide that push to move in the direction you need to go in. They keep you motivated and focused on achieving the goal of fitness.

2. The app will provide you with data based on your physical health. The fitness tracking application will keep a record of your daily workout routine, food intake, BMR, body weight, etc.

II. RELATED WORK

Mobile apps to manage chronic disease: Lessons learnt from MyFitnessCompanion [1]. This research paper examines the use of a fitness and health application, MyFitnessCompanion, among those in the healthcare field and by people who deal with the management of chronic diseases. It also addresses ways mobile health apps might be released within the next few years [1]. MyFitnessCompanion lets users track their progress with graphs that add their personal data to a PHR system similar to the Microsoft HealthVault [1]. MyFitnessCompanion has three different versions of the app (Free Gold Silver, Free). Free version limited to the number simultaneous monitoring of data is limited to 3 and 10 measurements. are available prior to when users are prompted to buy Premium versions (Silver or Gold) or erase prior measurements. Silver permits unlimited measurement collection and three displays. The highest version offered on this platform is the gold version [1]. MyFitnessCompanion at the moment offers a mix of various languages. MyFitnessCompanion can use the data of the users and predict personal thresholds. Users can change the variety of thresholds based on their activity levels. Users will also be prompted to analyze their measurements while being notified via either voice or text messages [1]. MyFitnessCompanion monitors the level of energy, calories burned, the body temperature, as well as the rate of breathing. It uses built-in GPS to give precise outdoors distance tracking. It also allows users to manually input data for tracking purposes, apart from using Bluetooth. The majority of tests are taken at the moment of necessity (94.5 percent) but only a small proportion of people are able to monitor an individual's heartbeat, their respiratory rate, or oxygen levels over a

longer duration. MyFitnessCompanion stores the measurements on local storage in your smartphone, however, it allows users to add their information about their health in a PHR custom system. This system can be used by doctors to monitor the users health on a yearly basis.[1] Smartphone Applications For Patients' Health and Fitness. This research paper outlines evidence that apps can aid patients in reaching their fitness and health goals [2]. It also speaks about the qualities you should look for in the application. It comes with a variety of features such as; Free version allows users to try the basic functions of the application. Paid version: Includes one-time subscription fees for more advanced features. After installing the app, it will collect essential information from users like gender and date of birth, weight and height, and date of birth. There are numerous apps that include virtual coaches who can interact and encourage the user to the point that they feel as if they're being instructed by a person in a an intimate way. Certain apps with advanced features have amazing animations and illustrations of the proper method of exercise like gym exercises. Many apps use barcodes to scan the food item and get its nutritional information. Many fitness and health apps let users post their achievements with acquaintances through the social networks (Facebook, Twitter, Pinterest, Instagram). This way, social media support can help encourage feedback and positive competition among users. Many apps send short statistics to their customers as well as weekly reports and suggestions for new goals and exercises for the next few weeks. Use of fitness apps: The various features discussion in this research paper are as follows; advanced user account Or Registration: All diet apps should be to collect and evaluate user data. The ideal profile for any consumer of the app must include gender weight, age, body specifications, levels of activity as well as medical history. This knowledge will help you enjoy your experience with your diet app more efficiently. Integration of mobile fitness apps with fitness band trackers. Fitness bands are used to automatically track important data such as total calories burnt during interval training, heart rate of the user, as well as pulse rate and these values, are then added to the app. Food logging and calorie counter: The food logging and calorie counter are the two key aspects in any fitness app and will help the user to track their daily food intake and calculate their calories for the day [1]. Push Notifications: The use of push notifications help to maintain each users total retention on the app as well as interaction. Diet tracking features of the app help encourage users to strictly follow their meal plan in order to achieve their basic goals. Blogs: Consumers can share our blogs on social media which will help improve our app's exposure in the market. Pre-Made Diet Plans: Using a cookbook provided by the app will be useful for consumers to track their meals. Many people are looking for an app that helps with fitness and diet not just to keep track of food intake, but also to help them keep a nutritious diet. Food plans can be useful. The user will also be provided assistance by the app as they cook using the pre made diet plan in their kitchen. The app can have a speech recognition system which will guide the user in each step of the process of cooking the meal. Community Feature: With the use of social media, users can share their progress achieved with their peers. Thus, using stars, badges and ranks to reward users for their achievements like the goal of completing or losing weight can encourage consumers to take action. Users' Perspective on the Mobile Fitness Applications: This research paper indicated how effective fitness apps were among users and the data analysis and interpretation of the apps [3]. Research paper's goals: To gain insight into the opinions of users regarding mobile health apps. To comprehend the impact of fitness apps on users. To determine the effectiveness of fitness apps in increasing fitness of users. To investigate the effects on fitness programs to reduce time and expense. To know if an app for fitness is preferable over fitness centers. To understand the appeal of fitness apps and their users. Data Analysis and Interpretation of Users Gender of Re-spondents Data Analysis and Interpretation of Users. Gender of Respondents. Of the respondents in total 56 percent of them are male , while 44 percent female. The study shows that males tend to be more likely to use the fitness apps when than female respondents [3]. Age of the Respondents 70 percent are in the category of 20-35 years. The remainder are divided in two categories, which are people who are aged between 35 to 45 years old , and the rest were set in 45 years old, making it a total of 18 percent and a total of 12 percent of all users. With this data, we can interpret that most of the users were young people [3]. Type of App Preferred Most Important Element in a Fitness App From the overall people who have surveyed, 30 percent see fitness exercises being the highest priority. It is clear that the majority respondents consider the routines for exercising and progress charts are the most essential in fitness apps [3]. Duration of App Usage: This is a clear indication of the growing app's popularity. The majority of respondents have been using them just recently. Therefore, adding new features to fitness apps is a smart idea. In total, 34 percent people made use of this app for a prolonged period of time, i.e three months, six, months and up to 1 year [3]. Time Spent on Apps for Fitness It is clear that of the users who use the app daily to keep up with their workout routines. 28 percent of them are regular users and 24 percent of them are regular users and 8 percent are regular users [3]. Main Training Program for Fitness: The results show respondents' most popular training plan to improve their fitness. It is evident 40 percent of overall respondents favor workouts and counting calories. Other categories include cardio based exercises (26 percent) and Aerobic training programmes (24 percent) and diet programs (10 percent). In the process of creating the Calorie Counter application for Smartphones The health monitoring system is classified by technological advancements in two categories, the conventional and the digital system for monitoring health . The past was when a person's health-related activities were assessed using an analog method that required an analog scale as well as thermometers. The technology for tracking health has surpassed the limitations of conventional methods of tracking health, and has also helped to bring about the rise of fitness-related devices [3] This paper contains four apps that are used for altering important lifestyle habits which are related to weight gain in young adults, such as physical activity and takeaway (fast food), fruit and vegetables, and consumption of sugared beverages. It is used to analyze the development process [6]. Smartphone apps can be an innovative medium that offers a large amount of interventions for individualized health behavior changes, but researchers rarely find target audiences, available technologies, existing commercial apps, and their use. You need to consider the possibility of short life [6]. Stopwatches are no longer used today. and bathroom scales to assess fitness levels are becoming less common both in the developed and developing nations all over the world. The study showed that children adults who are in good health are keen on apps that are designed to improve health-related behavior. They also liked the ability to track their behavior and goals as well as the capability to seek advice and help "on the go". The study also revealed an association between the use of the calorie and fitness trackers as well as eating disorders. This conclusion was backed by the study that showed that people who use applications for health and fitness on their mobiles scored higher in their eating habits compared to those who didn't, and that the use of more than one type of mobile health application

increased the frequency of eating [3]. The topic is crucial in medical research, most importantly to maintain the health of human body. The advancement of this application into an Android-based software makes it more accessible to smartphones because of the increasing popularity of Android mobile phones that are based on Android. The application for mobile devices monitors the physical fitness of an individual over time, determining the calories burned in exercise [3]. This study analyzed how the rewards of using diet and fitness apps motivate users to continue using these apps. The effects of the seven chips received were analyzed by hierarchical regression analysis. The results showed that the five benefits of recordability, networkability, reliability, comprehension, and epidemic greatly predicted the intent of users to continue using the diet / fitness app. Accuracy and virtual satisfaction from entertainment were not important predictors. These insights help expand your theoretical and practical knowledge of new digital mobile media phenomena by identifying motivations for using the diet / fitness app. Based on the results, recommendations for researchers, practitioners, and developers are made [7]. The purpose of this paper was to investigate the determinants of user recruitment for smartphone fitness apps in the context of emerging economies [10]. This study used the acceptance of extended unified theory and the use of technology (UTAUT2) as a basic model with two other components: self-efficacy and personal innovation. The data was collected by an online survey and a total of 324 valid responses were collected for statistical analysis. All virtual relationships were tested by partial least squared structural equation modeling (PLSSEM) using an open source programming language and software environment, R software package. Key predictors of the intent to adopt a smartphone fitness app include expected effort, social impact, and perceived value, habits, and personal innovation. In addition, this study confirms the key relationships between individual innovation and habits, self-efficacy and effort expectations, and effort expectations and performance expectations. This study shows that individual innovation is the strongest predictor of behavioral intent. Contrary to expectations, factors such as performance expectations, enabling conditions, and hedonic motivation did not affect behavioral intent. This survey provides app developers with important clues that can have a significant impact on the adoption of fitness apps. This result suggests that marketers should focus on users with a high level of personal innovation who can continue to act as role models and have a significant impact on the social environment. Interestingly, this result suggests that fitness apps shouldn't place too much emphasis on the hedonic value of the services they offer compared to other apps. This study is one of the few studies to investigate the adoption of smartphone fitness apps in the context of emerging markets using an enhanced version of the UTAUT2 model. In addition, this study shows how new intrinsic and extrinsic variables (such as self-efficacy and personal innovation) contribute to the better explanatory power of the UTAUT2 framework [10]. The top 400 free and paid apps from the iTunes and Google Play stores have been reviewed. The app was included when the main target behavior was PA, the target user was an adult, and the app had standalone capabilities. The app was downloaded to a mobile phone and evaluated by two reviewers based on the following quality criteria: (1) User privacy and safety, (2) Behavior modification technology (BCT) presence, development And the quality of the evaluation process, (3) User evaluation and ease of use [9]. The purpose of this review and content analysis was to use Healthcare Quality Indicators to rank the quality of the most popular PA apps on the market [9].

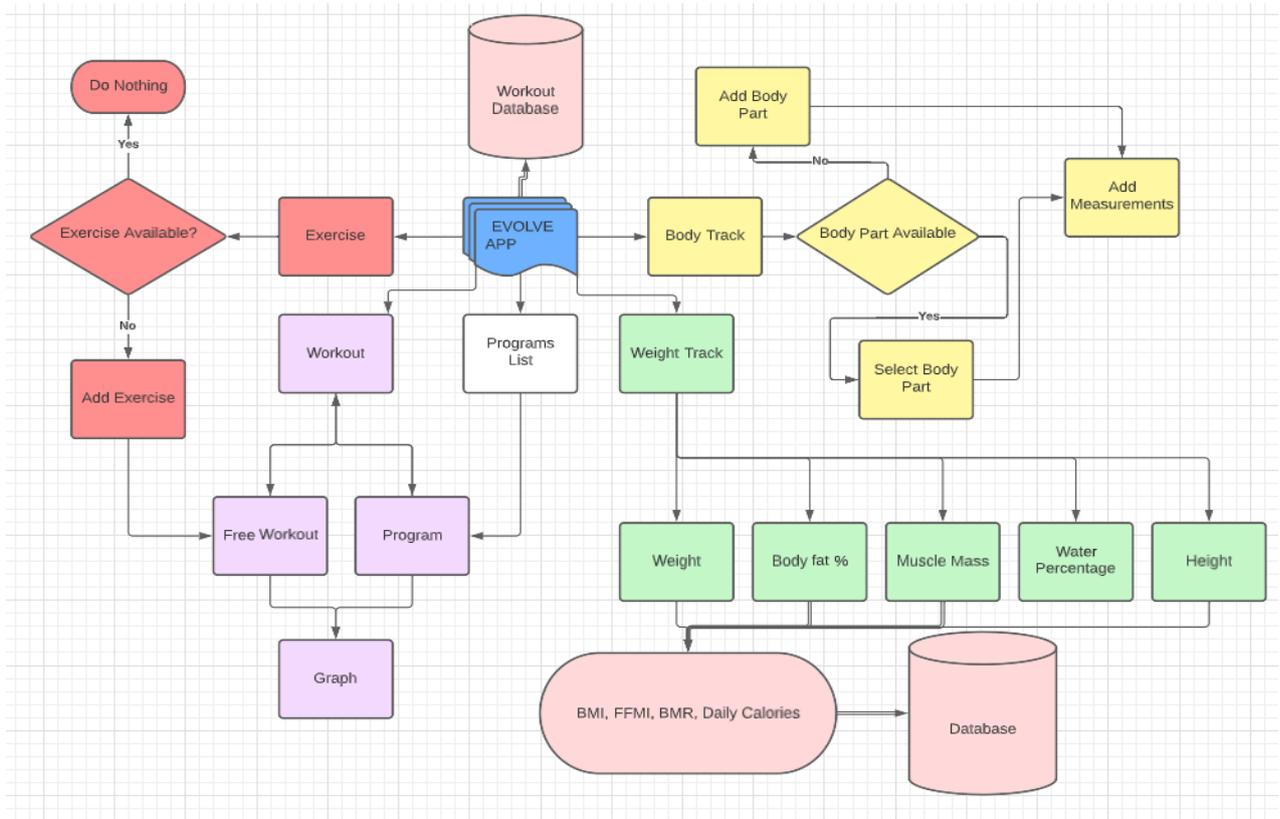
This article summarizes data that promotes physical activity using the smartphone app, based on a bibliographic search using related search terms from PubMed and CINAHL [8]. After reviewing the article summary or full text, 15 eligible studies on the acceptability or effectiveness of smartphone apps for increasing physical activity were identified. Of the 15 studies included, 6 were qualitative studies, 8 were randomized controlled trials, and 1 was a non-randomized study with pre-and post-design. The results show that the intervention effect is moderate, but the smartphone app may be effective in promoting physical activity. Participants of different ages and genders automatically track physical activity (such as steps), track their progress towards their physical activity goals, and are easy and flexible enough to be used in different types of physical activity. Responds positively to certain apps [8]. College students experience weight gain, which can contribute to serious health problems. Health education efforts with college students are increasingly using new technologies. Smartphone applications (apps) in particular are becoming more popular and used by all young people [5]. A formative study was conducted to explain how college students in the southwestern United States use health / fitness apps to change their behavior [5]. 18 to 30-year-old college students (n = 27) who reported using the health/fitness app were recruited from a large public university campus and participated in an interview on app choices, action goals and features. Interviews were recorded, transcribed, and analyzed topic by topic using a four-person coding team and qualitative research software NVivo [5]. Most participants downloaded the app to reach their goal and felt that the app helped them reach their goal. Two groups of people were discovered. A group that uses the app to support established behavior and a group that uses the app to adopt new behavior. The majority of participants reported that the acceptable app was free and easy to use, provided visual / auditory cues, and had game-based rewards. Most participants strongly hated connecting social media to the app and didn't use these features [5]. From 2007 to January 2018, a total of 7 electronic databases (EMBASE, EmCare, MEDLINE, Scopus, Sport Discus, Cochrane Library, Web of Science) were searched. The study is eligible if it is a randomized controlled trial in adults using the smartphone app as the primary or sole component of physical activity intervention, following population, interventions, controls and results. The control condition was objective physical activity measured in any minute of moderate to intense physical activity steps, with no or minimal intervention. The quality of the study was assessed using a 25-point tool based on the integrated criteria checklist for reported trials. A meta-analysis of study effects was performed using a random effects model approach. Perform a sensitivity analysis to determine if the intervention effect varies based on the duration of the intervention, targeted behavior (physical activity alone vs. physical activity combined with other healthy behaviors), or target population (general adult population vs. specific health population) [11]. The original database search identified a total of 6170 studies. Of these, nine studies involving a total of 1740 people met the approval criteria. Of these, six studies may be included in a meta-analysis of the effects of sports apps on the number of steps per day. Compared to the control condition, the average number of steps per day for participants increased significantly (P = 0.19) in the smartphone app, and the average number of steps per day between groups was 476.75 steps (95% CI - 229.57). It was ~ 1183 .07). In the sensitivity analysis, physical activity programs that lasted less than 3 months were more effective than apps evaluated for 3 months or longer

($P = 0.01$), and physical activity apps separated into physical activity target apps were only physical activity. It has been shown to be more effective than the app. ($P = 0.04$). The effectiveness of the physical activity app did not appear to differ between target populations [11]. Fitness app Application Research Based on big data and algorithm. It uses algorithms, literature research and big data analysis techniques. Through fitness app analysis it is found that all types of fitness app network content are missing to shape the correct values of practitioners. Analyze the benefits and the limits of current fitness app moral education to play its greatest role the fitness app gives an overview of moral education and makes suggestions for the development of multidimensional moral education. [12]. With increasing health awareness of the general public, the demand for sports is increasing. Fitness apps will continue to grow. Especially during the new coronavirus, Pneumonia, people can't go out and more and more people choose to use sports fitness app as a fitness technique. Online fitness is becoming a new sports trend. Compared to traditional gyms, fitness apps have their own advantages [12]. The first is that it is easy to use and does not take much time. For young people don't have much time or energy to go to the gym because of the high work pressure, you have a great need for exercise and sports and fitness apps can easily solve this contradiction. No separate fitness equipment required. Simply turn on the phone and you can: You can train anytime, anywhere. Second, data visualization. Fitness app can be displayed. Check the training data and physical condition on the screen, appropriate training plan and diet. This type of professional analysis is second to none traditional gym. Third, most fitness apps on the market now have social networks function. It provides you with a platform for communicating with fitness enthusiasts, share your experience. Including social elements is one of their strengths [13]. Users of mHealth devices and apps become more autonomous and motivated by self-adjusting their health behaviors, and more proactively and consistently in their lifestyles and wellness behaviors. This suggests that it is worthwhile to subsidize the prices of these devices to encourage the use of them for governments, private insurers, and technology companies. In fact, Apple recently worked with a Medicare plan provider to subsidize watches for the elderly [14]. Second, personalization is a double-edged sword. On the one hand, this limits some patients' involvement and well-being with wearable technology. Personalization, on the other hand, increases the use of telemedicine by patients and reduces medical costs. Practitioners of the healthcare ecosystem will benefit from having these conflicting effects in mind when designing their communication strategies. For example, they can perform experiments or conduct market research among locals to investigate the impact of personalization on patient preferences for face-to-face and telemedicine consultations. By collecting feedback on patient preferences, patients can anticipate the net benefits of personalization and adjust the frequency of personalized communication [14]. Third, mHealth devices and apps may provide health insurers with the ability to personalize premiums. They may be able to reward consumers who do more exercise, eat healthier and try to sleep longer with lower premiums. This is similar to what some car insurance companies are already doing. That is, you can equip your car with a tracking device to monitor your driving behavior and reward better drivers with lower premiums [14]. A mobile health (mHealth) app that supports individuals pursuing health and wellness goals such as: B. Weight management, stress management, smoking cessation, and self-management of chronic illness are increasing. Despite their potential benefits, the use of these tools is limited, as most users stop using them after just a few uses. In these situations, the mHealth app is less likely to get good results [15]. This research conducts a qualitative longitudinal survey of the continued use of the mHealth app. Data was collected from 17 participants over a two-week period through 34 pre- and post-use interviews and 193 diaries [15]. The research identifies two aspects that help mHealth app users explain their decision to continue using. Function evaluation by mHealth app users (user experience) and sustainability of health goals (intention) [15]. Key factors that influence user ratings for mHealth apps: interface design, navigation, notifications, data collection methods and tools, goal management, knowledge depth, system rules, actionable recommendations, and user system customization. Presents and correlates these factors with previous literature on the design of behavioral change technologies [15]. A framework that uses these two dimensions to represent four decisions that a user may make after the first interaction with the mHealth app: stop using, limit use, switch apps, and continue using was developed. Proposed to investigate in future research on the use of the mHealth app [15]. This study provides insights into the factors that influence a user's decision to continue using the mHealth app, as well as other possible decision scenarios after initial use experience. This result contributes to existing knowledge about using mHealth and has a significant impact on the design of mHealth apps for increased long-term user engagement [15].

System architecture

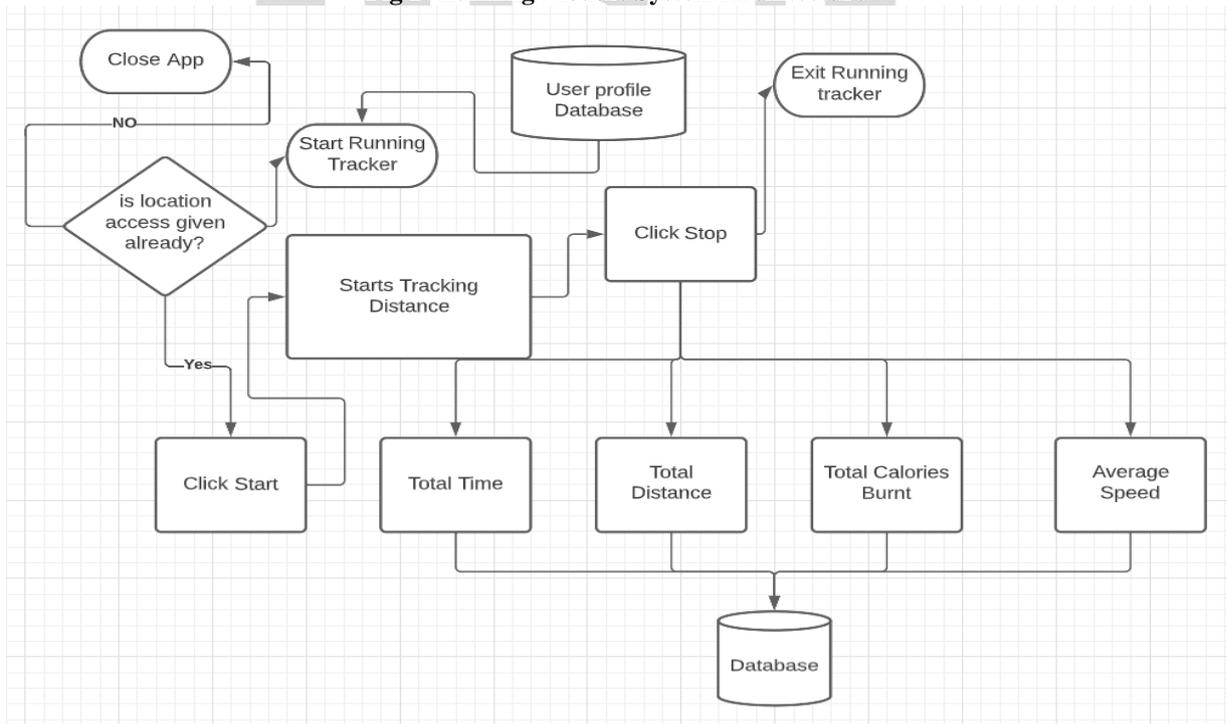
Fitness Module: The fitness module consists of 5 main features, i.e., exercise, workout, program list, weight track and body track. Users can add exercises based on their preference. These exercises will then be added to a free workout module where they can be accessed from. The workout feature stores the users workouts, programs and displays the users progress in the form of graphs. Program list feature stores the manually created programs with the users within the program section of the workout feature. This list can be accessed at any time by the user. Weight track module keeps a track of the users body weight, body fat percentage, muscle mass, water percentage and height. With the help of this data, the application will formulate their BMI, FFMI, BMR, and daily calories. This data is stored within a database. The body track features allows the user to add their body measurements and view the progress they have made in the form of weight loss of muscle gain with the help of graph charts.

Fig 1. Fitness Module System Architecture



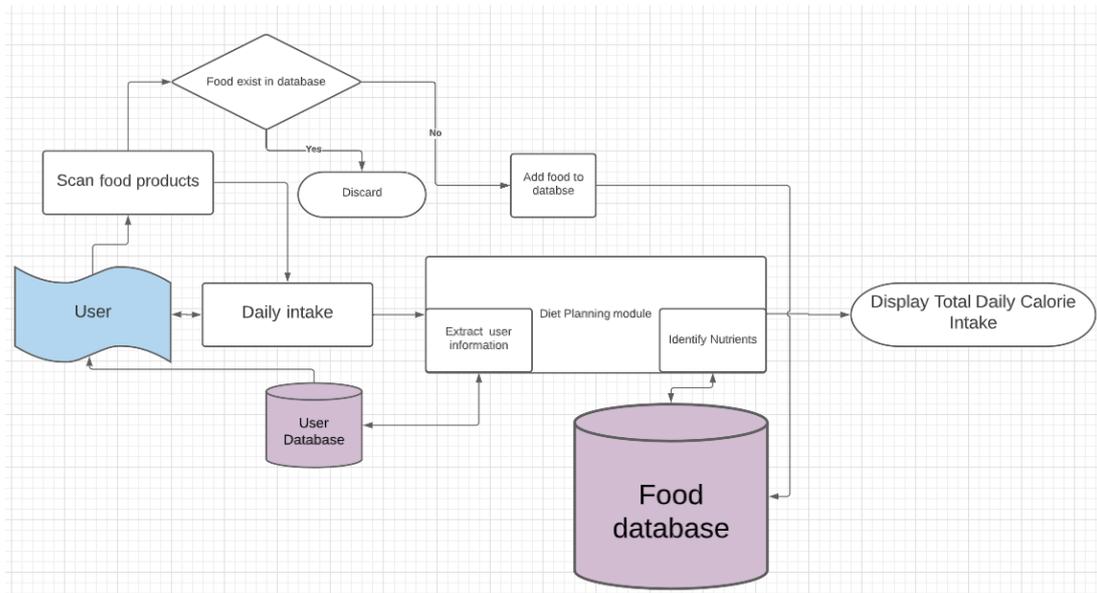
Running Module: The running module first gains access to the user’s location. Once location access is gained, the user can start running or walking and their workout will be tracked. At the end of the workout, this tracker will store the amount of calories burnt during the users workout, the users average running/walking speed, total distance covered as well as total time taken for the user to complete the workout. This data is stored within a database and can be viewed by the user at any time.

Fig 2. Running Module System Architecture



Barcode Scanner: The user can scan food products with the help of the barcode scanning module. This scanner will provide the user with the nutritional values of the scanned food product. This data will be stored within a food database for future use.

Fig 3. Barcode Scanner System Architecture



III. METHODOLOGY

Workout: The workout module allows users to track their daily workouts. The user’s can add the exercises they perform along with the sets, reps and weight used. The application will save this data along with the date and time of the performed exercise. This data can be viewed by the user at any given time from the history section. The application also comes with an inbuilt rest countdown timer. The function of this timer is to keep the user aware of the amount of rest time they have between each set of their workout. Viewing user progress is made simple with the help of activity charts in the form of graphs. These graphs show the user visual representation of the progress they made. This progress could be lifting more weight, or either doing more sets and reps,

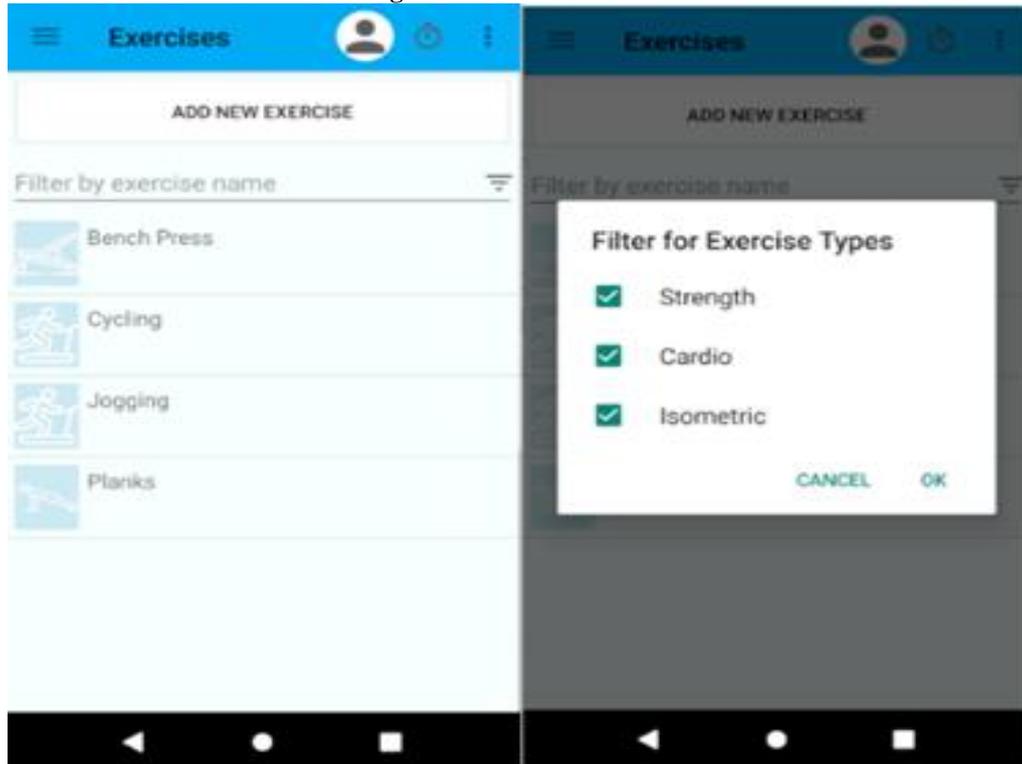
Fig 4. Workout Feature



Exercises: The exercise feature enables users to add the exercises they performed or are about to perform. The users can segregate the exercises based on cardio, isometric and strength. The users can add the name of the exercise, a short description about how to

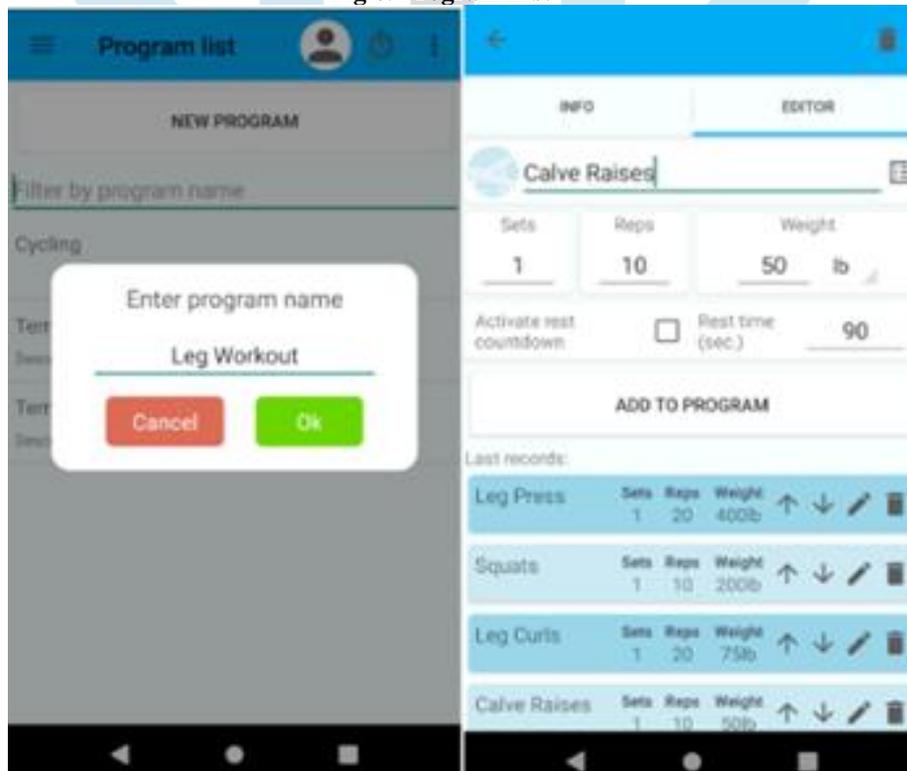
perform the exercise as well as the muscle groups which the exercise targets. This data will be saved within the exercise as well as the workout feature. The user can access this data whenever needed. This makes logging workout routines easy and saves time.

Fig 5. Exercise Feature



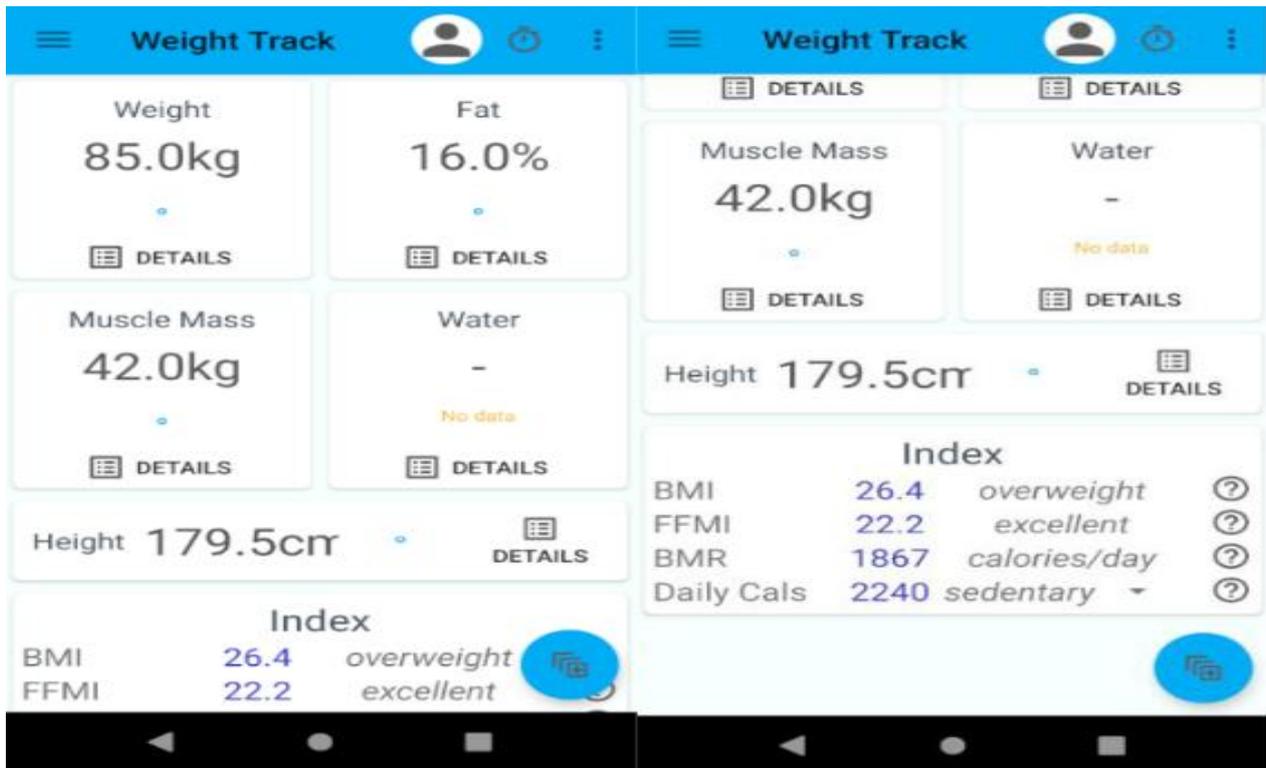
Program List: A workout program is essential for any person trying to maintain a healthy lifestyle. This feature allows users to create their own custom workout routines. Users can also add exercises based on their preference within these routines. This program list can be activated within the workout feature.

Fig 6. Program List



Weight Track: The weight track module takes data from the user such as weight, fat percentage, muscle mass percentage and height. This data will be used for the BMI calculation.

Fig 7. Weight Track Feature



The use of the BMI calculator is pretty straight forward. It determines the weight range of an individual relative to their weight and height. Based on the BMI rating, they can be classified into four categories: underweight, regular weight, overweight or extremely obese and severely. But, BMI is not a metric that considers things like age or levels of activity, so it is not a 100 percent precise measure of a body's weight that is healthy. However, it is an excellent gauge of health, and can assist you in determining whether you require medical assistance based on your BMI score.

Body Track: This feature stores data regarding users' body measurements. The user can measure various body parts like biceps, chest, waist, hips etc. This data will be stored along with the date and time. The user can then compare body measurements to analyze if they have made any significant weight loss or weight gain with the help of visual graphs. This keeps a track of the user's progress.

Fig 8. Body Track Feature



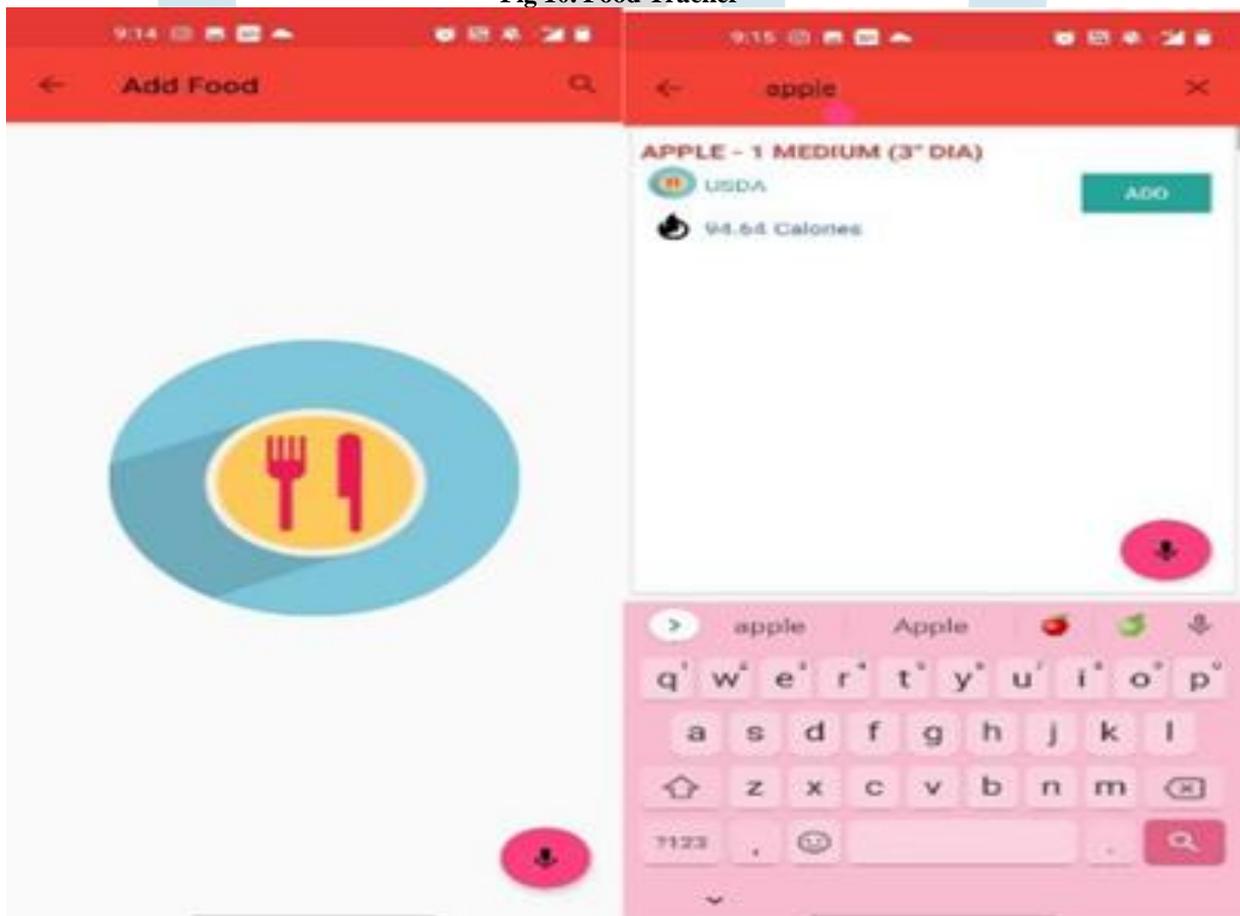
Barcode scanners: It collect the information on a product through scanning a stripe code that is usually found at the rear of an item. Utilizing one of the iPhone or Android scanners, apps on the device read the barcode, which reveals information like the name of the product and price, along with the current keeping Unit (SKU), etc. Barcodes are typically symbols of the form: Rectangle consisting of thin or thick parallel lines Parallel to each other [5]. The information you get by scanning a product is based on the data available within an individual database that is part of the service you are using.

Fig 9. Barcode Scanner



Food Tracker: The food tracker keeps a check on the user's food intake along with the amount of macronutrients consumed by the user, i.e, protein, carbohydrates and fats. With the food logging feature, the user can search for food items within the application, and retrieve its caloric data.

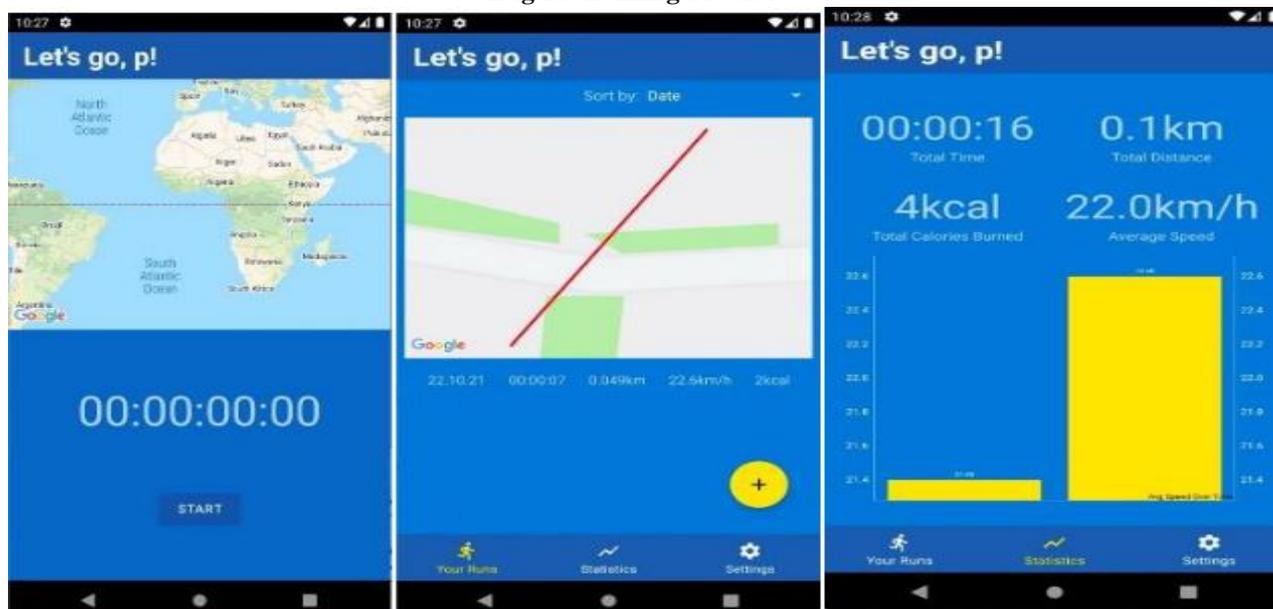
Fig 10. Food Tracker



Running App Tracker: Running app tracker is a straightforward simple application feature that monitors your speed and distance, calories burned as well as time and distance. Review your previous runs to keep track of your progress, and set routes within the

app to explore new routes around your home. It offers basic data on your run to help you begin your new routine. It also offers clear information that runners of all levels will appreciate. Functions: Tracks running, walking and jogging. Tracks time interval, speed, distance covered and route. Tracks calories. Keeps history of past workouts. Goal: Run Further, longer and with more intensity. Be held accountable for workouts. Helps keep track of total distance covered and total calories burnt. Improve overall fitness.

zFig 11. Running Tracker



CONCLUSION

Nowadays, more than 89 percent of people are using smart-phones and the rise of fitness and food tracking apps has gained significant growth and are being used by 33 percent of users around the world. However, with more than 97,000 wellness apps accessible in the mobile US storefronts, we're aware that it's difficult to choose the one for your needs, or to determine whether it's worth the effort. Our goal is to help you live healthier by keeping track of your water intake, food intake consumption, and exercise routine. This paper's application can help users better understand mobile health and fitness applications and its benefits.

IV. ACKNOWLEDGMENT

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