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DIET AND NUTRITION TRACKER FOR ANDROID DEVICES

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ABSTRACT A number of mobile fitness devices as well as smart watches have emerged on the technology landscape. However, the rate of adoption of these devices is still low especially in developing countries with a teeming population. On the other hand, smart phones are becoming ubiquitous given their steady price decline. To this end, the present study aims to leverage the smartphone platform by developing a smart phone fitness app that tracks the calories burnt by individuals who go about their daily activities while carrying their smart phones with them. In order to achieve this, the design specification for the application was done using Unified Modeling Language diagrams such as use case diagrams and sequence diagrams. This was then implemented using the following tools: Angular - a JavaScript framework and Ionic - a hybrid framework that was hosted via the Heroku Cloud Application Platform. The initial results show that the app can gain traction in terms of its adoption given the fact that it is cheaper to download the app than buy a new smart watch for the same purpose.

KEYWORDS : calories, cloud, fitness, smart phones, UML

INTRODUCTION

As of today, the use of stopwatches and bathroom scales to track fitness level is gradually becoming a thing of the past in both developed and developing nations of the world [1]. Tracking your nutrition has so many benefits, from helping to manage food intolerances to increasing energy, avoiding mood swings, and fueling the rhythms of your day. Whatever your reasons for logging your meals, a good app can help. Small changes can make a big difference to your health. Try incorporating at least six of the eight goals below into your diet. The advent of technology has made our generation sedentary. Due to technology, the amount of physical work has almost diminished which is the root cause of various problems. According to a new study around 30% of world's population is overweight or obese. These stats show that we are living in the dark times and the agenda of Health & Fitness is in desperate need of a push. You can see this push in the form of increasing number of Gyms and nutrition centers across the world. Gyms have been a huge success. However, everybody doesn't have the time to join the gym. Moreover, some do join on the New Year's Eve and then procrastinate for the rest of year. For such audiences, the diet & fitness app is a savior. They assist the users to follow a proper diet and to keep a check on their calories intake. This study therefore explores the possibility of developing a mobile application that would serve as a substitute to the use of these wearable in tracking calorie burn in individuals.

The rest of this study is structured as follows: Sectiondiscusses related works while Sectionpresents the design specification of the proposed application. Section, discusses the results obtained followed by conclusion of the paper insection 5.

RELATED WORK

Dennison et. all [2], suggested that young, currently healthy adults, have some interest in apps that attempt to support health-related behavior change. They also valued the ability to record and track behavior and goals and the ability to acquire advice and information “on the go”. Chen et. all [3] demonstrated that apps promoting physical activity applied an average of 5 out of 23 possible behavior change techniques.

Charlene et. all [4] observed that paid apps tended to be user-friendlier in terms of the user's literacy in comparison to free apps hence the need to explore the development of more user-friendly and accessible apps. This lead to the study done by Payne et. all [5] which showed evidence that apps are a feasible and acceptable means of administering health interventions. As a result, the study by Tang et. all [] opined that the use of particular design features and application of evidence-based behavior change techniques could optimize continued use and the effectiveness of internet/smart phone interventions. Furthermore, the works of Clawson et. all [7] revealed that abandonment does not necessarily reflect individuals' dissatisfaction with technology. Individuals were selling their old devices because they achieved their goals or were upgrading to newer models, scenarios that indicate success, rather than failure of technologies.

In addition, the study done by Simpson et. all [8] found that there was an association between use of calorie and fitness trackers and eating disorder symptomatology. This view was sup-ported by Sarconaet. all [9] where it was revealed that mobile health app users had significantly higher scores for eating behavior than nonusers, and the impact of using more than one type of mobile health app significantly improved eating behavior. Most participants also identified app use with feeling healthier, better self-monitoring of food intake and exercise, and having more motivation to eat healthier and increase physical activity.

As a result, Kaewkannateet. all [] compared four popular fitness trackers through a combination of subjective and objective experimental results as well as usability evaluation from seven real users and the results showed that Withings Pulse (which costs $120) was the most acceptable in terms of price and satisfaction levels. Another study by DE la Tarreet. all [] developed a mobile app that provides advice about obtaining a healthy diet according to age, clinical history and physical condition. The app was validated through usability evaluation and was found to be easy to use and attractive.

PROPOSED METHODOLOGY

Many articles and online materials were studied to understand the concept of developing the proposed application.Unified Modelling Language diagrams were drawn to conceptualize the application that was to be built. These include the use case diagram, sequence diagram and state chart diagram. Figure depicts the use diagram of the proposed application comprising of five use cases namely: track calorie burnt, calculate steps taken, measure distance covered, input/edit weight and input/edit height.From Fig. , it can be observed that the user (the actor) has access to all the four use cases.

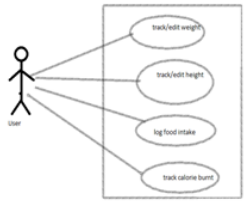


Figure 1: Use case diagram for the proposed system

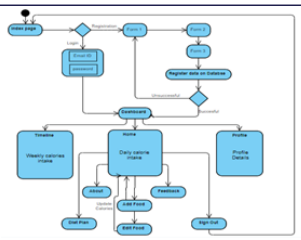


Figure 2: Activity diagram for the proposed system

Figure 2 represents the activity diagram shows flow of every activity taking place in the while the application is in use. The mobile application was developed using dart language which is used to develop android applications on Flutter engine.

Functional and Non Functional Requirements

Functional Requirements- In order for the application to work there are some hardware and software requirements. They are:-

- Smartphone
- Android O.S
- Internet Connectivity

Non-Functional Requirements- some non-functional requirements are:-

- Usability
- Scalability
- Reliability

Service Description: This application will provide the following services to the users:-

- Diet plans are available in the application for the users to follow according to their gender and profession.
- Calories intake logging is available.
- User will be able to set a target for weight management.
- This application will be available to android users.

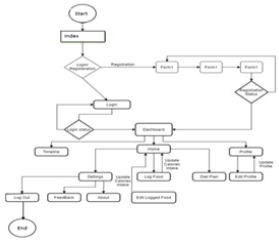
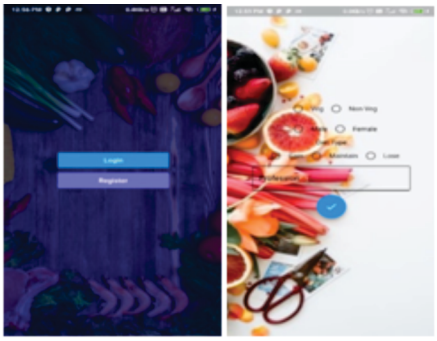


Figure. 3: Flow diagram of proposed system

Figure 3 shows the flow chart of the working of the application. It provides the information about the activities which take place and the entities that are involved during those activities.

RESULTS AND DISCUSSION

This section shows the outcome of the design specification conducted in the previous section. Figure 4 shows the page for authorized persons to login in so as to access their dashboard.The user will not be able to proceed without first registering as a user.The registration process does not cost anything.



(a) (b)

Figure.4: Login and register page of application

This project is significant to the field of medicine especially as it relates to the fitness of the human body. Developing the application as an Android-based app improves its accessibility via smartphones given the wide spread adoption of Android-based mobile devices. In addition, there is cost savings for the consumer, as there would be no more need to purchase a wearable. The mobile application developed tracks fitness data over time calculates the total food intake of a person and the number of calories burnt and taken every day. It also helps in managing weight and altering it, by keeping track of it.

This application has been built with some of the latest technologies hence; it enjoys the security benefits that come with those time-tested technologies. When deployed, it would greatly help users achieve their fitness and health goals. With such information as knowing the amount of calories burnt makes for room to calculate the calorie intake and maintain a healthy and balanced life.

Figure.5: Total calories intake (per day and weekly)

Figure 5 shows the dashboard of the application. Dashboard is the page that the users sees initially in the application. It is the one page that provides the user with the analysis of the application's data, trends, summaries etc. This dashboard displays the daily calorie intake and the target set by the user himself, the dashboard also represent a pie chart of the same data.The other feature of the application is the time line, which displays the calorie intake of every day of the week individually and also show the same data in the form of a timeline.

CONCLUSION

The mobile Health and Nutrition Tracker has been built using Dart language and Flutter engine and is developed for android users. It is highly expected that this application will help in improving the health of its users and aid them with their physical goals the plus side that it does not require an additional hardware (bands or watches) to function with. This project has been deployed as a mobile application to allow easy access for users.

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