Analysis on HealthyMe Fitness Tracking Application

Priyanka Maurya
Tannu Sharma
Rahul Srivastava
Ravindra Kumar Verma
Kamlesh Kumar (Assistant Professor)
Rudrendra Bahadur Singh (Assistant Professor)

Department of Computer Science and Engineering, Babu Banarasi Das Institute of Technology & Management, Lucknow, India.

Abstract - This application is a step-tracking platform that you download on your smartphone that records your steps via GPS tracker or your phone’s built-in sensor. Your phone must be in your pocket or hand to count your steps. These days, smartphone pedometer apps use your phone’s built-in GPS to calculate how far you’ve walked. GPS tracking built into smartphones has varying degrees of accuracy and helps apps know how far a user has walked. The pedometer is an accessory that allows you to measure your physical activity while walking. You can use it to count the number of steps you take during each fitness walking session, the distance you walk, the time you spend, or even the number of calories you burn with a more advanced pedometer. The GPS-based step tracking application uses your GPS tracker or your phone's built-in sensor to record your steps. Your phone must be in your pocket, pocket or hand to count your steps. Pedometer apps don't track your heart rate and may not be as accurate as wearable trackers, but they are convenient and much cheaper.

Keywords: step tracking, BMI, Calories, Burnt, Distance

1. Introduction

A healthy lifestyle is more than just a proper diet and consistent exercise. Getting enough sleep, taking care of your mind and body, and managing your medications and hospital visits also play an important role in maintaining your health. A great app is a great way to keep everything under control. That's why Healthline tested different apps for a healthy lifestyle. We've selected the best of the year based on content, credibility, and user ratings. Our application works with your phone’s GPS location tracking to track your steps and map your workouts. What sets this pedometer app apart from the rest is the ability to track both steps and distance travelled. It uses GPS to count your steps so you can track your route and location on an interactive map. In addition, the app also allows you to choose from a collection of mapped routes. This is a useful feature when traveling or looking for nearby walking places. It also tracks pace, stride length and cadence for fitness enthusiasts looking to push their walking workouts to new heights. This application uses TextView with an XML file that displays step counts and captions on the screen, and an ImageView to display a circle around the text. We have implemented this application using Java. The application also takes input from the user in the weight, height, diet, preferences and routine fields and calculates the person's ''Body Mass Index''. It is a measurement method that classifies obesity, overweight, normal weight, and underweight. This is the ratio of user's weight in kilograms (kg) to the square of user's height in meters (m). Based on this indicator, the application also suggests measures such as exercise and enlists the best nutritionists for consultation purposes. BMI is a measure of how thin or obese a person is based on height and weight and is intended to quantify tissue mass. It is commonly used as a general indicator of whether you are at a healthy weight for your height. Specifically, the value obtained from calculating BMI is used to classify a person as underweight, normal weight, overweight, or obese, depending on which range the value falls within. These BMI ranges vary by region, age and other factors, and may be further divided into subcategories such as severely underweight and severely obese. Being
overweight or underweight can have significant impacts on an individual's health, it can lead to a variety of health problems such as diabetes, high blood pressure, heart disease, and other chronic conditions. Therefore, it is important to maintain a healthy weight range to maintain overall health and well-being. BMI is not a perfect measure of healthy weight, but it is an indicator that can help determine if additional tests or procedures are needed.

2. Related Work

Step counting is a method of measuring physical activity that gained popularity in the mid-1900s with the introduction of accurate pedometers. Since 2010, the use of accelerometer-based activity trackers has increased. Steps are a useful metric for assessing physical activity as they are easy to measure, objective, and represent a fundamental unit of human ambulatory activity. However, due to biological variability, measurements must be taken over 3-7 days to attain valid and reliable estimates. Studies have shown strong associations between steps per day and health variables, and interventions using step counters have been successful in increasing physical activity. Challenges in step counting include establishing testing protocols, accuracy standards, and the best placement sites for devices. These challenges need to be addressed in order to achieve harmonization between studies and accurately quantify dose-response relationships.

Jungryul Seo, Yutsai Chiang, Teemu Laine and Adil Mehmood Khan in "Step counting on smartphones using advanced zero-crossing and linear regression" SciTePress - Science and Technology Publications, pages 401–404, 2012 the article discusses the design and implementation of a step counting algorithm for android-based smartphones. The algorithm uses an advanced zero crossing scheme to count the number of zero crossings and then employs linear regression to estimate the number of steps. The system was tested for three subjects using both subject-dependent and subject-independent settings and was found to have a high accuracy of estimation for both settings. Additionally, the battery consumption was found to be very low, proving the feasibility of using the algorithm for step counting on smartphones for longer durations.

Sampath Jayalath and Nimsiri Abhayasinghe, “A Gyroscopic Data based Pedometer Algorithm” Conference: 2013 8th International Conference on Computer Science & Education (ICCSE 2013) At: Colombo, Sri Lanka. The paper seems to propose a new algorithm for step detection using gyroscopic sensors embedded in mobile devices. The authors conducted a preliminary analysis of data collected from male and female volunteers in different environments and found that the use of gyroscopic sensors alone provides sufficient information for accurate step detection. The algorithm was developed by combining gyroscopic data with zero crossing and threshold detection techniques. The results of the analysis showed that the algorithm provides a high level of accuracy for step detection across different activities and at slow walking speeds.

Ahmed Abdulhasan Mahdi, Shibani Kulkarni Students, Dr.D.Y.Patil ACS College, Pimpri, Pune, India, The BMI Calculator, International Journal of Innovative Research in Science, Engineering and Technology (A High Impact Factor, Monthly, Peer Reviewed Journal), This app is a software application that calculates the body mass index (BMI) for a person quickly and easily. It includes both American and Indian standards for BMI calculation. The main focus of the app is to promote health and wellness. It provides suggestions for healthy eating and alerts users if they are underweight or overweight. Users simply enter their height and weight, and the app provides all the necessary information and suggestions for maintaining a healthy weight.

Atifa Sarwar, Hamid Mukhtar, Maajid Maqbool and Djamel Belaid, National University of Sciences and Technology (NUST), SmartFit: A Step Count Based Mobile Application for Engagement in Physical Activities, Article in International Journal of Advanced Computer Science and Applications · August 2015. This article presents SmartFit, a mobile application that promotes physical activity in adults by using step count as a metric. The authors argue that while considering walking, simply measuring the duration of the activity is not sufficient to determine a user's level of activeness. Instead, they propose an approach that converts steps into duration, which is then used to categorize users into different levels of activeness. SmartFit also incorporates gamification techniques, such as awarding and deducting points, to motivate and engage users. The app also provides feedback to users based on their goals and progress. The overall goal of SmartFit is to motivate and engage users in carrying out the recommended level of physical activity.

Sakitha Anna Joseph, Reshma Raj K., Sony Vijayan, User’s Perspective about Mobile Fitness Applications, International Journal of Recent Technology and Engineering (IJRTE) ISSN: 2277-3878 (Online), Volume-8 Issue-6, March 2020. This article discusses the growing popularity and effectiveness of fitness apps on mobile devices. These apps aim to serve the diverse needs of users by offering personalization, exercise and workout plans, as well as diet and nutrition guidance. These apps have been a great convenience for people who do not have time to visit fitness centers, as they provide cost-free exercise guidelines and diet packages. The study aims to understand users' perceptions of fitness apps and the reasons why they prefer them over fitness centers. The study collected data from 100 respondents.
to analyze factors such as time, cost, and accessibility. Additionally, it examines ways to increase user engagement and participation in using the apps.

Paromita Banerjee, Vishnu Vardhana Rao Mendu, Damanyanthi Korrapati and SubbaRao M Gavaravarapu, Calorie counting smart phone apps: Effectiveness in nutritional awareness, lifestyle modification and weight management among young Indian adults, Health Informatics Journal 2020, Vol. 26(2) 816–828 © The Author(s) 2019. This study aimed to evaluate the quality and effectiveness of calorie counting apps in India, as well as the perceived usefulness of these apps among users. The study highlights the increasing prevalence of obesity globally and in India, specifically noting that physical inactivity and dietary changes are contributing factors. The study also mentions the widespread use of mobile phones and mobile health (mHealth) applications, and the potential for these technologies to be used as tools to promote physical activity and healthy diets. The study notes that there are thousands of calorie counting apps available, but few studies have examined their quality and effectiveness, particularly in developing countries like India.

David R. Bassett Jr., Lindsay P. Toth1, Samuel R. LaMunion1, Scott E. Crouter, Step Counting: A Review of Measurement Considerations and Health-Related Applications, Published online: 22 December 2016, The Author(s) 2016. It discusses the use of step counting as a method of measuring physical activity. It notes that step counting has gained popularity in recent years with the introduction of activity trackers, and that steps are a convenient and intuitive way to measure physical activity. However, it also notes that step counting has inherent biological variability and that measurements must be made over several days to attain valid and reliable estimates. It is also mentioned that there are many different kinds of step counters that can be worn on various parts of the body, each with its own strengths and limitations. In addition, the use of step counting in surveillance and research studies and notes that interventions using step counters can help inactive individuals increase their daily step counts. It also mentions that there are challenges in establishing testing protocols and accuracy standards for step counters and in deciding upon the best placement sites. These challenges need to be addressed in order to harmonize studies and accurately quantify dose-response relationships between steps and health outcomes.

Bagrecha Komal, S Bramhecha, Amit R Chhajed and Sneha S Chhajed, Android Application Using GPS Navigation: Android Application, March 2012 Journal. It discusses about the systems and technology in the Generation IV era are developing and changing virtually instantly. Smart phones and Palmtops are likewise subject to the same restrictions. We are constantly hearing the terms "Android" and "Maps," which are extremely popular among young people in Pakistan. Due to Android's explosive growth and radical changes, we thought, why not build an application that users may adapt to their needs? As a result, we created a number of applications like Place Marking, Shortest Path Strategy, and Four Day Weather Predictions. To maintain a user's list of locations and points of interest for later use, these applications work in real-time cooperation with Google Maps.

Jihye Choi, Chongwook Chung and Hyekyung Woo, Diet-Related Mobile Apps to Promote Healthy Eating and Proper Nutrition: A Content Analysis and Quality Assessment, International Journal of Environmental Research and Public Health, 2021. The study conducted by Jihye Choi, Chongwook Chung, and Hyekyung Woo in the International Journal of Environmental Research and Public Health in 2021, aimed to assess the content and quality of dietary mobile apps in Korea using the Mobile App Rating Scale (MARS). They selected 29 dietary apps based on keywords and eligibility criteria for inclusion in the analyses. The study found that most of the apps featured a tracking tool, while few featured rewards or follow-up management. The study found that the manner in which the apps present information and the strategies used to encourage user engagement were key factors in determining the overall quality of the dietary mobile apps. The study's findings can facilitate the selection of dietary apps in Korea and provide guidelines for app developers regarding potential improvements in terms of content and quality.

Paromita Banerjee, Vishnu Vardhana Rao Mendu, Damanyanthi Korrapati and SubbaRao M Gavaravarapu, Calorie counting smart phone apps: Effectiveness in nutritional awareness, lifestyle modification and weight management among young Indian adults, Health Informatics Journal-2019. This study evaluated the quality and effectiveness of popular calorie counting mobile apps in promoting weight management and behavior change. The study selected the top 20 apps from the Google Play store and assessed their quality using a 55-point scoring scale that evaluated attributes such as standards used, content accuracy, user interface, and sources of database. The mean quality score was found to be 36.95, with a standard deviation of 5.65. The study also found that over 65 percent of the apps overestimated or underestimated calorie intake when compared to standards. To assess effectiveness, the study recruited 60 young volunteers and divided them into two groups. The intervention group, consisting of 30 participants, was asked to use one of the top 3 apps for 8 weeks. Pre- and post-comparisons were made with the control group, which consisted of 28 participants. The study found no significant difference in anthropometry or food consumption, but there was an increasing trend of 13.33% in physical activity in the intervention group.
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<tr>
<th>Title</th>
<th>Author</th>
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<th>Existing Approach</th>
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<td>Step counting on smartphones using advanced zero-crossing and linear regression</td>
<td>Jungryul Seo, Yutsai Chiang, Teemu Laine and Adil Mehmood Khan</td>
<td>SciTePress - Science and Technology Publications, This approach is using the zero cross algorithm and linear regression to estimate the step count.</td>
<td>Even on using the advanced zero cross algorithm the accuracy is 90% ours is more accurate since we are using Google Fit APIs step cumulative function.</td>
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<td>This approach is using the pedometer algorithm which is depending on the accelerometer detection to count user movements.</td>
<td>In our approach we are not using any extra steps like signal modification, nor we are using any extra variable that would affect the calculation of the algorithm hence our system is less complex.</td>
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<td>The BMI Calculator</td>
<td>Ahmed Abdulhasan Mahdi, Shibani Kulkarni</td>
<td>International Journal of Innovative Research in Science, Engineering and Technology (A High Impact Factor, Monthly, Peer Reviewed Journal), It consists of only BMI calculator but</td>
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<td>In this, badges were awarded to the users based on the step taken by them. Also weekly progress were recorded to keep motivating the users</td>
<td>We are also adding distance covered and calorie burnt by user. In addition, nutritionist suggestions are also added for helping users</td>
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<td>Calorie are calculated to aware people about increasing obesity among them. This application focuses on calculating calorie burned by the user. Our application have many features in it, which will monitoring user’s fitness.</td>
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<td>It counts the steps and the different types of step counters used by user. Along with step counting, many other features like distance travelled, calorie burnt, health suggestions and nutritionists contact details is also available.</td>
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<td>Diet-Related Mobile Apps to Promote Healthy Eating and Proper Nutrition: A Content Analysis and Quality Assessment</td>
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<td>International Journal of Environmental Research and Public Health</td>
<td>It provides diet chart to the users. It will provides diet chart to the user according to the need of the user, which we will get to know by calculating the BMI of the user.</td>
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<td>A More Reliable Step Counter using Built-in Accelerometer in Smartphone</td>
<td>Win Win Myo, Wiphada Wettayaprasit, Pattara Aiyarak</td>
<td>Indonesian Journal of Electrical Engineering and Computer Science</td>
<td>In this they introduced a more reliable step counter’s technique using Accelerometer sensor in a smartphone. In this we are calculating with the help of android using GPS.</td>
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3. Conclusion

We will be building an application that shows the number of steps a user has taken. We will use TextView in our XML file which will show the step count and a heading on the screen, and one ImageView for displaying the circle around the text, it will reset the step count back to zero. We will be using the Java programming language to build the application.

Our application will track steps by using the GPS or sensors built into the user's phone. The device needs to be carried in a pocket, bag or hand in order to accurately count steps. This method of tracking steps is convenient and cost-effective. Additionally, it should be noted that this application is designed to track steps, not heart rate.

This application is designed for individuals who want to keep track of the number of steps they take, including those taken during exercise. The app uses GPS tracking to monitor steps and map out the user's workout. This way, it offers a convenient way to monitor and track their daily physical activity.

This pedometer application offers a unique feature that differentiates it from others in the market. It is able to track not only the number of steps taken but also the distance covered during the walk. This allows users to have a more comprehensive view of their physical activity, and can be especially useful for those looking to track progress in fitness goals.

This application will also take input from the user in fields their weight, height, diet, preferences and daily routine and calculates the 'body mass index' of the person. Body Mass Index (BMI) is a metric used to classify individuals into categories based on weight and height. These categories include: obese, overweight, normal weight and underweight. It is calculated by taking the individual's weight in kilograms and dividing it by the square of their height in meters. This calculation provides a value that can be used to classify an individual's weight status. Based on this index, the application would also suggest measures like exercises, would recommend you a nutritionist from nearby area.

4. References


