

Fit

Written Report

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Introduction

Obesity, which has become a weighty problem worldwide, is on the rise in Singapore. According to the Health Promotion Board last year, Singapore could reach a tipping point and lose valuable ground in fighting obesity. Their extensive data shows that the average Singaporean today is heavier and is more likely to overeat. Children and working adults are especially vulnerable. Currently, Singaporeans are, on average, 3kg heavier today than they were 15 years ago (Ling et al., 2017). The median body mass index (BMI) score for adults last year was 23.15 - just outside the healthy range, and above the 2001 median of 22.23. It is projected that Singapore would hit obesity rates of 15 percent six years from now if nothing is done.

Looking at the current situation Singapore is facing, we have decided to come up with a fitness app to tackle this issue, but not just any regular fitness app. Introducing, Fit. Not only is it able to suggest recommended routines to follow based on your workout focus, it is also able to pair up the workout with a recommended diet or energy intake, and this is of utmost importance as simply going on a fad diet with little nutrition would take a toll on your body, such as adding on to your weight, instead of help it (Avena, 2013). There are many more features embedded within this fitness app, such that it is able to improve upon the fitness app concept.

With this app, we aim to help the users to lose weight by effectively introducing routine workouts to help them lose weight, and pair those workouts with diets that complement the weight loss program. Also, this would be a good opportunity for us to be exposed to a new framework and language, Flutter and Dart respectively, and hence would kill two birds with one stone.

Case Studies

Keelo:

Keelo is a fitness app that provides fast-paced workouts lasting between 7 minutes to 20 minutes and includes both bodyweight-based and equipment-based workouts. The guiding principle of Keelo would be using High intensity interval training in order to burn calories effectively. Individuals are able to use the app to exercise even if they don't have much time to spare. Keelo also allows the user to track their fitness, letting them see the areas they have exercised, the calories burnt, etc.

While this type of workout may be very effective in burning calories, this app does nothing to remind users to exercise, meaning that users may forget about the app due to the fast pace of their lives, reducing the effectiveness of the app.

MyFitnessPal:

MyFitnessPal is a tracking app that allows users to track their nutrition intake, with a gigantic food database with more than 300,000,000 items. By letting users track the amount of calories present in their food and plan their diet, it helps individuals lead healthier lives, and become more conscious about their food choices. MyFitnessPal also includes an online discussion forum where users are able to share tips and tricks in losing weight, and give encouragement to one another.

This app has a massive database of food items for everyone to peruse, enabling anyone to accurately track their calorie intake. However, food tracking could at times be very time consuming and tedious, leading to loss of interest and discontinued usage of this app. Hence, it is essential to think of how to prevent this problem from happening if a food tracker were to be done.

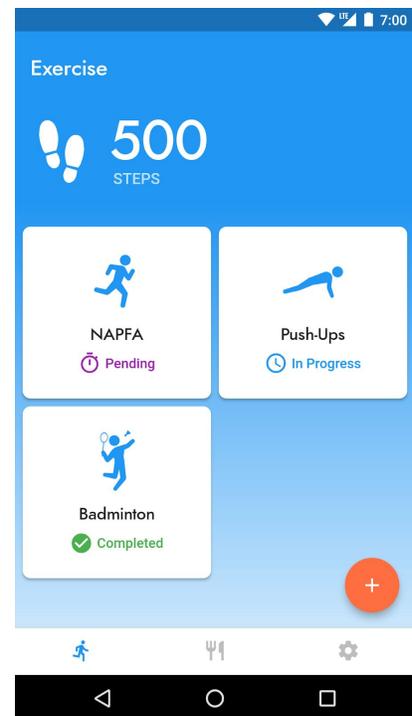
Study and Methodology

In order to make this app come to life, a lot of research is required in order to supply the necessary information to users. However, purely providing information on the various exercise routines and suitable diets would not be enough. In order to organise the information instead of leaving them in large chunks of text, we will be utilising Flutter, Google's mobile UI framework, to design the app in order to increase the simplicity of the app, making it more user-friendly.

The layout will consist of three main sections, where one tracks the progress of your current activity, one gives users the option to add more or remove extra activities, and one suggests diets accordingly. As for the screens, they would be designed such that users do not have to worry about messy information or cluttered images.

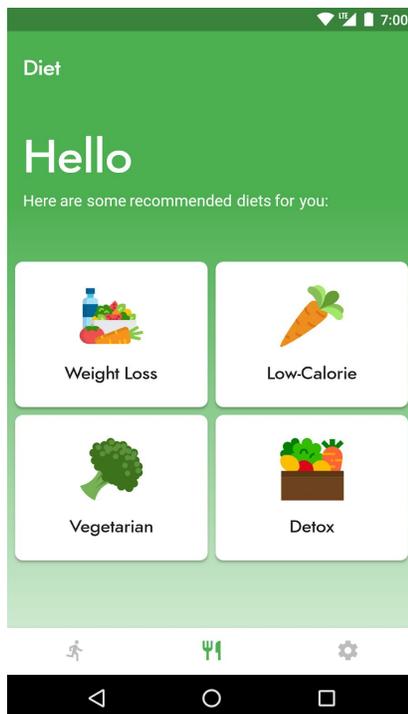
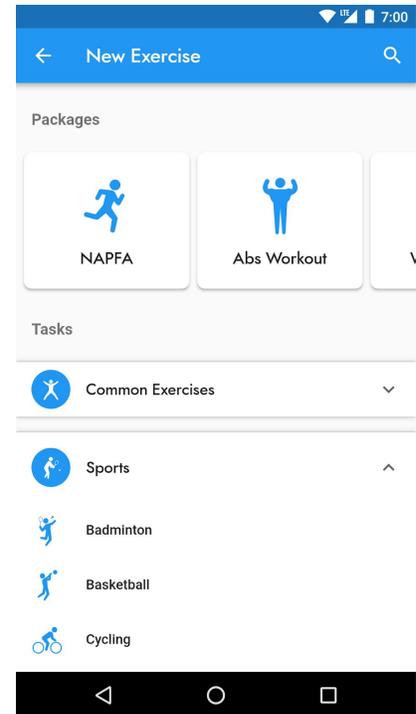
Main Features

One of the main features of our app is an intuitive, user-friendly user interface. There would be no cluttering of information in any part of the app, or clumping of unnecessary images. Because of the simplicity of the app's design, users would be able to get the most out of the app without feeling overwhelmed. Every function is very intuitive and no thinking is required to operate the app. Together with the selected colour scheme, the app will be able to succeed in terms of aesthetic appeal, and keep the user's eyes on the screen instead of having an instant dislike for it.



Another feature that was implemented is fully flexible workouts (right). We understand that people have differing amounts of free time available, and that there is no such thing as a one-size-fits-all workout regimen, and hence will be offering a fully customisable workout routine for users to enjoy.

The user is able to add, remove or edit activities and packages at will, allowing them to have full reign over their workout regiment. Packages are groups of activities created by us to suit different purposes. We categorised the individual exercises into 3 segments, the first being those that should be done with gym equipment, the second being sports, and the third being exercises that can done anytime, anywhere.



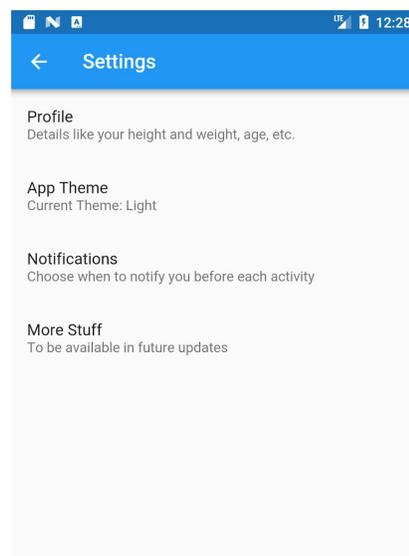
Thirdly, to complement the workout of choice, we also offer diet options (left) that can help the user to achieve their goal faster. The recommended diets would be created by us, in order to tailor it to suit the user's needs or wants while acting as a guide for food consumption. Each of these recommended diets would have suggestions for the 3 major meals of the day, as well as snacks. If the user has a change of mind and has a different purpose in mind, he would also be able to switch out of the selected diet, giving the user a free choice at any point of time.

Furthermore, we also have an in-built step counting system, which also helps the users to track their progress towards a healthy lifestyle, and can also track their passive exercise routine as well. The step counting feature utilises GPS coordinates and system accelerometer values to calculate the rough distance walked and steps taken, considering the user's gait. To do so, we utilised accelerometer values to detect user activity (stationary or moving) and requested a constant stream of GPS coordinates when the user was detected to be moving. We then utilised the Haversine formula (below) for calculating the great-circle distance between two points given their longitude and latitude values in order to determine distance travelled. Finally, considering the user's stride length, which we can approximate with the following equation : Stride length = User's height * 0.415 (Male) or User's height * 0.413 (Female), we can estimate the number of steps taken by dividing total distance by stride length.

$$d = 2r \arcsin \left(\sqrt{\sin^2 \left(\frac{\phi_2 - \phi_1}{2} \right) + \cos(\phi_1) \cos(\phi_2) \sin^2 \left(\frac{\lambda_2 - \lambda_1}{2} \right)} \right)$$

Every successful fitness app should also have notifications in a way or another. This is very crucial in this app, as our target audience is people who have very little time on their hands and might miss out on the timings they set for themselves. Knowing this, we are aiming to increase the effectiveness of the app, by reminding users of their schedule activities for them to carry out in case it flew to the back of their minds.

Last but not least, in order to allow the user to have full reign over the app, we would have settings (right) to



suit the user. They would be given the option to enable or disable the step counting function in the app if he or she wishes to do so, giving the user full control over what he wants to focus on. There would also be a “Dark Mode” option for users to reduce their phone glare to make the app useable anytime of the day.

Limitations

However, every app has its limitations, and our app is not an exception. First of all, while our app targets the busy people who are serious on getting fit, it may be ineffective in motivating them to carry out their regimens, as the app can only serve as much as a reminder or an obligation to the users, and not something that forces them to carry out their activities.

Secondly, the app is unable to track the details of people as effectively as we wanted it to do. While there was the profile screen that gets users to fill in their personal information mainly for the calculation of the user’s BMI, it is unable to update by itself, and we are unable to control what they really do even if they subscribed to a diet, hence being unable to get an algorithm. As a result, we require the users to update the details in order to obtain a more recent BMI index, giving them trouble. As such, all of the features that the app offers would have such inevitable drawbacks.

Conclusion

In all, we aimed to effectively tackle the issue of obesity in Singapore, hence creating an app that is essentially a hybrid between the pure-breeds of fitness apps and diet/calorie-tracking apps. At the same time, we have been recognising the need for an intuitive, user-friendly UI, that is able to bring about maximum customizability, comprehensibility and the ease of use. Hence, we have been updating the layouts of the app to please the users, offering them a pleasant user experience and gain their support. While there may be some drawbacks within the app's design, the overall layout of the app, paired with the in-depth analysis and research, would be able to improve the app's appeal to the audience, and hence succeed in its purpose in the end.