Activity Tracker Deliverable 2

Elaboration

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Glossary:

User - The person using the app
Scene - What is visible on the screen
Layout - The way the objects are arranged in the scene
Profile- Shows the step count, calories burned and the sleep patterns
Home - Shows the time, weather and the goal
Weather - Shows a scrollable weather forecast
Setting - Allows the user to adjust the time and set the age, weight and height of the user
Goal - A user specified achievement that acts as a reminder
Calorie - Unit of energy
Steps - The movement registered by putting foot in front of the other
Sleep pattern - The fluctuation of the quality of sleep
Height - The user's height
Weight - The user's weight
Age - The user's age

Overview:

Activity trackers, or sometimes referred to as fitness trackers, is a device or application for monitoring and tracking fitness-related metrics. Typical fitness trackers keep a record of parameters such as distance walked, calorie consumed, time asleep, and even a user's heartbeat. In 2015 the International Journal of Cardiology labeled Fitbit as an extremely accurate and reliable device for wireless physical activity tracking. [1] Physicians at the Journal of Cardiology recognized the importance of these devices when it comes to monitoring physical activity for the prevention and maintenance of chronic diseases.

Before jumping right into a project, it's good to know what devices and applications already exist on the market today. By examining other products, we will be able better wrap our heads around the activity tracker market and possibly find a niche (or a problem not yet addressed) within that market to help our project stand out.

Vision:

“Making Lifestyle Changes Manageable”

Sleep and exercise are a vital, and often neglected component of every person's overall health and well-being. Sleep is important because it enables the body to repair and be fit and ready for another day. While sleep requirements vary slightly from person to person, *Medical News Today* reports that most healthy adults need between 7 to 9 hours of sleep per night to function at their best. Individuals not only have complicated relationships with sleep, but according to *Time Magazine* only 23% of Americans get enough exercise. The Activity Tracker System software we are setting out to create will help users not only check their sleep patterns, but help contribute to people being more aware about their exercise activity.

Fully Dressed Use-cases:

Use Case 1:

Title: User takes 500 steps
Level: User
Primary Actor: User
Preconditions: User has entered in time, their weight, height and age
Stakeholders:

- User: Wants an accurate display of steps and calculated calories burned
- Developers: Wants the watch to accurately display steps and calculated calories

User - wants to see their steps and calories

Developers - Wants the app to work properly
Success Guarantee - Watch displays current total step count for the day correctly. Calories are calculated and displayed correctly.

Main success scenario:

1. User wears the Watch
2. User has entered in their current information
3. User has taken 500 total steps
4. User taps the Profile screen
5. User views step count on Profile screen
6. Watch accurately displays total steps
7. Watch continues to add steps each time a reading from pedometer is registered

Extensions:

1. Anytime watch crashes
    a. Error message is displayed
    b. Watch reboots and loads data from locally stored files
2. User has not entered in current information
    a. Default data is set
    b. Calorie calculations are based on defaults
3. Sensor functionality has stopped
    a. User is notified
    b. Watch reboots

Special Requirements (non-functional requirements):

- Touch screen UI that fits on a small watch screen and elements on screen are able to be individually tapped
- Somehow, we may want language internationalization based on the language selected by user, and the text displayed reacts to this decision

Technology and Data Variations:

- Watch face displays total amount of steps on labeled tab
- Watch pedometer measures steps as integers and adds it to total count

Frequency:

- Continuous

Use Case 2:

Title: User Taps Weather Scene
Level: User-Level Goal
Primary Actor: Activity Tracker System
Preconditions: User is connected to the internet and is on the Home Scene or Weather Scene.
Stakeholders:

- User: Wants an accurate display the current weather forecast
- Developers: Wants the watch to accurately display weather and the upcoming forecast

Success Guarantee - User taps on the weather scene and the open weather API accurately sends back the weather. The watch uses this data to display the current weather correctly and accurately on the weather scene in a table view.

Main Success Scenario:

1. User opens up the Weather Scene
2. Activity Tracker System makes a call to open weather API
3. Open Weather API accepts request
4. Open weather API returns JSON response
5. Activity Tracker System retrieves JSON data
6. Activity Tracker System parses JSON data
7. Activity Tracker System displays data in Table View

Extensions:

1. System not connected to the internet
    a. Show error message
2. System sends off invalid API request
    a. Show error message
3. API is Offline
    a. Show error message
4. Invalid JSON response
    a. Show error message

Special Requirements (non-functional requirements):

- Touch screen UI that fits on a small watch screen and elements on screen are able to be individually tapped

- Somehow, we may want language internationalization based on the language selected by user, and the text displayed reacts to this decision

Technology and Data Variations:

- Watch face displays weather forecast
- Watch face associated icon according to the weather
- Input location data for the API

Frequency:

- Near continuous

Use Case 3:

Title: User Updates Their Age, Height, Weight, goal, or Preferred Time
Level: User-Level Goal
Primary Actor: Activity Tracker System
Preconditions: User is connected to the internet and is on the Settings View.
Stakeholders:

- User: Wants an accurate display the current weather forecast
- Developers: Wants the watch to accurately display weather and the upcoming forecast

Success Guarantee - User taps on the settings scene and updates the values they wish to change in their settings. The user can either update a single stat, or they can updates multiple stats at a single time. Once the User taps the "Apply" button, the new stats will be updated and reflected throughout the other screens in the application.

Main Success Scenario:

8. User opens up the Settings View
9. The user either updates one or many stats located in the settings view
10. The user taps the “Apply” button
11. The users stats are applied to the User model
12. The users changes are reflected throughout all other screens on the Activity Tracker
13. Changes are then reflected permanently until the settings are updated again

Extensions:

5. User enters invalid age, weight, height, time, or goal
    a. Show error message and ask to submit a valid response

Special Requirements (non-functional requirements):

- Touch screen UI that fits on a small watch screen and elements on screen are able to be individually tapped

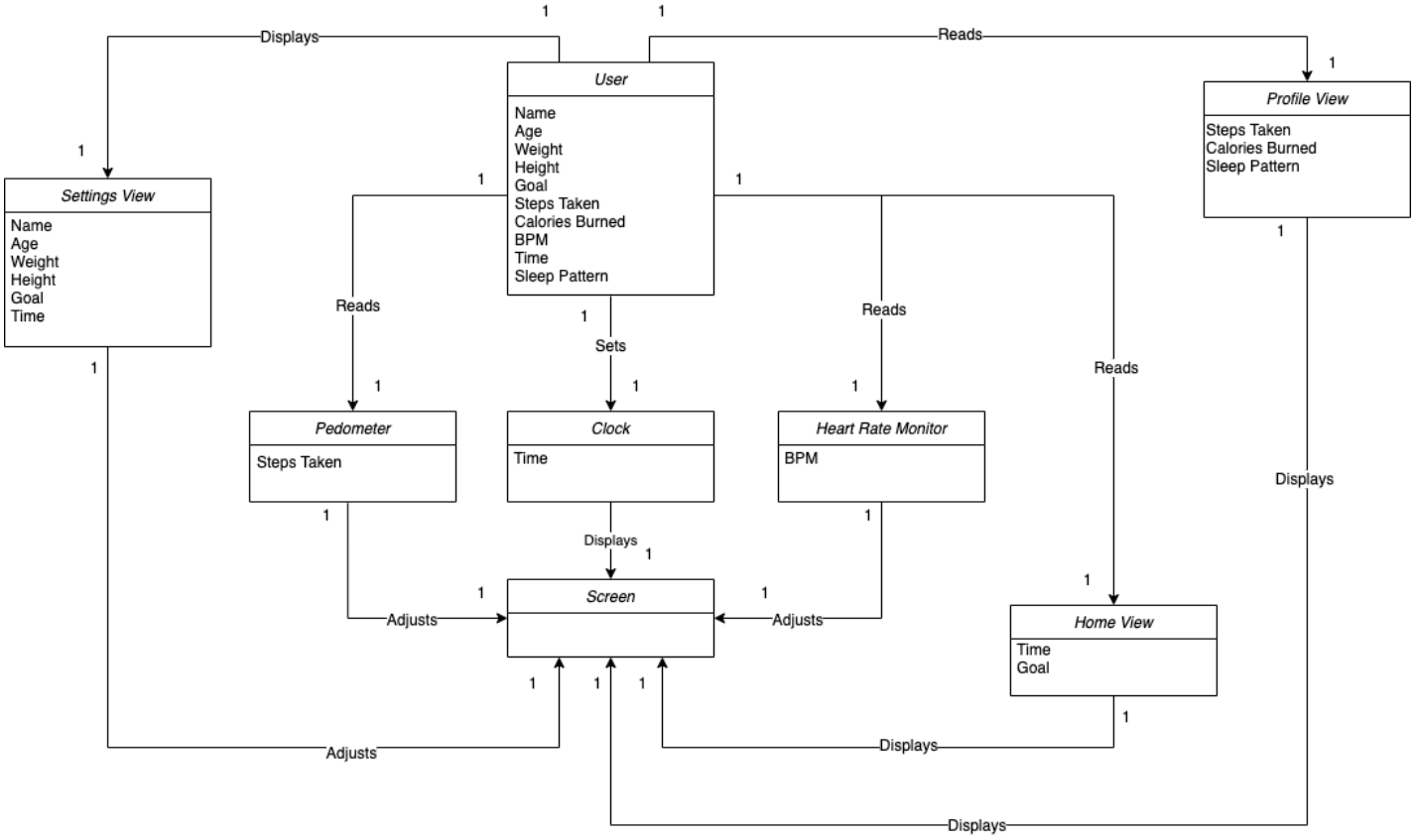
Technology and Data Variations:

- Watch face displays Settings View
- Current settings match the settings previously entered by the user
- Buttons are functional

Frequency:

- One Time

Domain Model:

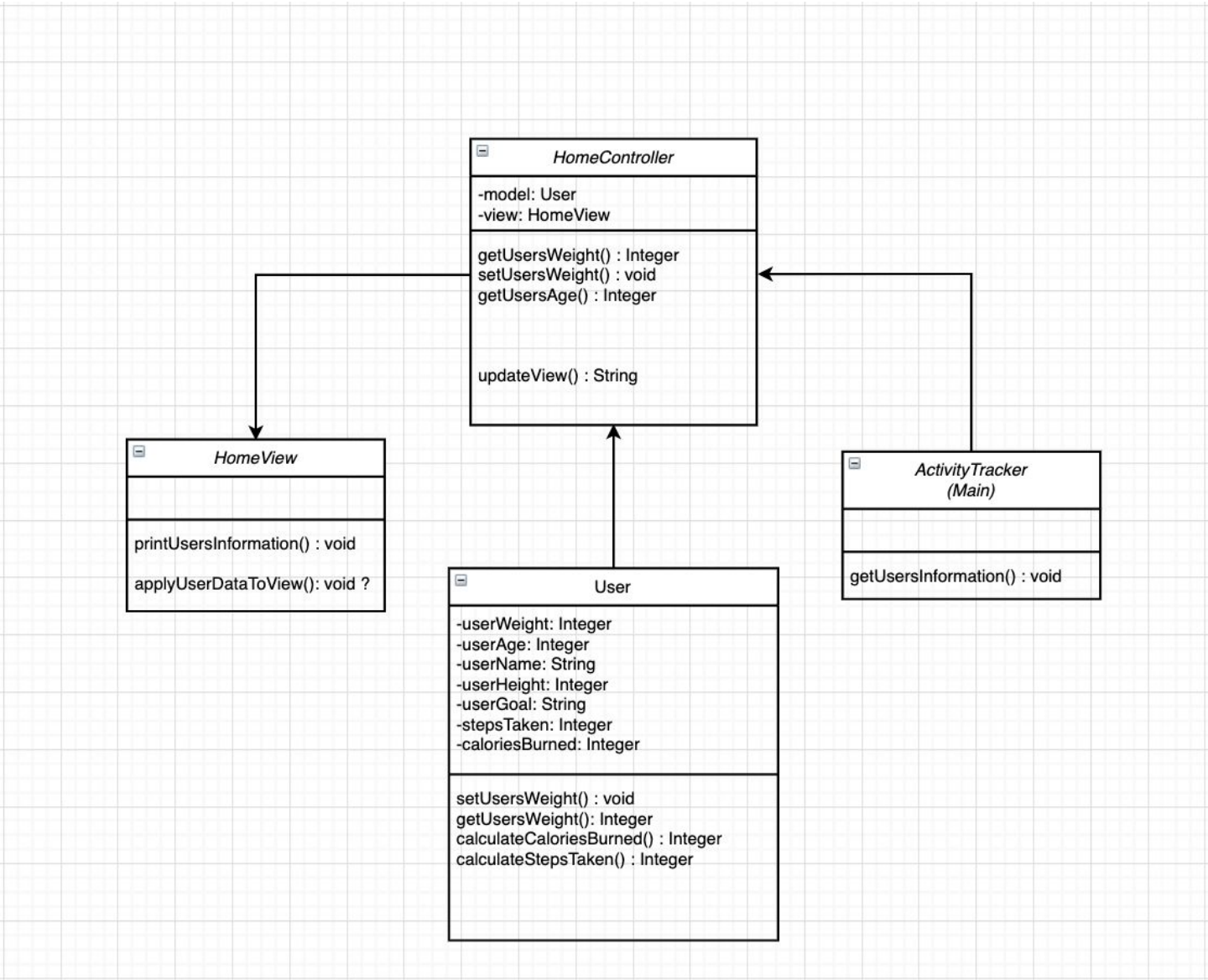


Domain Model Description:

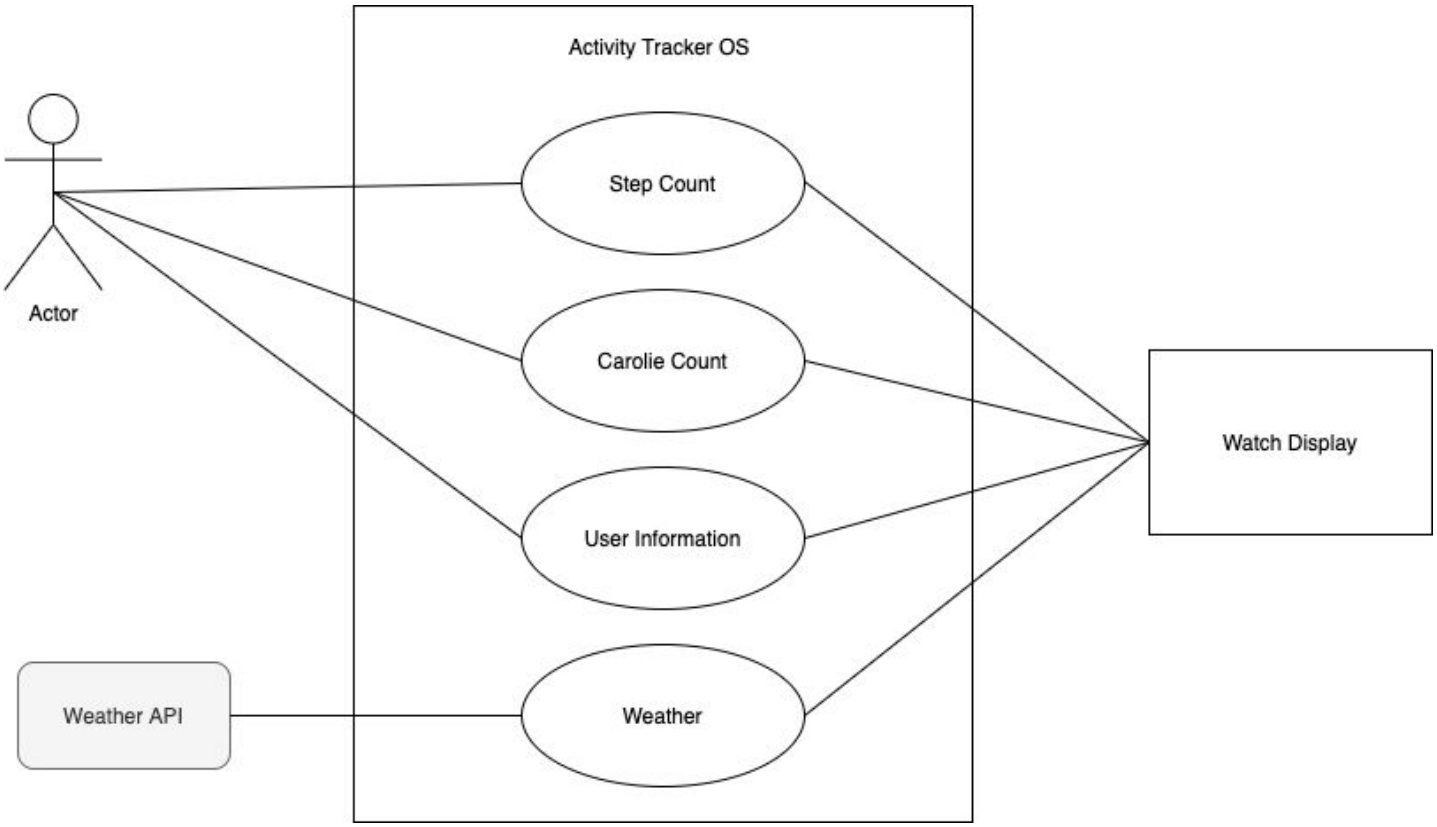
The domain model is a high level overview that describes selected aspects of our activity tracker. Currently we are highlighting the function requirements of our Activity Tracker. Extra features such as weather have been left out and will be attended to later on down the road. In the domain model, the main object is our User. The User of the Activity Tracker dictates a majority of the the majority of the data presented on the screen. A user has a name, age, height, weight, goal, number of steps taken, number of calories burned, BPM, sleep pattern, and the users preferred time. These data types can either be updated on the Settings View, or displayed for the

user to see on either of the three views (Home View, Profile View, or Settings View). All of our views will be reflected on the Activity Trackers screen (Stage).

Current Architecture Pattern (Class Diagram):



UML Diagram:



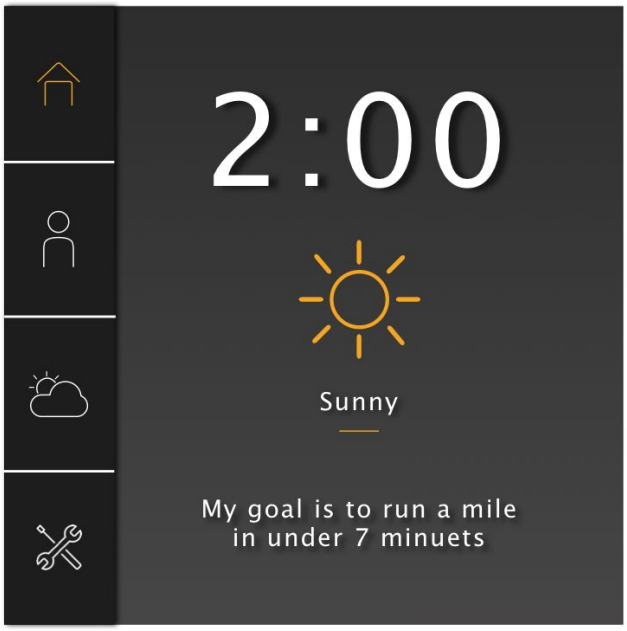
Supplemental Specs:

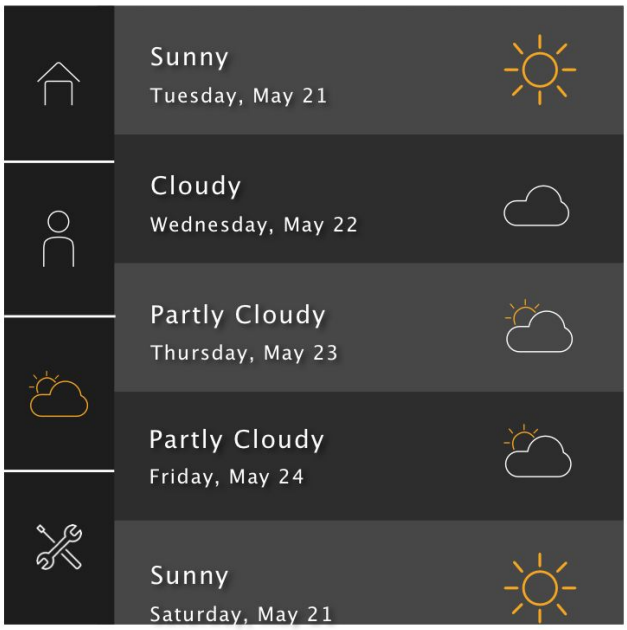
Functionality - Displaying and keeping the time is the apps highest priority.
Reliability - System of checks that will take place in order to make sure the app is running properly. Most common case is the app notifies the user with a pop up/notification and reboots.
Performance - The app will take no longer than 1 second to switch views or update the database

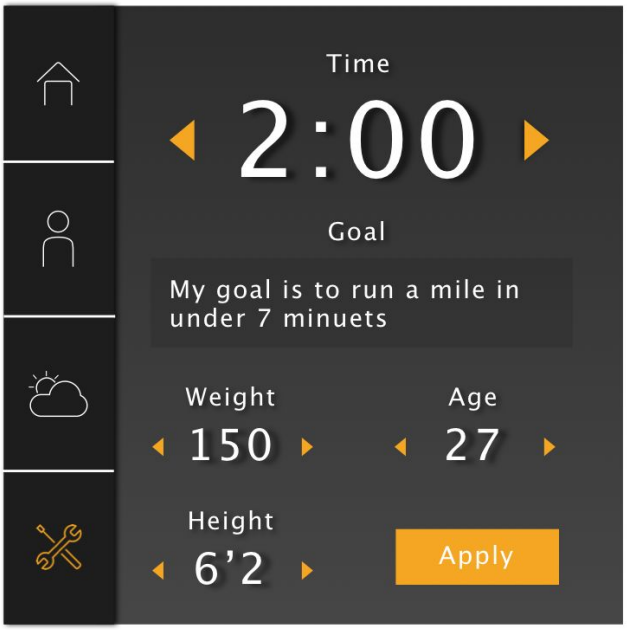
Usability - Due to small screen, text on screen should be able to be read from .5 - 1 ft away, avoid colors associated with common forms of colorblindness

HW Constraints - Due to time limitations the app will only be emulated on a computer and not on a fitbit.

Prototypes:



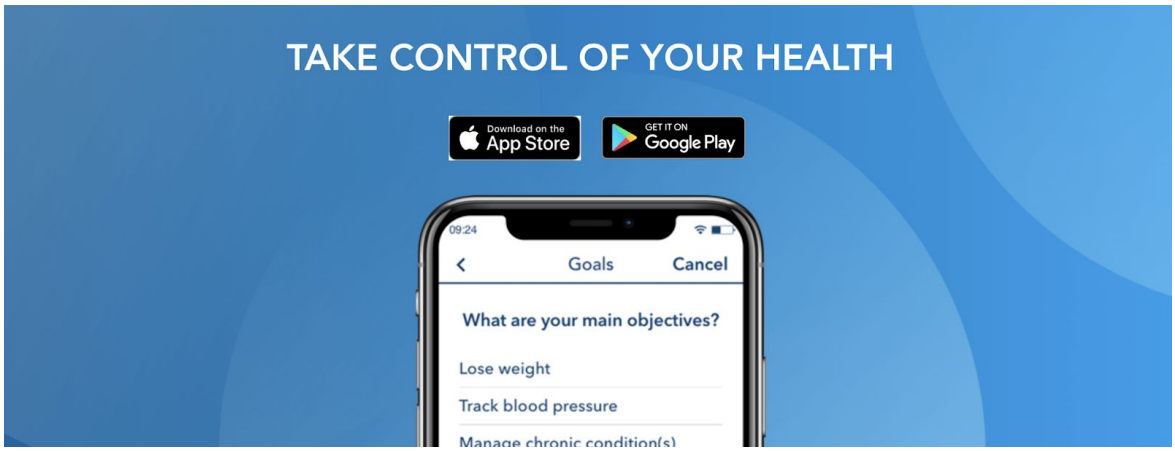




Sources:

I. TactioHealth

TactioHealth is a health and wellness app that can actively keep track of patient lab results and vaccination history. Tactio also allows wearers to view their blood glucose levels on the watch by getting a reading from a device implanted on the patient. It does this through IoT by getting hemoglobin A1C readings from the sensor on the implant. The implant then sends this information to the Fitbit and the Fitbit displays a color-coded feedback message telling the wearer what their A1C is and whether it is low, moderate or high. [2]

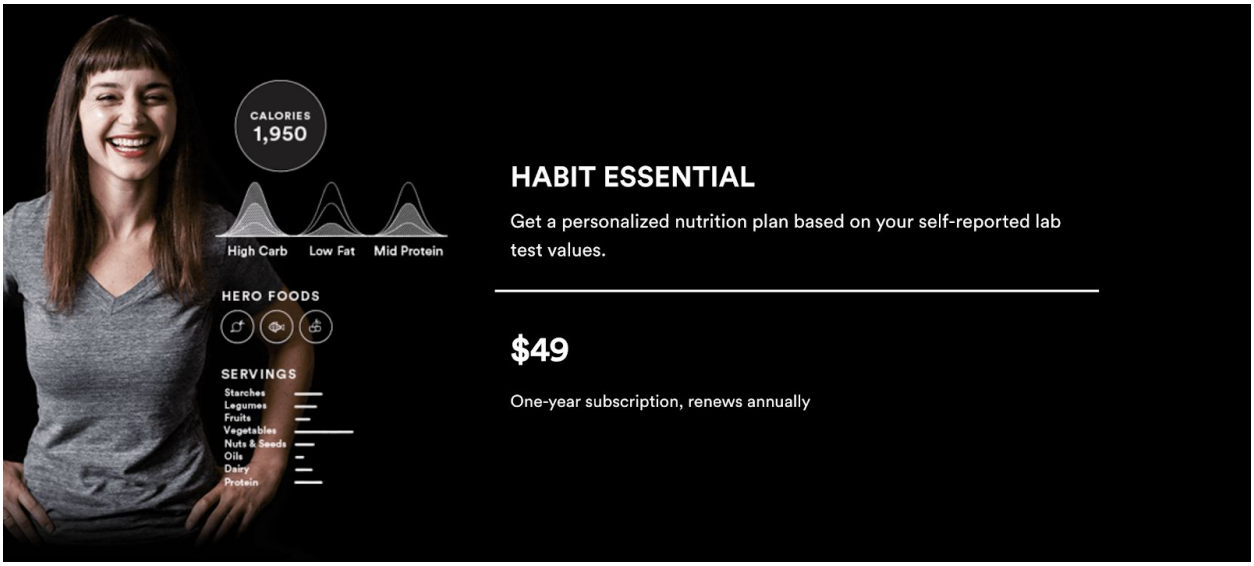


II. Habit

https://habit.com/

Habit is an online platform and mobile application to help users build customizable meal plans. The genius of Habit is its comprehensive approach to weight loss that includes biology-based nutrition recommendations, digital tools like food journaling, digital meal plans, recipe tracking, goal tracking, and activity tracking with FitBit. [3] To get started with Habit, first fill out a questionnaire. From there based recommendations look at your cholesterol levels, activity level, and personal wellness goal, to understand what your body

needs. With all the following information, Habit will customize your ideal plate, daily food guide, top-ranked foods in each food group, and personalized recipes. All with the intention of helping you push forward with your personal wellness goals. [3]



III. Endomondo

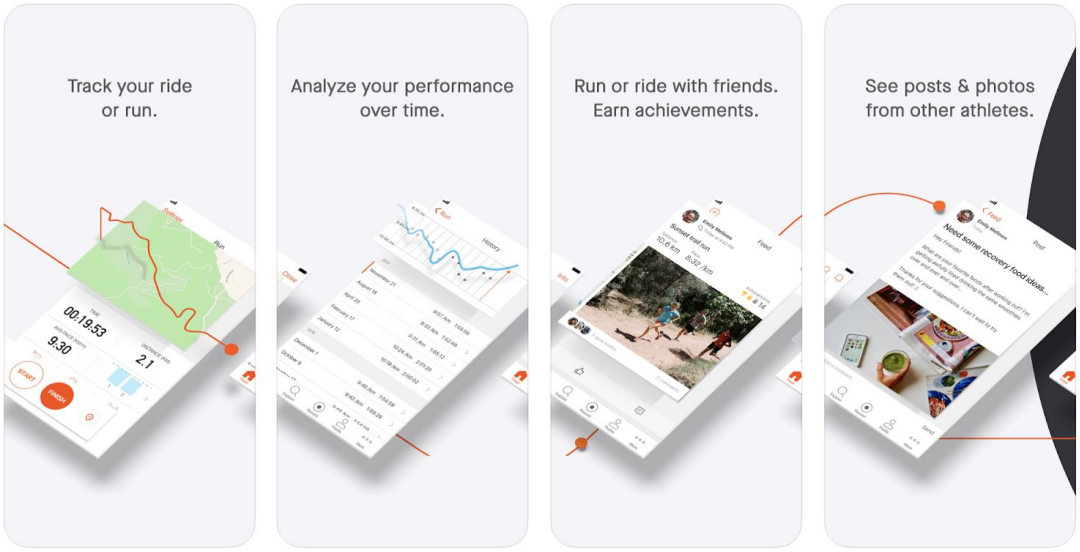
https://www.endomondo.com/

Endomondo turns your phone into a personal trainer in your pocket - ideal for running, cycling, walking and other distance sports. Connecting with a friend adds another layer of motivation and encouragement. Endomondo is integrated with a wide range of watches and sensors in order to enhance the user experience and provide you with more comprehensive workout data, such as heart rate stats. [4] Endomondo comes with a variety of features to help give users that personal trainer feel such as real-time GPS tracking, live maps, workout history, and heart rate sensors. Endomondo also comes with a variety of social features to help motivate you along your journeys like Global Fitness Communities, New Feed Sharing, and Facebook, Google+ and Twitter integration. Endomondo is a very comprehensive workout planner, however, it does not include meal prep features which is what Habit mainly focuses on. [4]

IV. Strava

https://www.strava.com/

Strava is the number one app for runners and cyclists. With features made for athletes, by athletes, Strava sets out to track and analyze every aspect of your exercise activity. Strava turns your iPhone and Android into a running and cycling computer. Strava also has the capabilities to be integrated Start Strava before an activity and you can track your favorite performance stats, and afterward, dive deep into your data. [5] Stravas key features include a runtime tracker, which will monitor your running distance over time. Performance analytics to give you feedback on your overall running goal, and social aspects to challenge competition among peers. [5]



V. Drivebit

https://drivebit.soft112.com/

A common issue that arises with Fitbit, or any fitness watch in general, is that sometimes when counting steps, the watch will misinterpret activities that do not consist of walking. Unfortunately, the watch has no other workaround other than manually logging driving activities so that it does not add steps to the step counter. Luckily, Drivebit has come up with a solution to make this a bit easier. A user can simply start the app and when prompted by the watch, they can enable that they are driving. This essentially turns off any count added to the pedometer. [6]

VI. Loseit

https://www.loseit.com/

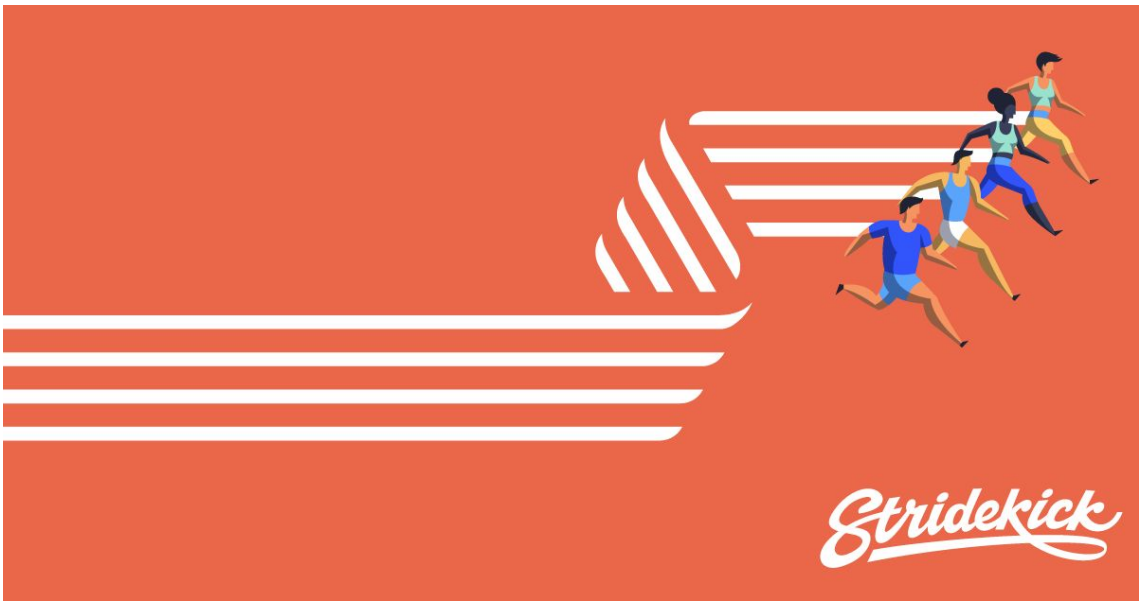
One of the main features of the Fitbit is the ability to track exercises and activities. Loseit wondered, what is the point of keeping track of all your exercising information? There really wasn't any, other than knowing that you have burned 400 calories today. Loseit's mission is to give the watch's ability to track all this information a purpose. The app begins by asking you a series of questions to learn a little bit more about you. It then uses this information to create a personalized daily calorie budget. It does this by allowing the user to track his/her calorie intake like the foods they eat and also deducts calories whenever the user

performs activities like running or biking. It uses the watches pedometer along with a few formulas based on your height, weight, and age to calculate a calorie budget for each user. [7]

VII. Stridekick

https://stridekick.com/

Stridekick connects to a number of different fitness trackers so you can compete with your friends no matter which device they use. Stridekick sets out to make exercising more social by engaging communities to challenge one another. Users can choose from three challenge modes: Leaderboard, Streak, and Target. After choosing, users can invite up to nine other people for friendly competition. [8] Users not only can join local games, but they can also join more significant community challenges with other runners on the Stridekick platform. New community challenges are always being added to keep users engaged, which pushes them closer and closer to their personal wellness goals. [8]



VIII. Trainerize

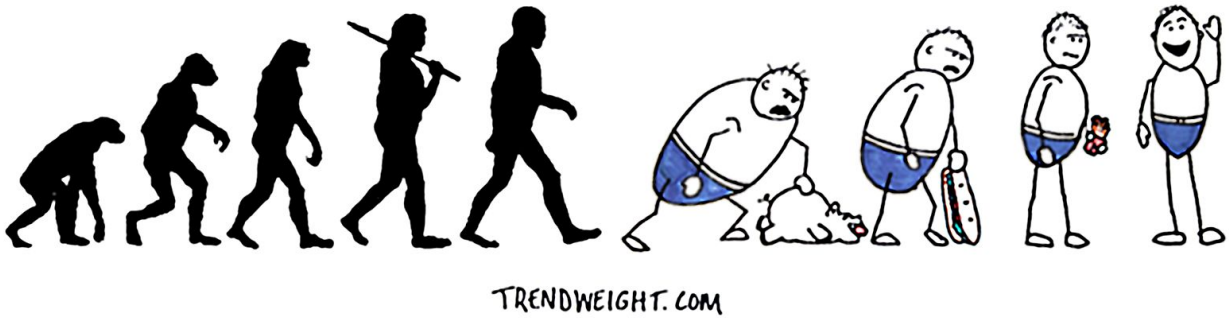
https://www.trainerize.com/

In a lot of fitness apps, we can see that the process is very automatic. And while that does work to a certain degree, it is missing that personal touch that real personal trainers can provide. Trainerize allows real fitness training professionals to set calorie goals and workouts for people through the app. The personal trainer can then give a user real feedback and tailor workouts accordingly. The reason this app is so successful is that it allows fitness trainers the ability to monitor the workout progress of their trainees and make sure they are getting the motivation that they need. The app uses the heart rate monitor, pedometer, and GPS to monitor the intensity of workouts and the duration to provide an accurate reading for the app. [9]

IX. Trendweight

https://trendweight.com/

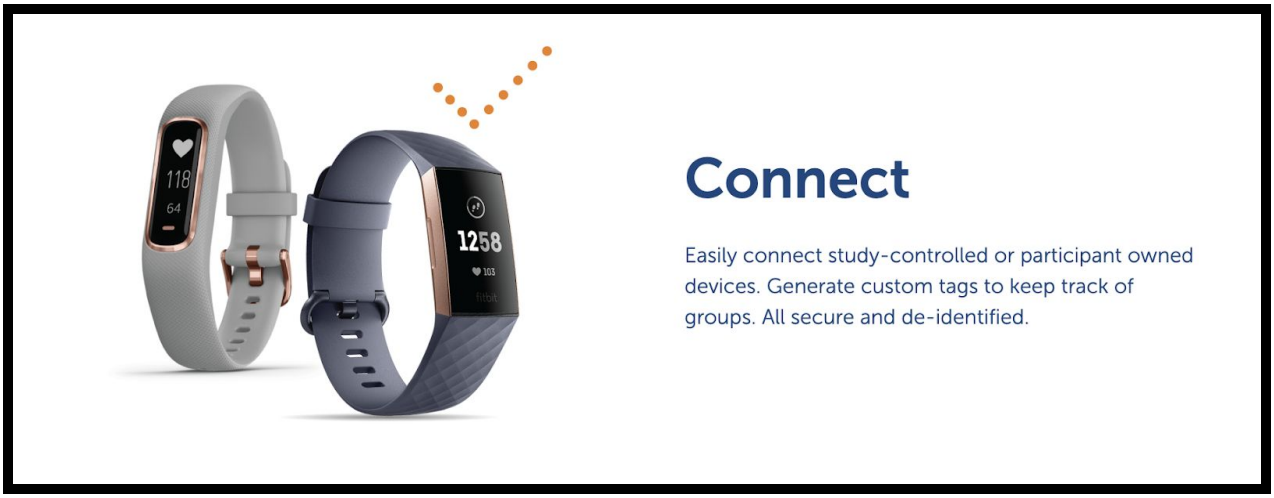
Trendwight is very different compared to traditional Fitbit apps. The purpose behind Trendweight is to teach people not to worry about day to day fluctuation of your body's weight but rather the trend over time. Trendweight only uses the watches interface to display a graph in which the user can see a calculated trend line based on their weigh-ins on a Bluetooth enabled scale. It plots a moving average in which this average can be used to determine a better idea of how your body's weight is trending, hence the name. [10]



X. Fitabase

https://www.fitabase.com/

Fitabase is a data management platform designed to support innovative research projects using wearable and internet-connected devices. Fitabase supports a wide ecosystem of wearable activity tracking devices and internet-connected scales such as Fitbit and Garmin. Fitabase is constantly exploring new opportunities to support additional devices and health data applications. [11] Fitabase includes daily trackers for several exercise routines such as steps, METs, Energy expenditure, heart rate, and floors. With many robust and personalized features, its the perfect application to integrate into an activity tracker. [11]



Research Conclusions:

The market for activity trackers is quite saturated. After viewing a number of different sources it is evident that our product needs a specific vision that causes it to stand out amongst all the different competitors. It is also worth looking into other features that could possibly be implemented that could improve features associated with the activity tracker we will be creating in the coming weeks.

References:

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